Kevin J. Anderson

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EDUCATION

Cornell University, Ithaca, NY
Ph.D. in Biomedical Engineering — January 2017
M.S. in Biomedical Engineering — April 2015
Thesis: Adhesive Dynamics Simulations of Rolling and Firm Adhesion of Circulating Tumor Microemboli
Mentor: Dr. Michael R. King

University of Alabama at Birmingham, Birmingham, AL
B.S. in Biomedical Engineering with honors in Science and Technology — May 2011
Thesis: Molecular Dynamics Simulations of the Effect of Poly-L-Lysine Interactions on a Lipid Bilayer
Mentor: Dr. Yuhua Song

EXPERIENCE

The Jackson Laboratory – Postdoctoral Associate — July 2017 – Present
- Adapting a deep learning algorithm towards the prediction of single cell DNA methylation profiles
- Integrating MRI imaging data with DNA methylation profiling to investigate glioma heterogeneity
- Characterizing the DNA methylation landscape of canine glioma

Vanderbilt University – Postdoctoral Research Scholar — February 2017 – July 2017
- Designed numerical experiments to study the adhesion of circulating tumor cell aggregates to the blood vessel wall under physiological conditions
- Designed model tumor cell aggregate mesh geometries

Cornell University – Graduate Research Assistant — August 2011 – January 2017
- Adapted a mathematical model of the transport of rigid spheres in low Reynolds shear flow to describe the motion of circulating tumor cell aggregates near a blood vessel wall
- Developed a mathematical model to describe the binding of the cell adhesion molecule E-selectin with tumor cell-bound carbohydrate ligands
- Gathered and analyzed tumor cell morphology data
- Designed model tumor cell aggregate mesh geometries
- Trained a new PhD student in techniques for running simulations using high performance computing clusters and analyzing simulation results
- Gave lectures to undergraduate and graduate students on the mathematical modeling of cancer metastasis

Cornell University – Teaching Assistant for BME 4010: Biomedical Engineering Analysis of Metabolic and Structural Systems — August – December 2015

- Addressed questions for ~70 undergraduate and graduate students relating to the quantitative biology of the renal, respiratory, cardiovascular, and musculoskeletal systems
- Led weekly, 1-2 hour long discussion sessions to supplement lectures
- Graded student assignments, exams and laboratory reports
- Prepared and instructed laboratory exercises that involved the development and use of PDMS microfluidic channel devices, examining tracheal compliance in sheep tissue samples, and measuring solute transport through cartilage
- Coordinated assignment grading, lab instruction, and student assistance with a group of teaching assistants

Cornell University – Teaching Assistant for BME 5400: Biomedical Computation August – December 2012
- Addressed questions for ~40 undergraduate and graduate students relating to mathematical models for biological applications, statistical analysis, and writing MATLAB programs
- Led weekly, 1-2 hour long discussion sessions to supplement lectures
- Graded student assignments and exams

Cornell University – BME Clinical Summer Immersion Student June – July 2012
- Collaborated with medical oncologists at the Weill Medical College of Cornell University to design a screening test and predictive model for gastric cancer patients to aid in the diagnosis of gastric cancer subtypes
- Shadowed two oncologists four days a week to observe patient diagnoses and treatments

CORD – Summer Science Institute Laboratory Instructor June – July 2011
- Instructed groups of ~20 under-represented high school students during 2-week camps focused on experiments in cellular and molecular biology
- Coordinated with other instructors to plan student activities
- Designed introductory molecular biology experiments

University of Alabama at Birmingham – Undergraduate Research Assistant June 2009 – May 2011
- Developed molecular dynamics simulations of poly-L-lysine interacting with neutral and negatively charged lipid bilayers to study membrane translocation of cell penetrating peptides

CORD – Summer Science Institute Research Intern Mentor June – August 2010
- Mentored an individual high school student through an independent research project on the study of cell penetrating peptides
- Supervised the development of a poster presentation at the end of the project outlining the research results

McWane Center – GENEius Lab Coordinator March 2009 – May 2010
- Instructed groups of ~20 high school students in introductory molecular biology and genetics laboratory experiments
- Gave lectures to high school students on the design and analysis of scientific experiments

HONORS/AWARDS

Alfred P. Sloan Foundation Fellowship April 2012

National Science Foundation Graduate Research Fellowship Program (NSF GRF) Fellowship March 2012

Sage Diversity Fellowship August 2011

UAB Presidential Honors Spring – Fall 2010

Francis J. Dupuis Scholarship August 2007

Delta Sigma Theta, Huntsville Alabama Alumnae Chapter Four Year Scholar's Award May 2007

100 Black Men of America, Inc., Greater Huntsville Chapter Scholarship April 2007

Wachovia Foundation Scholarship March 2007

Jane Knight Lowe Scholarship January 2007

ENGINEERING PROJECTS

Novel Surgical Drain Design August 2010 – May 2011
- Designed a prototype of a novel active surgical drain system for post-operative removal of serous fluid in mastectomy patients

Sensory Box Design Spring 2008
- Designed and built a sensory box to stimulate physical and mental development in infants with disabilities

VOLUNTEER EXPERIENCE

Biomedical Engineering Society – Outreach Committee October 2013 – May 2016
- Coordinated with committee in planning outreach events
- Instructed elementary, middle, and high school students in introductory scientific experiments
- Organized student programs focused on developing youth interest in STEM fields

Circle K International at UAB – Treasurer March 2010 – May 2011
- Managed funding for club activities and collected dues from members
- Managed the district and international member roster and ensured that our chapter maintained club eligibility for conferences and other organization events
- Coordinated with the executive board in planning club events

SPECIALIZED SKILLS

Operating Systems: Windows XP/Vista/7, Linux
Tools: Matlab, SSH, OpenMP, ImageJ, Microsoft Office, Maple, Pro/Engineer
Programming Languages: Fortran, Python, R

PUBLICATIONS

Anderson, K., de Guillebon, A., Hughes, H., Wang, W. and King, M. Effect of circulating tumor cell aggregate configuration on hemodynamic transport and wall contact. *Mathematical Biosciences* **294**, 181-194 (2017).

PRESENTATIONS

Anderson, K.J., King, M.R.* 2017. Adhesive dynamics simulations of hemodynamic transport and adhesion probability of multicellular aggregates in circulation. Oral presentation, Biomedical Engineering Society Annual Meeting, Phoenix, Arizona.

Anderson, K.J.*, de Guillebon, A., Geng, Y., Hughes, A.D., Wang, W., King, M.R. 2013. Multiscale simulation of the transport and adhesion of tumor cell aggregates in the circulation. Abstract for poster presentation, Biomedical Engineering Society Annual Meeting, Seattle, Washington.

Anderson, K.J.*, Song, Y. Effect of poly-L-lysine interactions and potential toxicity to a lipid bilayer. 2010. Oral presentation, UAB Undergraduate Expo, Birmingham, Alabama.

* denotes presentation speaker.