Sathyabaarathi Ravichandran, Ph.D.

The Jackson Laboratory for Genomic Medicine

10 Discovery Drive, Farmington, CT USA

sathya.ravi@jax.org | sathyabaarathi@gmail.com | +1 (860) 9647654

Profile summary: A computational immunologist with a focus on understanding how the immune system changes with age, and its role in health, acute infections, and upon immunization. I am also passionate about translating these findings into practical applications for improving healthcare and advancing translational research.

Education

- **Ph.D. Computational Biology**   **Aug 2013 - Aug 2020**
  Indian Institute of Science, Bangalore, India.

- **Bachelor of Technology (B.Tech) in Bioinformatics**   **Jun 2006 - May 2010**
  SASTRA University, Thanjavur, India.

Research Experience

- **Postdoctoral Associate**   **Oct 2021 - Present**
  The Ucar lab, The Jackson Laboratory for Genomic Medicine
  10 Discovery Drive, Farmington, CT, USA

- **Research Associate**   **Sep 2020 - Sep 2021**
  Chandra lab, Indian Institute of Science, Bangalore, India

- **Visiting Student**   **Oct 2016 - Oct 2016**
  Department of Applied Mathematics, University of Leeds, UK

- **PhD Scholar**   **Aug 2013 - Aug 2020**
  Indian Institute of Science, Bangalore, India

Awards and Fellowships

- **3rd place in the *Speak4science* flash talk series**, 7th Annual UConn Health/Jackson Laboratory Postdoc Research Day (Sep 2023).
- **Best Poster Award**, 32nd Annual Short Course on Experimental Models of Human Cancer course (Aug 2023).
- **AAI Trainee Abstract Award**, Immunology 2023 (May 2023).
- **Best Poster Award**, 2nd Sex Differences in the Immune System (Nov - Dec 2022).
- **The Brooks Scholar Postdoctoral Fellowship (Feb 2022 - Feb 2024)**, granted by The Jackson Laboratory - Cancer Center.
- **Global Travel Award**, Translational Systems Immunology (Jan - Feb 2018).
- **Global Travel Award**, Boehringer Ingelheim Fonds (2016).
- **The Dean's merit list for academic excellence - 2008, 2009 & 2010**, SASTRA University, India

Publications (*Co-first author)

1. **Ravichandran S**, Bhatt B, Shah A, Narayanaswamy B and Chandra N. Knock-down of a regulatory barcode shifts macrophage polarization destination from M1 to M2 and increases pathogen burden upon S. aureus infection. **eLife [in revision]**.

2. **Ravichandran S***, Erra-Diaz F*, Karakaslar OE*, Marches R, Kenyon-Pesce L, Rossi R, Chaussabel D, Nehar-Belaid D, LaFon CD, Pascual V, Palucka K, Paust S, Nahm MH, Kuchel GA, Banchereau J, Ucar D. Distinct baseline immune characteristics associated with responses to conjugated and unconjugated pneumococcal polysaccharide vaccines in older adults. doi: 10.1101/2023.04.16.23288531. PMID: 37131707; **Nature Immunology [in press]**.

3. Nehar-Belaid, D*, Sokolowski M*, **Ravichandran S*** Banchereau J, Chaussabel D, and Ucar D. Baseline immune states (BIS) associated with vaccine responsiveness and factors that shape the BIS. **Seminars in immunology**, vol. 70, p. 101842.

4. **Ravichandran S**, Banerjee U, Devi G, Kandukuru R, Thakur C, Chakravortty D, Narayanaswamy B, Singh A and Chandra N .VB10, a new blood biomarker for differential diagnosis and recovery monitoring of acute viral and bacterial infections. **EBioMedicine** 2021 May 1; 67:103352.

5. **Ravichandran S**, Chandra N. Interrogation of genome-wide networks in biology: comparison of knowledge-based and statistical methods. **International Journal of Advances in Engineering Sciences and Applied Mathematics.** 2019 Jan 1;2(11):119-37.

6. Nagarajan D, Roy N, Kulkarni O, Nanajkar N, Datey A, **Ravichandran S**, Thakur C, Sandeep T, Aprameya IV, Sarma SP, Chakravortty D. 76: A designed antimicrobial peptide to combat carbapenem-and tigecycline-resistant Acinetobacter baumannii. **Science advances.** 2019 Jul 1;5(7):eaax1946.

7. Nagarajan D, Nagarajan T, Roy N, Kulkarni O, **Ravichandran S**, Mishra M, Chakravortty D, Chandra N. Computational antimicrobial peptide design and evaluation against multidrug-resistant clinical isolates of bacteria. **Journal of Biological Chemistry.** 2018 Mar 9;293(10):3492-509.

8. Vetrivel U, **Ravichandran S**, Kuppan K, Mohanlal J, Das UN, Narayanasamy A. Agonistic effect of polyunsaturated fatty acids (PUFAs) and its metabolites on brain-derived neurotrophic factor (BDNF) through molecular docking simulation. **Lipids in health and disease.** 2012 Dec;11(1):1-8.

9. Harishankar A, Jambulingam M, Gowrishankar R, Venkatachalam A, Vetrivel U, **Ravichandran S**, Yesupadam SM, Madhavan HN. Phylogenetic comparison of exonic US4, US7 and UL44 regions of clinical herpes simplex virus type 1 isolates showed lack of association between their anatomic sites of infection and genotypic/sub genotypic classification. **Virology Journal.** 2012 Dec;9(1):1-8.

10. Vinita K, Sripriya S, Prathiba K, Vaitheeswaran K, **Ravichandran S**, Rajesh M, Amali J, Umashankar V, Kumaramanickavel G, Pal SS, Raman R. ICAM-1 K469E polymorphism is a genetic determinant for the clinical risk factors of T2D subjects with retinopathy in Indians: a population-based case–control study. **BMJ open.** 2012 Jan 1;2(4).

11. Sreenivasan S, **Ravichandran S**, Umashankar V, and Subramanian K. In vitro and In silico studies on inhibitory effects of curcumin on multi drug resistance associated protein (MRP1) in retinoblastoma cells." **Bioinformation** 8, no. 1 (2012): 13.

12. Jambulingam M, Vetrivel U, **Ravichandran S**, Sivashanmugan M, Murali I, and Hajib NM. Functional characterization of novel mutations in UL54 of ganciclovir resistant HCMV strain using structural analysis. **Bioinformation** 5, no. 9 (2011): 390.

13. Gandra M, Umashankar V, Kasinathan N, Krishnan T, **Ravichandran S**, Thirumalai K, Amali J, Rao C, and Jagadeesan M. Molecular screening of the CYP4V2 gene in Bietti crystalline dystrophy that is associated with choroidal neovascularization. **Molecular vision** 17 (2011): 1970.

Patents

1. **Ravichandran S** & Chandra N. (2020). **Biomarkers, and associated methods for detecting bacterial and viral infections in a blood sample.** (Indian Patent No: 202041015738)

Conference Talks & Posters

*Poster #Talk

- Distinct baseline immune characteristics associated with responses to conjugated and unconjugated pneumococcal polysaccharide vaccines in older adults. **7th Annual UCH/Jax Postdoc Research Day**, Sep 2023, Farmington, CT.***#**
- Distinct baseline immune characteristics associated with responses to conjugated and unconjugated pneumococcal polysaccharide vaccines in older adults. **Immunology 2023.** May 2023, Washington, DC.***#**
- Distinct baseline immune characteristics associated with responses to conjugated and unconjugated pneumococcal polysaccharide vaccines in older adults. **Systems Immunology in Aging and Complex Diseases**. Sep 2023, Farmington, CT.*****
- Distinct baseline immune characteristics associated with responses to conjugated and unconjugated pneumococcal polysaccharide vaccines in older adults.**32nd Annual Short Course on Experimental Models of Human Cancer course**. Aug 2023, Bar Harbor, ME.*****
- Distinct baseline immune characteristics associated with responses to conjugated and unconjugated pneumococcal polysaccharide vaccines in older adults. **7th Annual JAX Scientific Symposium**. May 2023. Farmington, CT.*****
- Pre-vaccination CD56dim CD16+ NK cell abundance and Th1/Th17 ratio predict responsiveness to conjugated pneumococcal vaccine in older adults. **CSHL Systems Immunology**. Apr 2023, Long Island, NYC.*****
- Pre-vaccination CD56dim CD16+ NK cells and Th1/Th17 ratio predict responsiveness to conjugated pneumococcal vaccine in older individuals and contribute to sex differences. **2nd Sex Differences in the Immune Systems.** Nov - Dec 2022. Virtual.*****
- Pre-vaccination CD56dim CD16+ NK cells and Th1/Th17 ratio predict responsiveness to conjugated pneumococcal vaccine in older individuals and contribute to sex differences. **Systems Immunology in Aging and complex diseases**. Sep 2022. Farmington, CT.*****
- Pre-vaccination CD56dim CD16+ NK cells and Th1/Th17 ratio predict responsiveness to conjugated pneumococcal vaccine in older individuals and contribute to sex differences. **7th Annual JAX Scientific Symposium**. May 2022. Portland, ME.*****
- Identification of molecular subnetworks that can assess disease severity in COVID-19 patients. **Cold Spring Harbor Laboratory - Systems Immunology**. Apr 2021, Virtual.*****
- Identification of a Robust Blood-Based Biomarker Signature for Chronic Systemic Inflammation through a Meta-Analysis of Disease Networks. **Translational Systems Immunology (A9)-Keystone Symposia**, Jan - Feb 2018. Snowbird, UT.***#**
- A global perspective of Chronic systemic Inflammatory Diseases: Identification of an orchestrated response core. **1st IBSE International Symposium**, Jan 2018. Indian Institute of Madras (IIT), Chennai, India.***#**
- Insights into the transcriptional regulation of human macrophage polarization. **Computational Bioengineering -BSSE Annual Research Symposium**, Jan 2017. Bangalore, India.*****
- Insights into transcriptional regulation of human macrophage activation in disease pathogenesis. **Whole-Cell Modeling Summer School**, Apr 2016, Center for Genomic Regulation, Spain.*****

Teaching Experience (TA)

- **Current Trends in Drug Discovery (BC302)**   **Jan 2016 - Mar 2016**
  Indian Institute of Science, Bangalore, India
- **Protein: Structure and Function (BC202)**   **Aug 2015 - Dec 2015**
  Indian Institute of Science, Bangalore, India
- **Winter School on Quantitative Systems Biology**   **Dec 2015**
  International Centre for Theoretical Sciences, Bangalore, India

Courses

- 32nd Annual short course on experimental models of human cancer, Aug 2023, Bar Harbor, ME
- Northeast Bioimage Analysis Meeting, Oct, 2023, JAX-GM, Farmington, CT
- AAI Advanced Course in Immunology, Jul 2022, Boston, MA
- Whole-Cell Modeling Summer School, Apr 2016, Barcelona, Spain

Professional Scientific Engagement:

- Associate Member, American Association of Immunologists (AAI)
- Peer reviewer for *Frontiers in Genetics*, *PLOS Computational Biology*, *MDPI Diagnostics*, and *MDPI Current Oncology* (13 reviews since 2022).

Technical Skills

- **Data analysis:** Microarray, Nanostring, Bulk RNAseq, scRNA-seq and snATAC-seq.
- **Network analysis** & **visualization:** Genome-scale network modeling (Protein interaction network, Transcriptional regulatory network), data-driven network modeling (WGCNA and ARACNe packages in R), network comparison and visualization using Cytoscape, and igraph package in R
- **Programming languages:** R, Python and Bash.
- **Machine learning:** Classification (Elastic net regularization, linear regression, logistic regression, random forest) using R (caret) & Python (scikit-learn).

References

1. **Dr. Duygu Ucar, Ph.D.**
   The Jackson Laboratory For Genomic Medicine,
   10 Discovery Drive, Farmington, CT USA
   Email: Duygu.Ucar@jax.org

2. **Dr. Michael Stitzel, Ph.D.**
   The Jackson Laboratory For Genomic Medicine,
   10 Discovery Drive, Farmington, CT USA
   Email: michael.stitzel@jax.org

3. **Dr. George A Kuchel, MD.**
   UConn Center on Aging, University of Connecticut,
   263 Farmington Avenue, Farmington, CT USA
   Email: kuchel@uchc.edu