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**MARIAH S. HAHN, PhD**  
Assistant Professor, Department of Chemical Engineering  
Texas A&M University  
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## EDUCATION/TRAINING

Rice University, Houston, TX  
Post-doctoral Researcher, 09/2004-07/2005, Bioengineering  
Advisor: Dr. Jennifer West, Department of Bioengineering

Massachusetts Institute of Technology, Cambridge, MA  
Ph.D., 09/2004, Electrical Engineering (Bioelectrical Concentration)  
Advisor: Dr. Robert Langer, Department of Chemical Engineering

Stanford University, Stanford, CA  
M.S., 01/2001, Electrical Engineering

University of Texas at Austin, Austin, TX  
B.S., 05/1998, Chemical Engineering

## PROFESSIONAL APPOINTMENTS

Assistant Professor, Texas A&M University  
Department of Chemical Engineering 08/2005-

Adjunct Professor, Texas A&M University  
Department of Biomedical Engineering 08/2005-

## HONORS AND AWARDS

|   |           |
|---|-----------|
| NSF CAREER Award                                  | 2010-2015 |
| ASEE GSW Young Faculty Award                      | 2009      |
| College of Engineering Select Young Faculty Award | 2009      |
| ACS PROGRESS/Dreyfus Lectureship Award            | 2008      |
| National Science Foundation Graduate Fellowship   | 1999-2002 |
| John Linvill Fellowship                           | 2000      |
| Jodie Isenhower Presidential Scholarship          | 1997      |
| National Science Scholar                          | 1995      |

## PEER-REVIEWED PUBLICATIONS

\*Corresponding author italicized.

1. C. Yang, A. Wax, *M. Hahn*, K. Ramashandran, and *M. Feld*. (2001). Phase-referenced interferometer with subwavelength and subhertz sensitivity applied to the study of cell membrane dynamics. Optics Letters 26 (16):1271-73.
2. *M.S. Hahn*, J. Kobler, S. Zeitels, *R. Langer*. (2005). Midmembranous vocal fold lamina propria proteoglycans across selected species. Annals of Otology, Rhinology, and Laryngology. 114 (6): 451-62. PMID: 16042103
3. *M.S. Hahn*, J.S. Miller, *J.L. West*. (2005). Laser scanning lithography for surface micropatterning on hydrogels. Advanced Materials. 17 (24): 2939-42.
4. M.S. Hahn, B. Teply, M. Stevens, S. Zeitels, *R. Langer*. (2006). Collagen composite hydrogels for vocal fold lamina propria restoration. Biomaterials. 27 (7): 1104-9. PMID: 16154633
5. *M.S. Hahn*, J. Kobler, B. Starcher, S. Zeitels, *R. Langer*. (2006). Quantitative and comparative studies of the vocal fold extracellular matrix I: Elastic fibers and hyaluronan. Annals of Otology, Rhinology, and Laryngology. 115 (2):156-64. PMID: 16514800

6. **M.S. Hahn**, L. Taite, J. Moon, M. Rowland, K. Ruffino, *J.L. West*. (2006). Photolithographic patterning of poly(ethylene glycol) hydrogels. *Biomaterials*. 27(12):2519-24. PMID: 16375965
7. J.S. Miller, M. I. Bethencourt, **M. Hahn**, T.R. Lee, *J.L. West*. (2006). Laser-scanning lithography (LSL) for the soft lithographic patterning of cell-adhesive self-assembled monolayers. *Biotechnology and Bioengineering*. 93 (6): 1060-8. PMID: 16444742
8. **M.S. Hahn**, J. Kobler, S. Zeitels, *R. Langer*. (2006). Quantitative and comparative studies of the vocal fold extracellular matrix II: Collagen. *Annals of Otology, Rhinology, and Laryngology*. 115 (3):225-32. PMID: 16572613
9. **M.S. Hahn**, J. Miller, *J. West*. (2006). Three dimensional biochemical and biomechanical patterning of hydrogels for guiding cell behavior. *Advanced Materials*. 18 (20): 2679-84.
10. **M.S. Hahn**, M.K. McHale, E. Wang, R. Schmedlen, *J. West*. (2007). Physiologic pulsatile flow bioreactor conditioning of poly(ethylene glycol)-based tissue engineered vascular grafts. *Annals of Biomedical Engineering*. 35 (2): 190-200. PMID: 17180465
11. J.J. Moon, S-H Lee, **M.S. Hahn**, B.A. Nsiah and *J.L. West*. (2007). Regulation of endothelial angiogenesis and vasculogenesis in synthetic poly(ethylene glycol) hydrogels modified with biomolecules. *FASEB Journal*. 21:706-15.
12. R. Murthy, C.D. Cox, **M.S. Hahn**, *M.A. Grunlan*. (2007). Protein-resistant silicones: Incorporation of PEO via siloxane tethers. *Biomacromolecules*. 8(10):3244-52. PMID: 17725363
13. H. Liao, D. Munoz-Pinto, X. Qu, Y. Hou, M. Grunlan, **M.S. Hahn**. (2008). Influence of hydrogel mechanical properties and mesh size on vocal fold fibroblast extracellular matrix production. *Acta Biomaterialia*. 4(5): 1161-71. PMID: 18515199
14. Y.Hou, A.R. Matthews, A.M. Smitherman, A.S. Bulick, **M.S. Hahn**, H. Hou; A. Han, *M.A. Grunlan*. (2008). Thermoresponsive nanocomposite hydrogels with cell-releasing behavior. *Biomaterials*. 29(22): 3175-84. PMID: 18455788
15. **M.S. Hahn**, C. Jao, W. Faquin, J. Grande-Allen. (2008). Glycosaminoglycan composition of the vocal fold lamina propria in relation to function. *Annals of Otology, Rhinology, and Laryngology*. 117(5): 371-81. PMID: 18564535
16. J. Moon, **M.S. Hahn**, X. Li, *J. West*. (2009). Micropatterning of poly(ethylene glycol) diacrylate hydrogels with biomolecules to regulate and guide endothelial morphogenesis. *Tissue Engineering*. 15(3):579-85. PMID: 18803481
17. A.S. Bulick, D. Munoz-Pinto, M. Mani, D. Cristancho, M. Urban, **M.S. Hahn**. (2009). Impact of endothelial cells and mechanical conditioning on smooth muscle cell extracellular matrix production and differentiation. *Tissue Engineering*. 15(4):815-25. PMID: 19108675
18. D. Munoz-Pinto, A. Bulick, **M.S. Hahn**. (2009). Uncoupled investigation of scaffold modulus and mesh size on smooth muscle cell behavior. *J Biomed Mater Res A*. 90(1):303-16. PMID: 19402139
19. D. Munoz-Pinto, P. Whittaker, **M.S. Hahn**. (2009). Lamina propria cellularity and collagen composition: An integrated assessment of structure in humans. *Annals of Otology, Rhinology, and Laryngology*. 118(4):299-306. PMID: 19462852
20. D. Munoz-Pinto, C.A. Jimenez-Vergara, L.M. Gelves, R. McMahon, V. Guiza-Arguello, **M.S. Hahn**. (2009). Probing vocal fold fibroblast response to hyaluronan in controlled 3D contexts. *Biotechnology and Bioengineering*. 104(4):821-31. PMID: 19718686
21. J. Gaspard, **M.S. Hahn**, J.A. Silas. (2009). Polymerization of hydrogels inside self-assembled block copolymer vesicles. *Langmuir*. 5(22):12878-84. PMID: 19835397
22. A. Rocha, **M.S. Hahn**, *H. Liang*. (2010). Critical-Fluid-Shear-Stress Analysis for Cell-Polymer Adhesion. *Journal of Materials Science*. 45(3): 811-17
23. D. Munoz-Pinto, R. McMahon, M. Kanzelberger, A.C. Jimenez-Vergara, Y. Hou, M. Grunlan, **M.S. Hahn**. (2010). Inorganic-organic hybrid scaffolds for osteochondral regeneration. *J of Biomed Mater Res A*. Epub 02/05/2010. PMID: 20128006
24. H. Hou, Y. Hou, M.A. Grunlan, D. Munoz-Pinto, **M.S. Hahn**, A. Han. Micropatterning of poly(N-isopropylacrylamide) PNIPAAm hydrogels: Effect on thermosensitivity and cell-release behavior. *Sensors and Materials*. In Press.
25. Y. Hou, C.A. Schoener, K.R. Regan, D. Munoz-Pinto, **M.S. Hahn**, *M.A. Grunlan*. (2010). Photo-crosslinked PDMS<sub>star</sub>-PEG hydrogels: Synthesis, characterization, and potential application for tissue engineering scaffolds. *Biomacromolecules*. Epub 02/12/2010. PMID: 20146518

26. C.A. Jimenez-Vergara, R. McMahon, D. Munoz-Pinto, L. Cubero-Ponce, A. Morales, **M.S. Hahn**. Approach for fabricating tissue engineered vascular grafts with stable endothelialization. *Annals of Biomedical Engineering*. In Revision.

### PEER-REVIEWED BOOK CHAPTERS

\*Corresponding author(s) italicized.

1. *R.J. Clifton, X. Jia, T.Jia, C. Bull, M.S. Hahn*. "Viscoelastic Response of Vocal Fold Tissues and Scaffolds at High Frequencies." *Mechanical of Biological Tissue*. Eds. G.A. Holzapfel, R.W. Ogden (2006).
2. **M. Hahn** and *B. Bouma*. "Optical Coherence Tomography." *Scott Brown's Otorhinolaryngology: Head and Neck Surgery*, 7th Ed. Hodder Arnold. (2008).
3. **M.S. Hahn**. "Mechanical Stimulation and Biomimetic Scaffolds for Tissue Engineered Vascular Grafts". *E-Book: Topics in Tissue Engineering* (2008).

### INVITED PRESENTATIONS

1. M.S. Hahn. Engineering the Vocal Fold Mucosa. Department of Chemical Engineering. Texas A&M University. 02/2004.
2. M.S. Hahn. Physiologic Pulsatile Flow Conditioning of PEG-Based Tissue Engineered Vascular Grafts. Department of Biomedical Engineering. Texas A&M University. 05/2005.
3. M.S. Hahn. Photopatterning Hydrogels for Tissue Engineering Applications. Center for Advanced Microstructures and Devices. Louisiana State University. 06/2006.
4. M.S. Hahn. Photopatterning Hydrogels for Tissue Engineering Applications. Professional Program in Biotechnology. Texas A&M University. 08/2006.
5. M.S. Hahn. Pulsatile Flow Bioreactor for Blood Vessel Tissue Engineering. Department of Systems Biology and Translational Medicine. Texas A&M Health Science Center. 01/2006.
6. M.S. Hahn. Proteoglycan and Collagen Composition of the Vocal Fold Lamina Propria – Toward Vocal Fold Regeneration. ICALB Phonosurgery Symposium. University of Wisconsin-Madison. 07/2008.
7. M.S. Hahn. Toward Rational Scaffold Design for Tissue Engineering Vascular Graft Applications. NSF/IGERT Seminar Series, Department of Biomedical Engineering, University of Texas-Austin. 02/2008.
8. M.S. Hahn. Engineering the Stem Cell Microenvironment – Influence of Scaffold Bioactivity and Microorganization. Department of Biomedical Engineering. University of Minnesota-Minneapolis. 10/2008.
9. M.S. Hahn. Biofuels and Bioremediation. 1<sup>st</sup> Annual Graduate Student Convention. Puerto Rico. 03/2009.
10. M.S. Hahn. Modulation of Scaffold Material Properties to Guide Stem Cell Differentiation. Houston Society for Engineering in Medicine and Biology. Cell, Molecular, and Tissue Engineering Session Keynote. 03/2009.
11. M.S. Hahn. Tissues, Cross-Discipline Research, and Life as a Graduate Student. Annual Undergraduate Research Scholars Program. Texas A&M University. 08/2009
12. M.S. Hahn. Directing Mesenchymal Stem Cell Differentiation Through Biomaterial Properties. TX-UK Stem Cells and Regenerative Medicine Workshop. 09/2009.
13. M.S. Hahn. Programming Mesenchymal Stem Cell Lineage Progression. Department of Biomedical Engineering. Case Western Reserve University. 10/2009.
14. M.S. Hahn. Programming Mesenchymal Stem Cell Lineage Progression. Department of Chemical and Biomolecular Engineering. Ohio State University. 10/2009.
15. M.S. Hahn. Cell Interactions with Designer Collagen-Based Hydrogels. Center for Extracellular Matrix Biology, Institute of Biosciences and Technology. Texas A&M Health Science Center. 11/2009.
16. M.S. Hahn. Dependence of Mesenchymal Stem Cell Behavior on Microenvironmental Stimuli. Department of Chemical Engineering. University of Arkansas. 12/2009.
17. M.S. Hahn. Directing Mesenchymal Stem Cell Lineage Progression. Department of Chemical Engineering. University of Texas-Austin. 03/2010.
18. M.S. Hahn. Title to be announced. Department of Biomedical Engineering. University of Wisconsin-Madison. 04/2010.

## CONFERENCE PRESENTATIONS

1. **M. Hahn**, R. Langer, and S. Zeitels. Tissue Engineering of the Vocal Cord Mucosa. *AICHE Annual Meeting*, San Francisco (2003).
2. **M. Hahn**, R. Langer, and S. Zeitels. Engineering the Vocal Fold Mucosa. *Tissue Engineering Society International*, Orlando (2003).
3. R. Clifton, **M. Hahn**, X. Jia, and T. Jiao. Viscoelastic Response of Vocal Fold Tissues and Scaffolds at High Frequencies. *Symposium on Mechanics of Biological Tissue*. Graz, Austria (2004).
4. **M. Hahn**, B. Teply, M. Stevens, A. Seiminski, S. Zeitels, and R. Langer. Hydrogels for Vocal Fold Restoration. *AICHE Annual Meeting*, Austin (2004).
5. **M. Hahn**, M. McHale, K. Nyugen, J. West. Effects of Pulsatile Flow on Tissue Engineered Vascular Grafts. *Society for Biomaterials Annual Meeting*, Memphis (2005).
6. J. Miller, **M. Hahn**, and J. West. Laser Scanning Lithographic and Soft Lithographic Patterning. *Society for Biomaterials Annual Meeting*, Memphis (2005).
7. R. J. Clifton, X. Jia, T. Jiao, C. Bull, **M. S. Hahn**. Viscoelastic Response of Vocal Fold Tissues and Scaffolds at High Frequencies. *Symposium on Mechanics of Biological Tissue* (2005).
8. **M. Hahn**, J. Miller, J. West. 3D Spatial Patterning of Poly(ethylene glycol) Hydrogels with Bioactive Ligands. *Biomedical Engineering Society Annual Meeting*, Baltimore (2005).
9. **M. Hahn**, J. Miller, J. West. Surface Micropatterning of Poly(ethylene glycol) Hydrogels. *AICHE Annual Meeting*, Cincinnati (2005).
10. M. McHale, **M. Hahn**, J. West. Tunable Hydrogel System for the Development of Tissue Engineered Vascular Grafts. *Society for Biomaterials Annual Meeting*, Pittsburgh (2006).
11. **M. Hahn**, J. West. Biomimetic Microcontrolled Materials for Guiding Cell Migration. *AICHE Annual Meeting*, San Francisco (2006).
12. Y. Hou, **M. Hahn**, M. Grunlan. PDMS<sub>star</sub>-PEO Copolymer Hydrogels. *ACS Regional Meeting* (2006).
13. H. Liao, **M. Hahn**. Scaffold Pore Structure and Mechanical Properties and their Effects on TE Outcome. *Biomedical Engineering Society Annual Meeting*, Chicago (2006).
14. D. Munoz-Pinto, **M. Hahn**. Scaffold Pore Structure and Mechanical Properties and their Effects on TEVG Outcome. *AICHE Annual Meeting*, San Francisco (2006).
15. H. Liao, **M. Hahn**. PEG-Based Hydrogels as Vocal Fold Regeneration Matrices. *AICHE Annual Meeting*, San Francisco (2006).
16. D. Munoz-Pinto and **M. Hahn**. Investigation of the Effects of Defined Biochemical Stimuli on Embryonic Smooth Muscle Progenitor Cell Differentiation. *AICHE Annual Meeting*, Salt Lake City (2007).
17. D. Munoz-Pinto, Y. Hou, M. Grunlan, **M. Hahn**. Novel Inorganic-Organic Hydrogels for Tissue Engineered Vascular Grafts. *AICHE Annual Meeting*, Salt Lake City (2007).
18. X. Qu, M. Grunlan, **M. Hahn**. Modulating Smooth Muscle Cell Response with Novel Tunable Inorganic-Organic Hydrogels. *American Chemical Society*, New Orleans (2008).
19. A.S. Bulick and **M. Hahn**. Novel PDMS-PEO Hydrogels for Tissue Engineered Vascular Grafts. *AICHE Annual Meeting*, Philadelphia (2008).
20. D. Munoz-Pinto and **M. Hahn**. Novel Inorganic-Organic Hybrid Hydrogels for Bone Tissue Engineering. *AICHE Annual Meeting*, Philadelphia (2008).
21. X. Qu and **M. Hahn**. Evoking a Mature SMC Phenotype in Mouse Embryonic Progenitor Cells. *AICHE Annual Meeting*, Philadelphia (2008).
22. M. Kanzelberger, D. Munoz-Pinto, **M. Hahn**. Controlled Exploration of Synergistic Effects of Heterotypic Cell-Cell Interactions and Mechanical Stimulation on Blood Vessel Formation. *Society for Biomaterials*, San Antonio (2009).
23. R. McMahon, A.C. Jimenez-Vergara, **M. Hahn**. The Relative Impact of Scaffold Modulus Versus Applied Strain On Smooth Muscle Cell Behavior. *AICHE Annual Meeting*, Nashville (2009).
24. D. Munoz-Pinto, **M. Hahn**. Relative Influence of Scaffold Bioactivity Versus Modulus On Cell Behavior. *AICHE Annual Meeting*, Nashville (2009).
25. M. Grunlan, B. Bailey, Y. Hou, **M. Hahn**, D. Munoz-Pinto. PDMS<sub>star</sub>-PEG Hydrogels: Fabrication and Use as Tissue Engineering Scaffolds. *Society for Biomaterials*, Seattle (2010).

26. D. Munoz-Pinto, B. Wang, T. Wilems, M-B Browning, E. Cosgriff-Hernandez, J. Rivera, B. Russell, M. Höök, **M. Hahn**. Bioactive Hydrogels based on Collagen-Mimetic Proteins. *Society for Biomaterials*, Seattle (2010).
27. M-B Browning, T. Wilems, **M. Hahn**, and E. Cosgriff-Hernandez. Decoupling PEG Hydrogel Mesh Size and Modulus with the Integration of 4-armed PEG. *Society for Biomaterials*, Seattle (2010).

## RESEARCH FUNDING

### Ongoing Research Support

1. DMR 0955259 Hahn (PI) 02/15/10-02/14/15  
CAREER: Programming Mesenchymal Stem Cell Fate – An Integrated Research and Education Approach  
 Total Award Amount: \$400,000  
 Role: PI
2. AHA 0830102N Hahn (PI) 01/01/08-12/31/11  
National Scientist Development Grant: In vitro Platform for the Systematic Investigation of Scaffold Properties on TEVG Outcome  
 Evaluate the dependence of smooth muscle cell behavior on specific scaffold properties.  
 Total Award Amount: \$308,000  
 Role: PI
3. R03 DC008891 Hahn (PI) 12/01/07-11/31/10  
Tissue Engineering Evaluation of Material Implants for Vocal Fold Restoration  
 Evaluate and compare various hydrogel-based implants for restoration of scarred vocal fold function.  
 Total Award Amount: \$206,658  
 Role: PI
4. R03 DC008891-02S1 Hahn (PI) 08/01/09-07/31/10  
ARRA: Tissue Engineering Evaluation of Material Implants for Vocal Fold Restoration  
 Competitive supplement to parent grant DC008891.  
 Total Award Amount: \$36,625  
 Role: PI
5. R21 HL089964 Hahn, Grunlan (PIs) 08/01/08-07/31/10  
Novel Star-PDMS/PEO Hydrogel Scaffolds with Tunable Properties for TEVG  
 Examine the potential of a novel class of inorganic-organic hybrid scaffolds for vascular graft applications.  
 Total Award Amount: \$376,298; Hahn Amount: \$192,101  
 Role: Joint PI
6. R21 HL089964-01A2S1 Hahn, Grunlan (PI) 08/01/09-07/31/10  
ARRA: Novel Star-PDMS/PEO Hydrogel Scaffolds with Tunable Properties for TEVG  
 Competitive supplement to parent grant HL089964.  
 Total Award Amount: \$90,830  
 Role: Joint PI
7. CBET 0731133 Karaman (PI) 09/01/07-08/31/10  
Design and In-vitro Characterization of Ni-free Biocompatible Shape Memory Alloys  
 Examine the cytotoxicity and corrosion characteristics of TiNb alloys.  
 Total Award Amount: \$414,234; Hahn Amount: \$185,148  
 Role: Co-I
8. CBET 0853668 Goldstein, Hahn (PIs) 09/01/09-08/31/11  
Collaborative Research: Ligament Tissue Engineering  
 Investigate hydrogel-electrospun mesh hybrid scaffolds for ligament tissue engineering.  
 Hahn Award Amount: \$82,500  
 Role: Joint PI
9. DMR 0909170 Karaman (PI) 08/01/09-07/31/11  
Materials World Network: U.S.-Japan Research Collaboration in Meta-Magnetic Shape Memory Alloys with Enhanced Ductility and Controlled Porosity  
 Investigate the cytotoxicity of porous Al-based alloys.



\*students co-authored or to be co-authored on publications due to contributions are italicized

1. Lillian Rodriguez, Spring 2006
2. Caitlin Molloy, Summer 2006
3. Krishna Posim-Reddy, Fall 2007 (completed MS at Brown University)
4. *Matthew Urban, Spring 2007*
5. Carolyn Pearce, Summer 2007 (currently attending UT Galveston Medical School)
6. *Leidy Marcela Gelves, Fall 2007* (completed MS at UIS, Colombia)
7. Sandra Iacob, Fall 2007-Spring 2009 (currently applying to MD-PhD programs)
8. *Diana Ortiz, Spring 2007*
9. Patricia Ramirez, Spring 2007 (currently pursuing a PhD in France)
10. Jason Griffin, Summer 2007
11. *Deissy Cristancho, Fall 2008*
12. Galina Sukhonosova, Spring 2008 (currently pursuing a PhD at Texas A&M)
13. Rohan Parolkar, Summer 2008 (currently applying to PhD programs)
14. *Lynnette Cubero-Ponce, Summer 2008*
15. *Anabel Morales, Summer 2008*
16. *Viviana Guiza-Arguello, Fall 2008* (currently pursuing a PhD at Texas A&M)
17. Brian Wagner, Fall 2008
18. Trevor Tumlinson, Summer 2009 (currently applying to medical school)
19. Bethany Vlaiku, Summer 2009 (currently applying to PhD programs)
20. Robert Rogers, Fall 2009-present

## PROFESSIONAL ACTIVITIES

### Professional Memberships

American Chemical Society (ACS), American Institute of Chemical Engineers (AIChE), American Society of Engineering Education (ASEE), Biomedical Engineering Society (BMES), and Society for Biomaterials (SFB)

### National Committees

|  |           |
|--|-----------|
| AIChE, Area 8b (Biomaterials), 2010 Vice-Chair               | 2009-2010 |
| SFB, Tissue Engineering Special Interest Group Program Chair | 2009-2010 |
| AIChE Women's Initiative Committee, Chair (AIChE)            | 2008-2009 |
| AIChE Women's Initiative Committee, Vice Chair (AIChE)       | 2007-2008 |

### Sessions Chairs

|                      |            |
|----------------------|------------|
| SFB Annual Meeting   | 2009, 2010 |
| AIChE Annual Meeting | 2007-2009  |
| BMES Annual Meeting  | 2006       |

### Journal Reviewer

Reviewed manuscripts for *Advanced Materials*, *Biomaterials*, *Tissue Engineering*, *Biotechnology and Bioengineering*, *Journal of Biomedical Materials Research Part A*, *Annals of Biomedical Engineering*, *Langmuir*, *Journal of Biomedical Materials Research Part B*, *Journal of the Acoustical Society of America*, *Biomacromolecules*, *Journal of Biomechanics*

### Proposal Reviewer

Reviewed proposals for the American Heart Association (AHA), the National Science Foundation (NSF/RAPD), the National Science Foundation (NSF/BMAT), the Petroleum Research Fund (PRF), and the National Institutes of Health (NIH/NIDCD).