Anthony J. Boyle

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Education & Current Position

Doctor of Philosophy Candidate, Biomedical Engineering (currently pursuing) — Aug 2011 - Present
Texas A&M University, College Station, TX, USA

Bachelor of Science, Biomedical Engineering — Aug 2007 - Aug 2011
Texas A&M University, College Station, TX, USA

Professional Experience

Graduate Research Assistant, Texas A&M University — Aug 2011 - Present
Department of Biomedical Engineering, Biomedical Device Laboratory
College Station, Texas

Dissertation: Design and development of a novel shape memory polymer foam neurovascular embolization device for clinical treatment of intracranial saccular aneurysms.

- Design a device for the clinical indication of embolization of intracranial saccular aneurysms that implements shape memory polymer foam technology.
- Conduct shape memory polymer material design and characterization.
- Fabricate prototypes and evaluate device performance using in vitro and in vivo models.
- Design and develop several experimental systems and protocols, including delivery and deployment performance testing in physiological simulated flow systems and benchtop aneurysm models.

Project Leader: Coordinate design team for the neurovascular embolization device project and assist in general management of lab facilities, equipment, and activities.

- Develop repeatable manufacturing protocols, quality controls, and inspection procedures.
- Conduct design control procedures, including generating user needs, design inputs, design outputs, and risk assessment.
- Assist in creating quality management system and quality controls for manufacturing of device components.
- Assisted in writing and preparation for submission of an awarded multi-million dollar NIH grant

Senior Engineer, Shape Memory Therapeutics, Inc. — Oct 2015 - Present
College Station, Texas

Project Manager: Manage neurovascular embolization device project.

- Implement design control and risk assessment procedures
- Conduct project planning and manage project milestones
- Lead weekly meetings and design reviews

Graduate Teaching Assistant, Texas A&M University Aug 2013 - May 2014

Department of Biomedical Engineering

College Station, Texas

Biofluid Mechanics: Teaching assistant for Biofluid Mechanics course in Department of Biomedical Engineering in the fall semester of 2013.

- Provided supplementary teaching assistance in topics of Navier-Stokes applications, dynamic scaling and similarity, and Buckingham Pi
- Conducted routine office hours and taught multiple lectures
- Graded assignments and exams.

Biomaterials Lab: Teaching assistant for Biomaterials Laboratory course in the Department of Biomedical Engineering in the spring semester of 2014.

- Assisted in the design and planning of lab modules in topics of polymer synthesis and characterization
- Trained students in use of standard equipment and techniques
- Managed weekly classes
- Graded assignments and exams

Student Researcher, Lawrence Livermore National Laboratory May 2011 - Aug 2011

Chemical Sciences Division, Physical and Life Sciences Organization

Livermore, California

Student Researcher: Characterize shape memory polymer foam material properties and conduct preliminary design studies for a neurovascular embolization device.

Publications

6. **Boyle, A.J.**, A.C. Weems, S.M. Hasan, L.D. Nash, M.B.B. Monroe, and D.J. Maitland. "Solvent Stimulated Actuation of Shape Memory Polymer Foams using Dimethyl Sulfoxide and Ethanol." *Smart Mater and Struct* **2016**, Submitted.

5. Horn, J., W.J. Hwang, M.W. Miller, **A.J. Boyle**, and D.J. Maitland. "Comparison of Shape Memory Polymer Foam and GDCs for Treatment of Saccular Aneurysms Using Porcine Aneurysm Model. Part 1: Evaluation of 0, 90, 180 days Post-Treatment Performance." *Biomedical Microdevices* **2015**, Submitted.

4. **Boyle, A.J.**, T.L. Landsman, M.A. Wierzbicki, L.D. Nash, W.J. Hwang, M.W. Miller, E. Tuzun, S.M. Hasan, and D.J. Maitland. "In vitro and in vivo Studies of a Shape Memory Polymer Foam over Wire Embolization Device in Saccular Aneurysm Models." *Journal of Biomedical Materials Research Part B* **2015**, 00B: 000-000.

3. Rodriguez, J.N., W. Hwang, J. Horn, T.L. Landsman, **A. Boyle**, M.A. Wierzbicki, S.M. Hasan, D. Follmer, J. Bryant, W. Small, and D.J. Maitland. "Design and Biocompatibility of Endovascular Polymeric Aneurysm Filling Devices." *Journal of Biomedical Materials Research: Part A* **2015**, 103: 1577-1594.

2. Rodriguez, J.N., M.W. Miller, **A. Boyle**, J. Horn, C.K. Yang, T.S. Wilson, J.M. Ortega, W. Small, L. Nash, H. Skoog, and D.J. Maitland. "Reticulation of Low Density Shape Memory Polymer Foam with an in vivo Demonstration of Vascular Occlusion." *Journal of Mechanical Behavior of Biomedical Materials* **2014**, 40: 102-114.

1. Singhal, P., **A. Boyle**, M. L. Brooks, S. Infanger, S. Letts, W. Small, D.J. Maitland, and T.S. Wilson. "Controlling the Actuation Rate of Low-Density Shape-Memory Polymer Foams in Water." *Macromolecular Chemistry and Physics* **2013**, 214: 1204–1214.

Technical Presentations

*presenting author

10. **Boyle, A.J.**,* T.L. Landsman, M.A. Wierzbicki, L.D. Nash, W.J. Hwang, M.W. Miller, E. Tuzun, S.M. Hasan, and D.J. Maitland. "Shape Memory Polymer Foam Embolization Devices for Treatment of Intracranial Saccular Aneurysms." Present at *ASME IMECE*. **Houston, TX, USA** (**November 2015**, oral presentation).

9. **Boyle, A.J.**,* T.L. Landsman, M.A. Wierzbicki, L.D. Nash, W.J. Hwang, M.W. Miller, E. Tuzun, S.M. Hasan, and D.J. Maitland. "Shape Memory Polymer Foam over Wire Embolization Device Delivered in Saccular Aneurysm Models." Present at *Biointerface Workshop & Symposium*. **Scottsdale, AZ, USA** (**September 2015**, poster presentation).

8. **Boyle, A.J.**,* T.L. Landsman, M.A. Wierzbicki, L.D. Nash, W.J. Hwang, M.W. Miller, E. Tuzun, S.M. Hasan, and D.J. Maitland. "Shape Memory Polymer Foam over Wire Embolization Device for Treatment of Intracranial Saccular Aneurysms." Present at *Texas A&M University Student Research Week*. **College Station, TX, USA** (**March 2015**, oral presentation).

7. Wilson, T.S., **A. Boyle***. "Shape Memory Polymer Foams for Medical Device Applications." Present at *CIMTEC 2014 6th Forum on New Materials*. **Montecatini Terme, Italy** (**June 2014**, oral presentation).

6. **Boyle, A.***, C. Maher, L.D. Nash, and D.J. Maitland. "Dimethyl Sulfoxide Stimulated Actuation of Shape Memory Polymer Foam." Present at *Texas Biomaterials Day*. **College Station, TX, USA** (**June 2014**, poster presentation).

5. Maitland, D.J.*, W. Hwang, B.L. Volk, T.S. Wilson, K.Hearon, L.Nash, **T. Boyle**, J.M. Ortega and P. Singhal. "Shape Memory Polymer Based Biomedical Implant Devices." Presented at *ASME 2013 International Mechanical Engineering Congress & Exposition*. **San Diego, CA, USA** (**Nov. 2013**, oral presentation).

4. Hearon, K.*, T. Ware, L.D. Nash, **T. Boyle**, C.Laramy, W.E. Voit, T.S. Wilson, and D.J. Maitland. "Electron Beam Crosslinked Polyurethane Shape Memory Polymers with Novel Processing Capabilities and Tunable Mechanical Properties." Presented at *Lawrence Livermore National Laboratory ESC Technical Seminar*. **Livermore, CA, USA** (**Nov. 2012**, oral presentation).

3. Brooks, M.*, P. Singhal, **T. Boyle**, L. Nash, M. Hasan, R. Muschalek, J.E. Raymond, T.S. Wilson, and D.J. Maitland. "Effects of Isophorone Diisocyanate on the Hydrophobicity of Shape Memory Polymers." Presented at *Texas A&M University USRG Poster Session*. **College Station, TX, USA** (**Aug. 2013**, poster presentation).

2. Sandoval, V.*, **A. Boyle**, and D.J. Maitland. "A Process Control System for the Particulate Quantification of Shape Memory Polymer Foams." Presented at *Texas A&M University USRG Poster Session*. **College Station, TX, USA** (**Aug. 2013**, poster presentation).

1. **Boyle, A.***, D.J. Maitland "Prototype, Fabrication, and Development of a Shape Memory Embolization Device for Cerebral Aneurysms." Presented at *Texas A&M University Student Research Week*. **College Station, TX, USA** (**Mar. 2012**, oral presentation).

Related Skills

- Proficiency in medical device design and development, including standard design control procedures
- Proficiency in medical device prototyping and manufacturing
- Proficiency in design and construction of physiological flow systems for device performance testing
- Proficiency with setup of controlled environments for medical device manufacturing
- Proficiency with setup of quality management systems and quality controls in manufacturing
- Proficiency with various extensometers in mechanical testing
- Proficiency with programming in MATLAB, C++, and Excel and use in data analysis
- Experience with SolidWorks, development of drawing files, and use in 3D printing models
- Experience with UV and excimer laser machining
- Experience with standard material characterization techniques, including DSC and DMA
- Experience with large animal research for study of vascular devices and therapies

Honors & Awards

2015 Texas A&M Student Research Week (oral presentation), session winner and 1st place in Medicine, Biomedical Engineering, Neuroscience

Texas A&M OGAPS Research and Presentation Grant

Biointerface Workshop & Symposium Poster Competition, 2nd place (tie)

Academic Research Mentoring

Undergraduate Researchers

Douglas Soderdahl, 2015 - present

Chandani Chitrakar, 2015 - present

Nicholas Kelly, 2015 - present

Daniel Crawford, 2015

Jason Szafron, 2013 - 2015

Conner Hutcherson, 2014

Cameron Maher, 2013 - 2014

Vivian Sandoval, USRG Summer 2013

Trey Young, 2012

Christine Laramy, USRG Summer 2012

Other Professional and Academic Service

Biomedical Engineering Ambassadors, Founding Officer, Texas A&M University (2012 - 2015)

- An organization dedicated to enhancing accessibility to the department for the community, prospective students, visiting scholars and prospective faculty

Biomedical Engineering Student Association, Texas A&M University (2015 - present)

National Society of Collegiate Scholars, Texas A&M University (2007 - present)

Biomedical Engineering Society, Texas A&M University (2007 - 2011)