

Sayyeda Marziya Hasan
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I. EDUCATION

Ph.D.
Diversity Fellowship **Biomedical Engineering**, 2011-2016
Texas A&M University, College Station, Texas
GPA: 3.56

B.S. **Chemistry**, Biology and Business Minors, 2011
Texas Lutheran University, Seguin, Texas
Cum Laude, GPA: 3.82

II. EMPLOYMENT

2016-present **Senior Engineer**
Shape Memory Therapeutics, Inc. College Station, Texas
Focus: Project manager for the design and development of shape memory polymer foams for commercialization of embolic devices

2011-2016 **Graduate Research Fellow**
Biomedical Device Laboratory, Department of Biomedical Engineering, Texas A&M University, College Station, Texas
Focus: Shape memory polyurethane/urea foams: Evaluation of thermo-mechanical properties and foam morphology

Summer 2010 **Biomaterials Research Internship**
UTSA/UTHSCSA Joint Graduate Program in Biomedical Engineering, University of Texas at San Antonio, San Antonio, Texas
Focus: Bioactive coatings on hydroxyapatite discs

Summer 2009 **Chemistry Research Internship**
Department of Chemistry, Texas Lutheran University, Seguin, Texas
Focus: Polyurethane synthesis and analysis of mechanical properties

2008-2011 **Supplemental Instructor**
Academic Support, Texas Lutheran University, Seguin, Texas

III. AWARDS and HONORS

Texas A&M University College of Engineering Commencement Student Speaker
Texas A&M University, College Station, TX 2016

3MT Texas A&M University Doctoral Runner Up
3-Minute Thesis Competition, Texas A&M University, College Station, TX 2016

1st place, 2015 BioInterface Poster Competition
Surfaces in Biomaterials Foundation, BioInterface Workshop and Symposium, Scottsdale, AZ, 2015

2nd place, Graduate Student Oral Competition
Student Research Week, Texas A&M University, College Station, TX, 2015

Engineering Graduate Student Travel Grant
Department of Biomedical Engineering, Texas A&M University, College Station, TX, 2015

Graduate Student Presentation Grant
Office of Graduate and Profession Studies, Texas A&M University, College Station, TX, Summer 2015 and Fall 2015

Graduate Diversity Fellowship
Texas A&M University, College Station, TX, 2011-2015

IV. PATENTS AND PUBLICATIONS

Patents

Hasan S.M. et al. Shape memory polymer nanocomposites and uses thereof. US Patent 62/166,652, filed May 26, 2015.

Hasan S.M., Rodriguez J.N., Singhal P., Wilson T.S., Maitland D.J. Particle-loaded shape-memory polymer foam. TTC Invention Disclosure: 4243TEES15.

Publications

"Particulate Matter in Nanoparticle-Loaded Polyurethane Shape Memory Foams." *Journal of Medical Devices*, 2016 (Article – Submitted)

Nash L.D., Docherty N.C., Monroe M.B.B., Ezell K.P., Carrow J.K., **Hasan S.M.**, Gaharwar A.K., Maitland D.J. "Cold Plasma Reticulation of Shape Memory Embolic Tissue Scaffolds." *Macromolecular Rapid Communications*, 2016 (Communication – Submitted)

Landsman T.L., Touchet T, **Hasan S.M.**, Smith C, Russell B.H., Rivera J.J., Maitland D.J., Cosgriff-Hernandez E. "A Shape Memory Foam Composite with Enhanced Fluid Uptake and Bactericidal Properties as a Hemostatic Agent." *Acta Biomaterialia*, 2016 (Article – Submitted)

Nash L.D., Ezell K.P., **Hasan S.M.**, Maitland D.J. "Characterization of Plasma Deposited Hydrocarbon Diffusion Barriers for Embolic Foam Devices." *IEEE Transactions on Nanobioscience*, 2015. (Article – Accepted)

Hasan S.M., Weems A.C., Muschalek R.L., Maitland D.J., Wilson T.S. "Biodegradation of Shape Memory Polymers." In *Lifetimes and Compatibility of Synthetic Polymers*; Lewicki J; Wiley-Scrivener, 2015. (Book Chapter – Accepted)

Hasan S.M., Easley A.D., Monroe M.B.B, Maitland D.J. "Development of siloxane-based amphiphiles as cell stabilizers for porous shape memory polymer systems." *Journal of Colloid and Interface Science*, 2016, 478, 334-343. DOI: 10.1016/j.jcis.2016.06.031

Boyle A.J., Weems A.C, **Hasan S.M.**, Nash L.D., Monroe M.B.B., Maitland D.J. "Solvent stimulated actuation of shape memory polymer foams using dimethyl sulfoxide and ethanol." *Smart Materials and Structure*, 2016, 25, 075014. DOI: 10.1088/0964-1726/25/7/075014

Landsman T.L., Weems A.C., **Hasan S.M.**, Thompson R.S., Wilson T.S., Maitland D.J. "Embolic Applications of Shape Memory Polyurethane Scaffolds." In *Advances in Polyurethane Biomaterials*; Cooper S.L., Guan J.; Elsevier, 2016 DOI: 10.1016/B978-0-08-100614-6.00020-2.

Hasan S.M., Nash L.D., Maitland D.J. "Porous Shape Memory Polymers: Design and Applications." *Journal of Polymer Science Part B: Polymer Physics*, 2016. DOI: 10.1002/polb.23982

Hasan S.M., Thompson R.S., Emery H., Nathan A.L., Weems A.C., Zhou F., Browning Monroe Mary Beth Maitland D.J. "Modification of Shape Memory Polymer Foams Using Tungsten, Aluminum Oxide, and Silicon Dioxide Nanoparticles" *RSC Advances*, 2016, 6, 918-927. DOI: 10.1039/C5RA22633C

Hasan S.M., Harmon G., Zhou F., Raymond J.E., Gustafson T.P., Wilson T.S., Maitland D.J. "Tungsten-loaded SMP foam nanocomposites with inherent radiopacity and tunable thermo-mechanical properties." *Polymers for Advanced Technologies*, 2016, 27, 195-203. DOI: 10.1002/pat.3621

Boyle A.J., Landsman T.L., Wierzbicki M.A., Nash L.D., Hwang W., Miller M.W., Tuzun E., **Hasan S.M.**, Maitland D.J.. "In vitro and in vivo Evaluation of a Shape Memory Polymer Foam-over-Wire Embolization Device Delivered in Saccular Aneurysm Models." *Journal of Biomedical Materials Research Part B: Applied Biomaterials*, 2015 DOI: 10.1002/jbm.b.33489

Rodriguez J.N., Hwang W., Horn J., Landsman T.L., Boyle A., Wierzbicki M.A., **Hasan S.M.**, Follmer D., Bryant J., Small W., Maitland D.J. "Design and biocompatibility of endovascular aneurysm filling devices." *Journal of Biomedical Materials Research Part A*, 2015, 103, 1577-1594. DOI: 10.1002/jbm.a.35271

Hasan S.M., Raymond J.E., Wilson T.S., Keller B.K., Maitland D.J. "Effects of Isophorone Diisocyanate on the Thermal and Mechanical Properties of Shape-Memory Polyurethane Foams." *Macromolecular Chemistry and Physics*, 2014, 215, 2420–9. DOI: 10.1002/macp.201400407

V. TECHNICAL PRESENTATIONS

Anthony J. Boyle,* Todd L. Landsman, Mark A. Wierzbicki, Landon D. Nash, Wonjun Hwang, Mathew W. Miller, Egemen Tuzun, **Sayyeda M. Hasan**, and Duncan 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)**. *presenting author

Sayyeda M. Hasan, Robert S. Thompson, Harrison Emery, Adam L. Nathan, Andrew C. Weems, Fang Zhou, Duncan J. Maitland. "Shape Memory Polymer Nanocomposites." Presented at *IEEE-NanoMed 2015*, **IEEE, Waikiki Beach, HI, USA. (November 2015, oral presentation)**

Sayyeda M. Hasan, Garrett Harmon, Fang Zhou, Jeffery E. Raymond, Tiffany P. Gustafson. "Opacification of shape memory polymer foams using tungsten nanoparticles for neurovascular embolic applications." Presented at *Society of Engineering Science 52nd Annual Technical Meeting*, **Texas A&M University, College Station, TX, USA. (October 2015, oral presentation)**

Sayyeda M. Hasan. "Shape Memory Polymer Foams for Biomedical Applications." *Invited speaker* at **Texas Lutheran University, Seguin, TX, USA (October 2nd, 2015- Oral Presentation)**

Sayyeda M. Hasan, Garrett Harmon, Fang Zhou, Jeffery E. Raymond, Tiffany P. Gustafson, Thomas S. Wilson, Duncan J. Maitland. "Opacification of shape memory polymer foams using tungsten nanoparticles for neurovascular embolic applications". Presented at *BioInterface 2015. Surfaces in Biomaterials Foundation*, **Scottsdale, AZ, USA. (September 2015, poster presentation – 1st place)**

Anthony J. Boyle*, Todd L. Landsman, Mark A. Wierzbicki, Landon D. Nash, Wonjun Hwang, Matthew W. Miller, Egemen Tuzun, **Sayyeda M. Hasan**, and Duncan J. Maitland. "Shape Memory Polymer Foam-over-Wire Embolization Device Delivered in Saccular Aneurysm Models". Presented at *BioInterface 2015. Surfaces in Biomaterials Foundation*, **Scottsdale, AZ, USA. (September 2015, poster presentation – runner up)**
*presenting author

Landon D. Nash*, Kendal P. Ezell, **Sayyeda M. Hasan**, Duncan J. Maitland. Plasma Deposited Hydrocarbon Diffusion Barriers for Embolic Foam Devices. Presented at *BioInterface 2015. Surfaces in Biomaterials Foundation*, **Scottsdale, AZ, USA. (September 2015, poster presentation – runner up)** *presenting author

Sayyeda M. Hasan, Robert S. Thompson, Harrison Emery, Adam L. Nathan, Fang Zhou, Duncan J. Maitland. "Tuning thermo-mechanical properties of shape memory polymer foams for endovascular embolic applications." Presented at *250th American Chemical Society National Meeting & Exposition*. **Boston, MA, USA. (August 2015, oral presentation)**

Harrison Emery*, **Sayyeda M. Hasan**, Duncan J. Maitland. "Fabrication of Shape Memory Polymer Nanocomposite Foams Using Surface Modified Metal Oxide Fillers." Presented at *Texas A&M Summer Undergraduate Research Symposium 2015*. Texas A&M University, College Station, TX, USA. (August 2015, poster presentation-1st place) *presenting author

Sayyeda M. Hasan, Garrett Harmon, Fang Zhou, Jeffery E. Raymond, Tiffany P. Gustafson, Thomas S. Wilson, Duncan J. Maitland. "Opacification of shape memory polymer foams using tungsten nanoparticles for neurovascular embolic applications". Presented at *Biomaterials Day*. **Rice University, Houston, TX, USA. (June 2015, poster presentation)**

Sayyeda M. Hasan, Jeffrey E. Raymond, Thomas S. Wilson, Brandis K. Keller and Duncan J. Maitland. "Effects of Isophorone Diisocyanate on the Thermal and Mechanical Properties of Shape-Memory Polyurethane Foams." Presented at *ENG-LIFE Workshop 2015*. **Texas A&M University, College Station, TX, USA. (April 2015, poster presentation)**

Sayyeda M. Hasan. "Tuning thermo-mechanical properties of shape memory polymer foams for endovascular embolic applications." Presented at *Student Research Week*. **Texas A&M University, College Station, TX, USA. (March 2015, oral presentation – 2nd place)**

Sayyeda M. Hasan, Jeffrey E. Raymond, Thomas S. Wilson, Brandis K. Keller and Duncan J. Maitland. "Effects of Isophorone Diisocyanate on the Thermal and Mechanical Properties of Shape-Memory Polyurethane Foams." Presented at *Southwest Regional Meeting*. **American Chemical Society, Dallas, TX, USA. (November 2014, poster presentation)**

Todd L. Landsman*, Tyler Touchet, Landon Nash, **Sayyeda M. Hasan**, Clayton Smith, Brooke Russell, Jose Rivera, Elizabeth Cosgriff-Hernandez, Duncan J. Maitland. "Antibacterial Shape Memory Polymer Foam-Hydrogel Composite Wound Dressing." Presented at *BioInterface 2014. Surfaces in Biomaterials Foundation*, **Redwood City, CA, USA. (October 2014, poster presentation – 1st place)** *presenting author

Marziya Hasan, Marilyn Brooks, Jeffrey E Raymond, Thomas S Wilson, and Duncan J Maitland. "Effects of Isophorone Diisocyanate on the Hydrophobicity and Actuation Time of Shape Memory Polyurethane Foams." Presented at *Whitaker Poster Session*. **Texas A&M University, College Station, TX, USA. (August 2014, poster presentation)**

Marziya Hasan, Marilyn Brooks, Jeffrey E Raymond, Thomas S Wilson, and Duncan J Maitland. "Effects of Isophorone Diisocyanate on the Hydrophobicity and Actuation Time of Shape Memory Polyurethane Foams."

Presented at *Biomaterials Day*. **Texas A&M University, College Station, TX, USA. (June 2014, poster presentation)**

Marziya Hasan, Marilyn Brooks, Jeffrey E Raymond, Thomas S Wilson, and Duncan J Maitland. "Effects of Isophorone Diisocyanate on the Hydrophobicity and Actuation Time of Shape Memory Polyurethane Foams." Presented at *Materials Advantage Poster Competition*. **Texas A&M University, College Station, TX, USA. (April 2014, poster presentation)**

Marziya Hasan. "Effects of Isophorone Diisocyanate on the Hydrophobicity and Actuation Time of Shape Memory Polyurethane Foams." Presented at *Student Research Week*. **Texas A&M University, College Station, TX, USA. (March 2014, oral presentation)**

VI. ACADEMIC RESEARCH MENTORING

Grace Fletcher, Graduate Research, Biomedical Engineering, Texas A&M University

Student research mentee in Biomedical Device Laboratory at Texas A&M in 2015-2016

- Research focus: Development of Biostable Shape Memory Polymer Systems

Jane Frederick, Undergraduate Research, Biomedical Engineering, Texas A&M University.

Student research mentee in Biomedical Device Laboratory at Texas A&M in 2015

- Undergraduate Thesis: Modification of Shape Memory Polymers using Hydrogenated Methylene Diphenyl Diisocyanate

Alexa Easley, Undergraduate Research, Biomedical Engineering, Texas A&M University.

Student research mentee in Biomedical Device Laboratory at Texas A&M in 2015

- Undergraduate Thesis: Thermo-mechanical properties and actuation profiles of shape memory foams to determine suitability for integration into endovascular coils

Harrison Emery, Undergraduate Research, Biomedical Engineering, Texas A&M University

Student research mentee in Biomedical Device Laboratory at Texas A&M from 2014-present

- Undergraduate Thesis: Fabrication of Shape Memory Polymer Nanocomposite Foams Using Surface Modified Metal Oxide Fillers

Garrett Harmon, Undergraduate Research, Biomedical Engineering, Texas A&M University

Student research mentee in Biomedical Device Laboratory at Texas A&M from 2014-2015

Yichen Dai, Undergraduate Research, Department of Electrical Engineering, Texas A&M University.

Student research mentee in Biomedical Device Laboratory at Texas A&M in 2014 for 10 weeks

Ana Dominguez, Undergraduate Research, Department of Physics, Texas A&M University.

Student research mentee in Biomedical Device Laboratory at Texas A&M in 2014 for 10 weeks

Brooke Cohen, Undergraduate Research, Department of Chemical Engineering, Cornell University.

Student research mentee in Biomedical Device Laboratory at Texas A&M in 2014 for 3 weeks

Rachael Muschalek, Undergraduate Research, Biomedical Engineering, Texas A&M University.

Student research mentee in Biomedical Device Laboratory at Texas A&M from 2013-4

- Undergraduate research scholar. "Synthesis of polyurethane shape memory polymers over nickel titanium wire." Texas A&M University, College Station, TX

VII. SERVICE

Society of Engineering Science

Student Volunteer, Fall 2015

52nd Annual Technical Meeting, Texas A&M University, College Station, Texas

S.H.A.P.E Outreach Activities

Participant, Fall 2014-present

STEM Night, Greens Prairie Elementary School, College Station, Texas

Middle School Outreach Activities

Program Assistant, Fall 2011-Spring 2012

College Station Middle School Science Club, College Station, Texas

Student Research Week Volunteer

Texas A&M University, 2012

VIII. SOCIETY MEMBERSHIPS

Biomedical Engineering Graduate Student Association, 2015-present
Steering Committee, 3rd year Graduate Student Representative

Society for Biomaterials, 2011-present
Vice-President, Inaugural Texas A&M Student Chapter, 2012-2013

Society of Women Engineers, 2011-present