



**\$159,585,000**  
**THE JACKSON LABORATORY**  
**Taxable Bonds, Series 2018**

**Dated: Date of Delivery**

**Due: July 1, as shown on the inside cover**

The Jackson Laboratory Taxable Bonds, Series 2018 (the "Bonds") will be issued pursuant to the terms of an Indenture of Trust, dated as of March 1, 2018 (the "Indenture"), by and between The Jackson Laboratory (the "Institution") and U.S. Bank National Association, as Trustee (the "Trustee"). The Institution has authorized the issuance of the Bonds.

The Bonds will be issued in fully-registered form in denominations of \$1,000 or any integral multiple thereof and, when issued, will be registered under a book-entry system in the name of Cede & Co., as nominee of The Depository Trust Company, New York, New York ("DTC"). DTC will act as securities depository for the Bonds. Individual purchases will be made in book-entry form only, in principal amounts of \$1,000 or any integral multiple thereof. Purchasers of the Bonds will not receive physical certificates (except under certain circumstances described in the Indenture) representing their ownership interests in Bonds purchased. See "BOOK-ENTRY SYSTEM AND GLOBAL CLEARANCE PROCEDURES" herein.

Interest on the Bonds will be payable on January 1 and July 1 of each year, commencing on July 1, 2018. So long as the Bonds are held by DTC, the principal of and interest on or Redemption Price (as defined herein) of the Bonds will be payable by wire transfer to DTC, which in turn is required to remit such principal and interest or Redemption Price to the DTC Participants (as defined herein) for subsequent disbursement to the Beneficial Owners of the Bonds, as more fully described in "BOOK-ENTRY SYSTEM AND GLOBAL CLEARANCE PROCEDURES" herein.

**The Bonds are subject to optional and mandatory redemption prior to their stated maturities as described herein. See "THE BONDS – Redemption" herein.**

Interest on the Bonds is generally subject to inclusion in federal gross income of the Holders thereof. For a discussion of certain federal tax considerations, see "CERTAIN UNITED STATES FEDERAL INCOME TAX CONSIDERATIONS" herein.

The Bonds constitute an unsecured general obligation of the Institution. The Institution has other unsecured indebtedness outstanding. See APPENDIX A – "CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY – Outstanding Indebtedness." The Institution is not restricted by the Indenture or otherwise from incurring additional indebtedness. Such additional indebtedness, if issued, may be either secured or unsecured and may be entitled to payment prior to payment on the Bonds. See "PAYMENT PROVISIONS FOR THE BONDS" herein.

**This cover page contains certain information for quick reference only. It is not intended to be a summary of this issue. Investors are advised to read this entire Offering Memorandum to obtain information essential to the making of an informed investment decision.**

*The Bonds will be offered when, as and if issued and accepted by the Underwriter, subject to prior sale, to withdrawal or modification of the offer without notice, and to the approval of legality and certain other matters by Locke Lord LLP, Boston, Massachusetts, Bond Counsel to the Institution and by Ropes & Gray LLP, Boston, Massachusetts, counsel to the Institution. Certain legal matters will be passed upon for the Underwriter by its counsel, Greenberg Traurig, LLP, Boston, Massachusetts. The Bonds are expected to be available for delivery to DTC in New York, New York or its custodial agent on or about March 19, 2018.*

**Barclays**

**\$159,585,000**  
**THE JACKSON LABORATORY**  
**TAXABLE BONDS, SERIES 2018**

**Maturities, Principal Amounts, Interest Rates, Prices and CUSIP Numbers<sup>†</sup>**

**\$78,240,000 Serial Bonds**

<u>Due</u> <u>July 1</u>	<u>Principal</u> <u>Amount</u>	<u>Interest</u> <u>Rate</u>	<u>Price</u>	<u>CUSIP</u> <u>Number<sup>†</sup></u>
2018	\$2,065,000	2.250%	100.00%	468223AA0
2019	4,635,000	2.616	100.00	468223AB8
2020	4,740,000	2.816	100.00	468223AC6
2021	4,865,000	2.978	100.00	468223AD4
2022	4,990,000	3.137	100.00	468223AE2
2023	4,815,000	3.287	100.00	468223AF9
2024	4,955,000	3.492	100.00	468223AG7
2025	5,110,000	3.642	100.00	468223AH5
2026	5,285,000	3.720	100.00	468223AJ1
2027	5,460,000	3.770	100.00	468223AK8
2028	5,650,000	3.870	100.00	468223AL6
2029	5,845,000	3.920	100.00	468223AM4
2030	6,055,000	3.970	100.00	468223AN2
2031	6,280,000	4.020	100.00	468223AP7
2032	3,670,000	4.070	100.00	468223AQ5
2033	3,820,000	4.120	100.00	468223AR3

\$21,650,000 4.234% Term Bond due July 1, 2038, Price: 100.00% CUSIP Number: 468223AS1<sup>†</sup>  
 \$59,695,000 4.334% Term Bond due July 1, 2048, Price 100.00% CUSIP Number: 468223AT9<sup>†</sup>

<sup>†</sup> CUSIP® is a registered trademark of the American Bankers Association. CUSIP Global Services (“CGS”) is managed on behalf of the American Bankers Association by S&P Global Market Intelligence. Copyright © 2018 CUSIP Global Services. All rights reserved. CUSIP® data herein is provided by CGS. This data is not intended to create a database and does not serve in any way as a substitute for the CGS database. The CUSIP numbers listed above are being provided solely for the convenience of Bondholders only at the time of issuance of the Bonds and no representation is made with respect to the correctness thereof. The CUSIP® number for a specific maturity is subject to being changed after the issuance of the Bonds as a result of the various subsequent actions including, but not limited to, a refunding in whole or in part of such maturity or as a result of the procurement of secondary market portfolio insurance or other similar enhancement by investors that is applicable to all or a portion of certain maturities of the Bonds. None of the Institution, the Trustee or the Underwriter has agreed to, nor is there any duty or obligation to, update this Offering Memorandum to reflect any change or correction in the CUSIP® numbers printed above.

**IN CONNECTION WITH THE OFFERING OF THE BONDS, THE UNDERWRITER MAY OVERALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE BONDS AT LEVELS ABOVE THOSE WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME. THE UNDERWRITER MAY OFFER AND SELL THE BONDS TO CERTAIN DEALERS AND DEALER BANKS AND OTHERS AT A PRICE LOWER THAN THE PUBLIC OFFERING PRICES STATED ON THE INSIDE COVER PAGE HEREOF AND SAID OFFERING PRICES MAY BE CHANGED FROM TIME TO TIME BY THE UNDERWRITER.**

No dealer, broker, salesperson or other person has been authorized by the Institution or the Underwriter to give any information or to make any representations with respect to the Bonds, other than those contained in this Offering Memorandum, and, if given or made, such other information or representations must not be relied upon as having been authorized by any of the foregoing. This Offering Memorandum does not constitute an offer by any person to sell or the solicitation by any person of an offer to buy, nor shall there be any sale of the Bonds by any person in any jurisdiction in which it is unlawful for such person to make such offer, solicitation or sale.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THE BONDS, OR DETERMINED THAT THIS OFFERING MEMORANDUM IS ACCURATE OR COMPLETE. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE. The Bonds have not been and will not be registered under the Securities Act of 1933, as amended (the "Securities Act"), and are being issued in reliance on the exemption contained in Section 3(a)(4) thereof. The Bonds are not exempt in every jurisdiction in the United States; some jurisdictions' securities laws (the "blue sky laws") may require a filing and a fee to secure the Bonds' exemption from registration.

The distribution of this Offering Memorandum and the offer or sale of Bonds may be restricted by law in certain jurisdictions. Neither the Institution nor the Underwriter represents that this Offering Memorandum may be lawfully distributed, or that any Bonds may be lawfully offered, in compliance with any applicable registration or other requirements in any such jurisdiction, or pursuant to an exemption available thereunder, or assume any responsibility for facilitating any such distribution or offering. In particular, no action has been taken by the Institution or the Underwriter that would permit a public offering of any of the Bonds or distribution of this Offering Memorandum in any jurisdiction where action for that purpose is required. To be clear, action may be required to secure exemptions from the blue sky registration requirements either for the primary distributions or any secondary sales that may occur. Accordingly, none of the Bonds may be offered or sold, directly or indirectly, and neither this Offering Memorandum nor any advertisement or other offering material may be distributed or published in any jurisdiction, except under circumstances that will result in compliance with any applicable laws and regulations.

All information set forth herein has been obtained from the Institution and other sources that the Institution believes to be reliable. Estimates and opinions are included and should not be interpreted as statements of fact. Summaries of documents do not purport to be complete statements of their provisions. The information and expressions of opinion herein are made as of the date hereof and are subject to change without notice, and neither the delivery of this Offering Memorandum nor any sale made hereunder will, under any circumstances, create any implication that there has been no change in the affairs of the Institution since the date hereof.

Certain statements included or incorporated by reference in this Offering Memorandum may constitute "forward looking statements" within the meaning of the United States Private Securities Litigation Reform Act of 1995, Section 21E of the United States Securities Exchange Act of 1934, as amended, and Section 27A of the Securities Act. Such statements are generally identifiable by the terminology used such as "plan," "expect," "estimate," "budget," "intend," "projection" or other similar words. Such forward-looking statements include, but are not limited to, certain statements contained in the information in APPENDIX A – "CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY." A number of important factors, including factors affecting the Institution's financial condition and factors which are otherwise unrelated thereto, could cause actual results to differ materially from those stated in such forward-looking statements. THE INSTITUTION DOES NOT PLAN TO ISSUE ANY UPDATES OR REVISIONS TO THOSE FORWARD-LOOKING STATEMENTS IF OR WHEN ITS EXPECTATIONS CHANGE, OR EVENTS, CONDITIONS OR CIRCUMSTANCES ON WHICH SUCH STATEMENTS ARE BASED OCCUR OR FAIL TO OCCUR.

The Underwriter has provided the following sentence for inclusion in this Offering Memorandum. The Underwriter has reviewed the information in this Offering Memorandum in accordance with, and as part of, its responsibility to investors under the federal securities laws as applied to the facts and circumstances of this transaction, but the Underwriter does not guarantee the accuracy or completeness of such information.

## **INFORMATION COVERING OFFERING RESTRICTIONS IN CERTAIN JURISDICTIONS OUTSIDE THE UNITED STATES**

### **EUROPEAN ECONOMIC AREA**

IN RELATION TO EACH MEMBER STATE OF THE EUROPEAN ECONOMIC AREA (THE “EEA”) THAT HAS IMPLEMENTED THE PROSPECTUS DIRECTIVE (EACH, A “RELEVANT MEMBER STATE”), THE UNDERWRITER HAS REPRESENTED AND AGREED THAT WITH EFFECT FROM AND INCLUDING THE DATE ON WHICH THE PROSPECTUS DIRECTIVE IS IMPLEMENTED IN THAT RELEVANT MEMBER STATE (THE “RELEVANT IMPLEMENTATION DATE”) IT HAS NOT MADE AND WILL NOT MAKE AN OFFER OF ANY BONDS WHICH ARE THE SUBJECT OF THE OFFERING CONTEMPLATED BY THIS OFFERING MEMORANDUM TO THE PUBLIC IN THAT RELEVANT MEMBER STATE OTHER THAN: (A) TO ANY LEGAL ENTITY WHICH IS A “QUALIFIED INVESTOR” AS DEFINED IN THE PROSPECTUS DIRECTIVE; (B) TO FEWER THAN 150 NATURAL OR LEGAL PERSONS (OTHER THAN QUALIFIED INVESTORS AS DEFINED IN THE PROSPECTUS DIRECTIVE) IN SUCH MEMBER STATE AS PERMITTED UNDER THE PROSPECTUS DIRECTIVE; OR (C) IN ANY OTHER CIRCUMSTANCES FALLING WITHIN ARTICLE 3(2) OF THE PROSPECTUS DIRECTIVE; PROVIDED THAT NO SUCH OFFER OF THE BONDS SHALL REQUIRE THE INSTITUTION OR ANY UNDERWRITER TO PUBLISH A PROSPECTUS PURSUANT TO ARTICLE 3 OF THE PROSPECTUS DIRECTIVE.

FOR THE PURPOSES OF THIS PROVISION, THE EXPRESSION AN “OFFER OF BONDS TO THE PUBLIC” IN RELATION TO THE BONDS IN ANY RELEVANT MEMBER STATE MEANS THE COMMUNICATION IN ANY FORM AND BY ANY MEANS OF SUFFICIENT INFORMATION ON THE TERMS OF THE OFFER AND THE BONDS TO BE OFFERED SO AS TO ENABLE AN INVESTOR TO DECIDE TO PURCHASE OR SUBSCRIBE THE BONDS, AS THE SAME MAY BE VARIED IN THAT MEMBER STATE BY ANY MEASURE IMPLEMENTING THE PROSPECTUS DIRECTIVE IN THAT MEMBER STATE, THE EXPRESSION “PROSPECTUS DIRECTIVE” MEANS DIRECTIVE 2003/71/EC (AND AMENDMENTS THERETO, INCLUDING THE 2010 PD AMENDING DIRECTIVE, TO THE EXTENT IMPLEMENTED IN THE RELEVANT MEMBER STATE) AND INCLUDES ANY RELEVANT IMPLEMENTING MEASURE IN THE RELEVANT MEMBER STATE AND THE EXPRESSION “2010 PD AMENDING DIRECTIVE” MEANS DIRECTIVE 2010/73/EU.

### **UNITED KINGDOM**

THE UNDERWRITER HAS REPRESENTED AND AGREED THAT: (I) IT HAS ONLY COMMUNICATED OR CAUSED TO BE COMMUNICATED AND WILL ONLY COMMUNICATE OR CAUSE TO BE COMMUNICATED, AN INVITATION OR INDUCEMENT TO ENGAGE IN INVESTMENT ACTIVITY (WITHIN THE MEANING OF SECTION 21 OF THE FINANCIAL SERVICES AND MARKETS ACT 2000 (THE “FSMA”)) RECEIVED BY IT IN CONNECTION WITH THE ISSUE OR SALE OF ANY BONDS IN CIRCUMSTANCES IN WHICH SECTION 21(1) OF THE FSMA DOES NOT APPLY TO THE INSTITUTION; AND (II) HAS COMPLIED AND WILL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE FSMA WITH RESPECT TO ANYTHING DONE BY IT IN RELATION TO THE BONDS IN, FROM OR OTHERWISE INVOLVING OR BEING CAPABLE OF HAVING EFFECT IN THE UNITED KINGDOM.

### **NOTICE TO U.K. AND EEA INVESTORS**

This Offering Memorandum is not a prospectus for the purpose of the Prospectus Directive implemented in member states of the EEA. This Offering Memorandum has been prepared on the basis that any offer of the Bonds in any Relevant Member State will be made pursuant to an exemption under the Prospectus Directive from the requirement to publish a prospectus for offers of the Bonds. Accordingly any person making or intending to make an offer in that Relevant Member State of the Bonds which are the subject of the offering contemplated in this Offering Memorandum may only do so in circumstances in which no obligation arises for the Institution or the Underwriter to publish a prospectus pursuant to Article 3 of the Prospectus Directive, in each case, in relation to such offer. Neither the Institution nor the Underwriter has authorized, nor do either authorize, the making of any offer of the Bonds in circumstances in which an obligation arises to publish a prospectus for such offer.

In the case of any Bonds being offered to a financial intermediary as that term is used in Article 3(2) of the Prospectus Directive, such financial intermediary will be deemed to have represented, acknowledged and agreed that the Bonds acquired by it in the offering have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an obligation for the Institution or the Underwriter to publish a prospectus pursuant to Article 3 of the Prospectus Directive. The Institution, the Underwriter and their respective affiliates and others will rely upon the truth and accuracy of the foregoing representation, acknowledgment and agreement.

This Offering Memorandum is for distribution in member states of the EEA only to, and is only directed at, persons who are “qualified investors” within the meaning of Article 2.1(e) of the Prospectus Directive. In the United Kingdom, this Offering Memorandum is only being distributed to, and is only directed at qualified investors (i) who have professional experience in matters relating to investments and fall within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended (the “Order”) or (ii) who fall within Article 49(2)(a) to (d) (“high net worth companies, unincorporated associations, etc.”) of the Order or (iii) to whom this Offering Memorandum can be lawfully communicated or caused to be communicated (all such persons together being referred to as “relevant persons”). This Offering Memorandum must not be acted on or relied on (i) in the United Kingdom, by persons who are not relevant persons and (ii) in any member state of the EEA, by persons who are not qualified investors. The Bonds are only available to and any investment or investment activity to which this Offering Memorandum relates is available only to (i) in the United Kingdom, relevant persons and (ii) in any member state of the EEA, qualified investors, and will be engaged in only with such persons.

The Bonds are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the EEA. For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client as defined in point (11) of Article 4(1) of Directive 2014/65/EU (as amended, “MiFID II”); (ii) a customer within the meaning of Directive 2002/92/EC (as amended, the “Insurance Mediation Directive”), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or (iii) not a qualified investor as defined in Directive 2003/71/EC (as amended, the “Prospectus Directive”). No key information document required by Regulation (EU) No 1286/2014 (as amended, the “PRIIPs Regulation”) for offering or selling packaged retail and insurance-based investment products or otherwise making them available to retail investors in the EEA has been prepared and therefore offering or selling the Bonds or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

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# OFFERING MEMORANDUM

Relating to

\$159,585,000

THE JACKSON LABORATORY

Taxable Bonds, Series 2018

## INTRODUCTION

### Purpose of this Offering Memorandum

The purpose of this Offering Memorandum, including the cover page and appendices hereto, is to set forth certain information concerning The Jackson Laboratory (the “Institution”) and the issuance of its \$159,585,000 The Jackson Laboratory Taxable Bonds, Series 2018 (the “Bonds”). The information contained in this Offering Memorandum is provided for use in connection with the initial sale of the Bonds. The definitions of certain terms used and not defined herein are contained in APPENDIX C – “DEFINITIONS OF CERTAIN TERMS.”

### Use of Proceeds

The Institution expects to use the proceeds of the Bonds (i) to expand, renovate, improve and equip an existing facility owned by the Institution located in Ellsworth, Maine, (ii) to refund certain outstanding indebtedness of the Institution, (iii) for other general corporate purposes, consistent with its status as an organization described in Section 501(c)(3) of the Internal Revenue Code of 1986, as amended (the “Code”), and (iv) to pay the costs of issuing the Bonds. See “USE OF PROCEEDS” and APPENDIX A – “CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY – Facilities – Ellsworth, Maine,” and “-The Ellsworth Project.”

### The Institution

The Institution is an independent, nonprofit corporation organized and existing under the laws of the State of Maine. The Institution, also referred to herein as the “Laboratory” and “JAX,” is a research organization whose mission is to discover precise genomic solutions for human diseases to enable research and education in the biomedical community. The Institution’s main campus is located in Bar Harbor, Maine; JAX also maintains locations in Sacramento, California, Farmington, Connecticut, and Ellsworth and Augusta, Maine. See APPENDIX A – “CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY” and APPENDIX B – “FINANCIAL STATEMENTS OF THE JACKSON LABORATORY.”

### The Bonds

The Bonds will be issued in accordance with the provisions of the Indenture of Trust, dated as of March 1, 2018 (the “Indenture”), by and between the Institution and U.S. Bank National Association, as Trustee (the “Trustee”). Pursuant to the Indenture, on each Payment Date, until the principal of and interest on the Bonds shall have been paid or provision for such payment shall have been made as provided in the Indenture, the Institution will pay the Trustee a sum equal to the amount payable on such Payment Date as principal of and interest on the Bonds. See “THE BONDS” herein.

## **Redemption**

The Bonds are subject to optional and mandatory sinking fund redemption prior to maturity at the Redemption Price described herein. See “THE BONDS – Redemption” herein.

## **Book-Entry System and Global Clearance Procedures**

When delivered, the Bonds will be registered in the name of Cede & Co., the nominee of The Depository Trust Company (“DTC”). DTC will act as the securities depository for the Bonds. Purchases of the Bonds may be made in book-entry form only, through brokers and dealers who are, or who act through, DTC Participants (as hereinafter defined). Beneficial Owners of the Bonds will not receive physical delivery of certificated securities (except under certain circumstances described in the Indenture). Payment of the principal of and interest on or Redemption Price of the Bonds are payable by the Trustee to DTC, which will in turn remit such payments to the DTC Participants, which will in turn remit such payments to the Beneficial Owners of the Bonds. In addition, so long as Cede & Co. is the registered owner of the Bonds, the right of any Beneficial Owner to receive payment for any Bond will be based only upon and subject to the procedures and limitations of the DTC book-entry system. Purchasers may own beneficial ownership interests in the Bonds through DTC (in the United States) or Clearstream Banking S.A. (“Clearstream Luxembourg”) or Euroclear Bank S.A./N.V. or its successor, as operator of the Euroclear System (“Euroclear”) (in Europe). See “BOOK-ENTRY SYSTEM AND GLOBAL CLEARANCE PROCEDURES” herein.

## **Security for the Bonds**

**The Bonds constitute unsecured general obligations of the Institution. The Institution has other unsecured indebtedness outstanding. See “Outstanding Indebtedness” below. The Institution is not restricted by the Indenture or otherwise from incurring additional indebtedness. Such additional indebtedness, if issued, may be either secured or unsecured and may be entitled to payment prior to payment on the Bonds. See “PAYMENT PROVISIONS FOR THE BONDS” herein.**

## **Outstanding Indebtedness**

As of December 31, 2017, the outstanding principal amount of the long-term indebtedness of the Institution totaled approximately \$88.829 million, of which \$33.165 million is expected to be refunded with a portion of the proceeds of the Bonds. See “USE OF PROCEEDS.” For additional information regarding the outstanding indebtedness of the Institution, see “ANNUAL DEBT SERVICE REQUIREMENTS,” APPENDIX A – “CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY – Outstanding Indebtedness,” and APPENDIX B – “FINANCIAL STATEMENTS OF THE JACKSON LABORATORY.”

## **Certain Information Related to this Offering Memorandum**

The descriptions herein of the Indenture and other documents relating to the Bonds do not purport to be complete and are qualified in their entirety by reference to such documents, and the description herein of the Bonds is qualified in its entirety by the form thereof and the information with respect thereto included in such documents. See APPENDIX D – “SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE” for a brief summary of the Indenture.

All capitalized terms used in this Offering Memorandum and not otherwise defined herein have the same meanings as in the Indenture. See APPENDIX C – “DEFINITIONS OF CERTAIN TERMS” for definitions of certain words and terms used but not otherwise defined herein.



The information and expressions of opinion herein speak only as of their date and are subject to change without notice. Neither delivery of this Offering Memorandum nor any sale made hereunder nor any future use of this Offering Memorandum will, under any circumstances, create any implication that there has been no change in the affairs of the Institution.

## THE BONDS

### General

The Bonds will be dated as of the date of their original issuance and will bear interest and mature (subject to prior redemption) as shown on the inside cover page hereof. The Bonds will be delivered in the form of fully registered Bonds in denominations of \$1,000 or any integral multiple thereof. The Bonds will be registered under a book-entry system initially in the name of “Cede & Co.,” as nominee of DTC and will be evidenced by bond certificates in the aggregate principal amount of each maturity of the Bonds. Registered ownership of the Bonds, or any portions thereof, may not thereafter be transferred except as set forth in the Indenture. See “BOOK-ENTRY SYSTEM AND GLOBAL CLEARANCE PROCEDURES” herein.

Interest on the Bonds will be payable semiannually, on January 1 and July 1 of each year (each, an “Interest Payment Date”), commencing on July 1, 2018, and will be calculated on the basis of a 360-day year, consisting of twelve 30-day months.

The principal and Redemption Price of the Bonds will be payable by check or by wire transfer of immediately available funds in lawful money of the United States of America upon presentation and surrender of such Bonds at the Designated Office of the Trustee.

Interest on the Bonds will be payable from the later of (i) the date of issuance, and (ii) the most recent Interest Payment Date to which interest has been paid or duly provided for. Payment of the interest on each Interest Payment Date will be made to the Person whose name appears on the bond registration books of the Trustee as the Holder thereof as of the close of business on the Record Date for each Interest Payment Date, such interest to be paid by check mailed by first class mail to such Holder at its address as it appears on such registration books, or, upon the written request of any Holder of at least \$1,000,000 in aggregate principal amount of Bonds, submitted to the Trustee at least one Business Day prior to the Record Date, by wire transfer in immediately available funds to an account within the United States designated by such Holder. The Record Date is the 15<sup>th</sup> day of the month immediately preceding each Interest Payment Date. Notwithstanding the foregoing, as long as Cede & Co. is the Holder of all or part of the Bonds in book-entry form, said principal, Redemption Price and interest payments will be made to Cede & Co. by wire transfer in immediately available funds.

### Redemption

#### *Optional Redemption*

The Bonds are subject to optional redemption prior to maturity at the written direction of the Institution to the Trustee, in whole or in part (in Authorized Denominations) on any Business Day at a Redemption Price equal to the Make-Whole Redemption Price. The “Make-Whole Redemption Price” is equal to (a) the greater of (i) 100% of the principal amount of the Bonds to be redeemed and (ii) the sum of the present values of the remaining scheduled payments of principal and interest to the respective maturity date of the Bonds to be redeemed, not including any portion of those payments of interest accrued and unpaid as of the date on which the Bonds are to be redeemed, discounted to the date on which the Bonds are to be redeemed, on a semi-annual basis (assuming a 360-day year consisting of twelve 30-day months) at the Treasury Rate (as defined below), plus (A) with respect to the Bonds maturing on July 1, 2018, to and including July 1, 2023, 10 basis points, (B)

with respect to the Bonds maturing on July 1, 2024, to and including July 1, 2028, 15 basis points, and (C) with respect to the Bonds maturing on July 1, 2029, to and including July 1, 2048, 20 basis points, plus (b) accrued and unpaid interest on the Bonds to be redeemed to the date fixed for redemption.

The Make-Whole Redemption Price of Bonds to be redeemed pursuant to the Indenture shall be determined by an independent accounting firm, investment banking firm or financial advisor (the “Calculation Agent”) retained by the Institution at the Institution’s expense to calculate such Make-Whole Redemption Price, and certified to the Institution and the Trustee by the Calculation Agent. The Trustee and the Institution may conclusively rely on the Calculation Agent’s determination of such Make-Whole Redemption Price and neither the Trustee nor the Institution shall be liable for such reliance.

“**Business Day**” for purposes of this section “Optional Redemption” means any day other than a day on which banks in New York, New York, Chicago, Illinois, or the city in which the Trustee maintains its designated office are required or authorized to close.

“**Make Whole Period**” means the number of years, including any fractional portion thereof, calculated on the basis of a 360-day year consisting of twelve 30-day months, between the redemption date and the respective maturity of each Bond to be redeemed.

“**Treasury Rate**” means, as of any redemption date, the time-weighted interpolated average yield for a term equal to the Make Whole Period of the yields of the two United States Treasury nominal securities at constant maturity (as compiled and published in the most recent Federal Reserve Statistical Release H.15 (519) that has become publicly available at least two Business Days but not more than 30 calendar days prior to the redemption date (excluding inflation indexed securities), or, if such Statistical Release is no longer published, any publicly available source of similar market data) maturing immediately preceding and succeeding the Make Whole Period. The Treasury Rate will be determined by the Calculation Agent.

***Mandatory Redemption***

The Bonds maturing on July 1, 2038 and July 1, 2048 are subject to mandatory redemption from sinking fund installments in the years and principal amounts set forth below, without premium, plus accrued interest to the date fixed for redemption.

**Term Bond Due July 1, 2038**

<u>Year</u>	<u>Sinking Fund Installment</u>
2034	\$3,980,000
2035	4,145,000
2036	4,325,000
2037	4,505,000
2038 <sup>†</sup>	4,695,000

**Term Bond Due July 1, 2048**

<u>Year</u>	<u>Sinking Fund Installment</u>	<u>Year</u>	<u>Sinking Fund Installment</u>
2039	\$4,895,000	2044	\$6,050,000
2040	5,110,000	2045	6,315,000
2041	5,330,000	2046	6,590,000
2042	5,560,000	2047	6,875,000
2043	5,800,000	2048 <sup>†</sup>	7,170,000

<sup>†</sup> Maturity.

### ***Partial Redemption of Bonds***

Upon surrender of any Bond redeemed in part only, the Institution will execute (but need not prepare) and the Trustee will prepare or cause to be prepared, authenticate and deliver to the Holder thereof, at the expense of the Institution, a new Bond or Bonds of Authorized Denominations, equal in aggregate principal amount to the unredeemed portion of the Bond surrendered.

### ***Effect of Redemption***

Notice of redemption having been duly given as provided in the Indenture and as described herein, and moneys for payment of the Redemption Price of and interest accrued on the Bonds (or portion thereof) so called for redemption being held by the Trustee, the Bonds (or portion thereof) so called for redemption shall become due and payable on the date fixed for redemption designated in such notice at the Redemption Price specified in such notice, plus interest accrued thereon to such date of redemption, and interest on the Bonds (or portion thereof) so called for redemption shall cease to accrue, said Bonds (or portion thereof) will cease to be entitled to any benefit or security under the Indenture, and the Holders of said Bonds will have no rights in respect thereof except to receive payment of said Redemption Price from funds held by the Trustee for such payment.

### ***Notice of Redemption***

Notice of optional redemption will be mailed by the Trustee by first class mail, not less than 20 days nor more than 35 days prior to the redemption date, to the respective Holders of any Bonds designated for redemption at their addresses appearing on the bond registration books of the Trustee. If the Bonds are no longer held by the Securities Depository or its successor or substitute, the Trustee shall also give notice of redemption by overnight mail to such securities depositories and/or securities information services as shall be designated in a Certificate of the Institution. Each notice of redemption shall state the date of such notice, the date of issue of the Bonds, the redemption date, the Redemption Price, the method of calculating the Make-Whole Redemption Price (if applicable), the place or places of redemption (including the name and appropriate address or addresses of the Trustee), the maturity (including CUSIP number, if any), and, in the case of Bonds to be redeemed in part only, the portion of the principal amount thereof to be redeemed. Each such notice will also state that on said date there will become due and payable on each of said Bonds the Redemption Price thereof or of said specified portion of the principal amount thereof in the case of a Bond to be redeemed in part only, together with interest accrued thereon to the redemption date, and that from and after such redemption date interest thereon shall cease to accrue, and shall require that such Bonds be then surrendered.

Failure by the Trustee to give notice as described above to any one or more of the securities information services or depositories designated by the Institution, or the insufficiency of any such notice will not affect the sufficiency of the proceedings for redemption. Failure by the Trustee to mail notice of redemption to any one or more of the respective Holders of any Bonds designated for redemption will not affect the sufficiency of the proceedings for redemption with respect to the Holders to whom such notice was mailed.

The Institution may instruct the Trustee to provide conditional notice of redemption, which may be conditioned upon the receipt of moneys or any other event. Additionally, any such notice may be rescinded by written notice given to the Trustee by the Institution no later than five Business Days prior to the date specified for redemption. The Trustee will give notice of such rescission, as soon thereafter as practicable, in the same manner, to the same Persons, as notice of such redemption was given. Any failure of the Institution to pay the Redemption Price on the date fixed for redemption as a result of the failure to meet a condition specified in a conditional redemption notice shall not constitute an Event of Default under the Indenture.

### ***Selection of Bonds for Redemption***

If the Bonds are registered in book-entry form and so long as DTC or a successor securities depository is the sole registered owner of the Bonds, notwithstanding the description below under “BOOK ENTRY SYSTEM AND GLOBAL CLEARANCE PROCEDURES,” if less than all of the Bonds are called for redemption prior to maturity, the particular maturity or maturities of the Bonds or portions thereof to be redeemed shall be allocated on a pro rata pass-through distribution of principal basis in accordance with DTC procedures, provided that, so long as the Bonds are held in book-entry form, the selection for redemption of such Bonds shall be made in accordance with the operational arrangements of DTC then in effect. If the DTC operational arrangements do not allow for the redemption of the Bonds on a pro rata pass-through distribution of principal basis as described above, then the Bonds will be selected for redemption, in accordance with DTC procedures, by lot or in such other manner as is in accordance with the applicable DTC operational arrangements.

The Institution intends that redemption allocations made by DTC be made on a pro rata pass-through distribution of principal basis as described above. However, none of the Institution, the Trustee or the Underwriter can provide any assurance that DTC, the DTC Participants or any other intermediary will allocate the redemption of Bonds on such basis.

For purposes of calculation of the pro rata pass-through distribution of principal, “pro rata,” means, for any amount of principal to be paid, the application of a fraction to each denomination of the respective Bonds where (i) the numerator is equal to the amount due to the respective Bondholders on a Payment Date, and (ii) the denominator is equal to the total original par amount of the respective Bonds.

If the Bonds are no longer registered in book-entry form, each owner will receive an amount of Bonds equal to the original face amount then beneficially held by that owner, registered in such owner’s name. Thereafter, any redemption of less than all of the Bonds will continue to be paid to the registered owners of such Bonds on a pro-rata basis, based on the portion of the original face amount of any such Bonds to be redeemed.

## **BOOK-ENTRY SYSTEM AND GLOBAL CLEARANCE PROCEDURES**

### **DTC and Book-Entry System**

*The information set forth below concerning DTC and DTC’s book-entry system has been obtained from sources that the Institution and the Underwriter believe to be reliable, but neither the Institution nor the Underwriter takes any responsibility for the accuracy thereof.*

The Depository Trust Company, New York, New York, will act as securities depository for the Bonds. The Bonds will be issued as fully-registered securities registered in the name of Cede & Co. (DTC’s partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully registered bond certificate will be issued in the aggregate principal amount of the Bonds and will be deposited with DTC.

DTC, the world’s largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a “banking organization” within the meaning of the New York Banking Law, a member of the Federal Reserve System, a “clearing corporation” within the meaning of the New York Uniform Commercial Code, and a “clearing agency” registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934, as amended. DTC holds and provides asset servicing for over 3.5 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments from over 100 countries that DTC’s participants (“Direct Participants”) deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities through electronic computerized book-entry transfers and pledges between Direct Participants’

accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation (“DTCC”). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly (“Indirect Participants,” and together with Direct Participants, “DTC Participants”). DTC has a Standard & Poor’s rating of AA+. The DTC Rules applicable to DTC Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at [www.dtcc.com](http://www.dtcc.com).

Purchases of the Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Bonds on DTC’s records. The ownership interest of each actual purchaser of each Bond (“Beneficial Owner”) is in turn to be recorded on the Direct and Indirect Participants’ records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct Participant or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the Bonds are to be accomplished by entries made on the books of Direct Participants and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in the Bonds, except in the event that use of the book-entry system for the Bonds is discontinued.

To facilitate subsequent transfers, all Bonds deposited by Direct Participants with DTC are registered in the name of DTC’s partnership nominee, Cede & Co. or such other name as may be requested by an authorized representative of DTC. The deposit of Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the Bonds. DTC’s records reflect only the identity of the Direct Participants to whose accounts such Bonds are credited, which may or may not be the Beneficial Owners. The Direct Participants and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time. Beneficial Owners of the Bonds may wish to take certain steps to augment transmission to them of notices of significant events with respect to the Bonds, such as redemptions, defaults, and proposed amendments to the security documents. For example, Beneficial Owners of the Bonds may wish to ascertain that the nominee holding the Bonds for their benefit has agreed to obtain and transmit notices to Beneficial Owners. In the alternative, Beneficial Owners may wish to provide their names and addresses to the registrar and request that copies of notices be provided directly to them.

Redemption notices shall be sent to DTC. If less than all of the Bonds within an issue are being redeemed, DTC’s practice is to determine by lot the amount of the interest of each Direct Participant in such issue to be redeemed.

Neither DTC nor Cede & Co. (nor such other DTC nominee) will consent or vote with respect to the Bonds unless authorized by a Direct Participant in accordance with DTC’s MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the Institution as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.’s consenting or voting rights to those Direct Participants to whose accounts the Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Payments of principal, interest and redemption premium, if any, with respect to the Bonds will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from the Institution or the Trustee, on the payment date in accordance with their respective holdings shown on DTC's records. Payments by DTC Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such DTC Participant and not of DTC nor its nominee, the Institution or the Trustee, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal and interest, and redemption premium, if any, to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the Institution or the Trustee, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct Participants and Indirect Participants.

DTC may discontinue providing its services as depository with respect to the Bonds at any time by giving reasonable notice to the Institution or the Trustee. Under such circumstances, in the event that a successor depository is not obtained, Bond certificates are required to be printed and delivered. The Institution may decide to discontinue use of the system of book-entry only transfers through DTC (or a successor securities depository). In that event, Bond certificates will be printed and delivered. See "Certificated Bonds" below.

SO LONG AS CEDE & CO. IS THE REGISTERED OWNER OF THE BONDS, AS NOMINEE OF DTC, REFERENCES HEREIN TO THE BONDHOLDERS OR REGISTERED OWNERS OF THE BONDS SHALL MEAN CEDE & CO. AND SHALL NOT MEAN THE BENEFICIAL OWNERS OF THE BONDS.

#### **Clearstream Luxembourg and Euroclear Systems**

*The information set forth below is subject to any change in or reinterpretation of the rules, regulations and procedures of Euroclear and Clearstream Luxembourg. Neither the Institution nor the Underwriter takes any responsibility for the accuracy of this section. Investors wishing to use the facilities of any of Euroclear or Clearstream Luxembourg are advised to confirm the continued applicability of the relevant rules, regulations and procedures.*

Beneficial Owners may elect to hold interests in the Bonds through either DTC (in the United States) or Clearstream Luxembourg or Euroclear (in Europe) if they are participants of those systems, or indirectly, through organizations that are participants in such systems. Interests held through Clearstream Luxembourg and Euroclear will be recorded on DTC's books as being held by the U.S. depository for each of Clearstream Luxembourg and Euroclear, which U.S. depositories will in turn hold interests on behalf of their participants' securities accounts.

Clearstream Luxembourg was incorporated as a limited liability company under the laws of Luxembourg. Clearstream Luxembourg holds securities for its participating organizations ("Clearstream Luxembourg Participants") and facilitates the clearance and settlement of securities transactions between Clearstream Luxembourg Participants through electronic book-entry changes in accounts of Clearstream Luxembourg Participants, thereby eliminating the need for physical movement of certificates. Transactions may be settled by Clearstream Luxembourg in many currencies, including United States dollars. Clearstream Luxembourg provides to Clearstream Luxembourg Participants, among other things, services for safekeeping, administration, clearance and settlement of internationally traded securities and securities lending and borrowing. Clearstream Luxembourg has established an electronic bridge with Euroclear to facilitate settlement of trades between Clearstream and Euroclear.

As a registered bank in Luxembourg, Clearstream Luxembourg is subject to regulation by the Luxembourg Commission de Surveillance du Secteur Financier (Commission for the Supervision of the Financial Sector). Clearstream Luxembourg Participants are financial institutions around the world, including underwriters, securities brokers and dealers, banks, trust companies, clearing corporations and certain other organizations, and may include the agents or their affiliates. Indirect access to Clearstream Luxembourg is also available to others, such as banks, brokers, dealers and trust companies that clear through, or maintain a custodial relationship with, a Clearstream Luxembourg Participant.

Distributions with respect to Bonds held beneficially through Clearstream Luxembourg will be credited to cash accounts of Clearstream Luxembourg Participants in accordance with its rules and procedures, to the extent received by the U.S. depository for Clearstream Luxembourg.

Euroclear was created in 1968 to hold securities for participants of Euroclear (“Euroclear Participants”) and to clear and settle transactions between Euroclear Participants through simultaneous electronic book-entry delivery against payment, thereby eliminating the need for physical movement of certificates and any risk from lack of simultaneous transfers of securities and cash. Such operations are conducted by Euroclear, and all Euroclear securities clearance accounts and Euroclear cash accounts are accounts with Euroclear. Euroclear Participants include banks (including central banks), securities brokers and dealers and other professional financial intermediaries and may include the agents or their affiliates. Indirect access to the Euroclear system also is available to other firms that clear through or maintain a custodial relationship with a Euroclear Participant, either directly or indirectly.

Securities clearance accounts and cash accounts with Euroclear are governed by the Terms and Conditions Governing Use of Euroclear and the related Operating Procedures of the Euroclear system, and applicable Belgian law (collectively, the “Terms and Conditions”). The Terms and Conditions govern transfers of securities and cash within Euroclear, withdrawals of securities and cash from Euroclear, and receipts of payments with respect to securities in Euroclear. All securities in Euroclear are held on a fungible basis without attribution of specific certificates to specific securities clearance accounts. Euroclear acts under the Terms and Conditions only on behalf of Euroclear Participants, and has no record of, or relationship with, persons holding through Euroclear Participants.

Distributions with respect to Bonds held beneficially through Euroclear will be credited to the cash accounts of Euroclear Participants in accordance with the Terms and Conditions, to the extent received by the U.S. depository of Euroclear.

### ***Global Clearance and Settlement Procedures***

Initial settlement for the Bonds will be made in immediately available funds. Secondary market trading between Participants will occur in the ordinary way in accordance with DTC’s rules. Secondary market trading between Clearstream Luxembourg Participants and/or Euroclear Participants will occur in the ordinary way in accordance with the applicable rules and operating procedures of Clearstream Luxembourg and Euroclear and will be settled using the procedures applicable to conventional eurobonds in immediately available funds.

Cross-market transfers between persons holding directly or indirectly through DTC, on the one hand, and directly or indirectly through Clearstream Luxembourg or Euroclear Participants, on the other, will be effected within DTC in accordance with DTC’s rules on behalf of the relevant European international clearing system by its U.S. depository; however, such cross-market transactions will require delivery of instructions to the relevant European international clearing system by the counterparty in such system in accordance with its rules and procedures and within its established deadlines (European time). The relevant European international clearing system will, if the transaction meets its settlement requirements, deliver instructions to its U.S. depository to take action to effect final settlement on its behalf by delivering or receiving Bonds in DTC, and

making or receiving payment in accordance with normal procedures. Clearstream Luxembourg Participants and Euroclear Participants may not deliver instructions directly to their respective U.S. depositories.

Because of time-zone differences, credits of Bonds received in Clearstream Luxembourg or Euroclear as a result of a transaction with a participant will be made during subsequent securities settlement processing and dated the business day following the DTC settlement date. Such credits, or any transactions in the Bonds settled during such processing, will be reported to the relevant Euroclear Participants or Clearstream Luxembourg Participants on that business day. Cash received in Clearstream Luxembourg or Euroclear as a result of sales of Bonds by, or through a Clearstream Luxembourg Participant or a Euroclear Participant to a participant will be received with value on the business day of settlement in DTC but will be available in the relevant Clearstream Luxembourg or Euroclear cash account only as of the business day following settlement in DTC.

Although DTC, Clearstream Luxembourg and Euroclear have agreed to the foregoing procedures in order to facilitate transfers of securities among participants of DTC, Clearstream Luxembourg and Euroclear, they are under no obligation to perform or continue to perform such procedures, and such procedures may be discontinued at any time.

**No Responsibility of Institution, Underwriter or Trustee.** NONE OF THE INSTITUTION, THE UNDERWRITER OR THE TRUSTEE GIVES ANY ASSURANCES THAT DTC, DIRECT PARTICIPANTS OR INDIRECT PARTICIPANTS OF DTC, CLEARSTREAM LUXEMBOURG, CLEARSTREAM LUXEMBOURG PARTICIPANTS, EUROCLEAR OR EUROCLEAR PARTICIPANTS WILL DISTRIBUTE TO THE BENEFICIAL OWNERS OF THE BONDS (1) PAYMENTS OF PRINCIPAL OF OR INTEREST ON OR REDEMPTION PRICE OF THE BONDS; (2) CONFIRMATIONS OF THEIR OWNERSHIP INTERESTS IN THE BONDS; OR (3) OTHER NOTICES SENT TO DTC OR CEDE & CO., ITS PARTNERSHIP NOMINEE, AS THE REGISTERED OWNER OF THE BONDS, OR THAT THEY WILL DO SO ON A TIMELY BASIS, OR THAT DTC DIRECT PARTICIPANTS OR INDIRECT PARTICIPANTS, CLEARSTREAM LUXEMBOURG, CLEARSTREAM LUXEMBOURG PARTICIPANTS, EUROCLEAR OR EUROCLEAR PARTICIPANTS WILL SERVE AND ACT IN THE MANNER DESCRIBED IN THIS OFFERING MEMORANDUM.

NONE OF THE INSTITUTION, THE UNDERWRITER OR THE TRUSTEE WILL HAVE ANY RESPONSIBILITY OR OBLIGATIONS TO DTC, THE DIRECT PARTICIPANTS OR THE INDIRECT PARTICIPANTS OF DTC, CLEARSTREAM LUXEMBOURG, CLEARSTREAM LUXEMBOURG PARTICIPANTS, EUROCLEAR, EUROCLEAR PARTICIPANTS OR THE BENEFICIAL OWNERS WITH RESPECT TO (1) THE ACCURACY OF ANY RECORDS MAINTAINED BY DTC OR ANY DIRECT PARTICIPANTS OR INDIRECT PARTICIPANTS OF DTC, CLEARSTREAM LUXEMBOURG, CLEARSTREAM LUXEMBOURG PARTICIPANTS, EUROCLEAR OR EUROCLEAR PARTICIPANTS; (2) THE PAYMENT BY DTC OR ANY DIRECT PARTICIPANTS OR INDIRECT PARTICIPANTS OF DTC, CLEARSTREAM LUXEMBOURG, CLEARSTREAM LUXEMBOURG PARTICIPANTS, EUROCLEAR OR EUROCLEAR PARTICIPANTS OF ANY AMOUNT DUE TO ANY BENEFICIAL OWNER IN RESPECT OF THE PRINCIPAL AMOUNT OF OR INTEREST ON OR REDEMPTION PRICE OF THE BONDS; (3) THE DELIVERY BY DTC OR ANY DIRECT PARTICIPANTS OR INDIRECT PARTICIPANTS OF DTC, CLEARSTREAM LUXEMBOURG, CLEARSTREAM LUXEMBOURG PARTICIPANTS, EUROCLEAR OR EUROCLEAR PARTICIPANTS OF ANY NOTICE TO ANY BENEFICIAL OWNER THAT IS REQUIRED OR PERMITTED TO BE GIVEN TO OWNERS UNDER THE TERMS OF THE INDENTURE; OR (4) ANY CONSENT GIVEN OR OTHER ACTION TAKEN BY DTC AS THE REGISTERED HOLDER OF THE BONDS.

**Certificated Bonds.** DTC may discontinue providing its services as securities depository with respect to the Bonds at any time by giving reasonable notice to the Institution and the Trustee. In addition, the



Institution may determine that continuation of the system of book-entry transfers through DTC (or a successor securities depository) is not in the best interest of the Beneficial Owners. If, for either reason, the book-entry system is discontinued, Bond certificates will be delivered as described in the Indenture and the Beneficial Owner, upon registration of certificates held in the Beneficial Owner's name, will become the Bondholder. Thereafter, Bonds may be exchanged for an equal aggregate principal amount of Bonds in other Authorized Denominations and of the same maturity, upon surrender thereof at the corporate trust office of the Trustee. The transfer of any Bond may be registered on the books maintained by the Trustee for such purpose only upon assignment in form satisfactory to the Trustee. For every exchange or registration of transfer of Bonds, the Institution and the Trustee may make a charge sufficient to reimburse them for any tax or other governmental charge required to be paid with respect to such exchange or registration of transfer, and the Trustee also may require the Bondholder requesting such exchange or registration of transfer of the Bonds to pay a reasonable sum to cover any expenses incurred by the Trustee or the Institution in connection with any such exchange or registration of transfer. The Trustee will not be required to exchange or transfer (i) any Bond during the 15 days next preceding the selection of Bonds for redemption, or (ii) any Bond called for redemption.

### **USE OF PROCEEDS**

The Institution expects to use the proceeds of the Bonds (i) to finance the costs of expanding, renovating, improving and equipping an existing facility owned by the Institution located in Ellsworth, Maine, (ii) to refund in full the Finance Authority of Maine Variable Rate Revenue Bond (The Jackson Laboratory Issue - Series 2012) (the "Refunded Bond"), outstanding in the principal amount of \$33.165 million, (iii) for other general corporate purposes of the Institution, consistent with its status as an organization described in Section 501(c)(3) of the Code, and (iv) to pay the costs of issuing the Bonds. See APPENDIX A - "CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY - Facilities - Ellsworth, Maine," "- The Ellsworth Project," and "- Outstanding Indebtedness."

### **PAYMENT PROVISIONS FOR THE BONDS**

The Indenture provides that, on or before each Payment Date, the Institution will pay the Trustee a sum equal to the amount payable on such Payment Date as principal of and interest on the Bonds. If on any Payment Date, the amounts held by the Trustee in the accounts within the Bond Fund are insufficient to make any required payments of principal of (whether at maturity or upon acceleration) and interest on the Bonds as such payments become due, the Institution is required to pay such deficiency to the Trustee. Upon the receipt thereof, the Trustee will deposit all payments received from the Institution into certain funds and accounts established pursuant to the Indenture. See APPENDIX D - "SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE."

The Bonds constitute unsecured general obligations of the Institution. The Bonds are not secured by a reserve fund, mortgage lien or security interest on or in any funds, property or other assets of the Institution, except for the Bond Fund and certain other funds held from time to time by the Trustee for the benefit of the Holders of the Bonds under the Indenture. Pursuant to the Indenture, the proceeds of the Bonds are held by the Institution, rather than the Trustee, and, as described above, the Institution is not required to deposit with the Trustee amounts necessary to pay the principal of and interest on the Bonds until the Payment Date on which such amounts become due and payable; therefore, the funds held from time to time by the Trustee for the benefit of the Holders of the Bonds under the Indenture are expected to be minimal. Amounts held by the Institution are not subject to any lien or charge in favor of the Holders of the Bonds and do not constitute security for the Bonds.

The Indenture does not contain any covenants limiting the ability of the Institution to incur indebtedness, encumber or dispose of its property, merge with or into any other entity, or any other similar covenants. Further, the Institution is not required by the Indenture to produce revenues at any specified level,

maintain any specified liquidity levels or reserves, or obtain any insurance with respect to its property or operations.

The remedies granted to the Trustee or the Holders of the Bonds upon an Event of Default under the Indenture may be dependent upon judicial actions which are often subject to discretion and delay. Under existing law, the remedies specified in the Indenture may not be readily available or may be limited. The various legal opinions to be delivered concurrently with the delivery of the Bonds will be qualified as to the enforceability of the provisions of the Indenture by limitations imposed by state and federal laws, rulings and decisions affecting equitable remedies regardless of whether enforceability is sought in a proceeding at law or in equity and by bankruptcy, reorganization, insolvency, receivership or other similar laws affecting the rights of creditors generally.

The Institution has other unsecured indebtedness outstanding. The Institution is not restricted by the Indenture or otherwise from incurring additional indebtedness. Such additional indebtedness, if issued, may be either secured or unsecured and may be entitled to payment prior to payment on the Bonds.

As of December 31, 2017, the outstanding principal amount of the long-term indebtedness of the Institution totaled approximately \$88.829 million, of which \$33.165 million comprising the Refunded Bonds is expected to be refunded with a portion of the proceeds of the Bonds. For additional information regarding the outstanding indebtedness of the Institution, see “ANNUAL DEBT SERVICE REQUIREMENTS” herein, APPENDIX A – “CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY – Outstanding Indebtedness,” and APPENDIX B – “FINANCIAL STATEMENTS OF THE JACKSON LABORATORY.”

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## ANNUAL DEBT SERVICE REQUIREMENTS

The following table sets forth, for each fiscal year of the Institution, the amounts required to be made available in such year by the Institution for payment of principal of, sinking fund installments and interest on its outstanding long-term indebtedness, including the Bonds.

<b>Fiscal Year Ending December 31</b>	<b>Outstanding Obligations<sup>1,2</sup></b>	<b>Bonds</b>		<b>Total Annual Debt Service<sup>3</sup></b>
		<b>Principal</b>	<b>Interest</b>	
2018	\$4,787,103	\$2,065,000	\$1,777,540	\$ 8,629,643
2019	4,352,753	4,635,000	6,227,208	15,214,961
2020	4,348,753	4,740,000	6,105,956	15,194,710
2021	4,350,503	4,865,000	5,972,478	15,187,981
2022	4,347,503	4,990,000	5,827,598	15,165,101
2023	4,349,753	4,815,000	5,671,062	14,835,815
2024	4,346,753	4,955,000	5,512,793	14,814,546
2025	4,353,503	5,110,000	5,339,764	14,803,267
2026	4,346,953	5,285,000	5,153,658	14,785,611
2027	4,349,453	5,460,000	4,957,056	14,766,509
2028	4,355,703	5,650,000	4,751,214	14,756,917
2029	4,319,195	5,845,000	4,532,559	14,696,753
2030	4,152,275	6,055,000	4,303,435	14,510,710
2031	4,149,550	6,280,000	4,063,051	14,492,601
2032	4,153,325	3,670,000	3,810,595	11,633,920
2033	4,148,250	3,820,000	3,661,226	11,629,476
2034	4,145,750	3,980,000	3,503,842	11,629,592
2035	4,150,250	4,145,000	3,335,329	11,630,579
2036	4,151,000	4,325,000	3,159,830	11,635,830
2037	4,152,750	4,505,000	2,976,709	11,634,459
2038	-	4,695,000	2,785,968	7,480,968
2039	-	4,895,000	2,587,181	7,482,181
2040	-	5,110,000	2,375,032	7,485,032
2041	-	5,330,000	2,153,565	7,483,565
2042	-	5,560,000	1,922,562	7,482,562
2043	-	5,800,000	1,681,592	7,481,592
2044	-	6,050,000	1,430,220	7,480,220
2045	-	6,315,000	1,168,013	7,483,013
2046	-	6,590,000	894,321	7,484,321
2047	-	6,875,000	608,710	7,483,710
2048	-	7,170,000	310,748	7,480,748

<sup>1</sup> Excludes debt service on the Refunded Bonds. Does not include certain forgivable loans from Connecticut Innovations Incorporated. See APPENDIX A – “CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY – Outstanding Indebtedness,” and Footnote 8 to the Institution’s annual audited financial statements included as APPENDIX B.

<sup>2</sup> Interest on variable rate bonds is calculated at an assumed rate of 4.25% per annum.

<sup>3</sup> Totals may not add due to rounding.

## CONTINUING DISCLOSURE

The Institution has entered into a continuing disclosure undertaking (the “Continuing Disclosure Undertaking”) in connection with certain tax-exempt revenue bonds issued for the benefit of the Institution (the “Tax Exempt Bonds”). Holders and prospective purchasers of the Bonds may obtain copies of the information provided by the Institution under the Continuing Disclosure Undertaking from the Municipal Securities Rulemaking Board’s Electronic Municipal Market Access system (“EMMA”). The Continuing Disclosure Undertaking will terminate when the related Tax Exempt Bonds are paid or deemed paid in full.

The Institution will covenant in the Indenture that unless otherwise available on EMMA or any successor thereto or to the functions thereof, copies of the Institution’s annual audited financial statements will either be posted on the Institution’s website or filed with the Trustee, in each case, within 180 days after the end of each fiscal year of the Institution.

## CERTAIN UNITED STATES FEDERAL INCOME TAX CONSIDERATIONS

The following discussion summarizes certain material U.S. federal income tax considerations relating to the acquisition, ownership, and disposition of the Bonds and it may not contain all of information that may be important to a particular investor. It is based on provisions of the U.S. Internal Revenue Code of 1986, as amended (the “Code”), Treasury Regulations promulgated thereunder, and administrative and judicial interpretations thereof, all in effect or proposed on the date hereof and all of which are subject to change, possibly with retroactive effect, so as to result in United States federal income tax consequences different from those set forth below. In addition, on December 22, 2017, President Donald Trump signed into law “An Act to provide for reconciliation pursuant to titles II and V of the concurrent resolution on the budget for fiscal year 2018,” H.R. 1 (hereinafter referred to as the “2017 Tax Cuts and Jobs Act”). Significant further guidance regarding the changes implemented by the 2017 Tax Cuts and Jobs Act is expected and therefore the description of the tax considerations relating to the acquisition, ownership, and disposition of the Bonds as described below may be affected as further guidance is issued. Prospective investors are urged to consult with their own professional tax advisers with respect to the tax consequences of the 2017 Tax Cuts and Jobs Act. Prospective investors should note that no rulings have been or are expected to be sought from the Internal Revenue Service (“IRS”) with respect to any of the U.S. federal income tax consequences discussed below. Accordingly, no assurance can be given that the IRS will agree with the views expressed in this summary, or that a court will not sustain any challenge by the IRS in the event of litigation.

The following relates only to Bonds that are acquired in the initial offering for an amount of cash equal to the initial offering price (i.e., the price at which a substantial amount of such Bonds is first sold to the public) and that are held as “capital assets” within the meaning of Section 1221 of the Code (i.e., generally, property held for investment).

This discussion does not address all U.S. federal income tax consequences applicable to any given investor, nor does it address the U.S. federal income tax considerations applicable to investors who may be subject to special tax treatment (regardless of whether or not such persons constitute U.S. Holders (defined below)), such as (but not limited to) banks and other financial institutions, retirement plans, employee stock ownership plans, certain U.S. expatriates, real estate investment trusts, regulated investment companies, insurance companies, tax-exempt organizations, dealers or traders in securities or currencies, partnerships or other pass-through entities for U.S. federal income tax purposes (or investors in such entities), S corporations, estates and trusts, investors who hold their Bonds as part of a hedge, straddle, or an integrated or conversion transaction, investors whose “functional currency” is not the U.S. dollar, or persons subject to the alternative minimum tax. In addition, this discussion does not include any description of the tax laws of any state, local, or non-U.S. jurisdiction that may be applicable to a particular investor and does not consider any aspects of U.S. federal tax law other than income taxation.

As used herein, “U.S. Holder” means a beneficial owner of a Bond that is, for U.S. federal income tax purposes: (i) an individual citizen or resident, as defined in Section 7701(b) of the Code, of the United States, (ii) a corporation (or other entity taxable as a corporation for U.S. federal income tax purposes) created or organized in or under the laws of the United States or any political subdivision thereof (including the District of Columbia), (iii) an estate, the income of which is subject to U.S. federal income taxation regardless of its source, or (iv) a trust if (A) a court within the United States is able to exercise primary supervision over the administration of the trust and one or more United States persons (as defined in the Code) have the authority to control all substantial decisions of the trust or (B) the trust validly elected to be treated as a domestic trust. As used herein, “Non-U.S. Holder” generally means a beneficial owner of a Bond (other than a partnership) who is not a U.S. Holder.

The U.S. federal income tax treatment of an entity classified as a partnership for U.S. federal income tax purposes that holds the Bonds generally will depend on such partner’s particular circumstances and on the activities of the partnership. Partners in such partnerships should consult their own tax advisors regarding the consequences of acquiring, owning and disposing of the Bonds (including their status as U.S. Holders or Non-U.S. Holders).

## **U.S. Holders**

**Interest.** Stated interest on the Bonds generally will be taxable to a U.S. Holder as ordinary interest income at the time such amounts are accrued or received, in accordance with the U.S. Holder’s method of accounting for U.S. federal income tax purposes.

“Original issue discount” will arise for U.S. federal income tax purposes in respect of any Bond if its stated redemption price at maturity exceeds its issue price by more than a de minimis amount (as determined for U.S. federal income tax purposes). For any Bonds issued with original issue discount, the amount of original issue discount is equal to the excess of the stated redemption price at maturity of that Bond over its issue price. The stated redemption price at maturity of a Bond is the sum of all scheduled amounts payable on such Bond other than qualified stated interest. U.S. Holders generally will be required to include any original issue discount in income for U.S. federal income tax purposes as it accrues, in accordance with a constant yield method based on a compounding of interest (which may be before the receipt of cash payments attributable to such income). Under this method, U.S. Holders of Bonds issued with original issue discount generally will be required to include in income increasingly greater amounts of original issue discount in successive accrual periods.

“Premium” generally will arise for U.S. federal income tax purposes in respect of any Bond to the extent its issue price exceeds its stated principal amount. A U.S. Holder of a Bond issued at a premium may make an election, applicable to all debt securities purchased at a premium by such U.S. Holder, to amortize such premium, using a constant yield method over the term of such Bond.

**Market Discount.** A holder who acquires a Bond in a secondary market transaction may be subject to U.S. federal income tax rules providing that accrued market discount will be subject to taxation as ordinary income on the sale or other disposition of a “market discount bond.” Dispositions subject to this rule include a redemption or retirement of a Bond. The market discount rules may also limit a holder’s deduction for interest expense for debt that is incurred or continued to purchase or carry a Bond. A market discount bond is defined generally as a debt obligation purchased subsequent to issuance, at a price that is less than the principal amount of the obligation, subject to a de minimis rule. The Code allows a taxpayer to compute the accrual of market discount by using a ratable accrual method or a constant interest rate method. Also, a taxpayer may elect to include the accrued discount in gross income each year while holding the bond, as an alternative to including the total accrued discount in gross income at the time of a disposition, in which case the tax basis of the bond will be increased by the amount of discount included in gross income and the interest expense deduction limitation described above will not apply.

**Disposition of the Bonds.** Unless a nonrecognition provision of the Code applies, the sale, exchange, redemption, retirement (including pursuant to an offer by the Issuer), reissuance, or other disposition of a Bond will be a taxable event for U.S. federal income tax purposes. In such event, a U.S. Holder generally will recognize gain or loss equal to the difference between (i) the amount of cash plus the fair market value of property received (except to the extent attributable to accrued but unpaid interest on the Bond which will be taxed in the manner described above under “Interest”) and (ii) the U.S. Holder’s adjusted tax basis in the Bond at the time of disposition. A U.S. Holder’s adjusted basis in a Bond will generally equal the purchase price paid by the U.S. Holder for the Bond, increased by the amount of any original issue discount previously included in income by such U.S. Holder with respect to such Bond and decreased by any payments previously made on such Bond, other than payments of qualified stated interest, or decreased by any amortized premium. Any such gain or loss generally will be capital gain or loss and generally will be long term capital gain or loss if such Bond is held by the U.S. Holder for more than one year. Long-term capital gain of non-corporate U.S. Holders is generally subject to tax at preferential rates. The deductibility of capital losses is subject to limitations.

Defeasance or material modification of the terms of any Bond may result in a deemed reissuance thereof, in which event a beneficial owner of the defeased Bonds generally will recognize taxable gain or loss equal to the difference between the amount realized from the sale, exchange or retirement (less any accrued qualified stated interest which will be taxable as such) and the beneficial owner’s adjusted tax basis in the Bond.

**Net Investment Income Tax.** Section 1411 of the Code generally imposes a 3.8% Medicare contribution tax on the net investment income of certain individuals, trusts, and estates to the extent their income exceeds certain threshold amounts. For these purposes, “net investment income” may include, among other things, interest and gains from the sale or other disposition of the Bonds. Prospective investors are advised to consult their tax advisors regarding the possible implications of this additional tax on their investment in the Bonds.

**Information Reporting and Backup Withholding.** In general, a U.S. Holder will be subject to backup withholding with respect to interest on the Bonds, and the proceeds of a sale or other disposition of the Bonds (including a redemption or retirement), at the applicable tax rate of 24%, unless such holder (a) is an entity that is exempt from backup withholding (including corporations) and, when required, demonstrates this fact, or (b) provides the payor with its taxpayer identification number (“TIN”), certifies that the TIN provided to the payor is correct and that the holder has not been notified by the IRS that such holder is subject to backup withholding due to underreporting of interest or dividends, and otherwise complies with applicable requirements of the backup withholding rules. In addition, such payments to U.S. Holders that are not exempt entities will generally be subject to information reporting requirements. A U.S. Holder who does not provide the payor with its correct TIN may be subject to penalties imposed by the IRS. Backup withholding is not an additional tax. The amount of any backup withholding from a payment to a U.S. Holder will be allowed as a credit against such holder’s U.S. federal income tax liability and may entitle such holder to a refund, provided that certain required information is timely furnished to the IRS.

## **Non-U.S. Holders**

The following discussion applies only to Non-U.S. Holders. This discussion does not address all aspects of U.S. federal income taxation that may be relevant to Non-U.S. Holders in light of their particular circumstances. For example, special rules may apply to a Non-U.S. Holder that is a “controlled foreign corporation” or a “passive foreign investment company,” and, accordingly, Non-U.S. Holders should consult their own tax advisors to determine the effect of U.S. federal, state, local and non-U.S. tax laws, as well as tax treaties, with regard to an investment in the Bonds.

**Interest.** Subject to the discussions below under the headings “FATCA Withholding” and “Information Reporting and Backup Withholding,” a Non-U.S. Holder will not be subject to U.S. federal income or

withholding taxes in respect of interest paid or accrued on a Bond (including original interest discount income) if the interest qualifies for the “portfolio interest exemption.” This generally will be the case if each of the following applicable requirements is satisfied:

- The interest is not effectively connected with a U.S. trade or business;
- The Non-U.S. Holder is not, and is not treated as, a bank receiving interest on an extension of credit pursuant to a loan agreement entered into in the ordinary course of its trade or business, as described in Section 881(c)(3)(A) of the Code;
- Certain certification requirements are met. Under current law, the certification requirement will be satisfied in any of the following circumstances:
  - If a Non-U.S. Holder provides to the payor a statement on an applicable IRS Form W-8 (or suitable successor form), together with all appropriate attachments, signed under penalties of perjury, identifying the Non-U.S. Holder by name and address and stating, among other things, that the Non-U.S. Holder is not a United States person.
  - If a Bond is held through a securities clearing organization, bank, or another financial institution that holds customers’ securities in the ordinary course of its trade or business, (i) the Non-U.S. Holder provides such a form to such organization or institution, and (ii) such organization or institution, under penalty of perjury, certifies to the payor that it has received such statement from the beneficial owner or another intermediary and furnishes the payor with a copy thereof.
  - If a financial institution or other intermediary that holds the Bond on behalf of the Non-U.S. Holder has entered into a withholding agreement with the IRS and submits an IRS Form W-8IMY (or suitable successor form) and certain other required documentation to the payor.

If the requirements of the portfolio interest exemption described above are not satisfied, a 30% withholding tax will apply to the gross amount of interest on the Bonds that is paid to a Non-U.S. Holder, unless either: (a) an applicable income tax treaty reduces or eliminates such tax, and the Non-U.S. Holder claims the benefit of that treaty by providing a properly completed and duly executed IRS Form W-8BEN or Form W-8BEN-E, as applicable (or suitable successor or substitute form) establishing qualification for benefits under the treaty, or (b) the interest is effectively connected with the Non-U.S. Holder’s conduct of a trade or business in the United States and the Non-U.S. Holder provides an appropriate statement to that effect on a properly completed and duly executed IRS Form W-8ECI (or suitable successor form).

If a Non-U.S. Holder is engaged in a trade or business in the United States and its investment in a Bond is effectively connected with the conduct of that trade or business, the Non-U.S. Holder generally will generally be required to pay U.S. federal income tax on that interest on a net income basis in the same manner as a U.S. Holder and the 30% withholding tax described above will not apply provided the duly executed IRS Form W-8ECI is provided. If a Non-U.S. Holder is eligible for the benefits of an income tax treaty between the U.S. and its country of residence, and the Non-U.S. Holder claims the benefit of the treaty by properly submitting an IRS Form W-8BEN or Form W-8BEN-E, as applicable, any interest income that is effectively connected with a U.S. trade or business will be subject to U.S. federal income tax in the manner specified by the treaty and generally will only be subject to such tax if such income is attributable to a permanent establishment (or a fixed base in the case of an individual) maintained by the Non-U.S. Holder in the United States. In addition, a Non-U.S. Holder that is treated as a foreign corporation for U.S. federal income tax purposes may be subject to a branch profits tax equal to 30% (or such lower rate provided by an applicable income tax treaty) of its earnings and profits for the taxable year, subject to adjustments, that are effectively connected with its conduct of a trade or business in the United States.

**Disposition of the Bonds.** Subject to the discussions below under the headings “FATCA Withholding” and “Information Reporting and Backup Withholding,” any gain realized by a Non-U.S. Holder upon the sale, exchange, redemption, retirement, reissuance or other disposition of a Bond generally will not be subject to U.S. federal income tax, unless (i) such gain is effectively connected with the conduct by such Non-U.S. Holder of a trade or business within the United States (and, in the case of certain income tax treaties, is attributable to a permanent establishment or “fixed base” within the United States); or (ii) in the case of any gain realized by an individual Non-U.S. Holder, such holder is present in the United States for 183 days or more in the taxable year of such sale, exchange, redemption, retirement, reissuance or other disposition and certain other conditions are met. If the first exception applies, the Non-U.S. Holder will generally be subject to U.S. federal income tax on the net gain derived from the sale, exchange, redemption, retirement at maturity, or other taxable disposition of the Bonds in the same manner as a U.S. Holder unless an applicable income tax treaty provides otherwise. If the second exception applies, the Non-U.S. Holder generally will be subject to U.S. federal income tax at a rate of 30% (except as otherwise provided by an applicable income tax treaty) on the amount by which its U.S.-source capital gains exceed its U.S.-source capital losses. In addition, corporate Non-U.S. Holders may be subject to a 30% (or lower applicable treaty rate) branch profits tax on any such effectively connected earnings and profits attributable to such gain.

**U.S. Federal Estate Tax.** A Bond that is held by an individual who at the time of death is not a citizen or resident of the United States will not be subject to U.S. federal estate tax as a result of such individual’s death, provided that at the time of such individual’s death, payments of interest with respect to such Bond would not have been effectively connected with the conduct by such individual of a trade or business within the United States.

**FATCA Withholding.** The Foreign Account Tax Compliance Act (“FATCA”) together with administrative guidance and certain intergovernmental agreements entered into thereunder generally imposes a 30% U.S. withholding tax on certain U.S. source payments, including interest, and, after December 31, 2018, on gross proceeds from a disposition of property of a type which can produce U.S. source interest (“withholdable payments”), paid to (i) a “foreign financial institution” (as specifically defined in the Code) which does not provide sufficient documentation, typically on IRS Form W-8BEN-E, evidencing either (x) an exemption from FATCA, or (y) its compliance (or deemed compliance) with FATCA (which may alternatively be in the form of compliance with an intergovernmental agreement with the United States) in a manner which avoids withholding, or (ii) or to a “non-financial foreign entity” (as specifically defined in the Code) which does not provide sufficient documentation, typically on IRS Form W-8BEN-E, evidencing either (x) an exemption from FATCA, or (y) adequate information regarding certain substantial United States beneficial owners of such entity (if any). The 30% withholding tax under FATCA applies regardless of whether the foreign financial institution or non-financial foreign entity receives payments as a beneficial owner or intermediary and whether the applicable payment otherwise is exempt from U.S. withholding (e.g., as “portfolio interest” or as capital gain upon the sale, exchange, redemption or other disposition of a Bond). Interest paid with respect to the Bonds and, after December 31, 2018, gross proceeds from the sale or disposition of the Bonds, may be subject to the 30% withholding tax if the holder fails to comply with FATCA. Non-U.S. holders are urged to consult their own tax advisors with respect to these information reporting rules and due diligence requirements and the potential application of FATCA to them.

**Information Reporting and Backup Withholding.** In general, the amount of any interest paid on the Bonds in each calendar year, and the amount of U.S. federal income tax withheld, if any, with respect to these payments will be reported to the IRS and each Non-U.S. Holder. Copies of the information returns reporting such interest payments and any withholding may also be made available to the tax authorities in the country in which the Non-U.S. Holder resides under an applicable income tax treaty or other information exchange agreement.



Non-U.S. Holders who have provided certification as to their non-U.S. status or who have otherwise established an exemption will generally not be subject to backup withholding tax on payments of interest if the payor does not have actual knowledge or reason to know that such certification is unreliable or that the conditions of the exemption are in fact not satisfied.

Payments of the proceeds from the disposition of a Bond (including a redemption or retirement) to or through a foreign office of a broker generally will not be subject to information reporting or backup withholding. However, information reporting, but generally not backup withholding, may apply to those payments if the broker is one of the following: (a) a United States person, (b) a “controlled foreign corporation” for U.S. federal income tax purposes, (c) a foreign person, 50% or more of whose gross income from all sources for the three-year period ending with the close of its taxable year preceding the payment was effectively connected with a U.S. trade or business, or (d) a foreign partnership with specified connections to the United States, unless the Non-U.S. Holder certifies as to its non-U.S. status or otherwise establishes an exemption.

Payment of the proceeds from a disposition of a Bond (including a redemption or retirement) to or through the United States office of a broker will be subject to information reporting and backup withholding unless the Non-U.S. Holder certifies as to its non-U.S. status or otherwise establishes an exemption from information reporting and backup withholding.

Backup withholding is not an additional tax, and amounts withheld as backup withholding are allowed as a refund or credit against a holder’s federal income tax liability, provided that the required information as to withholding is furnished to the IRS.

THE FOREGOING SUMMARY IS INCLUDED HEREIN FOR GENERAL INFORMATION ONLY AND DOES NOT DISCUSS ALL ASPECTS OF U.S. FEDERAL INCOME TAXATION THAT MAY BE RELEVANT TO A PARTICULAR BENEFICIAL OWNER OF BONDS IN LIGHT OF THE BENEFICIAL OWNER’S PARTICULAR CIRCUMSTANCES AND INCOME TAX SITUATION. PROSPECTIVE INVESTORS ARE URGED TO CONSULT THEIR OWN TAX ADVISORS AS TO ANY TAX CONSEQUENCES TO THEM FROM THE PURCHASE, OWNERSHIP AND DISPOSITION OF BONDS, INCLUDING THE APPLICATION AND EFFECT OF STATE, LOCAL, FOREIGN TAX LAWS AS WELL AS OTHER FEDERAL TAX LAWS AND THE POSSIBLE EFFECTS OF CHANGES IN THESE TAX LAWS.

#### **CERTAIN ERISA AND BENEFIT PLAN CONSIDERATIONS**

The Employee Retirement Income Security Act of 1974, as amended (“ERISA”), imposes certain fiduciary obligations and prohibited transaction restrictions on employee pension and welfare benefit plans subject to that statute (“ERISA Plans”). Section 4975 of the Code imposes essentially the same prohibited transaction restrictions on tax-qualified retirement plans described in Section 401(a) and 403(a) of the Code, which are exempt from tax under Section 501(a) of the Code, other than governmental and church plans as defined herein (“Qualified Retirement Plans”), on Individual Retirement Accounts (“IRAs”) described in Section 408(b) of the Code and on certain other plans described in Section 4975(e)(1) (collectively, “Tax-Favored Plans”). Certain employee benefit plans such as governmental plans (as defined in Section 3(32) of ERISA), and, if no election has been made under Section 410(d) of the Code, church plans (as defined in Section 3(33) of ERISA) and certain non-U.S. benefit plans (as described in Section 4(b)(4) of ERISA)), are not subject to ERISA requirements or Section 4975 of the Code. While assets of such plans may be invested in the Bonds without regard to ERISA and Code considerations described below, they may be nevertheless subject to the provisions of applicable federal, state, local or foreign law that are similar to these ERISA and Code provisions. Accordingly, fiduciaries of such plans should consult with their counsel in considering whether to purchase the Bonds.

In addition to the imposition of general fiduciary obligations, including those of investment prudence and diversification and the requirement that a plan's investment be made in accordance with the documents governing the plan, Section 406 of ERISA and Section 4975 of the Code prohibit a broad range of transactions involving assets of ERISA Plans and Tax-Favored Plans and entities whose underlying assets include plan assets by reason of ERISA Plans or Tax-Favored Plans investing in such entities (collectively, "Benefit Plans") and persons who have certain specified relationships to the Benefit Plans ("Parties In Interest" or "Disqualified Persons"), unless a statutory or administrative exemption is available. The definitions of "Party in Interest" and "Disqualified Person" are expansive. While other entities may be encompassed by these definitions, they include, most notably: (i) a fiduciary with respect to a plan; (ii) a person or entity providing services to a plan; and (iii) an employer or employee organization any of whose employees or members are covered by the plan. Certain Parties in Interest (or Disqualified Persons) that participate in a prohibited transaction may be subject to a penalty (or an excise tax) imposed pursuant to Section 502(i) of ERISA (or Section 4975 of the Code) unless a statutory or administrative exemption is available.

***Plan Asset Issues.*** Certain transactions involving the purchase, holding or transfer of the Bonds might be deemed to constitute prohibited transactions under ERISA and the Code if assets of the Institution were deemed to be assets of a Benefit Plan. The U.S. Department of Labor has promulgated regulations describing what constitutes the assets of a Benefit Plan with respect to a Benefit Plan's investment in an entity for purposes of certain provisions of ERISA and Section 4975 of the Code (the "Plan Assets Regulation").

Under the Plan Assets Regulation, the assets of the Institution would be treated as plan assets of a Benefit Plan for the purposes of ERISA and the Code only if the Benefit Plan acquires an "equity interest" in the Institution and none of the exceptions contained in the Plan Assets Regulation is applicable. An equity interest is defined under the Plan Assets Regulation as an interest in an entity other than an instrument which is treated as indebtedness under applicable local law and which has no substantial equity features. Although there can be no assurances in this regard, it appears that the Bonds should be treated as debt without substantial equity features for purposes of the Plan Assets Regulation. Accordingly, the assets of the Institution should not be treated as the assets of Benefit Plans investing in the Bonds. If the Institution's assets were deemed to constitute "plan assets" pursuant to the Plan Assets Regulation, transactions that the Institution might enter into, or may have entered into in the ordinary course of business, might constitute non-exempt prohibited transactions under ERISA and/or Section 4975 of the Code.

***Prohibited Transaction Exemptions.*** However, without regard to whether the Bonds are treated as an equity interest for such purposes, the acquisition and/or holding of Bonds by or on behalf of a Benefit Plan could be considered to give rise to a prohibited transaction if the Institution, its affiliates and other parties connected with the offering (such as the Underwriter), or any of their respective affiliates, is or becomes a Party in Interest or a Disqualified Person with respect to such Benefit Plan.

Most notably, ERISA and the Code generally prohibit the lending of money or other extension of credit between an ERISA Plan or Tax-Favored Plan and a Party in Interest or a Disqualified Person, and the acquisition of any of the Bonds by a Benefit Plan would involve the lending of money or extension of credit by the Benefit Plan. In such a case, however, certain exemptions from the prohibited transaction rules could be applicable depending on the type and circumstances of the plan fiduciary making the decision to acquire a Bond. Included among these exemptions are: Prohibited Transaction Class Exemption ("PTCE") 96-23, regarding transactions effected by "in-house asset managers"; PTCE 90-1, regarding investments by insurance company pooled separate accounts; PTCE 95-60, regarding transactions effected by "insurance company general accounts"; PTCE 91-38, regarding investments by bank collective investment funds; and PTCE 84-14, regarding transactions effected by "qualified professional asset managers." Further, the statutory exemption in Section 408(b)(17) of ERISA and Section 4975(d)(2) of the Code provides for an exemption for transactions involving "adequate consideration" with persons who are Parties in Interest or Disqualified Persons by reason of their (or their affiliate's) status as a service provider to a Benefit Plan and none of which is a fiduciary with

respect to the Benefit Plan assets involved (or an affiliate of such fiduciary). There can be no assurance that any class or other exemption will be available with respect to any particular transaction involving the Bonds or that, if available, the scope of the relief provided by the exemption will necessarily cover all acts that might be construed as prohibited transactions.

Any ERISA Plan fiduciary considering whether to purchase the Bonds on behalf of an ERISA Plan should consult with its counsel regarding the applicability of the fiduciary responsibility and prohibited transaction provisions of ERISA and the Code to such an investment and the availability of any of the exemptions referred to above. Persons responsible for investing the assets of Tax-Favored Plans that are not ERISA Plans should seek similar counsel with respect to the prohibited transaction provisions of the Code and the applicability of any similar state or federal law.

**The acquisition, holding, and, to the extent relevant, disposition of the Bonds by or to any Benefit Plan is in no respect a representation by the Institution (or any affiliate or representative of the Institution) that such an investment meets all relevant legal requirements with respect to investments by such Benefit Plans generally or any particular Benefit Plan, or that such an investment is appropriate for Benefit Plans generally or any particular Benefit Plan. By acquiring the Bonds, each Holder will be deemed to represent that either (i) it is not acquiring Bonds with assets of an ERISA Plan or other plan subject to the prohibited transaction restrictions of ERISA, the Code, or similar law, or (ii) the acquisition and holding of the Bonds will not give rise to a nonexempt prohibited transaction.**

#### **RATING**

Moody's Investors Service, Inc. ("Moody's"), 7 World Trade Center at 250 Greenwich Street, New York, New York, has assigned a rating of "A1" to the Bonds. Such rating reflects only the views of Moody's and any desired explanation of the significance of such rating may be obtained from Moody's. Generally, a rating agency bases its rating on the information and materials furnished to it and on investigations, studies and assumptions of its own. The above rating is not a recommendation to buy, sell or own the Bonds, and there is no assurance such rating will continue for any period of time or that such rating will not be revised or withdrawn entirely by the rating agency, if in the judgment of such rating agency, circumstances so warrant. Any revision or withdrawal of the rating may have an effect on the market price of the Bonds.

#### **INDEPENDENT AUDITORS**

The Institution's financial statements as of and for the fiscal years ended December 31, 2016 and 2015, included in APPENDIX B to this Offering Memorandum, have been audited by KPMG LLP, independent auditors, as stated in their report appearing therein.

#### **UNDERWRITING**

The Bonds will be purchased for reoffering by Barclays Capital Inc., as underwriter of the Bonds (the "Underwriter"), pursuant to a bond purchase contract entered into by and between the Institution and the Underwriter. The Underwriter has agreed, subject to certain conditions, to purchase the Bonds at a price equal to the principal amount thereof, less an underwriter's discount of \$485,459.85. The bond purchase contract provides that the Underwriter will purchase all of the Bonds if any are purchased, and that the Institution will indemnify the Underwriter and certain other parties against losses, claims, damages, and liabilities arising out of any incorrect statements of information, including the omission of material facts, contained in this Offering Memorandum and other specified matters. The public offering prices set forth on the inside cover page of this Offering Memorandum may be changed after the initial offering by the Underwriter.

The Underwriter and its affiliates are financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, principal investment, hedging, financing and brokerage activities. The Underwriter and its affiliates have, from time to time, performed, and may in the future perform, various investment banking services for the Institution, for which they received or will receive customary fees and expenses.

In the ordinary course of their various business activities, the Underwriter and its affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (which may include bank loans and/or credit default swaps) for their own account and for the accounts of their customers and may at any time hold long and short positions in such securities and instruments. Such investment and securities activities may involve securities and instruments of the Institution.

### **FINANCIAL ADVISOR**

Swap Financial Group LLC (“Swap Financial Group”), an independent financial advisory and consulting firm, has served as financial advisor to the Institution with respect to the issuance of the Bonds. As financial advisor, Swap Financial Group has assisted the Institution in matters relating to the planning, structuring and issuance of the Bonds, and provided other financial advice. Swap Financial Group is not obligated to make, and has not undertaken, an independent verification of any of the financial information contained in this Offering Memorandum, including the Appendices hereto, and Swap Financial Group makes no guarantee as to the accuracy, completeness or fairness of such information.

### **LEGAL MATTERS**

All legal matters incidental to the authorization and issuance of the Bonds by the Institution are subject to the approval of Locke Lord LLP, Boston, Massachusetts, Bond Counsel to the Institution and Ropes & Gray LLP, Boston, Massachusetts, counsel to the Institution. Certain legal matters will be passed on for the Underwriter by its counsel, Greenberg Traurig, LLP, Boston, Massachusetts.

There is no litigation pending or, to the Institution’s knowledge, threatened against the Institution or its officers or trustees contesting or questioning the validity of the issuance or sale of the Bonds, or the ability of the Institution to perform its obligations under the Indenture. See APPENDIX A – “CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY – Litigation.”

### **MISCELLANEOUS**

The references to the Indenture and the Bonds are brief summaries of certain provisions thereof. Such summaries do not purport to be complete, and reference is made to the Indenture and the Bonds for full and complete statements of their provisions. The agreements of the Institution with the owners of the Bonds are fully set forth in the Indenture, and neither any advertisement of the Bonds nor this Offering Memorandum is to be construed as constituting an agreement with the purchasers of the Bonds. So far as any statements are made in this Offering Memorandum involving matters of opinion, whether or not expressly so stated, they are intended merely as such and not as representations of fact. Copies of the documents mentioned in this paragraph are on file at the offices of the Trustee.

Information relating to DTC and the book-entry system and the Clearstream Luxembourg and Euroclear systems described herein under the heading “BOOK-ENTRY SYSTEM AND GLOBAL CLEARANCE PROCEDURES” is based on information furnished by DTC, Clearstream Luxembourg and Euroclear and is believed to be reliable, but neither the Underwriter nor the Institution makes any representations or warranties whatsoever with respect to such information.

APPENDIX A to this Offering Memorandum contains certain information relating to the Institution. While such information contained therein is believed to be reliable, the Underwriter does not make any representations or warranties whatsoever with respect to such information.

APPENDIX B to this Offering Memorandum contains the financial statements of the Institution as of and for the fiscal years ended December 31, 2016 and 2015, which have been audited by KPMG LLP, independent auditors, as stated in their report appearing therein.

The Underwriter has relied on the information contained in APPENDIX A and the financial statements contained in APPENDIX B.

APPENDIX C – “DEFINITIONS OF CERTAIN TERMS” and APPENDIX D – “SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE” have been prepared by Locke Lord LLP, Bond Counsel to the Institution.

All appendices are incorporated as integral parts of this Offering Memorandum.

The delivery of this Offering Memorandum has been duly authorized by the Institution.

THE JACKSON LABORATORY

By: /s/ S. Catherine Longley  
Vice President and Chief Financial Officer

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**CERTAIN INFORMATION CONCERNING THE JACKSON LABORATORY**

## APPENDIX A

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The following information is provided by The Jackson Laboratory (the “Laboratory” or “JAX”) in connection with the issuance of The Jackson Laboratory Taxable Bonds, Series 2018 (the “Bonds”).

## INTRODUCTION

The Laboratory is an independent, nonprofit, 501(c)(3) tax exempt research institute that strives to discover precise genomic solutions for disease and empower the global biomedical community in its shared quest to improve human health. Founded in 1929, the Laboratory’s purposes are scientific, medical, charitable and educational.

More specifically, the Laboratory performs research to identify the genetic and molecular causes of disease and to develop diagnostic treatments and cures. The Laboratory also furthers the work of other researchers and clinicians by developing research tools and diagnostic services that are made available to the global biomedical community. These efforts include the development and characterization (both genotypic and phenotypic) of mice for use in biomedical research; the development of genetic and other databases for use by the global research community; the establishment of cell-based resources from human and mouse origins for biological screens; and the development and optimization of clinical diagnostics and therapeutics for use in genetically based medicine. Additionally, the Laboratory enhances the knowledge and skills of the research and clinical communities through the provision of educational courses, conferences and programs.

The laboratory mouse is a powerful tool that scientists use to model human diseases and conditions in the search for better treatments and cures for humankind’s most devastating genetic diseases. To support its mission, the Laboratory maintains a repository of genetically distinct strains of research mice, hundreds of which model rare and orphan diseases, and makes them available to more than 1,900 organizations in over 75 countries. Distribution of these strains supports researchers seeking cures for the world’s most challenging human diseases and bringing therapies to patients. Since 1993, the National Institutes of Health (“NIH”) has helped fund the repository and associated databases of genetic information, which include data about each strain’s genetic makeup, breeding characteristics, physical traits and development characteristics, as well as references to published research involving each strain. Scientists worldwide obtain mouse models from the repository and use the repository to hold and disseminate mouse models developed in their own research to others around the world. See **“SCIENTIFIC PROGRAMS AND RESEARCH ACTIVITIES.”**

The Laboratory has a \$375 million operating budget for the fiscal year ended on December 31, 2018. As used hereinafter, and unless otherwise indicated by the context, all financial data for, or references to any year, refer to the fiscal year ended December 31 and are derived from the records of the Laboratory.

The Laboratory maintains its main campus in Bar Harbor, Maine and maintains other locations in Farmington, Connecticut, Sacramento, California, and Augusta, Maine. The Bar Harbor campus is dedicated primarily to mammalian genetics research and central operations, while the Farmington campus, also known as The Jackson Laboratory for Genomic Medicine (“JAX Genomic Medicine”), is dedicated primarily to human genetics and genomics research. The facility in Sacramento is primarily a mouse production facility and the Laboratory leases an office in Augusta for a single research project. See **“FACILITIES.”** The Laboratory has recently added a campus in Ellsworth, Maine on which a portion of the proceeds of the Bonds are expected to be applied to expand mouse production facilities. See **“THE ELLSWORTH PROJECT.”**

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As of December 31, 2017, the Laboratory employed approximately 2,100 persons at its locations in Maine, Connecticut and California. The Laboratory has 69 faculty members (also referred to herein as “principal investigators”) who lead independent research programs, apply for external funding, and educate and train students and postdoctoral fellows within their research laboratories. The Laboratory also provides centralized scientific services, including reproductive sciences and genotyping. These services, which are staffed by approximately 150 scientists and technicians, support the principal investigators’ research needs, promote repository genetic quality and contribute to the Laboratory’s development of the mouse as a model system for biomedical research. Services performed include: genotyping; high-throughput sequencing and gene expression technologies; histology; pathology; phenotyping; electron microscopy, light microscopy and in vivo services; genome engineering; computational science services; and surgical services to support both the principal investigators’ laboratories and the mouse repository.

In 2017 principal investigators were awarded 67 new grants totaling \$76.3 million in new research funding. The Laboratory’s NIH grant win rate across all of its campuses was nearly twice the national average in 2016. Laboratory scientists publish their research in national and international peer-reviewed scientific journals, and their work is frequently cited by other researchers. In 2017, research personnel published 297 articles in peer-reviewed journals. These scientific publications include numerous articles in high-impact journals, such as *Nature*, *Nature Genetics*, and *Science*. Laboratory researchers have been recognized by prestigious awards, including a Nobel Prize and Lasker Award, won by emeritus faculty in 1980 and 2010, respectively.

### LABORATORY HISTORY

The Laboratory was founded in 1929 by Dr. Clarence Cook Little on the premise that the causes of cancer and other diseases could be discovered through mammalian genetic research. Dr. Little, who at various times served as the president of the University of Maine, the president of the University of Michigan, and the managing director of the American Society for the Control of Cancer (now the American Cancer Society), believed that the key to mammalian genetics was the mouse – a creature strikingly similar to humans in its genetics and physiological makeup, and ideally suited to developing experimental models of human illnesses. Roscoe B. Jackson, president of Hudson Motorcar Company, and Edsel Ford, son of Ford Motor Company founder, Henry Ford, provided the initial funds for establishing the Laboratory. The Laboratory’s facility was constructed on donated land in Bar Harbor, Maine, immediately adjacent to Acadia National Park.

After a forest fire in 1947 burned much of Bar Harbor and Mount Desert Island, destroying the Laboratory’s buildings, equipment, library and 60,000 mice, donations of equipment, work space, replacement mice, books and journals came from across the country. The Laboratory rebuilt and over the next several decades expanded significantly. To better serve the West Coast research community, the Laboratory established a presence in California with the build-out of a leased facility in West Sacramento in 2001. The Laboratory sought to accommodate continued growth by purchasing a building in Sacramento in 2007 and renovating it for mouse production and laboratory services.

The Laboratory has grown to become a leader in mammalian genetics research and education, and a major provider of genetic resources to the scientific community worldwide. The Laboratory was designated a National Cancer Center in 1983 by the National Cancer Institute (the “NCI”), in recognition of its foundational cancer research and its contributions to international cancer research.

Recognizing the need to accelerate the clinical application of its research discoveries, the Laboratory sought a relationship with a medical school and a major medical center hosting clinical trials. In 2012, the Laboratory entered into an agreement with Connecticut Innovations, Incorporated (“CII”) an agency of the State of Connecticut to establish JAX Genomic Medicine on the University of Connecticut

Health Center (“UConn Health”) campus in Farmington. The facility was completed and occupied in 2014. CII provided loans and funding to establish JAX Genomic Medicine. See “**OUTSTANDING INDEBTEDNESS.**” The facility now hosts nearly 30 faculty and employs more than 340 full-time faculty and staff. In addition to collaborations with medical centers and health care systems, JAX Genomic Medicine faculty members work closely with other JAX scientists to enhance the translation of genomic information from mouse models and human clinical trials to medical therapies.

### SCIENTIFIC PROGRAMS AND RESEARCH ACTIVITIES

The Laboratory is a worldwide leader in mammalian genetics research and education and a major provider of genetic resources to the scientific community worldwide. Laboratory scientists have pioneered the use of functional genomics, computational biology, novel tools and mouse models to tackle critical questions in human health. Researchers are investigating the genetic components of biological processes and human diseases, including cancer, diabetes, Alzheimer’s disease and muscular dystrophy, among others. Research is conducted within the laboratories of principal investigators in Bar Harbor and Farmington, in interdisciplinary centers and through collaborations with other institutions. The Laboratory also sponsors a wide range of education programs to share its knowledge gained through research and mouse breeding.

Research at the Laboratory is interdisciplinary and is conducted across several major areas, including:

- Cancer
- Genetics and Genomics
- Bioinformatics and Computational Biology
- Developmental and Reproductive Biology
- Immunology
- Microbiome
- Neurobiology
- Aging

**Cancer.** The Laboratory has been designated a National Cancer Center by NCI since 1983. The Cancer Center emphasizes innovative approaches in cancer immunology, cancer genomics, systems biology and pharmacology to enable advances in cancer treatment and prevention. Current research efforts include identifying and characterizing molecular mechanisms and subtypes in glioblastoma; understanding the biology of immune checkpoints and improving the safety and efficacy of checkpoint blockades in cancer therapy; using patient-derived xenografts (PDX) in immuno-compromised mice to model human cancer progression and therapy response; characterizing the immune component of the tumor microenvironment; employing novel single cell sequencing and analysis protocols to precisely track cancer cell evolution and the development of therapy resistance; investigating the role of alternative RNA splicing misregulation in cancer initiation; identifying and characterizing the epigenetic traits and lesions that guide cancer cell evolution and affect therapy efficacy; and many other initiatives.

In addition, JAX received funding from the Harold Alfond® Foundation to enhance cancer diagnostics and treatment in Maine through the Maine Cancer Genomics Initiative (“MCGI”). MCGI leverages the strengths of key medical and bioscience research institutions in Maine to create an alliance focused on precision cancer diagnostics and treatment. JAX is employing novel genomic medicine tools developed in its Clinical Laboratory Improvement Amendments (“CLIA”) certified/College of American Pathologists (“CAP”) accredited laboratory to inform physicians about potential personalized therapy options for cancer patients that may mitigate tumor growth and avoid the potential delay and side effects associated with therapies initiated without prior genomic testing.

## APPENDIX A

**Genetics and Genomics.** Laboratory researchers are developing and using sophisticated new techniques to unravel the complexities of the human and mouse genome and are applying this knowledge to normal human biology and disease. Tools include new technologies to probe the three-dimensional structure and function of the genome and transcriptome; novel statistical methods; mouse populations that mirror genetic variation in the human genome; bioinformatics tools to track and integrate data from multiple biological systems and levels; and computational methods to map complex genetic architecture and infer models that predict the outcomes of genetic and environmental variation.

For example, researchers recruited to JAX Genomic Medicine have recently developed a technique for detection of global chromatin interactions in the genome, which are important for understanding transcriptional regulation in mice and humans. Also, researchers in the Knockout Mouse Phenotyping Program supported by the National Human Genome Research Institute are building a phenotype resource summarizing the function of thousands of genes in the mouse to create a resource for understanding human gene function. The incorporation of genomic technologies and information into medical decision-making and practice is a major focus of JAX Genomic Medicine.

**Bioinformatics and Computational Biology.** Laboratory scientists develop sophisticated tools for analysis, storage, organization and annotation of the ever-increasing amounts of available genetics data for internal use and for access by the research community. Computational researchers contribute to new methods that accelerate quantitative trait loci mapping and microarray analysis, models that allow researchers to determine what biological functions are performed by genes and proteins, and models that intuitively and precisely characterize the genetic architecture of disease. Computational faculty are increasing the value of both mouse and human data by leveraging both patient and experimental data sets to better model patient genetics in mouse strains and populations, which then can be used to discover therapeutic targets for clinical application. Laboratory scientists also develop and maintain several key bioinformatics resources. The Laboratory hosts the Mouse Genome Informatics (“MGI”) platform resource (<http://www.informatics.jax.org>), a free online database and bioinformatics resource containing data, tools and analyses for studying the genetics, genomics and biology of the laboratory mouse to facilitate the study of human health and disease. MGI is funded by the National Human Genome Research Institute, the National Cancer Institute and the National Institute of Child Health and Human Development. The *Mouse Phenome Database* (<http://phenome.jax.org/>) is a comprehensive collection of phenotypic data on commonly used and genetically diverse inbred mouse strains, with genotype and phenotype information related to a variety of research areas, including aging, cancer susceptibility, neurological and behavioral disorders, hypertension, osteoporosis and obesity. The Laboratory provides access to these resources free of charge to the public and encourages researchers worldwide to contribute their new discoveries to these databases.

**Developmental and Reproductive Biology.** Researchers in Reproductive Biology examine the genetics of egg and sperm production and associated problems to provide new ways to address reproductive disorders such as infertility, and to develop better contraception methods. Developmental Biology faculty members investigate the basic processes from fertilized egg to functional being, which also hold key information about how human genes function. Research initiatives include investigations into genetic regulation of spermatogenesis and male fertility; development of novel mouse models of reproductive disorders and infertility through the ReproGenomics Program; identification of genes that regulate bone density, size and shape in skeletal development and defects; and development of mammalian neural networks at the cellular and molecular levels and research into how defects in these processes contribute to brain disorders such as autism and schizophrenia. Areas slated for growth include stem and progenitor cell biology and genomic programming, with faculty at both Bar Harbor and Farmington expanding research into stem cell functional genomics.

**Immunology.** Laboratory scientists develop and use defined models to study the genetic basis for immune function in normal and disease biology, including aging, anemia, hematopoietic stem cell function and renewal, lupus and other autoimmune disorders. They are at the forefront of the new thinking about how the body's immune response and inflammation contribute to a variety of diseases, including cancer and diabetes. Laboratory scientists have developed powerful experimental model systems for human autoimmunity and immunodeficiency, including "humanized" mouse models that support engraftment with human stem cells and with human peripheral blood lymphocytes. Humanized mice provide critical models for experimental investigation of human immune diseases without putting individuals at risk, and they have been used to study malignancy, anemia, infectious diseases and transplantation tolerance. Researchers have used humanized mice to explore the genetic control mechanisms of autoimmunity in insulin-dependent (type 1) diabetes. This work has direct clinical implications by identifying mechanisms and compounds that normally prevent autoimmunity and revealing strategies for interventions in humans at risk for type 1 diabetes.

In addition, JAX faculty are researching the core properties of human immune response to pathogens, including finding patterns of dysfunction in the aging immune system, defining the underlying causes for variability of early (infant and young child) immune response, exploring the immune cascade in terms of both cellular responses and anatomic locations, and investigating the details of dendritic cell function. The research has important implications for cancer immunotherapies (see previous) as well as vaccine composition and delivery and the biology of aging.

**Microbiome.** It has only recently been appreciated how the microbiome -- the trillions of microbes, including bacteria, fungi, archaea and more that live on and in humans -- can influence health and wellness. JAX faculty are at the forefront of characterizing microbial populations associated with both health and disease, providing the foundation needed to discover causal relationships. For example, a recent JAX study analyzed stool samples from a neonatal intensive care unit and, based on the microbiome composition, predicted which babies were at risk for specific health complications. The research program is also focusing on the skin microbiome, which can play important roles in skin health and infection. Understanding the dynamics of skin bacterial colonies will provide insight into how to implement effective probiotic (beneficial bacteria) therapies to treat a variety of skin conditions.

**Neurobiology.** Research at the Laboratory addresses a wide range of studies regarding neurological function and dysfunction, from developmental processes and sensory disorders to neuron degeneration. Researchers use genomic data, computational modeling, advanced mouse populations and more to identify genetic and molecular mechanisms that underlie neuron death in the aging mammalian brain; epilepsy; neuromuscular degeneration and dysfunction leading to degenerative motor neuron diseases, such as amyotrophic lateral sclerosis (ALS); vision and deafness disorders; and addiction. Their work enhances progress toward prevention and development of effective therapies.

For example, Laboratory faculty recently launched a National Institute on Aging-funded Alzheimer's Disease Center in collaboration with Indiana University. Clinical trials of Alzheimer's disease ("AD") therapies have failed to date, but new capabilities such as gene editing and advanced computational methods provide the opportunity to learn far more about the biology of late-onset AD in human patients. The center will then be able to model the disease more accurately in mice and establish a more effective and translatable preclinical therapy testing pipeline. A complementary research program is investigating the genetics of AD resilience to discover why some individuals who are at risk show no sign of cognitive decline. Understanding the mechanisms of resilience has the potential to reveal therapy targets.

**Aging.** Laboratory researchers are also studying the biological process of aging, with the goal of increasing the health span during which people can enjoy a high quality of life and remain disease-free. A

## APPENDIX A

JAX-led study revealed the first drug that statistically prolongs life in a mammal, rapamycin, and research is ongoing into the pathways and mechanisms involved. Genetically diverse mouse populations are also showing wide variations in life span between individuals housed in the same environment, providing important insight into the genetics that help promote a long, healthy life. JAX researchers are now using the latest resources, including genomic technologies and specialized mouse models, to decipher the changes that occur as a consequence of aging -- and what underlies them -- in order to learn how to extend health span, delay age-related health issues, repair damaged organs and improve quality of life.

### *Genetic Resource Science and JAX<sup>®</sup> Mice, Clinical & Research Services (“JMCRS”).*

Laboratory researchers develop and provide mouse genetic resources and mouse related technologies, as well as maintain extensive databases of mouse strains and discoveries related to the genetics of each strain. Access to these databases is free and available to the public. These groups develop new disease models from spontaneous mutation-bearing mice that arise in the Laboratory’s colonies. Collectively, spontaneous mutant-developed models of genetic disease span a variety of phenotypic categories representative of many human diseases and syndromes. Phenotypes include neurological, neuromuscular and sensory (vision, hearing and balance) disorders; skeletal (craniofacial, spine and limb) dysmorphologies; growth defects; and renal/urinary disorders. Other mutations affect behaviors, coordinated movement, fertility and viability. In addition, researchers develop models of human disease through point mutations using gene-targeting vectors designed to knock-in or knock-out specific genes. A particular area of focus is on rare and orphan diseases.

The Laboratory maintains a repository of mice, with more than 10,000 different mouse strains, representing mouse models for much of the human disease spectrum. Beginning in 2000, NIH funded a major new Laboratory research program to increase the number and availability of mouse models for human neurological diseases, including epilepsy, addiction and neurodegenerative disorders. For the strains of mice in highest demand, the Laboratory maintains colonies sufficiently large enough to meet specific needs of researchers on a timely basis. JMCRS carefully plans its breeding to meet the seasonality of demand and follows patented breeding protocols to assure genetic consistency. The repository also includes smaller colonies for approximately 1,700 strains that are less in demand. These smaller colonies are frequently changed, as approximately 600 new strains enter the repository each year. The repository seeks new models used in published research that are deemed scientifically important. Cryopreserved strains may be reanimated upon request.

As part of its mission, the Laboratory provides support for researchers, including an extensive Clinical Knowledge Base (“CKB”), which includes technical information support provided by Ph.D. scientists, and webinars on the use of mice in research - all available without charge. In addition, the Laboratory offers workshops on colony management and other mouse-related research at various locations around the world. Newsletters and other publications provide insights learned by the Laboratory from the care of its colonies on mouse husbandry and breeding of various strains. These activities all derive from JMCRS’s expertise in mouse genetics and the use of the mouse in research. In addition, the Laboratory carefully monitors the health status and genetic makeup of its mice to assure the highest quality, and updates and enhances its knowledge of the mouse as a research model through the process of performing JMCRS breeding and services.

## RESEARCH COLLABORATIONS

Laboratory faculty maintain numerous external research collaborations and partnerships. In 2017, Laboratory scientists published research with collaborators at 404 institutes, centers or schools in 38 other countries and in 38 states in the United States. The Laboratory’s independent research is further supported by collaborations with other research institutions to share scientific services, genetic and bioinformatics resources, and conduct joint training and education programs. The Laboratory has established

translational research opportunities with physician scientists at the two largest cancer care centers in Maine (Eastern Maine Medical Center in Bangor and the Maine Medical Center in Portland). Through the Maine Cancer Genomics Initiative, the Laboratory is engaged with all of the cancer care centers in Maine to provide oncology clinicians with access to CLIA-certified genomic tests with the mission of educating the clinical community on cancer genomics and cancer genomic technologies. The Laboratory also has collaborations with the University of Connecticut (“UConn”), UConn Health, Connecticut Children’s Medical Center, Yale University and MDI Biological Laboratory. The Laboratory has a formal agreement with Beth Israel Deaconess Medical Center Cancer Center in Boston to explore the establishment of a comprehensive academic, research and service relationship. The Laboratory is also a translational research partner of Southwest Oncology Group (“SWOG”), a National Clinical Trials Network cooperative oncology group designated by the NCI. The Laboratory collaborates with the Cancer Center at the University of California at Davis (“UC Davis”) for the development and growth of the PDX Tumor Bank Consortium. UC Davis was the founding member of the Consortium that has grown to include 20 other institutions around the country. Additionally, the Laboratory joined the Tufts Clinical and Translational Science Institute (“CTSI”) in 2018.

In addition, the Laboratory partners with 10 academic medical centers and research universities in the New York area – Columbia University, Cornell University, New York University, New York Presbyterian Hospital, Rockefeller University, Cold Spring Harbor Laboratory, Stony Brook University, Mount Sinai School of Medicine, Northwell Health and Memorial Sloan-Kettering Cancer Center – in the New York Genome Center (the “NYGC”), a center for bioinformatics and genomics research. The NYGC is an independent, nonprofit organization focusing on collaborative research; its mission is to transform biomedical research and clinical care in New York and beyond by creating what will become one of the largest bioinformatics and genomics facilities in North America.

## EDUCATION

The Laboratory has a long history of educating the next generation of scientists through an array of programs, some of which predate its founding. Today, JAX Genomic Education (“JAX GE”) educates scientists of all ages and from all over the world through five program areas from the Laboratory’s campuses in Bar Harbor and Farmington.

***STEM and Undergraduate Education*** includes student research internships, teacher professional development in genomics, and a renowned Summer Student Program (“SSP”). There are over 2,000 SSP alumni, including three program alumni who became Nobel Laureates for their post-JAX work. Approximately 35 high school and college students are placed in Bar Harbor and 12 at JAX Genomic Medicine each year in this highly competitive program. Academic year interns include area college and high school students. The Laboratory supports teacher professional development through an NIH Science Education Partnership Award – *Teaching the Genome Generation* – that has reached 116 high school teachers and 4,750 high school students from 107 schools across New England.

The ***Predocctoral and Postdoctoral Training Program*** is central to the Laboratory’s education mission. Participants are exposed to an array of academic scientific experiences as well as opportunities to engage with leading scientists by participating in JAX GE’s courses and conferences. The Laboratory maintains two cooperative Ph.D. programs in mammalian genetics, with the Graduate School of Biomedical Science and Engineering at The University of Maine, and with the Sackler School of Graduate Biomedical Sciences at Tufts University. The Laboratory’s well-established Postdoctoral Program prepares Ph.D., M.D. and M.D.-Ph.D. scientists for independent scientific careers. The program typically has about 50 trainees at any time, equally distributed at both campuses and in all research areas.

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The *Clinical and Continuing Education Program* (“CCEP”) empowers health-care professionals to integrate genomics into their clinical practice by 1) promoting health-professional education; 2) partnering with health-professional communities; 3) anticipating health-professional needs; and 4) building point-of-care resources, web-based educational programs and in-person workshops. CCEP’s workshops incorporate reusable content to allow them to be delivered at the clinician’s location without compromising the educational integrity of the program. CCEP’s online programs are interactive and case-based, and include point-of-care tools as well as self-directed programs.

*Digital and Online Education* brings the power of online learning to bear on the Laboratory’s tradition of education programming and faculty research, with the objective of making the JAX GE portfolio more scalable, visible, modular and sustainable. Working with subject matter experts from across the institution, the Laboratory is building an online portfolio for a wide variety of learners. Students have access to high-quality online modules and courses, and are able to participate remotely in programming utilizing webcasting attendance options.

*Courses, Conferences and Workshops* is the flagship JAX GE program, which provides in-person educational opportunities for graduate and postgraduate students and established professionals. Students and trainees participate in the Laboratory’s internationally attended educational programs each year. In 2017, 467 faculty-scientists taught in 30 courses, workshops and conferences. With 1,314 individuals participating in the 30 programs, participant demographics include: 28% graduate students, 17% faculty/professors, 15% postdoctoral fellows and 6% undergraduate students; the remaining 34% of participants are industry professionals who represent a broad array of life science professions, to include medical doctors, veterinarians, research associates and technicians.

## INTELLECTUAL PROPERTY AND TECHNOLOGY TRANSFER

*Intellectual Property Ownership and Revenue Sharing.* Intellectual property generated at the Laboratory is governed by an Intellectual Property Rights Policy, which applies to Laboratory employees, including faculty and research scientists. The policy provides that the Laboratory owns all right, title and interest in any intellectual property that is developed by Laboratory employees in the course of or related to their employment or by those (either Laboratory employees or others) working or conducting research at the Laboratory or that is developed with Laboratory funding or other resources. All researchers, staff, employees and any other individuals working on the premises or with Laboratory resources, including non-employees, must promptly disclose and assign to the Laboratory any intellectual property, and must cooperate with the Laboratory in protecting such intellectual property. The Office of General Counsel is responsible for the filing, prosecution, maintenance and enforcement of the intellectual property developed at the Laboratory, and works with the Office of Scientific Translations and Alliances (“OSTA”) to license such intellectual property. Once licensed, the revenue generated by the intellectual property is distributed pursuant to a formula set forth in the Intellectual Property Rights Policy. These arrangements contemplate exceptions for rights of certain third parties, including for example the federal government, Howard Hughes Medical Institute (“HHMI”) and CII. For intellectual property generated collaboratively between the Laboratory and third parties, typically such intellectual property is jointly owned, and the institutions enter into an agreement governing the filing, prosecution, maintenance, enforcement and licensing of the intellectual property and the equitable distribution of revenue.

As required by federal law and NIH regulations, OSTA, in collaboration with the Office of General Counsel, works to ensure that the Laboratory’s research reaches the public. This effort includes licensing to the private sector, while simultaneously generating financial resources to support future research. OSTA’s primary functions include negotiating research-related agreements with industry in coordination with the Office of General Counsel and the Sponsored Research Administration office,



evaluating inventions and filing for patent protection, prosecuting patent applications, marketing and licensing the Laboratory’s intellectual property, and monitoring licensee performance.

As of December 31, 2017, the Laboratory had filed 377 patent applications in the United States and foreign jurisdictions, including 43 new applications filed in 2017.

In the United States and foreign jurisdictions, 50 patent applications were pending. The Laboratory has a portfolio of 89 issued patents, four of which were issued in 2017. In addition, as of December 31, 2017, the Laboratory had issued 96 non-exclusive licenses. Laboratory technologies have been key to the development of two new companies. For 2017, gross licensing revenue totaled approximately \$4.1 million.

### FACILITIES

The Laboratory maintains facilities in three states: Maine, California and Connecticut. While each site has some overlap with work done at other JAX sites, the individual sites also have specific functions that are not performed at the other locations.

<b>Activities Conducted at Campus Facilities</b>				
<b><u>Bar Harbor</u></b>	<b><u>Ellsworth</u></b>	<b><u>Augusta</u></b>	<b><u>Sacramento</u></b>	<b><u>Farmington</u></b>
Genetics Research	Mouse Breeding	Maine Cancer Genomics Initiative	Mouse Breeding	Genomics Research
Mouse Breeding			In Vivo Services	Scientific Support Services
Scientific Support Services				Clinical Diagnostic Services
In Vivo Services				

**Bar Harbor, Maine:** The Bar Harbor facility is the Laboratory’s main campus and consists of approximately 784,000 square feet of buildings located on 156 acres of land. It is located primarily at 600 Main Street, between the Gulf of Maine and Acadia National Park, approximately one mile from downtown Bar Harbor.

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*Bar Harbor campus.*

Laboratory and bioinformatics space is housed in buildings completed from 1947 to the most recent Laboratory space completed in 2018. The campus includes vivaria (locations where animals are kept under controlled, pathogen-free conditions for research/study) for breeding, repository and research colonies. Separate buildings house importation/reproductive sciences and information technology. The faculty primarily uses the mouse as its model or data from the mouse to study the genetic basis for human development and disease. As of December 31, 2017, there were approximately 1,360 employees, including 43 faculty, in Bar Harbor.

To be used as research models, mice must be bred, husbanded and distributed according to strict genetic, health and regulatory standards. The Laboratory maintains mouse breeding colonies in state-of-the-art vivaria. There are specially designed air-handling systems, autoclave systems for sterilizing all material entering the rooms, shower-in facilities and specially designed ventilated racks. The Association for Assessment and Accreditation of Laboratory Animal Care International reviews the facility and its procedures to assure adherence to the animal care guidelines maintained by the National Research Council Commission on Life Sciences. The Bar Harbor animal facility was last accredited in 2015 and is expected to undergo re-accreditation in mid-2018, with results expected to be available before the end of 2018. Accreditation lasts for three years.

**Ellsworth, Maine:** The Ellsworth facility is located at Kingsland Crossing on 17.7 acres of land. The renovation, improvement and equipping of the facility is being undertaken in several phases, with the first phase expected to be completed and placed into service in mid-2018, and the next phase expected to begin shortly thereafter. The first two phases will provide an approximate 275,000 gross square foot next-generation, state-of-the-art vivarium for breeding and distribution of research mouse models. The project

has an estimated cost of \$143 million, a portion of which will be financed with a portion of the Bond proceeds. See “**THE ELLSWORTH PROJECT.**”



*Artist rendering of renovated Ellsworth campus.*

**Augusta, Maine:** The Laboratory maintains an office at Maine General Medical Center in Augusta in support of the MCGI. A charitable contribution of \$8.4 million from the Harold Alfond® Foundation in 2016 supports the Laboratory’s efforts to enhance cancer diagnostics and treatment in Maine. Funded by the proceeds of this gift, JAX will perform approximately 1,800 molecular tumor tests at no cost to patients in Maine. MCGI will work with clinicians from every cancer care center in Maine to help patients and their physicians access precision cancer care.

**Sacramento, California:** The Sacramento facility is located at 1650 Santa Ana Avenue on 6.1 acres of land with a single building totaling nearly 229,000 square feet of space.

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## APPENDIX A



*Sacramento campus.*

The Sacramento facility includes a state-of-the-art vivarium for breeding and distribution of research mouse models. It also includes laboratory space, in which the Laboratory provides in vivo research services that involve the conduct of technical protocols and providing data or tissue back to the scientist, advancing the Laboratory's knowledge of the mouse as a research model in the process. Such in vivo services, as well as a PDX Cancer Tumor Bank, are offered from the Sacramento facility. As of December 31, 2017, there were approximately 340 employees in Sacramento.

**Farmington, Connecticut:** On January 5, 2012, CII, a quasi-governmental agency of the State of Connecticut, entered into an agreement with the Laboratory to fund the establishment of JAX Genomic Medicine through forgivable loans and direct grants. See "**OUTSTANDING INDEBTEDNESS.**" The purpose of JAX Genomic Medicine is to accelerate the development of genomics-based personalized medicine, working with academic and clinical research partners from Connecticut and around the world.

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*Farmington campus.*

JAX Genomic Medicine is situated on a 16.2-acre parcel leased from UConn Health is a Leadership in Energy and Environmental Design (LEED) gold-certified biomedical research facility of approximately 185,000 gross square feet with a mix of modern and efficient research laboratories; flexible and interactive bioinformatics research clusters intended to provide space for 30 principal investigators; adaptable scientific service cores; a state-of-the-art data center and satellite equipment rooms; collaboration, conferencing and training facilities; and supporting administrative facilities and infrastructure. As of December 31, 2017, there were approximately 345 employees in Farmington.

## **GOVERNANCE AND MANAGEMENT**

The Laboratory governance is vested in its Board of Trustees (the “Board”), which provides strategic direction, financial oversight and fundraising support. The Board appoints the president, who also holds the title of chief executive officer. The Nominating and Governance Committee proposes the Board chair, who is elected at the August meeting for a two-year term and may serve up to three consecutive terms. The Board may also elect one or more vice chairs as it deems necessary. The Laboratory has other officers as part of its management team, including several vice presidents and the chief financial officer. The chief financial officer serves as treasurer and the general counsel serves as secretary. These officers, as well as the assistant treasurers and assistant secretaries, are appointed by the president.

A Board of Scientific Counselors (“BSC”) provides advice to the president on the Laboratory’s scientific activities, including research, education, training and genetics resources programs. The BSC also advises the president on recruitment and promotion of scientific staff and scientific collaborations, as needed. The BSC is composed of at least nine members. The president and vice president of research appoint BSC members. Members of the BSC serve for three-year terms and work with the president and vice president of research to conduct regular faculty reviews. The chair of the BSC is elected by the members of the BSC in consultation with the president.

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The Board consists of 15 to 30 members, including the president and the chair of the BSC, who serve as *ex officio* members. There are presently 25 members. Board members are divided into three classes of approximately equal size such that the term of one-third of the members will expire at each regular annual meeting. Terms are for three years and each member may serve up to four consecutive full three-year terms. The Board meets at least four times each year. The members of the Board and their affiliations and terms are as follows:

<u>Name</u>	<u>Affiliation</u>	<u>Current Term Expires</u>
Thomas C. Barry	Chief Executive Officer and Founder, Zephyr Management	2020
Mark S. Blumenkranz, M.D.	Director, Ophthalmology Innovation Program, Byers Eye Institute (Stanford University)	2020
Otis W. Brawley, M.D.	Chief Medical Officer, American Cancer Society	2018
David R. Cabot	Former Senior Managing Director, Windhaven Investment Management	2018
Kathleen A. Corbet	Principal, Cross Ridge Capital	2018
Louis D'Ambrosio*	Chairman of the Board, Sensus USA, Inc.	2020
Timothy D. Dattels*	Managing Partner and Co-Head, TPG Capital	2018
Julie Hembrock Daum	Partner and Co-Practice Leader, Spencer Stuart	2020
David D. Elliman	Director and Principal, Elmrock Capital, Inc.	2019
Anthony B. Evnin, Ph.D.	Partner, Venrock	2019
Steven B. Fink, J.D.	Chief Executive Officer, Malibu Ventures	2020
Jeffrey M. Friedman, M.D., Ph.D.	Marilyn M. Smith Professor and HHMI Investigator, The Rockefeller University	2018
Peter F. Gerrity*	President, Gerrity Company, Inc.	2018
John A. Gibbons	Managing Partner, Odin Partners	2018
Paul A. Godley, M.D., Ph.D.*	Vice Dean for Diversity and Inclusion, University of North Carolina School of Medicine	2019
Charles E. Hewett, Ph.D.	Executive Vice President and Chief Operating Officer, The Jackson Laboratory	2020
Richard S. Lannamann*	President, Willowmere Investments	2019
Edison T. Liu, M.D.*	President and Chief Executive Officer, The Jackson Laboratory	<i>Ex officio</i>
Neal B. Milch, J.D.*	Chief Executive Officer, Autarkic Holdings, Inc.	2020
Dennis J. Paustenbach, Ph.D.	President and Senior Principal, Cardno ChemRisk	2019

\* Member of the Executive Committee.

<u>Name</u>	<u>Affiliation</u>	<u>Current Term Expires</u>
Janet Rossant, Ph.D.	Senior Scientist and University Professor, Hospital for Sick Children; Chair, The Jackson Laboratory BSC	<i>Ex officio</i>
David J. Roux, <i>Chair</i> *	Co-Founder and Senior Director, Silver Lake Partners	2020
Geoffrey W. Smith, J.D.	Managing Partner, Digitalis Ventures	2020
Joan A. Steitz, Ph.D.	Sterling Professor of Molecular Biophysics and Biochemistry, Yale University	2020
Brian F. Wruble	Retired	2019

\* Member of the Executive Committee.

The Board delegates certain of its functions to standing committees. The permanent standing committees are the Executive Committee, the Advancement Committee, the Audit Committee, the Compensation and Human Resources Committee, the Finance Committee, and the Nominating and Governance Committee. Additional committees may be established by the Board from time to time, and the Board may assign to such committees whatever legally delegable duties and powers it deems advisable. Subcommittees to the Finance Committee include a Debt Subcommittee and an Investment Subcommittee. The Debt Subcommittee is chaired by Thomas C. Barry, Chief Executive Officer and Founder of Zephyr Management.

## EXECUTIVE MANAGEMENT

The president and chief executive officer is responsible for leading and administering the Laboratory. Following the strategic imperatives adopted by the Board, he develops the scientific and operating plans. Senior management is responsible for carrying out these plans. Below is a brief biography for key members of the Senior Management Team.

***Edison T. Liu, M.D., President and Chief Executive Officer***, age 66. Liu was named the president and chief executive officer of the Laboratory in 2012. Previously, he was the founding executive director of the Genome Institute of Singapore (2001-2011), and was the president of the Human Genome Organization from 2007 to 2013. Between 1997 and 2001, he was the scientific director of the NCI's Division of Clinical Sciences in Bethesda, Maryland, where he was in charge of the intramural clinical translational science programs. From 1987 to 1996, Liu was a faculty member at the University of North Carolina at Chapel Hill ("UNC"), where he was the director of the UNC Lineberger Comprehensive Cancer Center's Specialized Program of Research Excellence in Breast Cancer; the director of the Laboratory of Molecular Epidemiology at UNC's School of Public Health; chief of Medical Genetics; and the chair of the Correlative Science Committee of the national cooperative clinical trials group, CALGB. Liu is an international expert in cancer biology, genomics, human genetics, molecular epidemiology and translational medicine. Liu's own scientific research has focused on the functional genomics of human cancers, particularly breast cancer, uncovering new oncogenes, and deciphering on a genomic scale the dynamics of gene regulation that modulate cancer biology. He has authored over 300 scientific papers and reviews, and co-authored two books. He obtained his B.S. in chemistry and psychology, as well as his M.D., at Stanford University. He served his internship and residency at Washington University in St. Louis Barnes Hospital, followed by an oncology fellowship at

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Stanford. From 1982 to 1987 he was at the University of California, San Francisco, at the G.W. Hooper Foundation.

***Kenneth Fasman, Ph.D., Vice President for Research***, age 58. Fasman joined the Laboratory in May 2015. Prior to joining the Laboratory full-time, Fasman built many connections with JAX; he has been a scientific collaborator and advisor to the Mouse Genome Informatics program for 25 years, has served three terms on JAX's Board of Scientific Counselors, and has served as chair of the Genetic Resource Sciences advisory board. Fasman joined the Laboratory from the Adelson Medical Research Foundation in Needham, Massachusetts, where he was vice president and chief scientific officer from 2008 to 2014, building international research collaborations in oncology and neurology. From 1998 to 2008, he worked with the international pharmaceutical company AstraZeneca, serving as director of drug development strategy and performance and vice president for R&D informatics. From 1992 to 1998, Fasman worked on the Human Genome Project as an assistant professor of neuroscience, biomedical engineering, and biomedical information sciences at the Johns Hopkins University School of Medicine, and later at the Whitehead Institute/MIT Center for Genome Research. Fasman earned a B.S.E. in electrical engineering and computer science from Princeton University, and a Ph.D. in biomedical engineering from Johns Hopkins University. He also co-founded a laboratory software and systems design consulting firm, BME Systems, Inc., Baltimore, Maryland, in the late 1980s. Besides Fasman's long advisory service for JAX, he has also served in advisory roles for the National Institute of Environmental Health Sciences, NIH's Big Data to Knowledge ("BD2K") program, Beth Israel Deaconess' Institute for RNA Medicine, and various advisory committees for Johns Hopkins University, Massachusetts Institute of Technology, and Boston University.

***Charles E. Hewett, Ph.D., Executive Vice President and Chief Operating Officer***, age 68. Hewett joined the Laboratory in 2004 and has overseen the launch of numerous research products and services; modernization of mouse production facilities; and completion of new research laboratories in Bar Harbor, and the relocation and expansion of the Laboratory's Sacramento operation. Hewett also led the development of JAX Genomic Medicine. Dr. Hewett is a member of the Laboratory's Board and also served as a founding board member of the New York Genome Center. Prior to joining the Laboratory, as chief executive officer of Atlantic Energy Partners and Neptune Regional Transmission System, Pittsfield, Maine, Hewett successfully developed a \$650 million underwater merchant D.C. electric transmission system connecting Long Island, New York to New Jersey. At the same time, he also served as vice president and secretary to the Board of the Cianbro Companies, Pittsfield, Maine. In the mid-1990s, Hewett served for three years as the chief operating officer of the Executive Branch of the State of Maine during Governor Angus King's first term. He has held chief executive posts in the international pharmaceutical industry, in electric generation and in natural resource management, and has created companies and managed start-up projects in Asia, Europe and the United States. He is a Phi Beta Kappa graduate in political economy from Williams College, and holds M.F.S., M.S. and Ph.D. degrees from Yale University, where he was a member of Sigma Xi.

***Charles Lee, Ph.D., FACMG, Scientific Director and Professor, The Jackson Laboratory for Genomic Medicine***, age 48. Lee was appointed as the scientific director of JAX Genomic Medicine in Farmington in August 2013. He received his Ph.D. from the University of Alberta (Canada) and conducted research fellowships at Cambridge University (England) and Harvard Medical School. He then joined the faculty of the Department of Pathology at Brigham and Women's Hospital/Harvard Medical School, last serving as the director of the Molecular Genetic Research Unit, director of the Cytogenetics Core at the Dana Farber - Harvard Cancer Center and associate professor at Harvard Medical School. He is noted for his discovery that copy number variation (CNV) is widespread in the human genome and often associated with disease susceptibility or resistance. His discovery and subsequent research have provided the tools that clinicians around the world need to help them make accurate diagnoses for genetic



testing. For his discoveries and research into the human genome, he has received several accolades and awards including the 2008 Ho-Am Prize in Medicine and a Chen Global Investigator award from the International Human Genome Organisation. He is also an elected fellow of the American Association for the Advancement of Science. He has authored more than 130 scientific papers and has held advisory roles for numerous national organizations including the U.S. Food and Drug Administration, the National Human Genome Research Institute, the American Society of Human Genetics and the American College of Medical Genetics.

**Gregory R. Leet, M.N.P.S., Vice President for Advancement**, age 60. As vice president for advancement, Leet leads development, communications and trustee relations for JAX. Leet joined the Laboratory in 2016 with more than 25 years of advancement experience, much of it as a senior leader in large, complex institutions. Prior to joining JAX, Leet served as vice chancellor for university advancement at the University of California, Irvine (“UCI”) leading all advancement and fundraising programs and initiatives, including those of the UCI Medical Center and Chao Comprehensive Cancer Center, and oversaw the university’s community and government relations programs. Under Leet’s leadership, UCI became the youngest university to complete a \$1 billion fundraising campaign. He also secured UCI’s then largest gift ever of \$40 million to establish a school of nursing and allied health sciences. During his tenure, UCI recruited nearly 90 advancement professionals globally, and implemented development analytics and a comprehensive donor relationship management system. Leet was formerly vice president at Grenzebach Glier & Associates, Chicago, Illinois, an advancement consulting firm. He also held leadership positions at the Arizona State University (“ASU”) Foundation, where Leet managed the development staff for a then-planned \$1.3 billion campaign. He also collaborated on fundraising projects such as the ASU Biodesign Institute and helped with ASU’s rebranding initiative and innovative prospect management program. The branding and prospect management efforts both garnered national awards from the Council for Advancement and Support of Education (“CASE”). Prior to ASU, Leet held several gift officer and management positions at Creighton University, a private comprehensive research and teaching university. Leet received his B.A. in journalism from Kansas State University and an M.A. in nonprofit management at ASU.

**S. Catherine Longley, J.D., Vice President and Chief Financial Officer**, age 64. Longley has been the vice president and chief financial officer of the Laboratory since August 2016. She came to JAX after a distinguished career in finance, public policy and law. Currently, she provides strategic leadership, direction and management for all financial activities, including leading the development of financial strategies and the long-term financial model for JAX. She oversees sponsored research administration, finance and government relations. She also serves as the institutional official for animal welfare and chairs JAX’s 403(b) Retirement Plan Committee. Previously, Longley served as the senior vice president for finance and administration and treasurer at Bowdoin College. Longley practiced law with Verrill & Dana, LLC, in Portland, Maine, including as a partner where she practiced in the areas of corporate law, finance and banking, and nonprofit and municipal bond finance. She served as commissioner in the cabinet of former Maine Governor Angus King, where she had oversight for all state professional and financial regulations, including banking, securities and insurance laws and regulations. She currently serves as a director and chair of the audit committee of Camden National Corporation, Camden, Maine. She holds a B.A. degree from Bowdoin College, as well as a J.D. from Suffolk University Law School.

**Auro Nair, Ph.D., President, JAX<sup>®</sup> Mice, Clinical & Research Services**, age 57. Nair joined the Laboratory in 2007 as associate general manager of JAX<sup>®</sup> Mice & Services. The Laboratory added clinical services to its offerings, and in 2011 Nair was named general manager of JAX<sup>®</sup> Mice, Clinical & Research Services, responsible for all clinical and scientific research services provided to internal researchers at the Laboratory and external researchers worldwide. In 2014 he was promoted to general manager, JAX<sup>®</sup> Mice, Clinical & Research Services with responsibility for all mouse production and

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operations added to his portfolio. He was named to his present post in 2017. Prior to joining JAX, Nair served as vice president for worldwide marketing and North American sales with Caliper Life Sciences (today part of PerkinElmer), Hopkinton, Massachusetts, where he had been responsible for commercialization of Caliper's products and services. He had been with Caliper and its predecessor company, Zymark, since 1997. From 1990 to 1997 Nair managed Quality Compliance and Analytical Services at GlaxoSmithKline's FDA-approved site in Singapore. Nair is a graduate in chemistry from the University of Science, Penang, Malaysia; holds a Ph.D. in chemistry from the University of Oklahoma, Norman; and has an Executive MBA from Suffolk University.

***Nadia Rosenthal, Ph.D., F.Med.Sci., Scientific Director and Professor, The Jackson Laboratory for Mammalian Genetics***, age 65. Rosenthal joined the Laboratory as its Scientific Director in 2015. She joined the Laboratory's Board of Scientific Counselors in 2011. Rosenthal's research uses mammalian genetics to explore the embryonic development of heart and skeletal muscle and the regeneration of adult tissues. She focuses on muscle and cardiac developmental genetics and the role of growth factors, stem cells and the immune system in tissue regeneration. She is a global leader in the use of targeted mutagenesis in mice to investigate muscle development, disease and repair, and is a participant in the European Conditional Mouse Mutagenesis Program, where she coordinates the selection and production of new Cre driver strains for the international mouse genetics community. After earning her Ph.D. in biochemistry at Harvard Medical School, she started collaborating with JAX researchers, developing her long-standing focus on mammalian genetics using the mouse as model. As her career progressed, through faculty appointments at Harvard Medical School and Boston University School of Medicine, Rosenthal's network with the JAX faculty and the Board continued to grow. In 2001 Rosenthal moved to Rome to establish the mouse biology program for the European Molecular Biology Laboratory (EMBL). While maintaining leadership of the EMBL program, Rosenthal joined Imperial College, London in 2005 as director of Science for the Harefield Heart Science Center and chair in Cardiovascular Science, and in 2009 established ARMI at Monash University, which now leads Australia in biomedical research grants. She established the first non-European membership in EMBL for Australia, coordinating partner laboratories around the country, and was elected Scientific Head of EMBL Australia in 2010. Rosenthal's many awards and honors include Fellow of the Academy of Medical Sciences, U.K. (2014), Doctors Honoris Causa from the Pierre and Marie Curie University in Paris (2009) and the University of Amsterdam (2010), the Ferrari-Soave Prize in Cell Biology from the University of Torino (2002) and an American Heart Association Established Investigator Award (1991-1996).

***John C. Ryan, General Counsel***, age 48. Ryan joined the Laboratory as General Counsel and Corporate Secretary in February, 2018. He will provide leadership and direction for all legal affairs of JAX, including managing the legal department. While serving as the senior executive officer responsible for ensuring that the Laboratory's activities meet all legal and regulatory requirements, Ryan also will facilitate commercial transactions, licensing, spin-offs, sponsored research agreements and other strategies to aid in commercializing the Laboratory's intellectual property. Prior to joining JAX, Ryan was president and chief executive officer and a member of the board of directors of Unilife Corporation, King of Prussia, Pennsylvania, a development stage medical device company, after serving as the company's senior vice president, general counsel and secretary. Ryan was previously a partner at the law firm Duane Morris and held senior roles for eight years at Aramark Corporation, Philadelphia, Pennsylvania, a food and facilities service provider, including senior vice president and deputy general counsel. Ryan began his legal career as an assistant district attorney at the Manhattan District Attorney's Office, and is a graduate of Northwestern University School of Law and New York University. He is a member of the board of directors of Life Sciences Pennsylvania and a trustee of the Friends Select School in Philadelphia, Pennsylvania.

**FINANCIAL AND OPERATING INFORMATION**

The following summary of the statement of activities (the “Summary”) of the Laboratory, for the unaudited fiscal year ended December 31, 2017 and the audited fiscal years ended December 31, 2016, 2015, 2014, 2013 and 2012 was derived from the financial statements of the Laboratory, prepared on the accrual basis of accounting. The Summary should be read in conjunction with (i) the complete set of the Laboratory’s audited financial statements as of December 31, 2016 and 2015, (ii) the related notes to such financial statements, and (iii) the report of the Laboratory’s independent auditors, KPMG LLP, all of which are included as **APPENDIX B** to the Offering Memorandum.

The Laboratory is funded by revenue from the sale of genetic resources and services; federal, state and foundation grants; contracts; philanthropy; and distributions from its endowment. The Laboratory paces the expansion of its research efforts to match the resources available from JMCRS, philanthropy, investment income and other funding sources. JMCRS is a capital intensive program and requires ongoing investment to assure state-of-the-art facilities and to expand capacity to serve the research community and the Laboratory’s research mission. Normal upgrade and replacement of JMCRS and other research facilities are typically funded through internally generated funds. Major expansions beyond what may be internally funded require identification of additional funding sources, including debt, grants and philanthropic support.

Net operating surpluses, if any, are used to fund Laboratory needs or are deposited into treasury cash or investment accounts.

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Comparative Summary Statement of Activities  
(in thousands)

	Fiscal Years ended December 31					
	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u> (unaudited)
<b>REVENUE, GAINS AND OTHER SUPPORT</b>						
Grants	\$64,913	\$69,652	\$83,459	\$82,052	\$81,791	\$87,906
Contributions	2,364	2,385	1,558	4,524	2,227	3,527
Genetic resources and services	158,899	165,348	185,316	209,836	230,818	256,815
Long-term investment return utilized	623	608	562	548	980	4,159
Other investment return	911	302	1122	801	7,874	15,021
Other revenue	1,875	2,231	2,513	2,565	3,309	3,699
<b>Total Revenue, Gains and Other</b>	<b>229,585</b>	<b>240,526</b>	<b>274,530</b>	<b>300,326</b>	<b>326,999</b>	<b>371,127</b>
<b>EXPENSES</b>						
Research	67,758	71,640	91,225	102,407	108,045	122,537
Genetic resources and services	96,334	100,272	108,424	121,245	129,570	140,903
Training	2,561	4,945	5,430	5,958	7,588	8,091
Institutional support	36,173	39,064	45,230	51,933	55,105	63,137
<b>Total Expenses</b>	<b>202,826</b>	<b>215,921</b>	<b>250,309</b>	<b>281,543</b>	<b>300,308</b>	<b>334,668</b>
<b>EXCESS OF REVENUE, GAINS AND OTHER SUPPORT OVER EXPENSES</b>	<b>26,759</b>	<b>24,605</b>	<b>24,221</b>	<b>18,783</b>	<b>26,691</b>	<b>36,459</b>
Grants and contributions for capital and long-term investments	382	2,284	6,243	3,370	4,081	8,699
Long-term investment return above amounts utilized	8,468	12,399	5,328	(1,274)	6,971	20,913
Unrealized net gain on interest rate swaps	231	3,650	(1,462)	355	991	1,207
Change in funded status of pension and post-retirement benefit plans	639	797	80	490	-	-
Adjustment to fair value of Connecticut forgivable loans	3,643	23,619	39,737	75,936	7,748	-
Valuation adjustment for loan to New York Genome Center	-	(1,000)	2,100	-	-	-
Other	(6,481)	(597)	(39)	(4,019)	(121)	560
<b>CHANGE IN NET ASSETS</b>	<b>33,641</b>	<b>65,756</b>	<b>76,208</b>	<b>93,641</b>	<b>46,361</b>	<b>67,838</b>
<b>NET ASSETS BEGINNING OF YEAR</b>	<b>317,380</b>	<b>351,021</b>	<b>416,778</b>	<b>492,986</b>	<b>586,627</b>	<b>632,988</b>
<b>NET ASSETS END OF YEAR</b>	<b>\$351,021</b>	<b>\$416,778</b>	<b>\$492,986</b>	<b>\$586,627</b>	<b>\$632,988</b>	<b>\$700,826</b>

**MANAGEMENT'S DISCUSSION OF RECENT OPERATING ACTIVITIES**

As a nonprofit corporation, the Laboratory allocates its resources to accomplish its mission of research and education, generate funds for future development of programs and provide operating flexibility. As a result of recent operating surpluses, the Laboratory has increased net assets by approximately 90%, or \$313 million, over the past five years.

Total operating revenue (including gifts and pledges) was \$327.0 million in 2016, compared to \$300.3 million in 2015, an increase of \$26.7 million or 9%.

Total operating expenses increased to \$300.3 million in 2016 from \$281.5 million in 2015, an increase of \$18.8 million or 7%. Management attributes these increases to growth in JMCRS operational costs, and increases in federal award spending of various grants and contracts. Operating expenses for 2016 included \$55.1 million of institutional support, including general and administrative expenses, as compared to \$51.9 million for 2015.

Operating revenues exceeded operating expenditures by \$26.7 million for the year ended December 31, 2016 as compared to \$18.8 million for 2015.

Revenues from providing genetic resources and clinical research activities are recognized when the resources are shipped or services are provided. Revenues from grants and research contracts are recognized as related costs are incurred. Payments or grants and research contracts received in advance of expenditures are recorded as deferred revenue until expended. Contributions, including unconditional promises to give, are recognized at fair value and increase net assets in the period received.

Total assets were \$795.7 million and \$754.3 million at December 31, 2016 and 2015, respectively. Of the net assets at December 31, 2016 and 2015, 10% for both years comprised either temporarily or permanently restricted net assets, most of which were restricted due to time or to restrictions by donors. As of December 31, 2016, cash and cash equivalents increased by \$5.2 million to \$9.6 million as compared to \$4.4 million at December 31, 2015. This increase resulted from \$60.2 million provided by operations, offset primarily by the construction projects of \$34.3 million and net purchases of investments of \$23.9 million.

**Unaudited 2017 Results**

Total operating revenue (including gifts and pledges) increased to \$371.1 million in 2017, compared to \$327.0 million in 2016, an increase of \$44.1 million or 13%.

Total operating expenses increased to \$334.7 million in 2017, an increase of 11%. Management attributes this increase to growth in JMCRS operational costs, and increases in federal award spending of various grants and contracts. Operating expenses for 2017 included \$63.1 million of institutional support, including general and administrative expenses.

Total assets were \$890.6 million at December 31, 2017. Of the net assets at December 31, 2017, 9.5% comprised either temporarily or permanently restricted net assets, most of which were restricted due to time or to restrictions by donors. As of December 31, 2017, unaudited treasury and operating cash totaled \$207.8 million.

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### Sources of Revenue

The following table sets forth the percentage of total revenues, gains and other support of the Laboratory by source for each of the audited fiscal years in the five-year period ended December 31, 2016, and for the unaudited fiscal year ended December 31, 2017.

	Total Revenues by Source					
	Fiscal Years ended December 31					
	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u> (unaudited)
Grants and contracts	28.3%	29.0%	30.4%	27.3%	25.0%	23.7%
Genetic resources and services	69.2	68.7	67.5	69.9	70.6	69.2
Contributions	1.0	1.0	0.6	1.5	0.7	1.0
Long-term investment return	0.3	0.3	0.2	0.2	0.3	1.1
Other investment return	0.4	0.1	0.4	0.3	2.4	4.0
Other	0.8	0.9	0.9	0.9	1.0	1.0
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

### Grants and Contracts

The level of grant revenue is dependent upon attracting and retaining researchers who are successful in obtaining external funding for their research programs. Laboratory staff is responsible for assisting the faculty in preparing and submitting grant applications. The Research Program Development office monitors funding opportunities and coordinates center grant and other collaborative grant applications. The major grant funding source for the research conducted at the Laboratory is the NIH. Most grants are awarded for five years with one year funded and four non-competitive renewals. New applications and competitive renewals are peer-reviewed and ranked for funding.

In 2016, the Laboratory received three multi-year grants totaling \$55 million from the NIH, and launched new centers for the study of Alzheimer's disease and addiction with such proceeds. For 2017, the Laboratory was awarded \$76.3 million (unaudited) in research grants.

CII grants are paid to JAX quarterly based on an annual request. The principal condition for the CII grants is that they must be spent in Connecticut for the research and the operations of JAX Genomic Medicine. Unspent funds may be rolled forward into future years and future years' grants may be reduced if the Laboratory does not meet minimum staffing levels. As of December 31, 2017, CII had advanced \$68 million in grants to support JAX Genomic Medicine. As of December 31, 2017 the Laboratory is on track to meet or exceed hiring goals. See **"OUTSTANDING INDEBTEDNESS."**

Overall, grants provided approximately 25% of the Laboratory's operating revenue in 2016. For that fiscal year, the Laboratory received approximately \$80 million in government and other private and public grants and contracts for research support and capital projects. Multimillion dollar awards fund interdisciplinary center programs including the National Institute on Aging's Nathan Shock Centers of Excellence in Basic Biology of Aging, the Mouse Genome Database, the Center for Genome Dynamics and the Center for Precision Genetics.

**Sources of Grants and Contracts Revenue**  
(in thousands)

	<b>Fiscal Years ended December 31</b>					
	<b><u>2012</u></b>	<b><u>2013</u></b>	<b><u>2014</u></b>	<b><u>2015</u></b>	<b><u>2016</u></b>	<b><u>2017</u></b> (unaudited)
NIH	\$53,838	\$53,100	\$60,736	\$59,880	\$59,229	\$65,507
Other Federal Agencies	799	786	466	514	461	1,329
Foundations and Academic	6,753	6,230	5,981	5,636	7,532	7,805
State	3,108	9,448	16,122	15,142	14,178	12,209
Corporations and Other	415	88	154	880	392	1,056
<b>Total</b>	<b>\$64,913</b>	<b>\$69,652</b>	<b>\$83,459</b>	<b>\$82,052</b>	<b>\$81,791</b>	<b>\$87,906</b>

NIH awards provide funds to cover direct and indirect costs. Direct costs are those costs directly related to a research project, including wages of scientists and technicians, supplies and grant-specific equipment. In addition, federal grants cover indirect costs, which are also incurred in the performing of research, but have been incurred for purposes common to other Laboratory operations. Indirect costs include interest on long-term debt, depreciation, utilities, occupancy and facilities costs, and general and administrative services such as accounting, purchasing, human resources and the library.

The federal Office of Management and Budget has established regulations that govern indirect cost reimbursement recovery principles and procedures to ensure that the federal government bears a fair share of the total costs associated with research programs. While the cost principles are intended to provide for sharing and allocation of indirect costs, certain costs are not allowable. For example, fundraising and other specified miscellaneous costs are not reimbursable. Effective January 1, 2014, the Laboratory negotiated a three-year, indirect cost-rate agreement with the U.S. Department of Health and Human Services that provides for indirect cost rates of 75% for its Bar Harbor and Sacramento campuses and 89% for its Farmington campus through December 31, 2017. The Laboratory is awaiting instructions from the U.S. Department of Health and Human Services on its next indirect cost rate. Until such notification, the 2014 rates remain in effect. Foundation grants carry various indirect rates with most ranging from zero to 10%.

Given federal budget constraints, it is anticipated that the NIH may further reduce grant reimbursements through limiting various direct costs (such as principal investigator salaries) and/or limiting indirect cost recovery. Any such reductions may have a material financial impact on the Laboratory.

### **Genetic Resources and Services**

Revenue received from the sale of mice and services to the research community represented approximately 71% of the Laboratory's fiscal year 2016 operating revenue. The Laboratory is a leading supplier of research mice to academic institutions, although it supplies a relatively small portion of pharmaceutical and biotechnology industry needs for research mice.

The growth in mice and services revenue is driven by biomedical researchers' need for the genetic quality and health status of JAX<sup>®</sup> Mice models and the Laboratory's efforts to provide the latest disease models. In addition, over the last five years, an expansion of mouse-related research services offered by the Laboratory has contributed to the growth in revenue.

## **APPENDIX A**

Revenue and costs are generated by the sale of mice from breeding colonies as well as services. The Laboratory has experienced an increase in demand for breeding and in vivo services as pharmaceutical, biotechnology and academic research organizations seek to outsource these services.

### **Budget Process**

Management prepares an annual operating budget each year for presentation to the Finance Committee of the Board in early November and approval by the Board prior to the beginning of the new fiscal year. The budgeting process includes an overview of the funding environment as well as an articulation of the funding priorities for the Laboratory. The major priorities for the 2018 budget include faculty recruitment, a Director's Innovation Fund, completion of the Center for Biometric Analysis, and the renovation of the Ellsworth facility. Revenue is estimated based on an evaluation of anticipated grant revenue, expected revenue from JMCRS, expected revenue from the endowment spending distribution, as well as other revenue, including revenue from philanthropy and fundraising. Budget requests are analyzed against the Senior Management Team's priorities and to assure expenditures align with the strategic plan. In addition to an annual budget, the Laboratory prepares forecasts and monitors expenditures monthly. In addition to the budget process, the Laboratory prepares long-range forecasts and planning models.

### **Capital Planning**

The Laboratory maintains a capital plan that includes replacement of end-of-life facilities, new buildings, build-out for new faculty, scientific and information technology equipment and applications. This plan is updated regularly with a focus on the next three years. As part of the annual budget approval process, the three-year capital plan is reviewed and the next year's capital budget is approved for expenditure.

The capital budget is funded primarily from funded depreciation, grants (state and federal), gifts and operating surplus in excess of principal payments. Capital campaigns are conducted for major expansion of research facilities and capital gifts are solicited for various projects.

In 2015, the Laboratory revised a master plan for its Bar Harbor campus that identifies the location of potential future expansion. The plan for the Ellsworth facility is to build out space as needed by the increase in the demand for mice and services. Additional phases are expected to be funded from Bond proceeds, additional indebtedness, or Laboratory funds. See **"THE ELLSWORTH PROJECT."**

### **Endowment and Investments**

The Laboratory maintains an endowment (the "Endowment"), as an organization described in Section 501(c)(3) of the Internal Revenue Code of 1986, as amended (the "Code"). Pursuant to the spending formula approved annually by the Board, the spending distribution from the Endowment helps support the operating budget. The current spending distribution rate from the Endowment is 4% of the 12 quarter moving average market value, with the final quarter in the spending formula determined on December 31 of the last audited year preceding the fiscal year of spending. For 2017, based on the spending formula, the Laboratory spent \$4.16 million for operating costs and research activities, including endowed chairs and research.



**Investments  
(in thousands)**

**Fiscal Years ended December 31**

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u> (unaudited)
Operating and Treasury Cash	\$127,436	\$121,825	\$152,030	\$176,208	\$200,685	\$207,800
Endowment	90,755	108,966	126,610	132,699	142,755	167,682
<b>Total</b>	<b>\$218,191</b>	<b>\$230,791</b>	<b>\$278,640</b>	<b>\$308,907</b>	<b>\$343,440</b>	<b>\$375,482</b>

Under the Laboratory's investment policy statement, the Board is responsible for establishing the level of risk that the organization is willing to assume in its investment strategy. The Endowment is managed with a total return objective and long-term goal of attaining an average annualized nominal return equal to or above the rate of inflation (as measured by the Consumer Price Index (CPI)) plus JAX's spending rate. The Laboratory diversifies its investments among various asset classes, incorporating multiple strategies and managers.

The Board appoints an Investment Subcommittee consisting of not less than two elected members of the Board. While a majority of responsibilities associated with the management of the endowment are delegated to the Investment Subcommittee, both the Board and Investment Subcommittee members have a fiduciary threshold of responsibility for the Endowment. These responsibilities are served through prudent policies and the delegation of daily management duties to management and investment advisor(s) as appropriate. The chair(s) of the Finance Committee also serve as *ex officio* member(s) of the Investment Subcommittee.

The Laboratory employs a total return approach to endowment management. Income and dividends are used to fund spending first, with net realized and unrealized appreciation providing incremental funding as needed. The Laboratory takes into consideration the factors contained in Maine's Uniform Prudent Management of Institutional Funds Act for the appropriation and accumulation of endowment funds.

The 2016 annualized return on the Endowment was 6.2%. The preliminary, unaudited investment return on the Endowment for 2017 was 17.4%, and the preliminary unaudited value was \$168 million for the year ended December 31, 2017. The three-year average return on the Endowment for the period ended December 31, 2017 was 7.2% (unaudited).

In addition to the Endowment, the Laboratory earns income on its short-term investment of operating and treasury cash. All cash in excess of requirements for minimum balances is invested in high-quality, short-term fixed income vehicles, primarily certificates of deposit, government agency bonds, and "AA" or better rated corporate bonds. From time to time, the Laboratory has invested a portion of its treasury cash in equities or other investment vehicles.

### THE ELLSWORTH PROJECT

The Laboratory purchased property in Ellsworth in 2012, which included 17.7 acres and a former home improvement store. A portion of the proceeds of the Bonds is expected to be used to finance a portion of the expansion, renovation, improvement, and equipping of the property, which will be undertaken in phases, to convert it to a state-of-the-art vivarium for breeding and distribution of research mouse models (the "Ellsworth Project"). The Ellsworth Project will encompass approximately 275,000

## APPENDIX A

gross square feet at its expected completion in 2019; the fit-out of the remaining space will occur at a later date. When fully operational, the Ellsworth Project is expected to increase the Laboratory's Maine production capacity by approximately 40%.

The Ellsworth Project has an estimated cost of \$143 million, of which \$60 million has been expended as of December 31, 2017. The Laboratory expects to use approximately \$110 million of the Bond proceeds for the Ellsworth Project, with the remaining funding provided through grants from the Maine Technology Asset Fund ("MTAF") and the Economic Development Agency ("EDA"), and from the Laboratory's operating funds. The Laboratory expects to utilize the remaining \$15 million of Bond proceeds for future phases of the Ellsworth facility expansion or other capital projects.

### Estimated Sources of Ellsworth Project Funding (in millions)

<u>Source</u>	<u>Amount</u>
Bond Proceeds	\$110.0
JAX Operating Funds	17.0
MTAF Awards	14.2
EDA Award	1.8
<b>Total</b>	<b>\$143.0</b>

### OUTSTANDING INDEBTEDNESS

At December 31, 2017, the Laboratory had the following debt outstanding:

<u>Series</u>	<u>Interest Rate</u>	<u>Final Maturity</u>	<u>Amount Outstanding (unaudited)</u>
Finance Authority of Maine Variable Rate Revenue Bond (The Jackson Laboratory Issue - Series 2012) <sup>1</sup> (the "FAME Bonds")	Variable	7/1/2031	\$33,165,000
ABAG Finance Authority for Nonprofit Corporations Revenue Bonds (The Jackson Laboratory) Series 2012	Fixed	7/1/2037	53,775,000
Note Payable for Real Estate Purchase	Fixed	10/1/2029	1,889,000
<b>Total</b>			<b>\$88,829,000</b>

<sup>1</sup> Expected to be refinanced with proceeds of the Bonds on or about the date of issuance of the Bonds.

In order to synthetically fix the interest rate of the FAME Bonds, the Laboratory maintains five interest rate swaps. At December 31, 2017, the aggregate mark-to-market value of these agreements was negative \$4.3 million. The Laboratory expects to terminate all of the swaps with operating funds on or about the date of issuance of the Bonds.

The Laboratory also maintains an agreement with CII whereby CII extended \$145 million and \$46.7 million in loans to the Laboratory to construct and build out JAX Genomic Medicine. The agreement with CII provides that the loans will be forgiven if the Laboratory employs at least 300 people with salaries 125% above the annual state average for a period of six months and meets other employment requirements within 10 years of the date of the agreement. Through December 31, 2017, \$137.8 million and \$23.6 million had been drawn on the \$145 million and \$46.7 million forgivable loans, respectively. The Laboratory expects to draw down the remaining \$30.3 million of available loan proceeds over the next four years. Management believes that the Laboratory is on track to meet the employment obligations for loan forgiveness within the next 12 months.

See Footnote 8 - “Bonds and Note Payable” to the Laboratory’s audited financial statements for the fiscal years ended December 31, 2016 and 2015, attached to the Offering Memorandum as Appendix B.

In addition, the Laboratory is in the process of obtaining an unsecured line of credit for operating purposes in the amount of \$25 million with a major financial institution.

### FUNDRAISING AND PHILANTHROPY

Over the past five years, the Laboratory has increased its focus on the area of private philanthropy. The Laboratory recruited a new vice president for advancement in December 2016, Gregory Leet, formerly the vice chancellor for university advancement at the University of California, Irvine. See “**EXECUTIVE MANAGEMENT.**” The Laboratory also benefits from significant philanthropy from its Board.

The Laboratory is currently in the midst of a multi-phase \$80 million dollar capital campaign to substantially increase the endowment through endowed chairs, Director’s Innovation Funds, and other fundraising strategies over the next two to five years. To date, through generous philanthropic gifts, the Laboratory has established eight endowed chairs to faculty that support various scientific endeavors. In addition to providing an important source of funding for research, named endowed chairs are a vital tool enabling JAX to attract, retain and support outstanding scientists. In 2016, the Laboratory raised more than \$13.6 million (on a non-GAAP basis), the highest amount of philanthropic support to date in a single year and an 18% increase over 2015. Gifts in 2016 came from more than 1,460 individual donors, organizations, corporations and private foundations. At the same time, JAX added 380 new donors and achieved a 32% increase in the average donation amount. Preliminary, unaudited 2017 philanthropic support raised was \$7.5 million. The Laboratory has established a charitable gift annuity program and is seeking increased support from private foundations and corporations.

### INSURANCE

The Laboratory maintains insurance policies covering certain risks in the areas of comprehensive general liability, directors’ and officers’ liability, workers compensation, fiduciary liability, errors and omissions, employment practices, cybersecurity, foreign property and casualty, products liability, employed lawyers, healthcare professionals, business travel and accident, professional liability for CLIA laboratories, environmental and umbrella liability coverage. The Laboratory maintains automobile

## APPENDIX A

liability and property insurance, including California earthquake coverage. The Laboratory carries business interruption insurance in amounts believed adequate for its operations.

### STAFFING AND EMPLOYEES

The Laboratory's employees are distributed across the Laboratory's campuses in Bar Harbor, Augusta, Ellsworth, Farmington and Sacramento, with the substantial majority located in Bar Harbor. In addition, there is a small number of employees in various other locations, working to promote the Laboratory's interests in their respective regions, or whose specialty skill-sets allow for effective telecommuting.

<b>Laboratory Staffing</b>	<b>December 31, 2017</b>
Lab/Scientific	627
Repository/Mice	765
Administration	636
Post-Doctoral	76
<b>Total</b>	<b>2,104</b>

JAX offers a highly competitive comprehensive benefits package that includes medical and dental insurance, life insurance and a retirement account. The retirement plan is a Section 403(b) retirement plan for eligible employees with a Laboratory match. JAX also has an employee wellness program that helps employees identify opportunities to improve health and supports employees in meeting those goals through health coaching, disease management and other mechanisms. JAX has on-site, primary-care physician and nursing support on its Bar Harbor campus, as well as fitness centers at its Bar Harbor and Farmington campuses. JAX also offers generous tuition reimbursement programs.

A post-retirement medical plan covers employees who retired before May 31, 2008, and faculty members eligible to retire in 2008. This plan is currently funded as benefit claims are paid. The Laboratory is self-insured for medical and extended medical leave benefits.

The Laboratory has no employees in unions or represented by collective bargaining agreements.

### LITIGATION

There are currently no litigation matters or other proceedings pending or, to management's knowledge, threatened against the Laboratory that would materially adversely affect its operations or financial condition, or adversely affect the Laboratory's ability to perform its obligations with respect to the Bonds.

### BONDOWNERS' RISKS AND MATTERS AFFECTING THE BIOMEDICAL RESEARCH INDUSTRY

In addition to the risks set forth in the forefront of the Offering Memorandum, the following factors, among others, constitute risks with respect to the Bonds.

#### In General

Future revenues and expenses of the Laboratory will be affected by events and conditions relating generally to, among other things, the correctness of the design and success of the Laboratory's strategic plans, changes in private philanthropy, litigation, ability to control expenses, legislation, tax laws and

other government regulation. While the Laboratory reasonably expects to generate sufficient revenues in the future to cover its expenses, unanticipated events and circumstances may occur that cause variations from this expectation and the variations may be material (see also “**Research Funding**” below).

Accordingly, there can be no assurance that there will be sufficient revenues to make payments with respect to the Bonds. The following general factors, among others, could affect the level of revenues to the Laboratory or its financial condition or otherwise result in risks for Bondowners.

### **Research Funding**

Future funding of the Laboratory’s research depends upon the continued availability of funds from the federal government and other public, private and commercial sources as well as the ability of the Laboratory’s researchers to successfully compete for such funds. Federal legislation and policies to control the federal budget, as well as other factors, could result in future reduction in the amount of research funding available from the federal government.

Laws and regulations applicable to federal funding provided under grants and contracts, including the charging of costs to grants or under contracts, are complex. The failure to comply with such laws and regulations can result in recoupments, fines or other penalties for the Laboratory.

### **Environmental Laws and Regulations**

Research institutions are subject to federal, state and local environmental and occupational health and safety laws and regulations that address, among other things, operations or facilities and properties owned or operated by the institution. The types of regulatory requirements faced by research institutions include: air and water quality control requirements; waste management requirements; specific regulatory requirements applicable to biohazards, radioactive substances, asbestos and polychlorinated biphenyls; requirements for providing notice to employees and members of the public about hazardous materials handled by or located at the institution; and requirements for training employees in the proper handling and management of hazardous materials and wastes. The Laboratory is also subject to numerous animal welfare laws and regulations, including policies promulgated by the Office of Laboratory Animal Welfare at the National Institutes of Health.

With the growth in human subject research at the Laboratory, a Clinical and Translational Research Support (“CTRS”) team was established. The Office of CTRS ensures compliance with the Laboratory’s federal-wide Assurance (HHS/OHRP) and federal regulations for protection of human subjects in research. The office manages the Laboratory’s Human Research Protection Program (“HRPP”) that includes the Laboratory’s Institutional Review Board (“IRB”), compliance oversight and quality assurance programs. In addition, all research conducted at the Laboratory that involves or may involve the use of human derived materials, or may use biological agents that may be infectious to humans, is assessed and reviewed by members of the Institutional Biosafety Committee (“IBC”) including a Biosafety Officer. This process includes submission of a research protocol outlining scientific justification, a risk assessment of the potential hazards, and the establishment of a safety plan that outlines the necessary precautions to work safely with such materials. The failure to comply with laws and regulations governing the protection of human subjects and use of human or infectious materials in research can result in fines or other penalties for the Laboratory.

In its role as an owner and/or operator of properties or facilities, the Laboratory may be subject to liability for investigating and remedying any hazardous substances that have come to be located on its property, including any such substances that may have migrated off the property. Typical operations include, but are not limited to, in various combinations, the handling, use, storage, transportation, disposal

## APPENDIX A

and/or discharge of hazardous, infectious, toxic, radioactive, flammable and other hazardous materials, wastes, pollutants or contaminants. As such, research institution operations are particularly susceptible to the practical, financial and legal risks associated with the obligations imposed by applicable environmental laws and regulations. There can be no assurance that the Laboratory will not encounter such risks in the future and such risks may result in material adverse consequences to the operations or financial condition of the Laboratory.

### Nonprofit Environment

*IRS Form 990 for Nonprofit Corporations.* The Internal Revenue Service (“IRS”) Form 990 is an annual information tax return filed by organizations described in Section 501(c)(3) of the Code (“501(c)(3) organizations”) with the IRS. Form 990 requires detailed public disclosure of compensation practices, corporate governance, loans to management and others, joint ventures and other types of transactions, political campaign activities and other areas the IRS deems to be compliance risk areas. Form 990 is intended to enhance transparency as to the operations of 501(c)(3) organizations. It is also intended to result in enhanced enforcement, as Form 990 provides detailed information on compliance risk areas available to the IRS and other regulatory agencies.

*Revocation of Tax Exemption; Private Inurement.* The maintenance of the Laboratory’s status as a 501(c)(3) organization is contingent on compliance with general rules promulgated in the Code and related regulations regarding the organization and operation of tax-exempt entities, including their operation for charitable, scientific, educational and other permissible purposes and their avoidance of transactions that may cause their earnings or assets to inure to the benefit of private individuals. Revocation of the tax-exempt status of the Laboratory under Section 501(c)(3) of the Code could adversely affect the operations of the Laboratory and, therefore, its ability to pay debt service on the Bonds. Any violation of the prohibition against private inurement may cause an organization to lose its status as tax-exempt under Section 501(c)(3). The IRS has issued guidance in informal private letter rulings and general counsel memoranda on some situations that give rise to private inurement, but there is no definitive body of law, regulations or public advisory rulings that address many common arrangements. While the Laboratory believes that the arrangements between the Laboratory and private persons and entities are generally consistent with the IRS’s guidance, there can be no assurance concerning the outcome of an audit or other investigation by the IRS given the lack of clear authority interpreting the range of activities undertaken by the Laboratory.

*Unrelated Business Taxable Income.* In recent years, the IRS and state, county and local tax authorities have audited the operations of various nonprofit organizations with respect to their exempt activities and the generation of unrelated business taxable income (“UBTI”). Most nonprofit organizations, including the Laboratory, participate in activities that may generate UBTI. For fiscal year 2016, \$83,753 or 0.03% of the Laboratory’s total revenue was reported as UBTI. An investigation or audit could result in assessment of taxes, interest and penalties with respect to unreported UBTI and, in some cases, ultimately could affect the tax-exempt status of such entity.

*Intermediate Sanctions.* Intermediate sanctions legislation enacted in 1996 imposes penalty excise taxes in cases where an exempt organization is found to have engaged in an “excess benefit transaction” with a “disqualified person.” An “excess benefit transaction” is any transaction in which an economic benefit is provided by the tax-exempt organization directly or indirectly to or for the use of any disqualified person if the value of the economic benefit provided exceeds the value of the consideration (including the performance of services) received for providing such benefit. The penalty excise taxes may be imposed in lieu of revocation of exemption, or in addition to such revocation in cases where the magnitude or nature of the excess benefit calls into question whether the organization functions as a public charity. The tax is imposed both on the “disqualified person” receiving such excess benefit and on

any officer, director, trustee or other person having similar powers or responsibilities who participated in the transaction willfully or without reasonable cause, knowing it to involve “excess benefit.” “Disqualified persons” include “insiders” such as board members, officers and senior management.

*Real Property Tax Exemption.* State, county and local taxing authorities may undertake audits and reviews of the operations of tax-exempt organizations with respect to their real property tax exemptions. In some cases, particularly where authorities are dissatisfied with the level of charitable activity provided by a nonprofit organization, the real property tax-exempt status of an organization may be questioned. The majority of the Laboratory’s real property is currently treated as exempt from real property taxation. Although the Laboratory’s real property tax exemptions with respect to its facilities have not, to the knowledge of management, been under challenge or investigation, an audit could lead to a challenge that could adversely affect the Laboratory’s real property tax exemptions.

It is not possible to predict the scope or effect of future legislative or regulatory actions with respect to taxation of nonprofit corporations. There can be no assurance that future changes in the laws and regulations of state or local governments will not materially adversely affect the financial condition of the Laboratory by requiring payment of income, local property or other taxes.

*2017 Tax Reform Legislation.* As a result of the recent federal income tax reform enacted into law under as part of the Tax Cuts and Jobs Act of 2017 (the “2017 Tax Act”), certain provisions will impact taxable and tax-exempt organizations, including revisions to taxes on UBTI, excise taxes on compensation of certain employees, excise taxes on certain private university endowments, reduction of corporate income tax rates and various other provisions. The regulations necessary to implement the 2017 Tax Act are expected to be promulgated throughout 2018 and the ultimate outcome of these regulations and the impact to the Laboratory cannot be determined presently.

## **Cybersecurity**

Like many other large organizations, the Laboratory relies on digital technologies to conduct its customary operations. In the past several years, a number of entities have sought to gain unauthorized access to digital systems of large organizations for the purposes of misappropriating assets or information or causing operational disruption. These attempts include highly sophisticated efforts to electronically circumvent network security as well as more traditional intelligence gathering and social engineering aimed at obtaining information necessary to gain access. The Laboratory maintains a network security system designed to stop “cyber-attacks” by third parties, and minimize its impact on operations; however, no assurances can be given that such network security systems will be completely successful. Such events or issues could lead to the inadvertent disclosure of protected health information or other confidential information, which could materially impact the operations, financial position and cash flows of the Laboratory.

## **Construction Risk**

The Laboratory began construction of the Ellsworth facility in the third quarter of calendar year 2016 with an expected occupancy in mid-2018. However, there can be no assurance that this schedule can be met. Uncontrollable delays are common in the construction industry. Such delays caused by, for example, strikes, weather or unavailability of materials, may delay completion of the Ellsworth facility. Any of these factors could delay construction, result in cost overruns or even prevent completion of the Ellsworth facility.

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### Other Risk Factors

In the future, the following factors, among others, may adversely affect the operations of research institutions, including the Laboratory or the market value of the Bonds, to an extent that cannot be determined at this time:

- (a) The occurrence of a natural or man-made disaster that could damage the Laboratory's facilities, interrupt utility service to the facilities, or otherwise impair the Laboratory's operations and the generation of revenues from the facilities;
- (b) Reductions in the level of charitable giving to the Laboratory or lower than expected fundraising results;
- (c) Possible replacement of the mouse as a biological model of the human, in which case the Laboratory's cash flow from sales of mice and services could decrease;
- (d) An outbreak of disease in animal colonies that could diminish the sales of mice to other institutions;
- (e) Unanticipated construction cost overruns;
- (f) Decreased revenue from sponsored research grants;
- (g) Decrease in investment returns; and
- (h) Further changes in tax laws that negatively impact the Laboratory.





**THE JACKSON LABORATORY**

Financial Statements

December 31, 2016 and 2015

(With Independent Auditors' Report Thereon)



KPMG LLP  
Two Financial Center  
60 South Street  
Boston, MA 02111

## Independent Auditors' Report

The Board of Trustees  
The Jackson Laboratory:

We have audited the accompanying financial statements of The Jackson Laboratory (the Laboratory), which comprise the balance sheets as of December 31, 2016 and 2015, the related statements of activities and cash flows for the years then ended, and the related notes to the financial statements.

### *Management's Responsibility for the Financial Statements*

Management is responsible for the preparation and fair presentation of these financial statements in accordance with U.S. generally accepted accounting principles; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### *Auditors' Responsibility*

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the organization's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the organization's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### *Opinion*

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of The Jackson Laboratory as of December 31, 2016 and 2015, and the changes in its net assets and its cash flows for the years then ended, in accordance with U.S. generally accepted accounting principles.

**KPMG LLP**

Boston, Massachusetts  
May 12, 2017

**THE JACKSON LABORATORY**

Balance Sheets

December 31, 2016 and 2015

(Dollars in thousands)

<b>Assets</b>	<b>2016</b>	<b>2015</b>
Cash and equivalents	\$ 9,602	4,375
Working capital investments, at fair value	191,083	171,833
Funds held in escrow	—	326
Accounts receivable, net	32,739	32,988
Contributions receivable, net	5,838	6,067
Other assets	22,133	14,979
Long-term investments, at fair value	142,755	132,699
Long-lived assets, net	391,524	391,073
Total assets	\$ 795,674	754,340
<b>Liabilities</b>		
Accounts payable and accrued expenses	\$ 38,336	41,022
Accrued postretirement obligations	6,321	5,659
Interest rate swaps, at fair value	5,463	6,454
Deposits and deferred revenue	10,562	7,157
Bonds and note payable, net	96,244	100,151
Connecticut forgivable loans, at fair value	5,760	7,270
Total liabilities	162,686	167,713
Net assets:		
Unrestricted	571,598	527,883
Temporarily restricted	41,210	40,348
Permanently restricted	20,180	18,396
Total net assets	632,988	586,627
Total liabilities and net assets	\$ 795,674	754,340

See accompanying notes to financial statements

**THE JACKSON LABORATORY**

Statement of Activities

Year ended December 31, 2016

(Dollars in thousands)

	<u>Unrestricted</u>	<u>Temporarily restricted</u>	<u>Permanently restricted</u>	<u>Total</u>
Operating activities:				
Revenue and other support:				
Grants	\$ 81,791	—	—	81,791
Contributions	1,309	918	—	2,227
Genetic resources and services	230,818	—	—	230,818
Long-term investment return utilized	366	614	—	980
Other investment return	7,874	—	—	7,874
Other revenue	3,309	—	—	3,309
Total revenue	<u>325,467</u>	<u>1,532</u>	<u>—</u>	<u>326,999</u>
Net assets released from restrictions	<u>1,713</u>	<u>(1,715)</u>	<u>2</u>	<u>—</u>
Total revenue and other support	<u>327,180</u>	<u>(183)</u>	<u>2</u>	<u>326,999</u>
Expenses:				
Research	108,045	—	—	108,045
Genetic resources and services	129,570	—	—	129,570
Training	7,588	—	—	7,588
Institutional support	55,105	—	—	55,105
Total expenses	<u>300,308</u>	<u>—</u>	<u>—</u>	<u>300,308</u>
Increase (decrease) in net assets from operating activities	<u>26,872</u>	<u>(183)</u>	<u>2</u>	<u>26,691</u>
Nonoperating activities:				
Grants and contributions for capital and long-term investments	2,280	19	1,782	4,081
Long-term investment return above amounts utilized	5,945	1,026	—	6,971
Unrealized net gain on interest-rate swaps	991	—	—	991
Adjustment to fair value of Connecticut forgivable loans	7,748	—	—	7,748
Other	(121)	—	—	(121)
Increase in net assets from nonoperating activities	<u>16,843</u>	<u>1,045</u>	<u>1,782</u>	<u>19,670</u>
Increase in net assets	43,715	862	1,784	46,361
Net assets, beginning of year	<u>527,883</u>	<u>40,348</u>	<u>18,396</u>	<u>586,627</u>
Net assets, end of year	<u>\$ 571,598</u>	<u>41,210</u>	<u>20,180</u>	<u>632,988</u>

See accompanying notes to financial statements.

**THE JACKSON LABORATORY**

Statement of Activities

Year ended December 31, 2015

(Dollars in thousands)

	<u>Unrestricted</u>	<u>Temporarily restricted</u>	<u>Permanently restricted</u>	<u>Total</u>
Operating activities:				
Revenue and other support:				
Grants	\$ 82,052	—	—	82,052
Contributions	1,147	3,377	—	4,524
Genetic resources and services	209,836	—	—	209,836
Long-term investment return utilized	—	548	—	548
Other investment return	801	—	—	801
Other revenue	2,565	—	—	2,565
Total revenue	<u>296,401</u>	<u>3,925</u>	<u>—</u>	<u>300,326</u>
Net assets released from restrictions	<u>1,736</u>	<u>(1,738)</u>	<u>2</u>	<u>—</u>
Total revenue and other support	<u>298,137</u>	<u>2,187</u>	<u>2</u>	<u>300,326</u>
Expenses:				
Research	102,407	—	—	102,407
Genetic resources and services	121,245	—	—	121,245
Training	5,958	—	—	5,958
Institutional support	51,933	—	—	51,933
Total expenses	<u>281,543</u>	<u>—</u>	<u>—</u>	<u>281,543</u>
Increase in net assets from operating activities	<u>16,594</u>	<u>2,187</u>	<u>2</u>	<u>18,783</u>
Nonoperating activities:				
Grants and contributions for capital and long-term investments	138	168	3,064	3,370
Long-term investment return above amounts utilized	(517)	(757)	—	(1,274)
Unrealized net gain on interest-rate swaps	355	—	—	355
Change in funded status of pension and post-retirement benefit plans	490	—	—	490
Adjustment to fair value of Connecticut forgivable loans	75,936	—	—	75,936
Other	(4,143)	124	—	(4,019)
Increase (decrease) in net assets from nonoperating activities	<u>72,259</u>	<u>(465)</u>	<u>3,064</u>	<u>74,858</u>
Increase in net assets	88,853	1,722	3,066	93,641
Net assets, beginning of year	<u>439,030</u>	<u>38,626</u>	<u>15,330</u>	<u>492,986</u>
Net assets, end of year	<u>\$ 527,883</u>	<u>40,348</u>	<u>18,396</u>	<u>586,627</u>

See accompanying notes to financial statements.

**THE JACKSON LABORATORY**

Statements of Cash Flows

Years ended December 31, 2016 and 2015

(Dollars in thousands)

	<b>2016</b>	<b>2015</b>
Cash flows from operating activities:		
Increase in net assets	\$ 46,361	93,641
Adjustments to reconcile increase in net assets to cash provided by operating activities:		
Depreciation and amortization	35,091	33,313
Adjustment to fair value of Connecticut forgivable loans	(7,748)	(75,936)
Realized and unrealized net investment (gains)/losses	(6,568)	6,753
Unrealized net (gains) on interest-rate swaps	(991)	(355)
Loss on disposal of long-lived assets	662	4,281
Contributions restricted for long-term investment and assets	(1,846)	(4,830)
Changes in actuarial assumptions	—	(490)
Changes in operating assets and liabilities	(4,805)	(4,201)
Net cash provided by operating activities	60,156	52,176
Cash flows from investing activities:		
Acquisition and construction of long-lived assets	(34,273)	(37,791)
Proceeds from investments	69,456	135,834
Purchases of investments	(93,440)	(175,678)
Net cash used in investing activities	(58,257)	(77,635)
Cash flows from financing activities:		
Repayment of bonds	(3,470)	(3,345)
Repayment of note payable	(101)	(130)
Decrease in funds held in escrow	326	7,048
Draws under Connecticut forgivable loans	4,727	14,232
Contributions restricted for long-term investment and assets	1,846	4,830
Net cash provided by financing activities	3,328	22,635
Net increase/(decrease) in cash and equivalents	5,227	(2,824)
Cash and equivalents, beginning of year	4,375	7,199
Cash and equivalents, end of year	\$ 9,602	4,375
Cash paid for interest	\$ 3,800	3,972

See accompanying notes to financial statements.

## THE JACKSON LABORATORY

Notes to Financial Statements

December 31, 2016 and 2015

### (1) Background

The Jackson Laboratory (the Laboratory) is a not-for-profit independent research organization focusing on research to advance human health. The purposes of the laboratory are scientific, medical, charitable, and educational. The Laboratory strives to discover precise genomic solutions for disease and empower the global biomedical community in its shared quest to improve human health. This mission is carried out through: (1) conducting basic biomedical research; (2) training and educating scientists worldwide; and (3) developing and providing scientific services, genetic resources, and genetic and clinical information related to genetic resources to the global scientific community.

### (2) Summary of Significant Accounting Policies

#### (a) Basis of Presentation

The Laboratory presents its financial statements on the accrual basis in accordance with U.S. generally accepted accounting principles (GAAP). All amounts presented in the notes to the financial statements are in thousands.

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, and disclosure of contingent assets and liabilities, at the dates of the financial statements and the reported amounts of revenues and expenses during the reporting periods. Actual results could differ from those estimates. Management estimates requiring the application of significant judgment include Connecticut forgivable loans, obligations under postretirement plan, liabilities under self-insured plans, allowances for uncollectible receivables, valuations of interest-rate swaps, and certain alternative investments.

The Laboratory is a not-for-profit organization as described in Section 501(c)(3) of the Internal Revenue Code (the Code), as amended, and is generally exempt from income taxes pursuant to the Code. In accordance with GAAP, the Laboratory assesses whether there are uncertain tax positions and determined that there were no uncertain tax positions that would have a material effect on the financial statements.

#### (b) Classification of Net Assets

Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) Subtopic 958-205, *Classification of Donor Restricted Endowment Funds Subject to an Enacted Version of the Uniform Prudent Management of Institutional Funds Act (ASC 958-205)*, provides guidance on the net asset classification of donor-restricted endowment funds, and requires comprehensive disclosures regarding both donor-restricted endowment funds and board-designated (quasi) endowment funds. The Laboratory is subject to the Maine Uniform Prudent Management of Institutional Funds Act (MUPMIFA) and, accordingly, classifies as temporarily restricted net assets the unappropriated and unspent balance above historic dollar value of its donor-restricted endowment funds. See note 5 for more information about the Laboratory's endowment.

## THE JACKSON LABORATORY

### Notes to Financial Statements

December 31, 2016 and 2015

The financial statements have been prepared to focus on the Laboratory as a whole and to present balances and transactions according to the existence or absence of donor-imposed restrictions. Accordingly, net assets and changes therein are classified as follows:

- Unrestricted Net Assets – Net assets not subject to donor-imposed stipulations but which may be designated for specific purposes by the Laboratory’s Board of Trustees.
- Temporarily Restricted Net Assets – Net assets subject to donor-imposed stipulations that may or will be released upon actions of the Laboratory meeting the donor-imposed stipulations and/or the passage of time. In addition, unspent appreciation of donor-restricted endowment funds in excess of their historic dollar value is classified as temporarily restricted net assets until appropriated by the Laboratory and spent in accordance with the standard of prudence imposed by MUPMIFA.
- Permanently Restricted Net Assets – Net assets subject to donor-imposed stipulations that they be maintained in perpetuity. Generally, the donors permit the Laboratory to use all or part of the income earned and/or capital gains, if any, on related investments for general or specific purposes.

Revenue is reported as an increase in unrestricted net assets unless its use is limited by donor-imposed restrictions or it is a gift pledge or remainder trust and included in temporarily restricted revenue until collected. Expenditures of temporarily restricted funds are reported in the program where expended with the release of the restriction shown as a decrease in temporarily restricted net assets and an offsetting increase in unrestricted net assets.

#### **(c) Revenue from Provision of Genetic Resources and Clinical and Research Services**

Revenue from providing genetic resources and clinical and research services is recognized when the resources are shipped or the services are provided and is included in Genetic Resources & Services revenue. Accounts receivable from such activities are reported net of allowance for uncollectible accounts.

#### **(d) Revenue from Grants and Research Contracts**

The Laboratory recognizes revenue from grants and research contracts as related costs are incurred. Payments received in advance of expenditures are recorded as deferred revenue until expended. The Laboratory received approximately 73% and 73%, respectively, of its revenue from grants and contracts from the National Institutes of Health (NIH) for the years ended December 31, 2016 and 2015. Connecticut Innovations, Incorporated (CI) research and operating grant provided 19% and 18% of the grant revenue in 2016 and 2015, respectively. Indirect costs are billed and recovered in accordance with the terms of the grant and represented \$25,411 and \$28,676, respectively, of revenue from grants for the years ended December 31, 2016 and 2015. Most NIH grants reimburse for indirect costs at an agreed percentage of direct costs incurred. CI reimburses eligible costs up to an annual maximum amount. The Laboratory applies the CI grant funds to direct costs and then to indirect costs. The loss or significant reduction of Connecticut funding or federal programs could have a material adverse effect on the Laboratory’s operations. However, the Laboratory is not aware that any federal programs will be materially reduced. In addition, direct and indirect costs charged to federal programs are subject to audit and possible future adjustment. Management believes that the Laboratory is in compliance with applicable laws and regulations and that any possible adjustments would not be material to the financial statements.



**THE JACKSON LABORATORY**

Notes to Financial Statements

December 31, 2016 and 2015

**(e) Revenue from Contributions**

Contributions, including unconditional promises to give, are recognized at fair value and increase net assets in the period received. Written promises to give that are scheduled to be received after the balance sheet date are shown as increases in temporarily restricted net assets and are reclassified to unrestricted net assets when the purpose or time restrictions are met. Promises to give subject to donor-imposed stipulations that the corpus be maintained permanently are recognized as increases in permanently restricted net assets. Conditional promises to give are not recognized until they become unconditional, that is, when the conditions on which they depend are substantially met. Contributions of cash and publicly traded securities are classified in Level 1 of the fair value hierarchy (see note 2(m)). Contributions of assets other than cash or publicly traded securities are recorded at their estimated fair value at the date of gift. As no market for future contributions exists, pledges are classified in Level 3 of the fair value hierarchy. Contributions to be received after one year are discounted at rates commensurate with the estimated risk of receipt of the pledge. Amortization of the discount is recorded as additional contribution revenue in the appropriate net asset category.

Contributions of cash or other assets that must be used to acquire long-lived assets or the contribution of long-lived assets are reported as temporarily restricted nonoperating support until the assets are acquired or placed in service.

Donor-directed changes made in subsequent periods to their original restrictions are reported as reclassifications between the applicable net asset classes.

**(f) Programmatic Expenses**

Expenses are presented on the statements of activities on a functional or programmatic basis, consisting of direct costs and indirect facility related costs. Facility-related expenses, including costs for the operation and maintenance of long-lived assets, financing costs and depreciation, are allocated on the basis of square footage utilized by each of the programs.

Expenses incurred by type for the years ended December 31, 2016 and 2015 are presented below:

Program	December 31, 2016				
	Research	Genetic resources and services	Training	Institutional support	Total
Salaries and wages	\$ 43,500	46,232	2,368	24,614	116,714
Benefits	13,424	14,267	731	7,596	36,018
Employee recruitment, training, memberships and subscriptions	1,283	394	32	3,396	5,105
Purchased services and stipends	10,276	4,762	1,191	6,353	22,582
Supplies and shipping	12,246	30,586	528	1,801	45,161
Maintenance, utilities and insurance	7,023	10,296	628	5,635	23,582
Travel and meals	1,559	2,564	792	1,713	6,628

**THE JACKSON LABORATORY**

Notes to Financial Statements

December 31, 2016 and 2015

December 31, 2016					
Program	Research	Genetic resources and services	Training	Institutional support	Total
Financing costs	\$ 1,899	3,013	91	371	5,374
Depreciation	16,792	15,119	1,133	2,422	35,466
Other expenses	43	2,337	94	1,204	3,678
Total	\$ <u>108,045</u>	<u>129,570</u>	<u>7,588</u>	<u>55,105</u>	<u>300,308</u>

December 31, 2015					
Program	Research	Genetic resources and services	Training	Institutional support	Total
Salaries and wages	\$ 43,453	44,747	2,247	24,246	114,693
Benefits	12,423	12,792	642	6,931	32,788
Employee recruitment, training, memberships and subscriptions	1,012	453	58	2,313	3,836
Purchased services and stipends	8,112	5,199	856	3,831	17,998
Supplies and shipping	11,107	26,267	425	2,819	40,618
Maintenance, utilities and insurance	6,783	10,173	427	6,109	23,492
Travel and meals	1,478	2,508	599	1,494	6,079
Financing costs	1,895	3,102	54	371	5,422
Depreciation	16,067	13,916	584	3,119	33,686
Other expenses	77	2,088	66	700	2,931
Total	\$ <u>102,407</u>	<u>121,245</u>	<u>5,958</u>	<u>51,933</u>	<u>281,543</u>

All direct and indirect costs of fundraising are expensed as incurred and are included in institutional support in the statements of activities. Direct fundraising expenses were \$3,033 and \$2,966 for the years ended December 31, 2016 and 2015, respectively.

**(g) Operating and Nonoperating Activities**

The statements of activities report changes in net assets from operating and nonoperating activities.

Operating activities consist of the Laboratory's ongoing research and training programs, including the provision of genetic resources and services. Included in operating revenue is investment return appropriated to support operations under the endowment income spending formula approved by the Board of Trustees, as described in note 5(b). Also included in operating revenue are research grant reimbursements of \$493 and \$171 for the years ended December 31, 2016 and 2015, for the purchase of equipment that became the property of the Laboratory upon acquisition. Depreciation charged to operating activities from research grant-funded equipment was \$1,368 and \$828 for the years ended December 31, 2016 and 2015, respectively.

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Notes to Financial Statements

December 31, 2016 and 2015

Nonoperating revenue includes items not related to the Laboratory's recurring activities or revenue that may not be used for operations. Accordingly, contributions for the acquisition of long-lived assets, net assets released from restrictions for the acquisition of long-lived assets, unrestricted bequests, investment return in excess of the amount appropriated under the Laboratory's spending formula, and grants to acquire land, buildings, and equipment are all reported as nonoperating activities. Changes in fair value of Connecticut forgivable loans and interest-rate swaps, as well as postretirement plan charges above periodic benefit costs, are also all presented as nonoperating activities.

### **(h) Cash and Equivalents**

For the purpose of the statement of cash flows the Laboratory considers cash equivalents as investments with maturities at date of purchase of three months or less.

### **(i) Self-Insurance Reserves**

The Laboratory is self-insured for worker's compensation claims for a portion of its worker's compensation program, and certain other healthcare benefits offered to active employees. These costs are accounted for on an accrual basis, which requires estimates to be made for claims incurred but not yet reported as of the balance sheet date.

### **(j) Long-Lived Assets**

Long-lived assets are reported at cost at date of acquisition or at fair value at date of donation in the case of gifts, which are classified in Level 3 of the fair value hierarchy. For assets placed in service, depreciation is provided using the straight-line method over the estimated useful lives of the assets. The cost of normal maintenance and repairs that does not add to the value of the asset or materially extend asset lives is not capitalized.

Depreciation is provided on a straight-line basis over the following estimated useful lives:

	<u>Years</u>
Buildings and improvements	15–50
Land improvements	5–15
Equipment and software	3–15

Management reviews long-lived assets for impairment whenever events or circumstances indicate that the carrying value of a long-lived asset may not be recoverable. Management determined that no long lived assets were impaired as of December 31, 2016 and 2015.

The Laboratory receives awards from various granting agencies that allow for the purchase of certain assets, scientific equipment and construction of buildings. These assets are depreciated in accordance with the aforementioned policy. The assets become the property of the Laboratory upon acquisition, unless the grant or funding agreement specifically states otherwise. Grant-funded assets are typically restricted as to use and disposal.

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Notes to Financial Statements

December 31, 2016 and 2015

### **(k) Bonds and Notes Payable**

Forgivable loans are valued at fair value, reflecting the probability of forgiveness. All other debt is carried at cost.

Certain items related to the issuance of debt such as accounting, legal and auditing, as well as debt issuance costs and original issue discounts or premium are amortized over the period the related obligation is outstanding, generally using the interest method.

### **(l) Derivative Instruments**

The Laboratory utilizes interest-rate swap agreements with various counterparties to essentially convert its variable-rate debt to fixed rates and not for speculative purposes. The swaps' fair values and changes therein are recognized in the Laboratory's financial statements. Differences between the fixed and variable interest rates in effect are settled net monthly under each swap, increasing or decreasing interest expense. The estimated fair value of each swap is measured at each reporting date and presented as an asset (liability) based on the termination value as of that date using techniques such as discounted cash flow analysis and option pricing models that incorporate assumptions about future market interest rates. See footnote 8(d) for additional information on the interest rate swaps.

### **(m) Fair Value Measurements**

The Laboratory determines fair value based on assumptions that market participants would use in pricing an asset or liability in the principal or most advantageous market. When considering market participant assumptions in fair value measurements, the following fair value hierarchy distinguishes between observable and unobservable inputs, which are categorized in one of the following levels:

- **Level 1 inputs:** Unadjusted quoted prices for identical assets or liabilities in active markets accessible to the entity at the measurement date.
- **Level 2 inputs:** Other than quoted prices included in Level 1, inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the asset or liability.
- **Level 3 inputs:** Unobservable inputs for the asset or liability used to measure fair value to the extent that observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at the measurement date.

The fair value hierarchy gives the highest priority to Level 1 inputs and the lowest priority to Level 3 inputs. In determining fair value, the Laboratory utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible. Levels are determined based on the aforementioned hierarchy, except for investments measured using net asset value (NAV) as a practical expedient to estimate fair value, as described in note 3.

It is the Laboratory's policy to review and reflect transfers between Levels as of the financial statement reporting date. Transfers between different levels of the fair value hierarchy are recorded as of the end of the reporting period.

The categorization of an investment within the fair value hierarchy is based on the inputs described above and does not necessarily correspond to the Laboratory's management's perceived risk of that investment. Moreover, the methods used by management may produce a fair value calculation that

## THE JACKSON LABORATORY

Notes to Financial Statements

December 31, 2016 and 2015

may not be indicative of net realizable value or reflective of future fair values. Furthermore, although the Laboratory believes its valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments and nonfinancial assets and liabilities could result in a different fair value measurement at the reporting date.

### **(n) Fair Value of Financial Instruments**

The Laboratory discloses fair value information about all financial instruments, whether or not recognized in the balance sheets, for which it is practicable to estimate fair value. The Laboratory's financial instruments not carried at fair value are carried at net realizable value, which approximates fair value. Such financial instruments consist of cash equivalents, receivables from customers, and accounts payable and accrued expenses, which would be classified in Level 1 of the fair value hierarchy (excluding employee benefit obligations, which are not financial instruments).

### **(3) Investments**

#### **(a) Overall Investment Objective**

The overall investment objective of the Laboratory is to invest its long-term assets in a prudent manner that is intended to achieve a long-term rate of return sufficient to fund a portion of its annual operating activities and increase investment value after inflation. The investment objective for working capital investments is preservation of value and liquidity, relying on highly rated short-term interest-bearing investments. The Laboratory diversifies its long-term investments among various asset classes incorporating multiple strategies and managers. The Finance Committee, which oversees the Laboratory's investment program in accordance with Board of Trustee approved investment policy, relies on the Investment Subcommittee to recommend investment policy and implement the approved policy.

#### **(b) Investment Strategies**

The endowment is invested a manner that emphasizes the diversification of assets across categories of asset classes with differing sources of return and risk drivers. Fees are minimized through the use of indexed funds and direct purchases of short-term bonds and notes. The restricted assets may be invested with less liquidity and seek longer term returns through nonmarketable assets. The Laboratory may hold shares or units in institutional stock and fixed income funds as well as in alternative investment funds involving hedged strategies, private equity and real asset strategies. Funds with hedged strategies generally hold securities or other financial instruments for which a ready market exists and may include stocks, bonds, put or call options, swaps, currency hedges, credit default swaps and other instruments, and are valued accordingly. Private equity funds focus on investments not available in the public equity market. Real asset funds generally hold interests in commercial real estate, natural resources, or timber assets. Private equity and real asset strategies therefore often require the estimation of fair values by the fund managers in the absence of readily determinable market values. Because of the inherent uncertainties of valuation, these estimated fair values may differ significantly from values that would have been used had a ready market existed. Such valuations are determined by fund managers and generally consider variables such as operating results, comparable earnings multiples, projected cash flows, recent sales prices, and other pertinent information, and may reflect discounts for the illiquid nature of certain investments held.

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Notes to Financial Statements

December 31, 2016 and 2015

**(c) Basis of Reporting**

Investments, including endowment and unrestricted operating investments are reported at estimated fair value. If an investment is held directly by the Laboratory and an active market with quoted prices exists, the market price of an identical security is used as the reported fair value. Reported fair values for shares in registered mutual funds are based on share prices reported by the funds as of the last business day of the fiscal year. The Laboratory's interests in commingled investment funds (multiple strategies) are generally reported at the net asset value (NAV) reported by the fund managers, which is used as a practical expedient to estimate the fair value of the Laboratory's interest therein, unless it is probable that all or a portion of the investment will be sold for an amount different from NAV.

**(d) Classification in the Fair Value Hierarchy**

The Laboratory owns interests in alternative investment funds rather than in the securities underlying each fund and has therefore applied the provisions of Accounting Standards Update (ASU) 2009-12, *Investments in Certain Entities that Calculate Net Asset Value (NAV) per Share (or its Equivalent)*. This standard allows for the estimation of the fair value of investments in investment companies for which the investment does not have a readily determinable value using NAV per share or its equivalent as a practical expedient. The Laboratory has utilized the NAV reported by each of the underlying funds as a practical expedient to estimate the value of the investment. In 2016, the Laboratory retrospectively adopted ASU 2015-07, *Disclosures for Investments in Certain Entities that Calculate NAV per Share (or its Equivalent)*(ASU 2015-07), which clarified how investments valued using NAV as a practical expedient within the fair value hierarchy should be classified. ASU 2015-07 removes the requirement to classify within the fair value hierarchy table in Levels 2 or 3 investments in certain funds measured at NAV or its equivalent as a practical expedient to estimate fair value. The adoption did not impact the Laboratory's balance sheet, statement of activities, or statement of cash flows and resulted only in changes to the investment footnote disclosures.

The inputs or methodology used for valuing or classifying investments for financial reporting purposes are not necessarily an indication of the risk associated with investing in those investments or a reflection on the liquidity of each fund's underlying assets and liabilities.

There were no transfers between Level 1 and Level 2 for the fiscal years ended December 31, 2016 and 2015.

The following tables summarize the Laboratory's investments and other assets by major category in the fair value hierarchy as of December 31, 2016 and 2015, as well as related strategy, liquidity and funding commitments:

	December 31, 2016					
	Level 1	Level 2	NAV or equivalent	Total	Redemption or liquidation	Days' notice
Working capital investments:						
Money market accounts and certificates of deposit	\$ 31,621	—	—	31,621	Daily	One
U.S. government agency bonds	—	3,046	—	3,046	Daily	One

**THE JACKSON LABORATORY**

Notes to Financial Statements

December 31, 2016 and 2015

							December 31, 2016					
							Level 1	Level 2	NAV or equivalent	Total	Redemption or liquidation	Days' notice
Corporate bonds	\$	—	25,357	—	25,357	Daily	One					
U.S. and global fixed income funds		—	23,628	—	23,628	Daily	One					
Multiple strategies		107,431	—	—	107,431	Daily	One					
Total working capital investments		139,052	52,031	—	191,083							
Long-term investments (endowment):												
Money market accounts and certificates of deposit												
		2,089	—	—	2,089	Daily	One					
U.S. and global fixed income funds												
		27,307	—	—	27,307	Daily	One					
Equities:												
U.S. mid and large cap value funds												
		52,363	—	—	52,363	Daily	One					
Global large cap												
		26,345	—	—	26,345	Daily	One					
Global – developed markets												
		13,302	—	—	13,302	Daily	One					
Global – emerging markets												
		—	—	—	—	Daily	One					
Total equities		92,010	—	—	92,010							
Multiple hedged strategies												
		4,840	—	12,877	17,717	Daily to locked-up	One to n/a					
Private equity and real assets												
		—	—	3,632	3,632	Locked-up <sup>1</sup>	N/A					
Total long-term investments		126,246	—	16,509	142,755							
Total		\$ 265,298	52,031	16,509	333,838							

<sup>1</sup> The lock-up periods have various terms with extensions of one to two years. As of December 31, 2016, the average remaining life of these partnerships is approximately nine years.

**THE JACKSON LABORATORY**

Notes to Financial Statements

December 31, 2016 and 2015

	December 31, 2015					
	Level 1	Level 2	NAV or equivalent	Total	Redemption or liquidation	Days' notice
Working capital investments:						
Money market accounts and certificates of deposit	\$ 42,250	—	—	42,250	Daily	One
U.S. government agency bonds	—	8,398	—	8,398	Daily	One
Corporate bonds	—	38,430	—	38,430	Daily	One
U.S. and global fixed income funds	—	23,297	—	23,297	Daily	One
Multiple strategies	59,458	—	—	59,458	Daily	One
Total working capital investments	101,708	70,125	—	171,833		
Long-term investments (endowment):						
Money market accounts and certificates of deposit	3,880	—	—	3,880	Daily	One
U.S. and global fixed income funds	22,792	—	—	22,792	Daily	One
Equities:						
U.S. mid and large cap value funds	46,519	—	—	46,519	Daily	One
Global large cap	24,427	—	—	24,427	Daily	One
Global – developed markets	13,246	—	—	13,246	Daily	One
Global – emerging markets	778	—	—	778	Daily	One
Total equities	84,970	—	—	84,970		
Multiple hedged strategies	4,978	—	12,820	17,798	Daily to locked-up	One to n/a
Private equity and real assets	—	—	3,259	3,259	Locked-up <sup>1</sup>	N/A
Total long-term investments	116,620	—	16,079	132,699		
Total	\$ 218,328	70,125	16,079	304,532		

<sup>1</sup> The lock-up periods have various terms with extensions of one to two years. As of December 31, 2015, the average remaining life of these partnerships is approximately eight years.



**THE JACKSON LABORATORY**

Notes to Financial Statements

December 31, 2016 and 2015

**(e) Commitments**

Private Equity investments are generally made through private limited partnerships. Under the terms of the partnership agreements, the Laboratory makes a commitment of a specific amount of capital to a partnership and is obligated to remit committed funding periodically when capital calls are exercised by the General Partner as the partnership executes on its investment strategy. Private equity funds are typically structured with investment periods of three-to-seven years. The aggregate amounts of unfunded commitments associated with private limited partnerships as of December 31, 2016 and 2015 were \$12,587 and \$3,370, respectively. The timing and amount of future capital calls expected to be exercised in any particular future year is uncertain.

Aggregate investment liquidity as of December 31, 2016 and 2015 is presented below based on redemption or sale period:

	<b>Investment fair values</b>	
	<b>2016</b>	<b>2015</b>
Investment redemption or sale period:		
Daily	\$ 317,329	288,453
Quarterly	4,909	10,047
Semi-annually to annually	7,402	1,651
Locked up	4,198	4,381
Total	\$ 333,838	304,532

**(4) Investment Return**

The following summarizes investment return for the years ended December 31, 2016 and 2015:

	<b>2016</b>	<b>2015</b>
Investment return:		
Interest and dividends	\$ 9,257	6,828
Realized net losses	(241)	(803)
Unrealized net gains/(losses)	6,809	(5,950)
Investment return	\$ 15,825	75

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Notes to Financial Statements

December 31, 2016 and 2015

Investment returns are included in the statements of activities as follows for the years ended December 31, 2016 and 2015:

	<b>2016</b>	<b>2015</b>
Investment return:		
Operating:		
Long-term investment return utilized	\$ 980	548
Other investment return	7,874	801
Nonoperating activities:		
Long-term investment return above amounts utilized	6,971	(1,274)
Investment return	\$ 15,825	75

Investment return is net of bank and advisory fees, which were \$367 and \$394 for the years ended December 31, 2016 and 2015, respectively.

**(5) Endowment**

The Laboratory's endowment consisted of approximately 62 individual donor-restricted funds, as well as Board-designated funds held for the long-term support of the Laboratory's mission.

In 2016, the Board of Trustees set separate long-term investment return objectives and risk parameters for donor-restricted and Board-designated funds. For 2016 and 2015, donor-restricted funds were invested with an investment objective of a real total return of 5%. In contrast, Board-designated funds were invested with an investment objective of preserving value over the medium term while maintaining liquidity in the short term, defined as two years. The investment return objective is also an average annual real total return of 4%. Actual returns in any given year may vary from this amount.

**(a) Interpretation of Relevant Law**

The Laboratory classifies as permanently restricted net assets the original value of gifts made to establish donor-restricted endowment funds and any additions to such funds. The remaining portion of a donor-restricted endowment fund that is not classified as permanently restricted net assets is classified as temporarily restricted net assets until appropriated for expenditure by the Laboratory in a manner consistent with the standard of prudence prescribed by MUPMIFA.

**(b) Endowment Spending Policy**

Endowment net assets classified as unrestricted include funds designated by the Board as endowment (also referred to as quasi-endowment), including any accumulated return thereon. For donor-restricted endowment funds, the Laboratory follows the provisions of the Maine Uniform Prudent Management of Institutional Funds Act (MUPMIFA). The Laboratory reports as permanently restricted net assets an amount equal to the value of each permanent donor-restricted endowment fund at the time it became an endowment fund, and subsequent contributions and accumulations pursuant to the applicable gift instrument. Unless otherwise explicitly stipulated by the donor, return on investments in donor-restricted endowment funds is reported as temporarily restricted net assets until appropriated for expenditure by the Laboratory. The Laboratory considers several factors in making a determination to appropriate or accumulate donor-restricted endowment funds, including the individual endowment

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fund's purpose, duration and preservation, the possible effect of inflation (or deflation), and expected total return.

**(c) Funds with Deficiencies**

From time to time, the fair value of assets associated with individual donor-restricted endowment funds may fall below the historic dollar value of permanently restricted contributions. Deficiencies of this nature are reported in unrestricted net assets when they occur. Deficiencies totaled \$54 and \$124 at December 31, 2016 and 2015, respectively. Under MUPMIFA, spending from certain endowment funds with deficiencies as of December 31, 2016 is allowed for fiscal year 2017.

**(d) Endowment Activity**

The Laboratory's endowment consisted of the following at December 31, 2016 and 2015:

		<b>2016</b>			
		<b>Unrestricted</b>	<b>Temporarily restricted</b>	<b>Permanently restricted</b>	<b>Total</b>
	Donor-restricted	\$ (54)	33,578	17,462	50,986
	Board-designated	91,769	—	—	91,769
	Total	\$ 91,715	33,578	17,462	142,755
		<b>2015</b>			
		<b>Unrestricted</b>	<b>Temporarily restricted</b>	<b>Permanently restricted</b>	<b>Total</b>
	Donor-restricted	\$ (124)	32,565	15,947	48,388
	Board-designated	84,311	—	—	84,311
	Total	\$ 84,187	32,565	15,947	132,699

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Changes in endowment assets for the years ended December 31, 2016 and 2015 are as follows:

	<b>December 31, 2016</b>			
	<b>Unrestricted</b>	<b>Temporarily restricted</b>	<b>Permanently restricted</b>	<b>Total</b>
Endowment, December 31, 2015	\$ 84,187	32,565	15,947	132,699
Cash contributions	—	—	1,513	1,513
Board transfer from operating funds to endowment	1,500	—	—	1,500
Investment return	6,287	1,640	—	7,927
Long-term investment return utilized	—	(614)	—	(614)
Adjustment for underwater endowments	70	(70)	—	—
Net assets transferred per restrictions	—	(2)	2	—
In-transit transactions	(329)	59	—	(270)
Endowment, December 31, 2016	\$ <u>91,715</u>	<u>33,578</u>	<u>17,462</u>	<u>142,755</u>

	<b>December 31, 2015</b>			
	<b>Unrestricted</b>	<b>Temporarily restricted</b>	<b>Permanently restricted</b>	<b>Total</b>
Endowment, December 31, 2014	\$ 81,813	33,197	11,600	126,610
Cash contributions	—	—	4,349	4,349
Board transfer from operating funds to endowment	3,000	—	—	3,000
Investment return	(518)	(210)	—	(728)
Long-term investment return utilized	—	(548)	—	(548)
Adjustment for underwater endowments	(124)	124	—	—
Net assets transferred per restrictions	—	2	(2)	—
In-transit transactions	16	—	—	16
Endowment, December 31, 2015	\$ <u>84,187</u>	<u>32,565</u>	<u>15,947</u>	<u>132,699</u>

In-transit transactions are due to timing of transfers between the Laboratory's operational accounts and endowment accounts for gifts received and reimbursement of expenditures. Gifts are shown as the amount of cash received and therefore include the collection of pledge payments and exclude uncollected pledges.

**THE JACKSON LABORATORY**

Notes to Financial Statements

December 31, 2016 and 2015

**(6) Accounts Receivable**

Accounts receivable consisted of the following as of December 31, 2016 and 2015:

	<b>2016</b>	<b>2015</b>
Due from provision of genetic resources and services	\$ 25,225	26,675
Amounts reimbursable under grants and contracts	6,485	4,885
Miscellaneous accounts receivable	1,894	2,589
	33,604	34,149
Less allowance for uncollectibles	(865)	(1,161)
Accounts receivable, net	\$ 32,739	32,988

**(7) Long-Lived Assets**

Long-lived assets consisted of the following as of December 31, 2016 and 2015:

	<b>2016</b>	<b>2015</b>
Land and improvements	\$ 10,591	10,468
Buildings and improvements	506,449	501,560
Construction in progress	29,774	14,192
Equipment and software	144,202	131,175
	691,016	657,395
Less accumulated depreciation	(299,492)	(266,322)
Long-lived assets, net	\$ 391,524	391,073

The change in accounts payable for acquisition and construction of long-lived assets was an increase of \$2,303 and a decrease of (\$6,641) for the years ended December 31, 2016 and 2015, respectively.

Commitments to third parties for the purchase of equipment, space renovation and construction projects were \$29,596 and \$7,959 as of December 31, 2016 and 2015, respectively.

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Notes to Financial Statements

December 31, 2016 and 2015

**(8) Bonds and Note Payable**

**(a) Bonds and Note Payable**

Bonds and note payable consisted of the following as of December 31, 2016 and 2015:

	<b>2016</b>	<b>2015</b>
Finance Authority of Maine Revenue Bonds (FAME Series 2012 Bonds)	\$ 35,155	37,075
Association of Bay Area Government for California fixed rate revenue bonds (ABAG Series 2012 bonds)	55,390	56,940
	90,545	94,015
Less unamortized discount	(180)	(192)
Plus unamortized premium	4,481	4,865
Debt issuance costs	(613)	(649)
Bonds payable, net	94,233	98,039
Note payable for real estate purchase	2,011	2,112
Bonds and note payable, net	\$ 96,244	100,151

The FAME Series 2012 bonds carry a variable interest rate and mature serially through July 1, 2031. A bank purchased the FAME Series 2012 bonds under a 10-year bond purchase agreement and supplemental letter agreement under which the Laboratory pays 67% of one-month LIBOR plus 1.02%. The agreements contain certain restrictive covenants, including meeting a semi-annual liquidity test, limits on incurring additional debt, and not allowing liens on property. Annually, in connection with providing the audited financial statements, the Laboratory may request an extension of the purchase agreement for up to nine additional years. In 2016, the Laboratory requested, and the bank granted a one year extension of the term of the original purchase agreement until 2026.

Should the financial institution holding the bonds under a direct purchase agreement accelerate the maturities of the obligation due to a subjective clause, under which conditions are not objectively determinable, the Laboratory would consider those obligations to be short-term in nature.

The Laboratory was in compliance with all financial covenants as of December 31, 2016 and 2015.

The ABAG Series 2012 bonds were issued with a par amount of \$60,290 and a premium of \$6,066 at fixed interest rates ranging from 2.5% to 5% over a 25-year term. The proceeds were used to refund existing ABAG bonds and fund the further fit-out of the Sacramento facility.

In connection with the purchase of property located contiguous to the Laboratory's Bar Harbor campus, the Laboratory entered into a \$2,260 fifteen year note with the seller of the property. The note bears a fixed interest rate of 4% and requires monthly mortgage amortization payments.

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Notes to Financial Statements

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### **(b) Connecticut Innovations, Incorporated Forgivable Loans**

On January 5, 2012, the Laboratory entered into several agreements with various sub-units of the state of Connecticut to build a 183,500 square foot laboratory and operate a genomics medicine research program in Farmington, Connecticut. The major agreements include a funding agreement with Connecticut Innovations, Incorporated (CI), a ground lease with the University of Connecticut Health Center (UCHC), and a collaboration agreement with the University of Connecticut (UConn).

The CI funding agreement provides a \$145,000 forgivable loan to construct a building and fit it out; a \$46,685 forgivable loan for the purchase of equipment over 10 years; and \$99,000 in grant commitments to support research and development over ten years. The loans will be forgiven if the Laboratory meets an employment goal of 300 employees for a period of six months, including a minimum of 90 senior scientists with an average wage exceeding a minimum target. In order for forgiveness to occur, the employment goal must be reached within ten years, or within the extended period if the Laboratory exercises an option to extend. The loans accrue simple interest at 1% per year, which is forgivable according to the same terms as the loans. If the Laboratory does not meet the employment goal, CI may elect that the Laboratory forfeit the building and equipment. In the event this election is made, the Laboratory reserves the right to lease the facility from CI for an initial period of five years, followed by an optional renewal period of five years. The loans are non-recourse to the Laboratory.

The Laboratory elected, under FASB ASC Topic 825, to report the forgivable loans at fair value. Therefore, the fair value of the loans is based on the probability that the Laboratory will meet the employment goals and the projected value of the underlying assets which collateralize the loans. An independent third-party valuation firm used a Monte Carlo simulation of key business plan assumptions to develop the fair value presented in the balance sheet. The difference between funds drawn through December 31 under the loans and the fair value is included in the nonoperating section of the statement of activities as an adjustment to fair value of Connecticut forgivable loans.

As part of the transaction, UCHC provided a 99-year ground lease for the building site. The ground lease contains a provision whereby the property will transfer to the Laboratory upon reaching 600 employees in Connecticut. The ground lease also includes limitations on the sale and use of the facility. A collaboration agreement with UConn covers joint faculty appointments, grant applications, UConn assignment and funding of faculty to be located at the Laboratory's Farmington site, and other related matters.

As of December 31, 2016 and 2015, the Laboratory had incurred \$152,139 and \$151,684, respectively, in project-related costs, which are included in construction in progress, buildings and improvements, and equipment. As of December 31, 2016 and 2015, the Laboratory had cumulatively received advances and accrued interest under the Connecticut forgivable loans of \$156,444 and \$150,205, respectively. The advances include \$0 and \$326 held in escrow by CI as retainage as of December 31, 2016 and 2015, respectively. The funds held in escrow are included in Funds Held in Escrow in the accompanying financial statements.

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The following table summarizes the valuation techniques and significant unobservable inputs used by the Laboratory that are categorized within Level 3 of the fair value hierarchy as of December 31:

	<u>Fair value at December 31, 2016</u>	<u>Valuation technique</u>	<u>Unobservable inputs</u>	<u>Range (weighted average)</u>
Connecticut forgivable loans \$	5,760	Third-party valuation based on Monte Carlo simulations	Employee annual salaries by position	\$45–\$228 (\$80k)
			Employee annual salaries increases	1%–2.5% (1.7%)
			Employee benefits as a% of salaries	23.5%–26.5% (25%)
			Weighted case scenario probabilities	75%–90% (83.33%)

	<u>Fair value at December 31, 2015</u>	<u>Valuation technique</u>	<u>Unobservable inputs</u>	<u>Range (weighted average)</u>
Connecticut forgivable loans \$	7,270	Third-party valuation based on Monte Carlo simulations	Employee annual salaries by position	\$28–\$333 (\$153k)
			Employee annual salaries increases	1%–2.5% (1.7%)
			Employee benefits as a% of salaries	23.5%–26.5% (25%)
			Weighted case scenario probabilities	65%–90% (78.33%)

**(c) Maturities of Long-Term Debt**

Maturities of long-term debt as of December 31, 2016, were as follows:

	<u>Amounts due</u>
Year ending December 31:	
2017	\$ 3,727
2018	3,882
2019	4,043
2020	4,208
2021	4,389
Thereafter	<u>224,446</u>
Total	<u>\$ 244,695</u>



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Included in "Thereafter" in the above table is \$152,139 drawn through December 31, 2016 under the nonrecourse Connecticut loan agreements described in note 8(b). Such balance would be forgiven if the Laboratory meets certain employment goals as defined in the agreements.

**(d) Interest-Rate Swaps**

The Laboratory entered into interest-rate swap agreements, including forward-starting swaps, to essentially convert the variable rate on the \$37,075 of FAME borrowings outstanding to various fixed rates. The swaps' notional amounts amortize at the same rate as and cover the entire related debt principal throughout the term of the bonds, which mature in 2031.

Because the swap fair values are primarily based on observable inputs, such as the interest yield curve, that are corroborated by market data, the swap fair values are categorized as Level 2 in the fair value hierarchy. The estimated fair value shown in the financial statements is based on the estimated termination value as of the end of the year.

As of December 31, 2016 and 2015, the following interest-rate swap agreements were outstanding:

2016						
Counterparty	Issue date	Effective date	Expiration date	Remaining notional amount	Swap fixed rate	Fair value asset (liability)
1	6/12/2002	7/1/2002	7/1/2022	\$ 9,385	3.920 %	\$ (1,151)
2	6/11/2003	7/1/2003	7/1/2031	10,255	2.860	(1,076)
3	5/5/2005	7/1/2005	7/1/2031	6,130	3.271	(812)
4	6/20/2003	7/1/2012	7/1/2031	9,385	4.140	(1,865)
5*	6/20/2003	7/1/2022	7/1/2031	5,905	4.000	(559)
Totals						\$ <u>(5,463)</u>

\* As of December 31, 2016, represents a separate forward swap that effectively extends the initial swap expiration date through the related debt maturity date.

2015						
Counterparty	Issue date	Effective date	Expiration date	Remaining notional amount	Swap fixed rate	Fair value asset (liability)
1	6/12/2002	7/1/2002	7/1/2022	\$ 9,900	3.920 %	\$ (1,452)
2	6/11/2003	7/1/2003	7/1/2031	10,800	2.859	(1,297)
3	5/5/2005	7/1/2005	7/1/2031	6,475	3.271	(970)
4	6/20/2003	7/1/2012	7/1/2031	9,900	4.140	(2,181)
5*	6/20/2003	7/1/2022	7/1/2031	5,905	4.000	(554)
Totals						\$ <u>(6,454)</u>

\* As of December 31, 2015, represents a separate forward swap that effectively extends the initial swap expiration date through the related debt maturity date.

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The variable-rate side of the swaps is based on 67% of one-month LIBOR plus 1.02%. Swap agreements 3 and 4 contain a requirement for the Laboratory to post cash collateral if the aggregate mark-to-market value of the swaps exceeds a \$5,000 liability as of any month-end. Swap agreements 1, 2, and 5 contain a requirement for the Laboratory to post cash collateral if the aggregate mark-to-market value of the swaps exceed an \$8,000 liability as of any month end. The mark-to-market threshold amounts are exclusive. The counterparties are required to maintain a minimum credit rating as per the individual agreements.

Interest rate volatility, remaining outstanding principal and time to maturity will affect each swap's fair value at subsequent reporting dates. To the extent the Laboratory holds a swap through its expiration date, the swap's fair value will reach zero.

### **(9) Employee Benefits**

#### **(a) *Defined Contribution Retirement Plan and Other Benefits***

Subject to meeting certain eligibility requirements, all employees participate in a defined contribution 403(b) retirement plan administered by the Laboratory. Contribution expense was \$9,414 and \$8,685 for the years ended December 31, 2016 and 2015, respectively.

In addition, the Laboratory has supplemental pension obligations under employment agreements. The present value of the obligations is included in accrued expenses and is funded primarily through a split-interest life insurance arrangement. The cash value of the insurance policy is included in other assets. Life annuities were purchased to meet another obligation to provide additional retirement income. The cost of these annuities is included in other assets and is being amortized over the vesting period after which the annuity contracts transfer to the employee.

#### **(b) *Postretirement Medical Plan***

The Laboratory maintains a postretirement medical plan covering certain retired employees with hire dates before 2003 and faculty members eligible to retire on May 31, 2008, and their dependents. Other than the payment of current benefits totaling \$490 and \$489 in the years ended December 31, 2016 and 2015, respectively, the Laboratory has not funded the postretirement plan.

The impact of the changes in actuarial assumptions was a decrease in the liability resulting in a gain of \$880 and a loss of \$490 for the years ended December 31, 2016 and 2015, respectively, included in the nonoperating section of the statements of activities.

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Benefit obligations and funded status of the plan for the years ended December 31, 2016 and 2015 were as follows:

	<b>Year ended December 31</b>	
	<b>2016</b>	<b>2015</b>
Changes in benefit obligations:		
Benefit obligation at beginning of year	\$ 5,659	6,329
Interest cost	235	239
Total actuarial (gain) loss	870	(372)
Medicare Part D subsidy with adjustment	47	(48)
Benefits paid, net of employee contributions	<u>(490)</u>	<u>(489)</u>
Benefit obligation at end of year	<u>6,321</u>	<u>5,659</u>
Changes in plan assets:		
Fair value of plan assets at beginning of year	—	—
Actual return on plan assets	—	—
Employer contributions	490	489
Employee contributions	52	52
Benefits paid	<u>(542)</u>	<u>(541)</u>
Fair value of plan assets at end of year	<u>—</u>	<u>—</u>
Accrued benefit cost recognized in the balance sheet	<u>\$ (6,321)</u>	<u>(5,659)</u>

Net periodic benefit cost consisted of the following components for the years ended December 31, 2016 and 2015:

	<b>Year ended December 31</b>	
	<b>2016</b>	<b>2015</b>
Interest cost	\$ 235	239
Medicare Part D subsidy	(73)	(61)
Amortization of net actuarial loss	<u>43</u>	<u>69</u>
Net periodic benefit cost recorded	<u>\$ 205</u>	<u>247</u>

The net loss and prior service credit for the postretirement plan that will be amortized into net periodic benefit cost in 2016 is \$43. The weighted average assumptions related to the discount rate used to determine benefit obligations for 2016 and 2015 were 3.66% and 3.69%, respectively.

The discount rates used to determine net periodic benefit cost for the years ended December 31, 2016 and 2015 were 3.69% and 3.42%, respectively.

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The assumed health care cost trend rates at December 31, 2016 and 2015 were as follows:

	<u>2016</u>	<u>2015</u>
Healthcare cost trend rate assumed for next year	6.0 %	6.0 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	3.8	3.8
Year that the rate reaches the ultimate trend rate	2076	2076

Assumed health care trend rates have a significant effect on the amounts reported for the health care plans. A one-percentage-point change in assumed health care cost trend rates would have the following effects:

	<u>One-point increase</u>	<u>One-point decrease</u>
Effect on total of service and interest cost	\$ 19	17
Effect on total on postretirement benefit obligation	620	535

The Laboratory's estimated future benefit payment obligation for the retiree medical benefit pension plan future benefit payment obligations are as follows:

	<u>Retiree medical benefits</u>
Year ending December 31:	
2017	\$ 434
2018	436
2019	434
2020	436
2021	436
2022 through 2026	2,106

**(c) Deferred Compensation Program**

The Laboratory maintains a nonqualified salary deferral plan (the 457(b) Plan) authorized under Section 457(b) of the Internal Revenue Code. The Laboratory holds an investment approximately matching the employee investment selections to assure funding is available to meet future liabilities. The liability at December 31, 2016 and 2015 was \$4,294 and \$3,792, respectively, and is included in accounts payable and accrued expenses. The investments valued at \$4,294 and \$3,792 as of December 31, 2016 and 2015, respectively, and are included in other assets.

The Laboratory also maintains a deferred compensation program under Section 457(f) of the Internal Revenue Code for management and certain highly compensated employees under which a portion of

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the employee's compensation is deferred and vested over time. The liability of \$684 and \$430 at December 31, 2016 and 2015, respectively, is included in accounts payable and accrued expenses, and the corresponding assets are included in other assets.

**(10) Restricted Net Assets**

The Laboratory classifies gift pledges based on donor purpose restriction. Unrestricted pledges are shown as time restricted until collected.

**(a) Temporarily Restricted Net Assets**

Temporarily restricted net assets consisted of the following as of December 31, 2016 and 2015:

	<u>2016</u>	<u>2015</u>
Time-restricted	\$ 1,133	1,140
Unappropriated return on donor-restricted endowments	33,578	32,554
Restricted for acquisition and construction of long-lived assets	1,833	1,814
Restricted for research, training and other programs	<u>4,666</u>	<u>4,840</u>
	<u>\$ 41,210</u>	<u>40,348</u>

**(b) Permanently Restricted Net Assets**

Permanently restricted net assets consisted of the following as of December 31, 2016 and 2015:

	<u>2016</u>	<u>2015</u>
Research	\$ 13,343	11,890
Training	486	436
Other programs	865	853
General purposes	<u>2,768</u>	<u>2,768</u>
Total endowment	17,462	15,947
Pledges receivable	<u>2,718</u>	<u>2,449</u>
	<u>\$ 20,180</u>	<u>18,396</u>

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December 31, 2016 and 2015

**(c) Pledges Receivable and Remainder Trusts**

As of December 31, net assets restricted for the following purposes included outstanding pledges and remainder trusts, net of allowance for uncollectible pledges and time-value discounts:

	<u>2016</u>	<u>2015</u>
Time-restricted only	\$ 790	1,180
Restricted for acquisition or construction of long-lived assets	—	321
Restricted for research, training, and other programs	1,944	2,126
Permanently restricted	<u>2,718</u>	<u>2,449</u>
	<u>\$ 5,452</u>	<u>6,076</u>

**(d) Net Assets Released from Restrictions**

Net assets released from restrictions consisted of the following for the years ended December 31, 2016 and 2015:

	<u>Year ended December 31</u>	
	<u>2016</u>	<u>2015</u>
Operating activities:		
Research programs	\$ 1,045	821
Training programs	528	627
Other	137	66
Collection of unrestricted pledges	3	222
Transfer to permanently restricted	<u>2</u>	<u>2</u>
	<u>\$ 1,715</u>	<u>1,738</u>

**(11) Commitments and Contingencies**

**(a) Leases**

The Laboratory leases laboratory and office space and other equipment under leases accounted for as operating leases. Some of these leases have renewal options. Total rental expense was \$473 and \$96 for the years ended December 31, 2016 and 2015, respectively.

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Estimated future minimum lease payments under noncancelable facility and equipment operating leases as of December 31, 2016 are as follows:

	<u>Amounts due</u>
Year ending December 31:	
2017	\$ 78
2018	<u>5</u>
Total	<u>\$ 83</u>

**(12) Legal Claims**

The Laboratory is subject to certain legal proceedings and claims that arise in the ordinary course of conducting its activities. While it is not possible to predict accurately or determine the eventual outcome of such actions, management believes that the outcome of proceedings will not have a material adverse effect on the Laboratory's financial position.

**(13) Related Party Transactions**

Members of the Laboratory's Board of Trustees and senior management may, from time to time, be associated, either directly or indirectly, with companies doing business with the Laboratory. The Laboratory has a written conflict of interest policy that requires, among other things, that no member of the Board of Trustees may participate in any decision in which he or she has a material financial interest.

Each trustee and member of management is required to certify compliance with the conflict of interest policy on an annual basis as well as disclose any potential related party transactions to the Audit Committee.

**(14) Subsequent Events**

The Laboratory has evaluated subsequent events from the balance sheet date of December 31, 2016 through May 12, 2017, the date on which the financial statements were issued, and determined there are no other items to disclose.

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**DEFINITIONS OF CERTAIN TERMS**

*In addition to terms defined elsewhere in this Offering Memorandum, the following are definitions of certain terms used in this Offering Memorandum and the Indenture of Trust dated as of March 1, 2018 (the "Indenture"):*

"Authorized Denomination" means \$1,000 or any multiple integral thereof.

"Authorized Representative" means any one of the Institution's President and Chief Executive Officer, Executive Vice President and Chief Operating Officer, or Vice President and Chief Financial Officer, or any other Person designated as an Authorized Representative by a resolution of the bylaws of the Institution from time to time, to perform any specific act or execute any specific document.

"Beneficial Owner" means any Person which has or shares the power, directly or indirectly, to make investment decisions concerning ownership of any of the Bonds (including any Person holding Bonds through nominees, depositories or other intermediaries) established to the reasonable satisfaction of the Trustee or the Institution.

"Bond Fund" means the fund by that name established pursuant to the Indenture.

"Bonds" means The Jackson Laboratory Taxable Bonds, Series 2018, authorized by, and at any time Outstanding, pursuant to the Indenture.

"Book-Entry Form" or "Book-Entry System" means a form or system, as applicable, (i) under which physical bond certificates in fully registered form are registered only in the name of a Securities Depository or its nominee as Bondholder, with the physical bond certificates held by and "immobilized" in the custody of the Securities Depository; (ii) maintained by and the responsibility of others than the Institution or the Trustee; and (iii) is the record that identifies and records the transfer of the interests of the owners of book-entry interests in those Bonds.

"Business Day" means any day other than (A) a Saturday or Sunday or legal holiday or a day on which banking institutions in the city or cities in which the Designated Office of the Trustee is located are authorized by law or executive order to close or (B) a day on which the New York Stock Exchange is closed; provided that for purposes of optional redemption of the Bonds pursuant to the Indenture and the definition of "Treasury Rate," "Business Day" means any day other than a day on which banks in New York, New York, Chicago, Illinois, or the city in which the Trustee maintains the Designated Office are required or authorized to close.

"Calculation Agent" means an independent accounting firm, investment banking firm or financial advisor retained by the Institution at the expense of the Institution.

"Certificate," "Statement," "Request" and "Requisition" of the Institution mean, respectively, a written certificate, statement, request or requisition signed in the name of the Institution by the Authorized Representatives. Any such instrument and supporting opinions or representations, if any, may, but need not, be combined in a single instrument with any other instrument, opinion or representation, and the two or more so combined shall be read and construed as a single instrument. If and to the extent required by the Indenture, each such instrument shall include the statements provided for in the Indenture.

"Code" means the Internal Revenue Code of 1986, as amended, or any successor statute thereto and any regulations promulgated thereunder.

## APPENDIX C

“Default” means any event which is or after notice or lapse of time or both would become an Event of Default.

“Designated Office” means the Designated Office of the Trustee, which as of the date of this Indenture is located at One Federal Street, Boston, MA 02110, Attention: Global Corporate Trust, and such other offices as the Trustee may designate from time to time by written notice to the Institution and the Holders.

“DTC” means The Depository Trust Company, a New York corporation.

“Event of Default” means any of the events specified in the Indenture.

“Holder” or “Bondholder,” whenever used in the Indenture with respect to a Bond, means the Person in whose name such Bond is registered.

“Indenture” means the Indenture of Trust, as originally executed or as it may from time to time be supplemented, modified or amended by any Supplemental Indenture.

“Indenture Fund” means the fund by that name established pursuant to the Indenture.

“Institution” means The Jackson Laboratory, a nonprofit corporation existing under the laws of the State, or said nonprofit corporation’s successor or successors

“Interest Account” means the account by that name in the Bond Fund established pursuant to the Indenture.

“Interest Payment Date” means January 1 and July 1 of each year, commencing July 1, 2018.

“Investment Securities” means either of the following: (1) direct nonprepayable, noncallable obligations of the United States of America (including obligations issued or held in book-entry form on the books of the Department of the Treasury of the United States of America); (2) direct nonprepayable, noncallable obligations, the timely payment of the principal of and interest on which are fully guaranteed by the United States of America, including instruments evidencing a direct ownership interest in securities described in this clause such as CATS, TIGRs, and Stripped Treasury Coupons rated or assessed in the top two Rating Categories by S&P and Moody’s and held by a custodian for safekeeping on behalf of holders of such securities; and (3) any other investment determined by the Institution.

“Make-Whole Period” means the number of years, including any fractional portion thereof, calculated on the basis of a 360-day year consisting of twelve 30-day months, between the redemption date and the respective maturity date of each Bond to be redeemed.

“Make-Whole Redemption Price” means (a) the greater of (i) 100% of the principal amount of the Bonds to be redeemed and (ii) the sum of the present values of the remaining scheduled payments of principal and interest to the respective maturity date of the Bonds to be redeemed, not including any portion of those payments of interest accrued and unpaid as of the date on which the Bonds are to be redeemed, discounted to the date on which the Bonds are to be redeemed, on a semi-annual basis (assuming a 360-day year consisting of twelve 30-day months) at the Treasury Rate, plus (A) with respect to the Bonds maturing on July 1, 2018, to and including July 1, 2023, ten (10) basis points, (B) with respect to the Bonds maturing on July 1, 2024, to and including July 1, 2028, fifteen (15) basis points, and (C) with respect to the Bonds maturing on July 1, 2029, to and including July 1, 2048, twenty (20) basis points, plus (b) accrued and unpaid interest on the Bonds to be redeemed to the date fixed for redemption.

“Moody’s” means Moody’s Investors Service, its successors and their assigns, or, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, any other nationally recognized securities rating agency designated by the Institution upon notice to the Trustee.

“Offering Memorandum” means the final Offering Memorandum dated March 12, 2018, relating to the Bonds.

“Opinion of Counsel” means a written opinion of counsel (who may be counsel for the Institution) satisfactory to the Trustee.

“Outstanding” when used as of any particular time with reference to Bonds, means (subject to the provisions of the Indenture) all Bonds theretofore, or thereupon being, authenticated and delivered by the Trustee under the Indenture except: (1) Bonds theretofore cancelled by the Trustee or surrendered to the Trustee for cancellation; (2) Bonds with respect to which all liability of the Institution shall have been discharged in accordance with the Indenture, including Bonds (or portions of Bonds) referred to in the Indenture; and (3) Bonds for the transfer or exchange of or in lieu of or in substitution for which other Bonds shall have been authenticated and delivered by the Trustee pursuant to the Indenture.

“Payment Date” means an Interest Payment Date or a Principal Payment Date.

“Person” means an individual, corporation, firm, association, partnership, trust, limited liability company or other legal entity or group of entities, including a governmental entity or any agency or political subdivision thereof.

“Principal Account” means the account by that name in the Bond Fund established pursuant to the Indenture.

“Principal Payment Date” means each date on which principal shall be payable on the Bonds according to their terms, including principal due pursuant to Sinking Fund Requirements.

“Rating Agency” means Moody’s and S&P.

“Record Date” means the fifteenth day (whether or not a Business Day) of the month immediately preceding each Interest Payment Date.

“Redemption Fund” means the fund by that name established pursuant to the Indenture.

“Redemption Price” means, when used with respect to a Bond or portion thereof to be redeemed by (i) optional redemption, the Make-Whole Redemption Price payable upon redemption thereof, and (ii) mandatory sinking fund redemption, 100% of the principal amount thereof.

“Responsible Officer” means any officer of the Trustee assigned to administer its duties under the Indenture.

“S&P” means S&P Global Ratings, its successors and their assigns, or, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, any other nationally recognized securities rating agency designated by the Institution upon notice to the Trustee.

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“Securities Depository” means DTC and its successors and assigns, or any other securities depository selected or substituted as set forth in the Indenture, which agrees to follow the procedures required to be followed by such securities depository in connection with the Bonds.

“Series 2012 Bonds” means the Finance Authority of Maine Variable Rate Revenue Bond (The Jackson Laboratory Issue – Series 2012).

“Sinking Fund Requirement” means the aggregate principal amount of the Bonds required to be retired pursuant to the Indenture on or before the corresponding Sinking Fund Retirement Date.

“Sinking Fund Retirement Date” means the date on or before which the Bonds are required pursuant to the Indenture to be retired in an amount equal to the Sinking Fund Requirement for such date.

“Special Record Date” means the date established by the Trustee pursuant to the Indenture as the record date for the payment of defaulted interest on the Bonds.

“State” means the State of Maine.

“Supplemental Indenture” means any indenture hereafter duly authorized and entered into between the Institution and the Trustee, supplementing, modifying or amending the Indenture; but only if and to the extent that such Supplemental Indenture is specifically authorized under the Indenture.

“Treasury Rate” means, as of any redemption date, the time-weighted interpolated average yield for a term equal to the Make-Whole Period of the yields of the two United States Treasury nominal securities at “constant maturity” (as compiled and published in the Federal Reserve Statistical Release H.15 (519) that is publicly available not less than two (2) Business Days nor more than 30 calendar days prior to the redemption date (excluding inflation indexed securities) (or, if such Statistical Release is no longer published, any publicly available source of similar market data)) maturing immediately preceding and succeeding the Make-Whole Period. The Treasury Rate will be determined by a Calculation Agent.

“Trustee” means U.S. Bank National Association, a national banking association duly organized and existing under and by virtue of the laws of the United States of America, or its successor or successors, as Trustee under and as provided in the Indenture.

“Underwriter” means Barclays Capital Inc.

“Uniform Commercial Code” means the Uniform Commercial Code as in effect in the Commonwealth of Massachusetts from time to time.

## SUMMARY OF CERTAIN PROVISIONS OF THE INDENTURE

*The following is a brief summary, prepared by Locke Lord LLP, bond counsel to the Institution, of certain provisions of the Indenture of Trust dated as of March 1, 2018 (the "Indenture") pertaining to the Bonds. This summary does not purport to be complete, and reference is made to the Indenture for full and complete statements of such and all provisions.*

### **Establishment and Pledge of Indenture Fund**

Subject only to the provisions of the Indenture permitting or requiring the application thereof for the purposes and on the terms and conditions set forth therein, the Indenture Fund and all amounts held therein are pledged, assigned and transferred by the Institution to the Trustee for the benefit of the Bondholders to secure the full payment of the principal or Redemption Price of and interest on the Bonds in accordance with their terms and the provisions of the Indenture. The Institution grants to the Trustee a security interest in and acknowledges and agrees that the Indenture Fund and all amounts on deposit therein shall constitute collateral security to secure the full payment of the principal or Redemption Price of and interest on the Bonds in accordance with their terms and the provisions of the Indenture. For purposes of creating, perfecting and maintaining the security interest of the Trustee on behalf of the Bondholders in and to the Indenture Fund and all amounts on deposit therein, the parties to the Indenture agree as follows: (1) the Trustee shall maintain records reflecting the interest, as set forth in the Indenture, of the Bondholders in the Indenture Fund and/or the amounts on deposit therein; and (2) the Indenture Fund and the amounts on deposit therein and any proceeds thereof shall be held by the Trustee acting in its capacity as an agent of the Bondholders, and the holding of such items by the Trustee (including the transfer of any items among the funds and accounts in the Indenture Fund) is deemed possession of such items on behalf of the Bondholders.

Nothing in the Indenture or in the Bonds, expressed or implied, shall be construed to constitute a security interest under the Uniform Commercial Code or otherwise in the assets of the Institution other than in any interest of the Institution in the Indenture Fund and/or the amounts on deposit therein. No recourse for the payment of the principal or Redemption Price of or interest on any Bond, or for any claim based thereon or otherwise in respect thereof, and no recourse under or upon any obligation, covenant or agreement of the Institution in the Indenture or in any Supplemental Indenture or in any Bond, or because of the creation of any indebtedness represented thereby, shall be had against any employee, agent, or officer, as such, past, present or future, of the Institution or of any successor entity, either directly or through any successor entity, whether by virtue of any constitution, statute or rule of law, or by the enforcement of any assessment or penalty or otherwise, it being expressly understood that all such liability is expressly waived and released as a condition of, and as a consideration for, the execution of the Indenture and the issue of the Bonds. No officer or agent of the Institution, nor any Person executing the Bonds, shall in any event be subject to any personal liability or accountability by reason of the issuance of the Bonds. (Section 5.01)

### **Funds and Accounts**

The Indenture creates an Indenture Fund (and a Bond Fund and a Redemption Fund thereunder). The Indenture also creates an Interest Account and Principal Account under the Bond Fund. All of the funds and accounts are to be held by the Trustee.

Application of Proceeds of Bonds. The proceeds from the sale of the Bonds (net of underwriter's discount and original issue discount, if any) shall be applied by the Underwriter as follows: (a) the amount required, together with other available funds, to redeem the Series 2012 Bonds shall be wired to

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TD Bank, N.A. for the refunding of the Series 2012 Bonds; and (b) the remainder shall be wired to the Institution. (Section 3.02)

Indenture Fund. The Trustee establishes for the sole benefit of the Bondholders, a master fund referred to in the Indenture as the “Indenture Fund” containing the Bond Fund and the Redemption Fund and each of the accounts contained therein. The Indenture Fund and each of the funds and accounts in the Indenture Fund shall be identified on the books of the Trustee with reference hereto and shall be maintained by the Trustee and held in trust apart from all other moneys and securities held under the Indenture or otherwise, and the Trustee shall have the exclusive and sole right of withdrawal therefrom in accordance with the terms of the Indenture. All amounts deposited with the Trustee pursuant to the Indenture shall be held, disbursed, allocated and applied by the Trustee only as provided in the Indenture. (Section 5.01)

Bond Fund. Upon the receipt thereof, the Trustee shall deposit all payments received from the Institution (other than proceeds from the sale of the Bonds that are to be deposited as provided in the Indenture, amounts which are to be deposited in the Redemption Fund or income or profit from investments that are to be applied pursuant to the Indenture) in a special fund designated the “Bond Fund” which the Trustee shall establish and maintain and hold in trust and which shall be disbursed and applied only as authorized in the Indenture.

At the times specified below, the Trustee shall allocate within the Bond Fund in the following order of priority the following amounts to the following accounts or funds, each of which the Trustee shall establish and maintain and hold in trust and each of which shall be disbursed and applied only as hereinafter authorized: (1) on each Interest Payment Date, the Trustee shall deposit in the “Interest Account” the aggregate amount of interest becoming due and payable on such Interest Payment Date, until the balance in said account is equal to said aggregate amount of interest; and (2) on the Principal Payment Date, the Trustee shall deposit in the “Principal Account” the aggregate amount of principal, including Sinking Fund Requirements, becoming due and payable on the Principal Payment Date, until the balance in said account is equal to said aggregate amount of such principal. (Section 5.02)

Interest Account. All amounts in the Interest Account of the Bond Fund shall be used and withdrawn by the Trustee solely for the purpose of paying interest on the Bonds as it shall become due and payable (including accrued interest on any Bonds redeemed prior to maturity pursuant to the Indenture). (Section 5.03)

Principal Account. All amounts in the Principal Account of the Bond Fund shall be used and withdrawn by the Trustee solely to pay principal (including any Sinking Fund Account Requirement) on the Bonds as it shall become due and payable on the Principal Payment Dates. (Section 5.04)

Redemption Fund. Upon the receipt thereof, the Trustee shall deposit the following amounts in a special fund designated the “Redemption Fund” which the Trustee shall establish and maintain and hold in trust: (1) all moneys deposited by the Institution with the Trustee directed to be deposited in the Redemption Fund for optional redemption of the Bonds; and (2) all interest, profits and other income received from the investment of moneys in the Redemption Fund.

All amounts deposited in the Redemption Fund shall be used and withdrawn by the Trustee solely for the purpose of redeeming Bonds, in the manner and upon the terms and conditions specified in the Indenture, at the next succeeding date of redemption for which notice has been given; provided that, at any time prior to the selection of Bonds for such redemption, the Trustee shall, upon direction and at the expense of the Institution, apply such amounts to the purchase of Bonds at public or private sale, as and when and at such prices (including brokerage and other charges, but excluding accrued interest, which is

payable from the Interest Account) as the Institution may direct, except that the purchase price (exclusive of accrued interest) may not exceed the Redemption Price (exclusive of accrued interest) then applicable to such Bonds (or, if such Bonds are not then subject to redemption, the par value of such Bonds); and provided further that in lieu of redemption at such next succeeding date of redemption, or in combination therewith, amounts in such account may be transferred to the Principal Account as set forth in a Request of the Institution. (Section 5.05)

*Payments by the Institution; Allocation of Funds.* On each Payment Date, until the principal of and interest on the Bonds shall have been fully paid or provision for such payment shall have been made as provided in the Indenture, the Institution shall pay to the Trustee a sum equal to the amount payable on such Payment Date as principal of (including Sinking Fund Requirements) and interest on, the Bonds. Each payment made pursuant to this paragraph shall at all times be sufficient to pay the total amount of interest and principal (whether at maturity, on a Sinking Fund Retirement Date or upon acceleration) becoming due and payable on the Bonds on such Payment Date. If on any Payment Date the amounts held by the Trustee in the accounts within the Bond Fund are insufficient to make any required payments of principal of (whether at maturity, on a Sinking Fund Retirement Date or upon acceleration) and interest on the Bonds as such payments become due, the Institution shall forthwith pay such deficiency to the Trustee.

The obligations of the Institution to make the payments required by the immediately preceding paragraph and to perform and observe the other agreements on its part contained in the Indenture shall be a general obligation of the Institution, absolute and unconditional, irrespective of any defense or any rights of set-off, recoupment or counterclaim it might otherwise have against the Trustee, and during the term of the Indenture, the Institution shall pay all payments required to be made by the immediately preceding paragraph as prescribed therein and all other payments required under the Indenture, free of any deductions and without abatement, diminution or set-off. Until such time as the principal of and interest on, the Bonds shall have been fully paid, or provision for the payment thereof shall have been made as required by the Indenture, the Institution (i) will not suspend or discontinue any payments provided for in the immediately preceding paragraph; (ii) will perform and observe all of its other covenants contained in the Indenture; and (iii) except as otherwise provided in the Indenture, will not terminate the Indenture for any cause, including, without limitation, the occurrence of any act or circumstances that may constitute failure of consideration, destruction of or damage to all or a portion of the projects financed with the proceeds of the Bonds, commercial frustration of purpose, any change in the tax or other laws of the United States of America or of the State or any political subdivision of either of these, or any failure of the Trustee to perform and observe any covenant, whether express or implied, or any duty, liability or obligation arising out of or connected with the Indenture, except to the extent permitted by the Indenture. (Section 5.06)

### **Investment of Moneys in Funds and Accounts Held By Trustee**

Moneys held in the Indenture Fund shall be invested by the Trustee, upon written direction of the Institution, solely in Investment Securities. Investment Securities shall be purchased at such prices as the Institution may direct. All Investment Securities shall be acquired subject to the limitations as to maturities in the Indenture and such additional limitations or requirements consistent with the Indenture as may be established by the written request of the Institution. No request of the Institution shall impose any duty on the Trustee inconsistent with its responsibilities under the Indenture. Absent receipt by the Trustee of written investment instructions from the Institution, moneys in the Indenture Fund shall remain uninvested.

The Trustee may commingle any of the funds or accounts established pursuant to the Indenture into a separate fund or funds for investment purposes only, provided that all funds or accounts held by the

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Trustee under the Indenture shall be accounted for separately as required by the Indenture. The Trustee or its affiliates may act as sponsor, depository, advisor, principal or agent in the making or disposing of any investment. The Trustee is hereby authorized, in making or disposing of any investment permitted by the Indenture, to deal with itself (in its individual capacity) or with any one or more of its affiliates, whether it or such affiliate is acting as an agent of the Trustee or for any third person or dealing as principal for its own account. The Trustee may sell at the best price reasonably obtainable by it, or present for redemption, any Investment Securities so purchased whenever it shall be necessary to provide moneys to meet any required payment, transfer, withdrawal or disbursement from the fund or account to which such Investment Security is credited, and, subject to the provisions of the Indenture, the Trustee shall not be liable or responsible for any loss resulting from any investment made in accordance with provisions of the Indenture. The Trustee shall not be responsible for any tax, fee or other charge in connection with any investment, reinvestment or the liquidation thereof. (Section 5.07)

### Validity of Bonds

The recital contained in the Bonds that the same are issued pursuant to the Indenture shall be conclusive evidence of their validity and of compliance with the provisions of the Indenture in their issuance. (Section 3.03)

### Particular Covenants

*Punctual Payment.* The Trustee shall solely from funds provided by the Institution punctually pay the principal or Redemption Price and interest when due in respect of all the Bonds. When and as paid in full, all Bonds shall be delivered to the Trustee and shall be cancelled by the Trustee and delivered to, or upon the order of, the Institution. (Section 6.01)

*Compliance with Indenture.* The Institution covenants not to issue, or permit to be issued, any Bonds under the Indenture in any manner other than in accordance with the provisions of the Indenture, and shall not suffer or permit any Default (within its power to prevent) to occur under the Indenture, but shall faithfully observe and perform all the covenants, conditions and requirements of the Indenture. (Section 6.02)

*Against Encumbrances.* The Institution shall not create or suffer to be created any pledge, lien, charge or other encumbrance upon all or any part of the Indenture Fund or any of the amounts held therein pledged or assigned under the Indenture while any of the Bonds are Outstanding, except the pledge and assignment created by the Indenture and any statutory liens or other liens arising by operation of law. The Institution will assist the Trustee in contesting any pledge, lien, charge or other encumbrance that does not comply with the provisions of the Indenture. (Section 6.03)

*Power to Issue Bonds and Make Pledge and Assignment.* The Institution is duly authorized to issue the Bonds and to enter into the Indenture and to pledge and assign the funds and accounts purported to be pledged and assigned under the Indenture. The Bonds are and will be legal, valid and binding obligations of the Institution in accordance with their terms, and the Institution and the Trustee shall at all times, to the extent permitted by law, defend, preserve and protect said pledge and assignment of funds and accounts and all the rights of the Bondholders under the Indenture against all claims and demands of all Persons, subject to the limitations set forth in the Indenture relating to the Trustee. (Section 6.04)

*Accounting Records and Financial Statements.* With respect to each fund or account established and maintained by the Trustee pursuant to the Indenture, the Trustee shall at all times keep, or cause to be kept, proper books of record and account prepared in accordance with corporate trust accounting standards, in which complete and accurate entries shall be made of all transactions relating to the receipt,



investment, disbursement, allocation and application of payments received from the Institution and the proceeds of the Bonds. Such books of record and account shall be available for inspection by the Institution and any Bondholder, or his or her agent or representative duly authorized in writing, upon reasonable notice, at reasonable hours and under reasonable circumstances.

The Trustee shall, upon request and at the expense of the Bondholder making such request, make available to each Bondholder who shall have certified such Bondholder's position to the Trustee and provided indemnity to the Trustee satisfactory to it, a complete financial statement (which need not be audited and may be its regular account statements) covering receipts, disbursements, allocation and application of any moneys (including proceeds of Bonds) in any of the funds and accounts established pursuant to the Indenture for such month; provided that, notwithstanding the foregoing, the Trustee shall not be obligated to deliver an accounting for any fund or account that has a balance of \$0.00 and has not had any activity since the last reporting. The Trustee may conclusively rely and shall be fully protected in conclusively relying upon information furnished by a Bondholder for the purposes described in this paragraph. The Trustee shall also, upon request, furnish a copy of a statement to the Institution for the period of time requested by the Institution. (Section 6.05)

Representations and Warranties of the Institution including Continuing Disclosure. Under the Indenture, the Institution has made certain representations and warranties with respect to: corporate organization, authorization and powers, tax matters, securities law status, annual reports and other current information, maintenance of corporate existence and continuing disclosure. (Section 6.06)

#### **Events of Default and Remedies of Bondholders**

Events of Default. The following events shall be "Events of Default": (a) default in the due and punctual payment of the principal or Redemption Price of any Bond when and as the same shall become due and payable, whether at maturity as therein expressed, by proceedings for redemption, by acceleration or otherwise, except with respect to failure to pay Make-Whole Redemption Price as a result of failure to meet any condition specified in a conditional notice of redemption; (b) default in the due and punctual payment of any interest on any Bond when and as such interest shall become due and payable; (c) default by the Institution in the performance or observance of any of the other covenants, agreements or conditions on its part contained in the Indenture or in the Bonds, if such default shall have continued for a period of 60 days after written notice thereof, specifying such default and requiring the same to be remedied and stating that such notice is a "Notice of Default" under the Indenture, shall have been given to the Institution by the Trustee, or to the Institution and the Trustee by the Holders of not less than a majority in aggregate principal amount of the Bonds at the time Outstanding, unless if such default is not capable of being cured within sixty (60) days, the Institution has commenced action to cure such default within said sixty (60) days and diligently pursues the cure; (d) the commencement by the Institution of a voluntary case under the federal bankruptcy laws, or if the Institution shall become insolvent or unable to pay its debts as they become due, or shall make an assignment for the benefit of creditors, or shall apply for, consent to or acquiesce in the appointment of, or taking possession by, a trustee, receiver, custodian or similar official or agent for itself or any substantial part of its property; (e) the appointment of a trustee, receiver, custodian or similar official or agent for the Institution or for any substantial part of its property and such trustee or receiver shall not be discharged within sixty (60) days; or (f) an order or decree for relief in an involuntary case under the federal bankruptcy laws shall be entered against the Institution, or a petition seeking reorganization, readjustment, arrangement, composition, or other similar relief as to it under the federal bankruptcy laws or any similar law for the relief of debtors shall be brought against it and shall be consented to by it or shall remain undismissed for sixty (60) days. (Section 7.01)

Acceleration of Maturity. If an Event of Default shall occur, then, and in each and every such case during the continuance of such Event of Default, the Trustee may, and upon the request of the

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Holders of not less than a majority in aggregate principal amount of the Bonds at the time Outstanding, the Trustee shall, upon notice in writing to the Institution, declare the principal of all the Bonds then Outstanding, and the interest accrued thereon, to be due and payable immediately, and upon any such declaration by the Trustee the same shall become and shall be immediately due and payable, anything in the Indenture or in the Bonds contained to the contrary notwithstanding.

Any such declaration, however, is subject to the condition that if, at any time after such declaration and before any judgment or decree for the payment of the moneys due shall have been obtained or entered, there shall be deposited with the Trustee a sum sufficient to pay all the principal or Redemption Price of and interest on the Bonds payment of which is overdue, with interest on such overdue principal at the rate borne by the Bonds, and the reasonable charges and expenses of the Trustee (including counsel fees), and any and all other Defaults known to the Trustee (other than in the payment of principal of and interest on the Bonds due and payable solely by reason of such declaration) shall have been made good or cured to the satisfaction of the Trustee or provision deemed by the Trustee to be adequate shall have been made therefor, then, and in every such case, the Trustee shall, on behalf of the Holders of all of the Bonds by written notice to the Institution, rescind and annul such declaration and its consequences and waive such Default; but no such rescission and annulment shall extend to or shall affect any subsequent Default, or shall impair or exhaust any right or power consequent thereon. (Section 7.02)

Rights as a Secured Party. The Trustee, as appropriate, may exercise all of the rights and remedies of a secured party under the Uniform Commercial Code with respect to securities in the Indenture Fund, including without limitation the Bond Fund and the Redemption Fund, including the right to sell or redeem such securities and the right to retain the securities in satisfaction of the obligation of the Institution hereunder. Notice sent by registered or certified mail, postage prepaid, or delivered during business hours, to the Institution at least seven (7) days before an event under Uniform Commercial Code Sections 9-610 and 9-611, or any successor provision of law shall constitute reasonable notification of such event. (Section 7.03)

Application of Moneys Collected by the Trustee. If an Event of Default shall occur and be continuing, all moneys then held or thereafter received by the Trustee under any of the provisions of the Indenture (subject to provisions of the Indenture requiring moneys to be held for payment of particular Bonds) shall be applied by the Trustee as follows and in the following order:

(A) To the payment of reasonable fees and expenses of the Trustee (including reasonable fees and disbursements of its counsel) incurred in and about the performance of its powers and duties under the Indenture;

(B) To the payment of any expenses necessary in the opinion of the Trustee to protect the interests of the Holders of the Bonds; and

(C) To the payment of the principal or Redemption Price of and interest then due on the Bonds (upon presentation of the Bonds to be paid, and stamping thereon of the payment if only partially paid, or surrender thereof if fully paid) subject to the provisions of the Indenture, as follows:

(1) Unless the principal of all of the Bonds shall have become or have been declared due and payable,

*First:* To the payment to the Persons entitled thereto of all installments of interest then due in the order of the maturity of such installments, and, if the amount available shall not be sufficient to pay in full any installment or installments due on the same date, then to the payment

thereof ratably, according to the amounts due thereon, to the Persons entitled thereto, without any discrimination or preference; and

*Second:* To the payment to the Persons entitled thereto of the unpaid principal or Redemption Price of any Bonds that shall have become due, whether at maturity or by call for redemption, in the order of their due dates, with interest on the overdue principal at the rate borne by the Bonds, and, if the amount available shall not be sufficient to pay in full all the Bonds due on any date, together with such interest, then to the payment thereof ratably, according to the amounts of principal or Redemption Price due on such date to the Persons entitled thereto, without any discrimination or preference.

(2) If the principal of all of the Bonds shall have become or have been declared due and payable, to the payment of the principal and interest then due and unpaid upon the Bonds, with interest on the overdue principal at the rate borne by the Bonds, and, if the amount available shall not be sufficient to pay in full the whole amount so due and unpaid, then to the payment thereof ratably, without preference or priority of principal over interest, or of interest over principal, or of any installment of interest over any other installment of interest, or of any Bond over any other Bond, according to the amounts due respectively for principal and interest, to the Persons entitled thereto without any discrimination or preference. (Section 7.04)

Trustee to Represent Bondholders. The Trustee is irrevocably appointed as trustee and true and lawful attorney-in-fact of the Holders of the Bonds for the purpose of exercising and prosecuting on their behalf such rights and remedies as may be available to such Holders under the provisions of the Bonds, the Indenture and applicable provisions of any law. Upon the occurrence and continuance of an Event of Default or other occasion giving rise to a right in the Trustee to represent the Bondholders, the Trustee in its discretion may, and upon the written request of the Holders of not less than a majority in aggregate principal amount of the Bonds then Outstanding, and upon being indemnified to its reasonable satisfaction therefor, shall, proceed to protect or enforce its rights or the rights of such Holders by such appropriate action, suit, mandamus or other proceedings as it shall deem most effectual to protect and enforce any such right. If more than one such request is received by the Trustee from the Holders, the Trustee shall follow the written request executed by the Holders of the greatest percentage (which percentage shall be, in any case, not less than a majority in aggregate principal amount) of the Bonds then Outstanding. All rights of action under the Indenture or the Bonds or otherwise may be prosecuted and enforced by the Trustee without the possession of any of the Bonds or the production thereof in any proceeding relating thereto, and any such suit, action or proceeding instituted by the Trustee shall be brought in the name of the Trustee for the benefit and protection of all the Holders of such Bonds, subject to the provisions of the Indenture. (Section 7.05)

Bondholders' Direction of Proceedings. The Holders of a majority in aggregate principal amount of the Bonds then Outstanding shall have the right, by an instrument or concurrent instruments in writing executed and delivered to the Trustee, and upon indemnifying the Trustee to its reasonable satisfaction therefor, to direct the time, method and place of conducting all remedial proceedings taken by the Trustee under the Indenture, provided that such direction shall not be otherwise than in accordance with law and the provisions of the Indenture, and that the Trustee shall have the right to decline to follow any such direction which in the opinion of the Trustee would be unjustly prejudicial to Bondholders not parties to such direction. (Section 7.06)

Limitation on Bondholders' Right to Sue. No Holder of any Bond shall have the right to institute any suit, action or proceeding at law or in equity, for the protection or enforcement of any right or remedy under the Indenture or any applicable law with respect to such Bond, unless (1) such Holder shall have given to the Trustee written notice of the occurrence of an Event of Default; (2) the Holders of not less

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than a majority in aggregate principal amount of the Bonds then Outstanding shall have made written request upon the Trustee to exercise the powers granted in the Indenture or to institute such suit, action or proceeding in its own name; (3) such Holder or said Holders shall have tendered to the Trustee indemnity reasonably satisfactory to it against the costs, expenses and liabilities to be incurred in compliance with such request; and (4) the Trustee shall have refused or omitted to comply with such request for a period of 60 days after such written request shall have been received by, and said tender of indemnity shall have been made to, the Trustee.

Such notification, request, tender of indemnity and refusal or omission are declared by the Indenture, in every case, to be conditions precedent to the exercise by any Holder of Bonds of any remedy under the Indenture or under law; it being understood and intended that no one or more Holders of Bonds shall have any right in any manner whatever by his or their action to affect, disturb or prejudice the security of the Indenture or the rights of any other Holders of Bonds, or to enforce any right under the Indenture or applicable law with respect to the Bonds, except in the manner provided in the Indenture, and that all proceedings at law or in equity to enforce any such right shall be instituted, had and maintained in the manner provided in the Indenture and for the benefit and protection of all Holders of the Outstanding Bonds, subject to the provisions of the Indenture. (Section 7.07)

*Absolute Obligation of Institution.* Notwithstanding any other provision of the Indenture, or in the Bonds, nothing shall affect or impair the obligation of the Institution, which is absolute and unconditional, to pay the principal or Redemption Price of and interest on the Bonds to the respective Holders of the Bonds at their date of maturity or Sinking Fund Retirement Date, or upon call for redemption, as provided in the Indenture, or, subject to the provisions of the Indenture regarding limitation on Bondholders' right to sue, affect or impair the right of such Holders to enforce such payment by virtue of the contract embodied in the Bonds. (Section 7.08)

*Termination of Proceedings.* In case any proceedings taken by the Trustee or any one or more Bondholders on account of any Event of Default shall have been discontinued or abandoned for any reason or shall have been determined adversely to the Trustee or the Bondholders, then in every such case the Institution, the Trustee and the Bondholders, subject to any determination in such proceedings, shall be restored to their former positions and rights under the Indenture, severally and respectively, and all rights, remedies, powers and duties of the Institution, the Trustee and the Bondholders shall continue as though no such proceedings had been taken. (Section 7.09)

*Remedies Not Exclusive.* No remedy conferred in the Indenture upon or reserved to the Trustee or to the Holders of the Bonds is intended to be exclusive of any other remedy or remedies, and each and every such remedy, to the extent permitted by law, shall be cumulative and in addition to any other remedy given under the Indenture or now or hereafter existing at law or in equity or otherwise. (Section 7.10)

*Delay or Omission Not Waiver.* No delay or omission of the Trustee or of any Holder of the Bonds to exercise any right or power arising upon the occurrence of any Default shall impair any such right or power or shall be construed to be a waiver of any such Default or an acquiescence therein; and every power and remedy given by the Indenture to the Trustee or to the Holders of the Bonds may be exercised from time to time and as often as may be deemed expedient. (Section 7.11)

*Waiver of Past Defaults.* The Trustee may, and upon request of the Holders of not less than a majority in aggregate principal amount of the Outstanding Bonds shall, on behalf of the Holders of all the Bonds waive any past Default under the Indenture and its consequences, except a Default: (A) in the payment of the principal or Redemption Price of or interest on any Bond, or (B) in respect of a covenant or other provision of the Indenture which, pursuant to the Indenture, cannot be modified or amended

without the consent of the Holder of each Outstanding Bond affected. Upon any such waiver, such Default shall cease to exist, and any Event of Default arising therefrom shall be deemed to have been cured, for every purpose of the Indenture, but no such waiver shall extend to any subsequent or other Default or impair any right consequent thereon. (Section 7.12)

Undertaking for Costs. Subject to the provisions of the Indenture regarding the Trustee's rights to compensation and indemnification, the parties to the Indenture agree, and each Holder of any Bond by such Person's acceptance thereof shall be deemed to have agreed, that any court may in its discretion require, in any suit for the enforcement of any right or remedy under the Indenture, or in any suit against the Trustee for any action taken or omitted by it as Trustee, the filing by any party litigant in such suit of an undertaking to pay the costs of such suit, and that such court may in its discretion assess reasonable costs, including reasonable attorneys' fees, against any party litigant in such suit, having due regard to the merits and good faith of the claims or defenses made by such party litigant; but the provisions of this paragraph shall not apply to any suit instituted by the Trustee or to any suit instituted by any Bondholder or group of Bondholders holding in the aggregate more than a majority in aggregate principal amount of the Outstanding Bonds. (Section 7.13)

Notice of Default. Upon a Responsible Officer's actual knowledge of the existence of any Default under the Indenture, the Trustee shall notify the Institution in writing as soon as practicable but in any event within 5 Business Days.

Upon a Responsible Officer's actual knowledge of the existence of any Default under the Indenture, the Trustee shall transmit by mail to all Bondholders, as their names and addresses appear in the bond register, notice of such Default under the Indenture within 90 days, unless such Default shall have been cured or waived; provided, however, that, except in the case of a Default in the payment of the principal or Redemption Price of or interest on any Bond, the Trustee shall be protected in withholding such notice if and so long as Responsible Officers of the Trustee in good faith determine that the withholding of such notice is in the interest of the Bondholders; and provided, further, that in the case of any Default of the character specified in (c) under "Events of Default" above, no such notice to Bondholders shall be given until at least 60 days after the occurrence thereof. (Section 7.14)

Trustee May File Proofs of Claim. In case of the pendency of any receivership, insolvency, liquidation, bankruptcy, reorganization, arrangement, adjustment, composition or other judicial proceeding relative to the Institution or any other obligor upon the Bonds or the property of the Institution or of such other obligor or their creditors, the Trustee (irrespective of whether the principal of the Bonds shall then be due and payable as therein expressed or by declaration or otherwise and irrespective of whether the Trustee shall have made any demand on the Institution for the payment of overdue principal or interest) shall be entitled and empowered, by intervention in such proceeding or otherwise: (1) to file and prove a claim for the whole amount of principal (or Redemption Price) and interest owing and unpaid in respect of the Bonds and to file such other papers or documents as may be necessary or advisable in order to have the claims of the Trustee (including any claim for the reasonable compensation, expenses, disbursements and advances of the Trustee, its agents and counsel including expenses and fees of outside counsel and allocated costs of internal legal counsel) and of the Bondholders allowed in such judicial proceeding; and (2) to collect and receive any moneys or other property payable or deliverable on any such claims and to distribute the same; and any receiver, assignee, trustee, liquidator or sequestrator (or other similar official) in any such judicial proceeding is, by the Indenture, authorized by each Bondholder to make such payments to the Trustee and, in the event that the Trustee shall consent to the making of such payments directly to the Bondholders, to pay to the Trustee any amount due to it for the reasonable compensation, expenses, disbursements and advances of the Trustee, its agents and counsel including expenses and fees of outside counsel and allocated costs of internal legal counsel, and any other amounts due the Trustee under the Indenture.

## APPENDIX D

Nothing contained in the Indenture shall be deemed to authorize the Trustee to authorize or consent to or accept or adopt on behalf of any Bondholder any plan of reorganization, arrangement, adjustment or composition affecting the Bonds or the rights of any Holder thereof, or to authorize the Trustee to vote in respect of the claim of any Bondholder in any such proceeding. (Section 7.15)

### The Trustee

*Duties, Immunities and Liabilities of Trustee.* The Trustee shall, prior to an Event of Default, and after the curing or waiver of all Events of Default which may have occurred, perform such duties and only such duties as are specifically set forth in the Indenture, and no implied covenants or obligations shall be read into the Indenture against the Trustee. The Trustee shall, during the existence of any Event of Default of which it has actual knowledge (which has not been cured or waived), exercise such of the rights and powers vested in it by the Indenture, and use the same degree of care and skill in its exercise, as a prudent person would exercise or use under the circumstances in the conduct of such person's own affairs; provided, however, the Trustee shall be under no obligation to take any action to protect, preserve or enforce any rights or interests, or to take any action under any of the agreements or documents related to the Indenture, whether on its own motion or the request of any other person unless from time to time the Trustee is provided with indemnity reasonably satisfactory to the Trustee.

The Institution may remove the Trustee at any time unless an Event of Default shall have occurred and then be continuing, and shall remove the Trustee if at any time requested to do so by an instrument or concurrent instruments in writing signed by the Holders of not less than a majority in aggregate principal amount of the Bonds then Outstanding (or their attorneys duly authorized in writing), or if at any time the Trustee shall cease to be eligible in accordance with the Indenture, or shall become incapable of acting, or shall be adjudged a bankrupt or insolvent, or a receiver of the Trustee or its property shall be appointed, or any public officer shall take control or charge of the Trustee or of its property or affairs for the purpose of rehabilitation, conservation or liquidation, in each case by giving written notice of such removal to the Trustee, and thereupon shall appoint a successor Trustee by an instrument in writing.

The Trustee may at any time resign by giving written notice of such resignation to the Institution and by giving the Bondholders notice of such resignation by mail at the addresses shown on the registration books maintained by the Trustee. Upon receiving such notice of resignation, the Institution shall promptly appoint a successor Trustee by an instrument in writing. The Trustee shall not be relieved of its duties until such successor Trustee has accepted appointment.

Any removal or resignation of the Trustee and appointment of a successor Trustee shall become effective upon acceptance of appointment by the successor Trustee. If no successor Trustee shall have been appointed and have accepted appointment within 30 days of giving notice of removal or notice of resignation as aforesaid, the resigning Trustee or any Bondholder (on behalf of itself and all other Bondholders) may petition any court of competent jurisdiction for the appointment of a successor Trustee, and such court may thereupon, after such notice (if any) as it may deem proper, appoint such successor Trustee. Any successor Trustee appointed under the Indenture shall signify its acceptance of such appointment by executing and delivering to the Institution and to its predecessor Trustee a written acceptance thereof, and thereupon such successor Trustee, without any further act, deed or conveyance, shall become vested with all the moneys, estates, properties, rights, powers, trusts, duties and obligations of such predecessor Trustee, with like effect as if originally named Trustee in the Indenture; but, nevertheless at the request of the successor Trustee, such predecessor Trustee shall execute and deliver any and all instruments of conveyance or further assurance and do such other things as may reasonably be required for more fully and certainly vesting in and confirming to such successor Trustee all the right, title and interest of such predecessor Trustee in and to any property held by it under the Indenture and shall

pay over, transfer, assign and deliver to the successor Trustee any money or other property subject to the trusts and conditions set forth in the Indenture. Upon request of the successor Trustee, the Institution shall execute and deliver any and all instruments as may be reasonably required for more fully and certainly vesting in and confirming to such successor Trustee all such moneys, estates, properties, rights, powers, trusts, duties and obligations. Upon acceptance of appointment by a successor Trustee as provided in this paragraph, the Institution shall mail or cause to be mailed (at the expense of the Institution) a notice of the succession of such Trustee to the trusts under the Indenture to the Bondholders at the addresses shown on the registration books maintained by the Trustee. If the Institution fails to mail such notice within 15 days after acceptance of appointment by the successor Trustee, the successor Trustee shall cause such notice to be mailed at the expense of the Institution.

Any successor Trustee shall be a trust company or bank having trust powers in the Commonwealth of Massachusetts, having a combined capital and surplus of (or if such trust company or bank is a member of a bank holding system, its bank holding company shall have a combined capital and surplus of) at least fifty million dollars (\$50,000,000). In case at any time the Trustee shall cease to be eligible in accordance with the provisions of this paragraph, the Trustee shall resign immediately in the manner and with the effect specified in the Indenture. (Section 8.01)

*Preservation and Inspection of Documents.* All documents received by the Trustee under the provisions of the Indenture shall be retained in its possession and shall be subject upon prior written notice to the inspection of the Institution and any Bondholder, and their agents and representatives duly authorized in writing, at reasonable hours and under reasonable conditions. (Section 8.05)

*Trustee Lien to Secure Institution's Compensation and Indemnification Obligations.* To secure the Institution's payment obligations for compensation and indemnification of the Trustee under the Indenture, the Trustee shall have a lien prior to the Bonds on all money or property held or collected by the Trustee under the Indenture other than money or property held in trust to pay principal of and interest on particular Bonds. (Section 8.06)

### **Modification or Amendment of the Indenture**

*Amendments Permitted.* The Indenture and the rights and obligations of the Institution and of the Holders of the Bonds and of the Trustee may be modified or amended from time to time and at any time by an indenture or indentures supplemental to the Indenture, which the Institution and the Trustee may enter into when the written consent of the Holders of a majority in aggregate principal amount of the Bonds then Outstanding shall have been filed with the Trustee. No such modification or amendment shall (1) extend the fixed maturity or Sinking Fund Account Retirement Date of any Bond, or reduce the amount of principal thereof, or reduce the rate of interest thereon, or extend the time of payment of interest thereon, or reduce any premium payable upon the redemption thereof, without the consent of the Holder of each Bond so affected, or (2) reduce the aforesaid percentage of Bonds the consent of the Holders of that is required to effect any such modification or amendment, or permit the creation of any lien on the Indenture Fund or the amounts pledged under the Indenture prior to or on a parity with the lien created by the Indenture, or deprive the Holders of the Bonds of the lien created by the Indenture on the Indenture Fund and such amounts (except as expressly provided in the Indenture), without the consent of the Holders of all Bonds then Outstanding. It shall not be necessary for the consent of the Bondholders to approve the particular form of any Supplemental Indenture, but it shall be sufficient if such consent shall approve the substance thereof. Promptly after the execution by the Institution and the Trustee of any Supplemental Indenture pursuant to this paragraph, the Trustee shall mail a notice, setting forth in general terms the substance of such Supplemental Indenture, to the Bondholders at the addresses shown on the registration books maintained by the Trustee. Any failure to give such notice, or any defect therein, shall not, however, in any way impair or affect the validity of any such Supplemental Indenture.

## APPENDIX D

The Indenture and the rights and obligations of the Institution, of the Trustee and of the Holders of the Bonds may also be modified or amended from time to time and at any time by an indenture or indentures supplemental to the Indenture, which the Institution and the Trustee may enter into without the necessity of obtaining the consent of any Bondholders, but only to the extent permitted by law and only for any one or more of the following purposes: (1) to add to the covenants and agreements of the Institution contained in the Indenture other covenants and agreements thereafter to be observed, to pledge or assign additional security for the Bonds (or any portion thereof), or to surrender any right or power reserved in the Indenture to or conferred upon the Institution, provided that such covenant, agreement, pledge, assignment or surrender shall not materially adversely affect the interests of the Holders of the Bonds; (2) to make such provisions for the purpose of curing any ambiguity, inconsistency or omission, or of curing or correcting any defective provision, contained in the Indenture, or in regard to matters or questions arising under the Indenture, as the Institution or the Trustee may deem necessary or desirable and not inconsistent with the Indenture, and which shall not materially adversely affect the interests of the Holders of the Bonds; (3) to modify, amend or supplement the Indenture or any Supplemental Indenture in such manner as to permit the qualification hereof under the Trust Indenture Act of 1939, as amended, or any similar federal statute hereafter in effect, and to add such other terms, conditions and provisions as may be permitted by said act or similar federal statute, and which shall not materially adversely affect the interests of the Holders of the Bonds (provided, however, that such modifications, amendments, supplements and additions shall be permitted under this paragraph only if qualification under said act or similar federal statute is required by applicable law now or hereafter in effect); or (4) to provide for the procedures required to permit any Bondholder, at its option, to utilize an uncertificated system of registration of its Bond or to facilitate the registration of the Bonds in the name of a nominee of the Securities Depository in accordance with the provisions of the Indenture.

The Trustee may in its discretion, but shall not be obligated to, enter into any such Supplemental Indenture authorized by either of the two preceding paragraphs which materially adversely affects the Trustee's own rights, duties or immunities under the Indenture or otherwise. In signing a Supplemental Indenture, the Trustee shall receive and be fully protected in relying upon an Opinion of Counsel stating that such amendment is authorized or permitted by the Indenture. (Section 9.01)

*Effect of Supplemental Indenture.* Upon the execution of any Supplemental Indenture pursuant to the Indenture, the Indenture shall be deemed to be modified and amended in accordance therewith, and the respective rights, duties and obligations under the Indenture of the Institution, the Trustee and all Holders of Bonds Outstanding shall thereafter be determined, exercised and enforced under the Indenture subject in all respects to such modification and amendment, and all the terms and conditions of any such Supplemental Indenture shall be deemed to be part of the terms and conditions of the Indenture for any and all purposes. (Section 9.02)

*Amendment of Particular Bonds.* The provisions of the Indenture regarding modification or amendment of the Indenture shall not prevent any Bondholder from accepting any amendment as to the particular Bonds held by such Bondholder, provided that due notation thereof is made on such Bonds. (Section 9.04)

### **Defeasance**

*Discharge of Indenture.* The Bonds may be paid or discharged by the Institution or the Trustee on behalf of the Institution in any of the following ways: (A) by paying or causing to be paid the principal or Redemption Price of and interest on all Bonds Outstanding, as and when the same become due and payable; (B) by depositing with the Trustee, in trust, at or before maturity, moneys or securities in the necessary amount (as provided in the Indenture) to pay when due or redeem all Bonds then Outstanding; or (C) by delivering to the Trustee, for cancellation by it, all Bonds then Outstanding.



If the Institution shall also pay or cause to be paid all other sums payable under the Indenture by the Institution (including the outstanding fees and expenses of the Trustee and its counsel), then and in that case at the election of the Institution (evidenced by a Certificate of the Institution filed with the Trustee signifying the intention of the Institution to discharge all such indebtedness and the Indenture and upon receipt by the Trustee of an Opinion of Counsel to the effect that the obligations under the Indenture and the Bonds have been discharged), and notwithstanding that any Bonds shall not have been surrendered for payment, the Indenture and the pledge of the Indenture Fund and all amounts held therein made under the Indenture and all covenants, agreements and other obligations of the Institution under the Indenture (except as otherwise provided in the Indenture) shall cease, terminate, become void and be completely discharged and satisfied and the Bonds shall be deemed paid. Notwithstanding the foregoing, prior to any discharge becoming effective as described under this subheading, there shall have been delivered to the Trustee: (a) an opinion of counsel reasonably satisfactory to the Trustee to the effect that all conditions precedent to defeasance set forth in the Indenture have been complied with; (b) except in the case of a defeasance effected solely by the deposit of money without any investment, a verification report of an independent certified public accountant to the effect that there are in the Redemption Fund sufficient money or securities in the necessary amount (as provided in the Indenture) to pay or redeem any Outstanding Bonds (whether upon or prior to their maturity); and (c) a certificate of defeasance of the Trustee with respect to the Bonds. (Section 10.01)

*Discharge of Liability on Bonds.* Upon the deposit with the Trustee, in trust, at or before maturity, of money or securities in the necessary amount (as provided in the Indenture) to pay or redeem any Outstanding Bond (whether upon or prior to its maturity or the redemption date of such Bond), provided that, if such Bond is to be redeemed prior to maturity, notice of such redemption shall have been given as provided in the Indenture or provision satisfactory to the Trustee shall have been made for the giving of such notice, then all liability of the Institution in respect of such Bond shall cease, terminate and be completely discharged, and the Bonds shall be deemed paid, except only that thereafter the Holder thereof shall be entitled to payment of the principal or Redemption Price of and interest on such Bond by the Institution, and the Institution shall remain liable for such payments, but only out of such money or securities deposited with the Trustee as aforesaid for their payment, subject, however, to the provisions of the Indenture regarding payment of Bonds after discharge of the Indenture.

The Institution may at any time surrender to the Trustee for cancellation by it any Bonds previously issued and delivered, which the Institution may have acquired in any manner whatsoever, and such Bonds, upon such surrender and cancellation, shall be deemed to be paid and retired. (Section 10.02)

*Payment of Bonds After Discharge of Indenture.* Notwithstanding any provisions of the Indenture, any moneys held by the Trustee in trust for the payment of the principal or Redemption Price of, or interest on, any Bonds and remaining unclaimed for three years (or, if shorter, one day before such moneys would escheat to the Commonwealth of Massachusetts under then applicable Massachusetts law) after such principal, Redemption Price or interest, as the case may be, has become due and payable (whether at maturity or upon call for redemption), shall be repaid to the Institution free from the trusts created by the Indenture upon receipt of an indemnification agreement acceptable to the Institution and the Trustee indemnifying the Trustee with respect to claims of Holders of Bonds which have not yet been paid, and all liability of the Trustee and the Institution with respect to such moneys shall thereupon cease; provided, however, that before the repayment of such moneys to the Institution as aforesaid, the Trustee may (at the cost of the Institution) first mail to the Holders of Bonds which have not yet been paid, at the addresses shown on the registration books maintained by the Trustee, a notice, in such form as may be deemed appropriate by the Trustee with respect to the Bonds so payable and not presented and with respect to the provisions relating to the repayment to the Institution of the moneys held for the payment thereof. (Section 10.04)

## **APPENDIX D**

### **Limitation of Rights to Parties and Bondholders**

Nothing in the Indenture or in the Bonds expressed or implied is intended or shall be construed to give to any Person other than the Institution, the Trustee and the Holders of the Bonds, any legal or equitable right, remedy or claim under or in respect of the Indenture or any covenant, condition or provision therein contained; and all such covenants, conditions and provisions are and shall be held to be for the sole and exclusive benefit of the Institution, the Trustee and the Holders of the Bonds. (Section 11.02)

### **Evidence of Rights of Bondholders**

Any request, consent or other instrument required or permitted by the Indenture to be signed and executed by Bondholders may be in any number of concurrent instruments of substantially similar tenor and shall be signed or executed by such Bondholders in Person or by an agent or agents duly appointed in writing.

The fact and date of the execution by any Person of any such request, consent or other instrument or writing may be proved by the certificate of any notary public or other officer of any jurisdiction, authorized by the laws thereof to take acknowledgments of deeds, certifying that the Person signing such request, consent or other instrument acknowledged to him the execution thereof, or by an affidavit of a witness of such execution duly sworn to before such notary public or other officer.

The ownership of Bonds shall be proved by the registration books for the Bonds held by the Trustee.

Any request, consent, or other instrument or writing of the Holder of any Bond shall bind every future Holder of the same Bond and the Holder of every Bond issued in exchange therefor or in lieu thereof, in respect of anything done or suffered to be done by the Trustee or the Institution in accordance therewith or reliance thereon. (Section 11.07)

### **Waiver of Personal Liability**

No member, officer, agent or employee of the Institution shall be individually or personally liable for the payment of the principal or Redemption Price of or interest on the Bonds or be subject to any personal liability or accountability by reason of the issuance thereof or the performance of any duty under the Indenture; but nothing contained in the Indenture shall relieve any such member, officer, agent or employee from the performance of any official duty provided by law or by the Indenture. (Section 11.11)

### **Governing Law; Venue**

The Indenture shall be construed in accordance with and governed by the laws of the Commonwealth of Massachusetts. The Indenture shall be enforceable in the Commonwealth of Massachusetts, and any action arising under the Indenture shall (unless waived by the Institution) be filed and maintained in the State of Maine. (Section 11.13)

### **CUSIP Numbers**

Neither the Trustee nor the Institution shall be liable for any defect or inaccuracy in the CUSIP number that appears on any Bond or in any redemption notice. (Section 11.15)





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