Cameron W. Irvin

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Education

Georgia Institute of Technology, Atlanta, GA *August 2015 - Present*

- Candidate for Ph.D., Materials Science and Engineering

Georgia Institute of Technology, Atlanta, GA *August 2011 – May 2015*

- Bachelor of Science, Biomedical Engineering
- Minor: Materials Science and Engineering
- GPA: **3.68/4.0**, Summa Cum Laude
- Alpha Eta Mu Beta (BME Honors Society) Member

Research Experience and Publications

Laboratory for Pathology Dynamics, Dr. Cassie Mitchell, Georgia Tech

ALS Calcium and Mitochondria Analysis *October 2014 – May 2015*

- Invited by *Frontiers in Neuroscience* to write about the role of mitochondria, oxidative stress, and calcium in ALS cell homeostasis
- Used our lab's database to evaluate the correlations between mitochondrial physical and chemical properties, intracellular calcium, antioxidants, and oxidants
- Established trends of various parameters for developing understanding behind ALS pathologies
- **Finding:** ATP production in SOD1 G93A mice is depressed since birth

Publication: **Irvin C.**, Kim R., and Mitchell C. (2015). "Seeking homeostasis: temporal trends in respiration, oxidation, and calcium in SOD1 G93A Amyotrophic Lateral Sclerosis mice." *Frontiers in Cellular Neuroscience*. (Invited Manuscript).

ALS G93A Field Analysis Project *May 2014 – December 2014*

- Performed a field analysis of the G93A mutation mouse model
- Used computational keyword categorization to analyze how the thousands of papers, figures, and values on the model were distributed among our selected ontologies
    - Opened up the understanding of the current state of ALS G93A research and identified areas where research was needed most
- **Finding:** First ever informatics-based approach to systematic review of a field

Publication: Kim R., **Irvin C.**, Tilva K., and Mitchell C. (2015). "State of the Field: an informatics-based systematic review of the SOD1 G93A transgenic mouse model." *Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration.*

Advanced Quantification Manager *January 2014 – May 2014*

- Optimized gain quantification process through database layout design and scripts
- Analyzed the specific ontologies of our study and assisted with database restructuring

Research Associate and DMA Project Consultant *May 2013 – December 2013*

- Quantified and analyzed data from hundreds of publications for a large scale meta analysis
- Contributed to the lab's goal of examining potential for combination treatment strategies in ALS

Dr. Ken Gall's Advanced Materials Laboratory, Georgia Tech *January 2015 – May 2015*
Biomaterial Mechanical Tester

- Prepared various biopolymers for a surface roughness study
- Utilized a Satek force transducer for tensile and fatigue testing of samples
- Calculated stress, strain, toughness, and modulus values from the outputted data
- Will appear as second author on a paper currently being drafted on the effects of surface topography on the mechanical properties of polymer biomaterials

Projects and Work Experience

Vertera Spine, Internship *May 2015 – August 2015*
Project Lead: Developing a better understanding of surface porous PEEK processing

- Altered parameters and documented changes in surface porosity for a PEEK spine cage
- Performed tensile, fatigue, tensile adhesion, shear fatigue, and compression tests on various dogbone and cylinder PEEK samples
- Used SEM, FTIR, XPS, LEXT Confocal Microscopy, and Contact Angle Meas. for analysis

Ian's Friends Foundation, Capstone Design Project *January 2015 – May 2015*
Sponsored Project: DynaSpine, A Vertebral Replacement for Spine Tumor Removal

- Worked with Ian's Friends Foundation along with prominent Neurosurgeons in the Atlanta area on developing a pediatric vertebral replacement that emulates natural spine movement
- The product consisted of a ball and socket mechanism held in place by elastomeric inserts that bends and flexes to degrees comparable to a healthy spine

Engineers Without Borders, Member of Technical Committee *August 2012 – May 2015*
Uganda Project: Provide a clean, sustainable water source in Oloo, Uganda

- Generated the development and implementation plans of the water distribution system
- Aided in the design and layout of the water distribution system implemented in 2014
- Addition of solar panels to take place in late 2015

Skills

Biomedical	Medical Product Design, Pathology Dynamics, Cellular and Molecular Physiology, Biomedical Systems Modeling, Biomechanics, Biofluid Mechanics, Biotransportation
Characterization	Marcus Nanotechnology Cleanroom Certification, Variable Pressure Scanning Electron Microscopy (**SEM**), LEXT Confocal Microscopy, X-Ray Photoelectron Spectroscopy (**XPS**), Fourier Transform Infrared Spectroscopy (**FTIR**), Contact Angle Measurement
Materials	Tensile Testing, Fatigue Testing, Shear Fatigue, Tensile Adhesion, Manufacturing Processes, Material Characterization, Sample Preparation (**Lathe**, **Mill, Hot Press, Oven**), Characterization Data Analysis
Computation	Informatics, MATLAB, SolidWorks, Database Scripting, FileMaker, LabVIEW, Microsoft Office, Data Acquisition, Cross Correlational Matrices, IGOR
CAD Software	2D and 3D Modeling and Assemblies, Orthographic Sketching, Rendering, Finite Element Analysis (**FEA**), 3D Printing