

RAMILLE N. SHAH, Ph.D.

Assistant Professor

Departments of Materials Science & Engineering and Surgery, Northwestern University

303 E. Superior St., 10-115 ♦ Chicago, IL 60611 ♦ Phone: 312.503.3931

Email: ramille-shah@northwestern.edu

EDUCATION

- 9/01-6/06 MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA**
Ph.D. in Biomaterials, Department of Materials Science and Engineering
Thesis: *Gene-Supplemented Collagen-Glycosaminoglycan Scaffolds for Nonviral Gene Delivery in Articular Cartilage Tissue Engineering*
Advisor: Myron Spector, Ph.D.
Minor: Business/Management in Biotech/Biomedical Industries
- 9/97-6/00 NORTHWESTERN UNIVERSITY Evanston, IL**
B.S. in Materials Science and Engineering (Specialization in Biomaterials), Cum Laude
Honors Thesis: *Characterization of Poly(L-Lactic Acid) Scaffolds Coated with Cholesteryl(L-Lactic Acid)₂₅ Self-Assembling Biomolecules for Use in Tissue Engineering*
Advisor: Samuel I. Stupp, Ph.D.

EXPERIENCE

- 09/09-present NORTHWESTERN UNIVERSITY Chicago, IL**
Assistant Professor, Materials Science and Engineering (09/09-present)
Assistant Professor, Surgery – Transplant Division (04/12-present)
Assistant Professor, Orthopaedic Surgery (09/09-04/12)
Research Interests: development of new 3D printable functional materials for biomedical and non-biomedical applications, complex tissue and organ engineering, self-assembling biomaterials, mechanical stimulation of cells in scaffolding systems.
- 6/06-08/09 NORTHWESTERN UNIVERSITY Chicago, IL**
Research Assistant Professor, Materials Science and Engineering (3/08-8/09)
Assistant Director for Research, Institute for BioNanotechnology in Medicine (IBNAM) (3/08-8/09)
Postdoctoral Associate (6/06-2/08)
Postdoc Advisor: Samuel I. Stupp, Ph.D.
➤ Developed self-assembling peptide amphiphile gel scaffolds for regenerative medicine and tissue engineering applications (i.e. articular cartilage, bone, and cardiovascular applications).
➤ Discovered novel biopolymer/peptide amphiphile systems that form self-assembling hybrid structures in the form of membranes, sacs, and strings for various biomedical applications.
- 11/01-6/06 MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA**
BRIGHAM AND WOMEN'S HOSPITAL Boston, MA
VA BOSTON HEALTHCARE SYSTEM
➤ Created novel approaches for the development of orthopedic biodegradable implants wedding gene transfer, tissue engineering, and nanotechnology strategies.
- 9/98-9/09 METAL COATINGS TECHNOLOGIES Evanston, IL**
Laboratory Coordinator, Researcher, and Consultant
➤ Optimized the chemical composition and coating procedures for developing an environmentally friendly corrosion resistant protective glass coating on metal substrates.

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9/97-6/00

NORTHWESTERN UNIVERSITY

Evanston, IL

- Established successful procedures to coat polymer scaffolds with unique self-assembling molecules to enhance cell attachment and tissue regeneration.

TEACHING EXPERIENCE

09/12-

Materials Science and Engineering Course at Northwestern University: *Introduction to Materials Science and Engineering Principles* (MSC301, Fall 2012 and 2013).

03/12-

Materials Science and Engineering Course at Northwestern University: *Engineering Strategies in Tissue Engineering and Regenerative Medicine* (MSC372, Spring 2012 and 2013).

03/10

Materials Science and Engineering Course at Northwestern University: *Design of Biomaterials for Tissue Engineering and Regenerative Medicine* (MSC395, Spring 2010).

04/09

Lectured in the Northwestern University Chemical/Bio-Engineering graduate course on: "Self-Assembling Bioactive Nanostructures for Regenerative Medicine."

10/07

Lectured in the Northwestern University Biomaterials graduate course on: "Cell function and differentiation, tissues and cell-matrix interactions, tissue response to injury, and cell-biomaterial interactions."

4/06

Gave guest lectures in the MIT Design of Medical Devices/Implants graduate course on "Biomaterial Scaffolds for Articular Cartilage Tissue Engineering and Regenerative Medicine."

PUBLICATIONS

**Please note the name change from R.M. Capito to R.N. Shah in 2009.*

1. Rutz, A.L., Hyland, K.E., Jakus, A.E., Burghardt W.R., **Shah, R.N.**, "A Tunable Bioink Method for Multi-Material 3D Printing of Cell-Laden Extracellular Matrix Hydrogels" *Advanced Materials* **2014**, (*in press*).
2. Lee, S.S., Hsu E.L., Mendoza, M., Ghodasra, J., Nickoli, M.S., Ashtekar, A., Polavarapu, M., Babu, J., Riaz, T.M., Nicolas, J.D., Nelson, D., Hashmi, S.Z., Kaltz, S.R., Earhart, J.S., Merk, B.R., McKee, J.S., Bairstow, S.F., **Shah, R.N.**, Hsu, W.K., Stupp, S.I., "Gel Scaffolds of BMP-2-Binding Peptide Amphiphile Nanofibers for Spinal Arthrodesis" *Advanced Healthcare Materials* **2014**, (*in press*).
3. Ramji, K., **Shah R.N.**, "Electrospun Soy Protein Nanofiber Scaffolds for Tissue Regeneration" *J Biomaterials Application* **2014**, (*in press*).
4. Chien, K.B., Chung, E.J., **Shah R.N.**, "Investigation of Soy Protein Hydrogels for Biomedical Applications: Materials Characterization, Drug Release, and Biocompatibility" *J Biomedical Materials* **2014**, 28(7), 1085.
5. Chien, K.B., Aguado, B., Bryce, P.J., **Shah R.N.**, "Acute and Humoral Response to Three Dimensional Porous Soy Protein Biomaterial Scaffolds" *Acta Biomaterialia* **2013**, 9(11), 8983.
6. Chung, E.J, Chien, K.B., Aguado, B.A., **Shah, R.N.**, "Osteogenic Potential of BMP-2-Releasing Self-Assembled Membranes" *Tissue Engineering Part A* **2013**, 19(23-24), 2664.
7. Lee, S.S., Huang, B.J, Kaltz, S.R., Sur, S., Newcomb, C.J., Stock, S.R., **Shah, R.N.**, Stupp, S.I., "Bone Regeneration with Low Dose BMP-2 Amplified by Biomimetic Supramolecular Nanofibers within Collagen Scaffolds." *Biomaterials* **2013**, 34(2), 452.

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8. Chung, E.J., Jakus, A.E., **Shah, R.N.**, "In Situ Forming Collagen-Hyaluronic Acid Membrane Structures: Mechanism of Self-Assembly and Applications in Regenerative Medicine" *Acta Biomaterialia* **2013** 9(2), 5153.
9. Chien, K.B., **Shah, R.N.**, "Novel Soy Protein Scaffolds for Tissue Regeneration: Material Characterization and Interaction with Human Mesenchymal Stem Cells" *Acta Biomaterialia* **2012**, 8(2), 694.
10. Murphy, M.B., Blashki, D., Buchanan, R.M., Fan, D., De Rosa, E., **Shah, R.N.**, Stupp, S.I., Weiner, B.K., Simmons, P.J., Ferrari, M., Tasciotti, E., "Multi-Composite Bioactive Osteogenic Sponges Featuring Mesenchymal Stem Cells, Platelet-Rich Plasma, Nanoporous Silicon Enclosures, and Peptide Amphiphiles for Rapid Bone Regeneration" *Journal of Functional Materials* **2011**, 2 (2), 39.
11. **Shah, R.N.**, Shah, N.A., Del Rosario Lim, M.M., Hsieh, C., Nuber, G.W., Stupp, S.I., "Supramolecular Design of Self-Assembling Nanofibers for Cartilage Regeneration" *Proceedings of the National Academy of Science* **2010**, 107, 3293.
12. **Capito, R.M.**, Mata, A., Stupp, S.I., "Self-Assembling Peptide Based Nanostructures for Regenerative Medicine" *Nanotechnology, Volume 5: Nanomedicine*. Weinheim: WILEY-VCH Verlag GmbH & Co. KGaA; **2009**, 385-412.
13. Mata, A., Hsu, L., **Capito, R.M.**, Aparicio, C., Henrikson, K., Stupp, S.I., "Micropatterning of Bioactive Self-Assembling Gels" *Soft Matter* **2009**, 5, 1228.
14. **Capito, R.M.**, Azevedo, H., Velichko, Y., Mata, A., Stupp, S.I., "Self-Assembly of Large and Small Molecules into Hierarchically Ordered Sacs and Membranes" *Science* **2008**, 319, 1812.
15. Xu, X., **Capito, R.M.**, Spector, M., "Delivery of Plasmid IGF-1 to Chondrocytes Via Cationized Gelatin Nanoparticles" *J. Biomed. Mat. Res. A* **2008**, 73A, 73.
16. Xu, X., **Capito, R.M.**, Spector, M., "Plasmid Size Influences Chitosan Nanoparticle Mediated Gene Transfer to Chondrocytes" *J. Biomed. Mat. Res. A* **2008**, 84A, 1038.
17. Gotterbarm, T., Niska, J., Capito, R.M., Vickers, S.M., Spector, M., "P115 IGF-1 Gene-Supplemented Type II Collagen Scaffolds for Mesenchymal Stem Cell-Driven Chondrogenesis In Vitro" *Osteoarthritis and Cartilage* **2007**, 15(2), B116.
18. **Capito, R.M.** and Spector, M., "Collagen Scaffolds for Nonviral IGF-1 Gene Delivery in Articular Cartilage Tissue Engineering" *Gene Therapy* **2007**, 14, 721.
19. Capito, R.M. and Spector, M., "Effect of Expansion Medium on Ex Vivo Gene Transfer and Chondrogenesis in Type II Collagen-Glycosaminoglycan Scaffolds In Vitro" *Osteoarthritis and Cartilage* **2007**, 14, 1203.
20. Steinert, A.F., Palmer, G.D., Capito, R.M., Hofstaetter, J.G., Pilapil, C., Ghivizzani, S.C., Spector, M.S., Evans, C.H., "Genetically Enhanced Engineering of Meniscus Tissue Using Ex Vivo Delivery of Transforming Growth Factor-b1 Complementary Deoxyribonucleic Acid" *Tissue Engineering* **2007**, 13, 2227.
21. Kinner, B., **Capito, R.M.**, and Spector, M., "Regeneration of Articular Cartilage" *Adv. Biochem. Engin./Biotechnol.* **2005**, 94, 91.
22. **Capito, R.M.** and Spector, M., "Scaffold-Based Articular Cartilage Repair: Future Prospects Wedding Gene Therapy and Tissue Engineering" *IEEE Eng. Med. Biol.* **2003**, 22, 42.

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PATENTS

1. **Capito, R.M.**, Azevedo, H., Stupp, S.I. "Self-Assembling Membranes and Related Methods Thereof" (12/031,421). Northwestern University, issue date August 2013.
2. **Shah, R.N.**, Shah N.A., Stupp, S.I. "Peptide-Based Scaffolds for Cartilage Regeneration and Methods for Their Use" (US8450271). Northwestern University, issue date May 2013.
3. Jennings, H., **Capito, R.M.**, and Thomas, J.J. "Protective Coatings for Metals" (US8173221). Metal Coating Technologies, LLC, issue date May 2012.

Invention Disclosures/Provisional and Non-Provisional Patents

1. **Shah, R.N.**, Jakus, A, Hersam, M., Secor, E.B. "High-Content Graphene Ink Compositions and Related Composites" – Provisional patent submitted October 15, 2014.
2. **Shah, R.N.**, Rutz, A.L. "Poly(Ethylene glycol) Cross-Linking of Soft Materials to Tailor Viscoelastic Properties for Bioprinting" – Non-provisional patent filed September 25, 2014.
3. **Shah, R.N.**, Jakus, A., Jaycox, K. "Method for Fabricating Soft and Hard Lunar, Martian, and Additional Soil-Based 3D-Objects via 3D-Printing" – Invention disclosure submitted September 15, 2014.
4. **Shah, R.N.** and Jakus, A. "Ceramic-Containing Bioactive Inks and Printing Methods for Tissue Engineering Applications" – Non-provisional patent application submitted August 2, 2014.
5. **Shah, R.N.** Jakus, A, Dunand D. "Methods for Fabricating Three-Dimensional Metallic Objects via Additive Manufacturing Using Metal Oxide Pastes" –Non-provisional patent application submitted August 1, 2014.
6. **Shah, R.N.** and Jakus, A. "Ink Compositions for Three-Dimensional Printing and Methods of Forming Objects Using the Ink Compositions" – Provisional patent application submitted May 15, 2014.
7. Laronda, M., Rutz, A.L., **Shah, R.N.**, Woodruff, T.K. "3D Printed Artificial Ovary" – Invention disclosure submitted April 3, 2014.
8. Laronda, M., Jakus, E., Wertheim, J., **Shah, R.N.**, Woodruff, T.K. "Decellularized Ovary" – Invention disclosure submitted April 1, 2014.
9. **Shah, R.N.**, Chien, K.B, Sundaresan, K. "Soy Protein Containing Porous Materials" – Non-provisional patent application filed November 14, 2013.
10. **Shah, R.N.** and Chung-Yoo, E. "Self-Assembling Collagen-Hyaluronic Acid Membranes as Tissue Adjuncts (Bioactive Coatings) for Enhanced Regeneration" – submitted March 2012.

PRESENTATIONS

INVITED TALKS

1. **Shah, R.N.**, "3D Printable Biomaterials: New Advances and Future Promise" *Simpson Querrey Institute for Bionanotechnology Seminar*, Chicago, IL, Nov 2014.
2. **Shah, R.N.**, "Hyperelastic Bone: A New Class of Osteogenic Bone Substitute Scaffolds Enabled Through 3D Printing" *American Association for Dental Research/Chicago Section Seminar*, Chicago, IL, July 2014.
3. **Shah, R.N.**, "New Advances in Biomaterials for 3D Printing of Artificial Organs and Tissues" *Transplant Research (NUCTRIBE) Seminar*, Northwestern University, Chicago, IL, June 2014.

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4. **Shah, R.N.**, “Expanding the Material Toolbox for 3D Printing: From Medicine to Energy Applications” *Materials Science and Engineering Advisory Board Meeting*, Northwestern University, Chicago, IL, May 2014.
5. **Shah, R.N.**, Keynote Address: “3D Printing Bioartificial Tissues and Organs: Integrating a Tissue Engineering and Additive Manufacturing (TEAM) Approach in Research and Education” *Biotechnology Symposium: Brining Biotech from Bench to the K-12 Classroom*, Northwestern University, Chicago, IL May 2014.
6. **Shah, R.N.**, “Tissue Engineering and Additive Manufacturing (TEAM) Lab” *Masters in Biotechnology Program*, Northwestern University, Chicago, IL November 2013.
7. **Shah, R.N.**, “A Near Universal Technique for Fabricating Complex, Ordered, and Functional 3D Structures Via 3D Printable Particle-Based Inks” *Northwestern-Argonne Meeting*, Northwestern University, Chicago, IL September 2013.
8. **Shah, R.N.**, “The Use of 3D Bioplotting Scaffolds and Ultrasonic Stimulation for Tissue Engineering” *Oral Biology Legacy Centennial Conference*, University of Illinois at Chicago, Chicago, IL June 2013.
9. **Shah, R.N.**, “3D Printing of Biomaterial Scaffolds for Tissue Engineering” *NU/CDI/IBNAM-CRN International Workshop – Building a Kidney*, Northwestern University, Chicago, IL April 2013.
10. **Shah, R.N.**, “Elucidating Optimal 3D Bioplotting Scaffold Parameters for Enhancing the Viability, Growth, and Function of Mature and IPS Cell-Derived Hepatocytes” *Comprehensive Transplant Center Seminar – Northwestern University*, Chicago, IL, July 2012.
11. **Shah, R.N.**, “Ultrasound Stimulation of Cells in 3D Scaffolds” *Alumni Association – Northwestern University*, Evanston, IL, March 2012.
12. **Shah, R.N.**, “Soy-Based Biomaterials for Tissue Engineering and Regenerative Medicine” *Bio Interest Group Seminar, Mechanical Engineering Department – University of Illinois*, Urbana, IL, March 2012.
13. **Shah, R.N.**, “3D Printing of Composite Materials for Tissue Engineering Applications” *Cellgene*, Warren, NJ, October 2011.
14. **Shah, R.N.**, “New Biomaterial Strategies in Orthopaedic Tissue Engineering and Regenerative Medicine” *Biomedical Engineering Seminar – Northwestern University*, Evanston, IL, January 2011.
15. **Shah, R.N.**, “New Frontiers in Orthopaedic Tissue Engineering and Regenerative Medicine” *Orthopaedic Surgery Grand Rounds – University of Texas Medical School*, Houston, TX, October 2009.
16. **Shah, R.N.**, “Tissue Engineering and Regenerative Medicine Strategies for Articular Cartilage Regeneration” *Covidien*, North Haven, CT, April 2009.
17. **Capito, R.M.**, “Self-Assembling Nanostructures for Regenerative Medicine” *Minisymposium on Stem Cell Biology and Regenerative Medicine*, Chicago, IL, April 2009.
18. **Capito, R.M.** and Stupp, S.I., “Bioactive Nanostructures for Regenerative Medicine” *2009 Annual Meeting of the American Association for the Advancement of Science*, Chicago, IL, February 2009.
19. **Capito, R.M.**, “Self-Assembling Peptide Amphiphile (PA) Systems for Regenerative Medicine” *Institute for Bioengineering of Catalonia*, Barcelona, Spain, June 2008. **Capito, R.M.**, “Self-Assembling Peptide Systems for Regenerative Medicine” *Johns Hopkins University*, Baltimore, MD, June 2008.
20. **Capito, R.M.**, “Self-Assembling Peptide Systems for Regenerative Medicine” *Rice University*, Houston, TX, March 2008.

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21. **Capito, R.M.**, "Self-Assembling Peptide Amphiphiles for Articular Cartilage Regeneration" *Göteborg University Institute of Laboratory Medicine & Department of Clinical Chemistry and Transfusion Medicine*, Gothenburg, Sweden, March 2008.

CONFERENCES/MEETINGS

22. Jakus A.E., Jordon S.W., **Shah, R.N.**, "3D-Printing Enabled Osteogenic Hyperelastic Bone Substitute" *TERMIS Americas Annual Conference and Exposition*, Washington, DC, December 2014.
23. Jordan, S.W., Xu, W., Jakus, A.E., Chavez-Munoz, C., Hong, S.J., Mustoe, T.A., **Shah, R.N.**, Galiano, R.D., "Negative Pressure-Assisted Decellularization of Skeletal Muscle For Regenerative Surgery". *TERMIS Americas Annual Conference and Exposition*, Washington, DC, December 2014.
24. Laronda, M.M., Rutz, A.L., Jakus, A.E., Xiao, S., Whelan, K.A., Wertheim, J.A., **Shah, R.N.**, Woodruff, T.K., "Ovarian Follicles Develop and Ovulate within a Bioengineered Artificial Ovary" *TERMIS Americas Annual Conference and Exposition*, December 2014.
25. **Shah, R.N.**, Jakus, A.E., "3D-Printable Particle Laden Inks: A New Class of Materials for Biological, Energy, and Advanced Structural Applications" *Materials Research Society*, Boston, MA, Nov 2014.
26. Jakus, A.E., Secor, E.B., Rutz, A.L., Jordan, S.W., Hersam, M.C., **Shah, R.N.**, "3D-Printed Graphene Structures: Electrical and Biological Properties" *Materials Research Society*, Boston, MA, Nov 2014. 2014.
27. Jakus, A.E., Rutz, A.L., Jordan, S.W., **Shah, R.N.**, "3D-Printing Enabled Osteogenic Hyperelastic Bone Substitute" *Materials Research Society*, Boston, MA, Nov 2014.
28. Jakus, A.E., Taylor, S.L., Dunand, D.C., **Shah, R.N.**, "3D-Printed Metal and Alloys: An Oxide Ink and Thermochemical Reduction Approach" *Materials Research Society*, Boston, MA, Nov 2014.
29. Jakus, A.E., Gao, Z., Barnett, S.A., **Shah, R.N.**, "3D-Printed Solid Oxide Fuel Cells From High Particle Content Liquid Inks" *Materials Research Society*, Boston, MA, Nov 2014.
30. Laronda, M.M., Jakus, A.E., Whelan, K.A., **Shah, R.N.**, Woodruff, T.K., "Engineered endocrine organ transplant utilizing a decellularized ovary scaffold" *16th International Congress of Endocrinology*, June 2014.
31. **Shah, R.N.**, Jakus, A.E., Rutz, A.L., "Hyperelastic Osteogenic Bone Substitute Scaffolds Enabled Through 3D Printing" *RAPID Conference*, Detroit, MI, June 2014.
32. **Shah, R.N.**, Jakus, A.E., Rutz, A.L., "Hyperelastic Osteogenic Bone Substitute Scaffolds Enabled Through 3D Printing" *World Biomaterials Conference*, Denver, CO, April 2014.
33. Xu, W., Zhong, A., Jakus, A.E., Jia, S., Xie, P., Chavez-Munoz, C., Hong, S.J., **Shah, R.N.**, Galiano, R., Mustoe, T.A., "Application of a Three Dimensional Human Keratinocyte-Fibroblast Cell Culture Model in the Study of Cutaneous Wound Healing" *Wound Heal Society Meeting*, Orlando, FL April 2014,
34. Rutz, A.L., **Shah R.N.**, "A Cross-linking Technique for Rapid Prototyping of 3D Micropatterned Cell-Laden Hydrogels" *Biomedical Engineering Society 2013 Annual Meeting*, Seattle, WA, September 2013.
35. Rutz, A.L., **Shah, R.N.**, "Extrusion-based Rapid Prototyping 3D Micropatterned Hydrogels for Tissue Engineering" *John E. Hilliard Symposium*, Evanston, IL, May 2013.
36. Jakus, A.E., **Shah R.N.** "From Medicine to Energy: 3D-Printing-Enabled Materials from Particle-Laden Inks" *2014 NU Materials Science and Engineering Annual Hilliard Symposium*, Evanston, IL, May 2014.

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37. Jakus, A.E., **Shah R.N.** "3D-Printed Hyperelastic Bone for Hard-Tissue Engineering Applications" *2014 NU Materials Science and Engineering Annual Hilliard Symposium*, Evanston, IL, May 2014.
38. Jakus, A.E., Rutz, A.L., **Shah R.N.**, "Custom Design and Fabrication of 3D-Scaffolds: Everything From Living Gels to Novel Composites and Metals" *Northwestern University's First 60th Anniversary Class Reunion*, Evanston, IL, October 2013.
39. Jakus, A.E., Yoo S.C., **Shah, R.N.**, "3D-Printed Bioactive and Mechanically Resilient Hydroxyapatite Composite Scaffolds" *1st Annual Northwestern Post-Doctoral Forum*, Evanston, IL, September 2013.
40. Jakus, A.E., Yoo S.C., **Shah R.N.**, "3D-Printed Elastic Hydroxyapatite Scaffolds for Osteochondral Tissue Engineering Applications" *UIC Centennial Oral Biology Conference*, Chicago, IL, June 2013.
41. Jakus, A.E., Rutz, A.L., **Shah, R.N.**, "Bioplotted 'Elastic' Hydroxyapatite-Based Tissue Engineering Scaffolds" *TMS Pacific Rim International Conference on Materials*, Waikoloa, HI, August 2013.
42. Jakus, A.E., **Shah, R.N.**, Dunand, D.C., "Bioplotted Metals and Alloys: A Near Universal Technique For Fabricating Ordered Scaffolds" *TMS Pacific Rim International Conference on Materials*, Waikoloa, HI, August 2013.
43. Jakus, A.E., **Shah, R.N.**, "A Single Platform 3D-Printing Approach for Fabricating Tissue Engineering Bio Scaffolds from Multiple Material Systems". *2013 NU Materials Science and Engineering Annual Hilliard Symposium*, Evanston, IL, May 2013.
44. Chien, K., Jakus, A.E., **Shah, R.N.**, "3D Transdifferentiation of Human Mesenchymal Stem Cells into Hepatocyte-Like Cells Using Bioprinted Scaffolds" *Biomaterials Conference*, Boston, MA, April 2013.
45. **Shah, R.N.**, Rutz, A.L., Jakus, A.E., and Chien, K.B., "Viability and Function of Induced Pluripotent Stem (IPS) Cell-Derived Hepatocytes on Bioprinted Gelatin Scaffolds" *Biomaterials Conference*, Boston, MA, April 2013.
46. Rutz, A.L., Jakus, A.E., Chien K.B., **Shah, R.N.**, "Bioprinted Gelatin Hydrogels for Liver Tissue Engineering" *Northwestern University Biotechnology Day*, Evanston, IL, October 2012.
47. Jakus, A.E., **Shah, R.N.** "Ultrasonically Stimulated Microporous Soy Scaffolds for Tissue Regeneration," *Tomographers Anonymous*, Evanston, IL, October 2011.
48. Chien, K. and **Shah, R.N.**, "Novel Porous Soy Protein Scaffolds Support Human Mesenchymal Stem Cell Viability and Proliferation" *Materials Research Society Conference*, San Francisco, CA, April 2011.
49. Chien, K. and **Shah, R.N.**, "Effect of Chemical and Enzymatic Crosslinking of Novel Porous Soy Protein Scaffolds on Human Mesenchymal Stem Cell Morphology and Growth" *Society for Biomaterials Conference*, Orlando, FL., April 2011.
50. **Capito, R.M.** and Stupp, S.I., "Bioactive Nanostructures for Regenerative Medicine" *Tissue Engineering and Regenerative Medicine Conference*, San Diego, CA, December 2008.
51. **Capito, R.M.**, Shah, N.A., Gordan, N., and Stupp, S.I., "Self-Assembling Peptide Amphiphiles for Articular Cartilage Regeneration" *Tissue Engineering and Regenerative Medicine International Society Conference*, Porto, Portugal, June 2008. Selected for the "**50 Best Abstracts Award.**"
52. **Capito, R.M.**, Azevedo, H.S., Velichko, Y., Mata, A., and Stupp, S.I., "Self-Assembly of Biomaterials at an Interface: Formation of Sacs, Membranes, and Strings" *8th World Biomaterials Congress*, Amsterdam, The Netherlands, May 2008.

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53. **Capito, R.M.** and Stupp, S.I., "Regenerative Scaffold Technologies for Central Nervous System and Diabetes" *NIH Bioengineering Research Partnership PI Meeting*, Bethesda, MD, July 2007.
54. **Capito, R.M.** and Stupp, S.I., "Nanotechnology for Regenerative Medicine and Cancer Therapies" *Pfizer Meeting*, Northwestern University, Evanston, IL, June 2007.
55. **Capito, R.M.** and Spector, M., "Collagen Scaffold-Based IGF-1 Gene Delivery Incorporating Transfection Enhancers: Lipid Transfection Reagents and Gelatin Nanoparticles" *Annual Orthopedic Research Society Conference*, San Diego, CA, February 2007.
56. **Capito, R.M.** and Spector, M., "Localized and Prolonged IGF-1 Expression by Non-Viral Gene Transfer to Chondrocytes Via Type II Collagen Scaffolds In Vitro" *International Cartilage Repair Society Conference*, San Diego, CA, January 2006.
57. **Capito, R.M.** and Spector, M., "Nonviral IGF-1 Gene Transfer to Chondrocytes Via Type II Collagen Scaffolds for Localized and Prolonged Expression in Cartilage Tissue Engineering" *Tissue Engineering Society International Conference*, Shanghai, China, October 2005.
58. **Capito, R.M.** and Spector, M., "Nonviral IGF-1 Gene Transfer to Chondrocytes In Vitro Using Type II Collagen Scaffolds" *International Cartilage Repair Society Conference*, Gent, Belgium, May 2004.
59. **Capito, R.M.** and Spector, M., "Effects of Selected Growth Factors on Monolayer Expansion of Adult Canine Articular Chondrocytes and Subsequent Growth in Type II Collagen-Glycosaminoglycan Matrices In Vitro" *7th World Biomaterials Congress*, Sydney, Australia, May 2004.
60. **Capito, R.M.**, Palmer, G., Ghivizzani, S., Spector, M., "IGF-1 Gene-Supplemented Collagen Scaffolds Enhance IGF-1 Synthesis by Chondrocytes" *Annual Orthopedic Research Society Conference*, San Francisco, CA, March 2004.

AWARDS and ASSOCIATIONS

Crain's Chicago Business 40 Under 40 (December 2014)
Center for Regenerative NanoMedicine Grant Awardee (August 2013)
Mark Pescovitz Memorial Grant Awardee (August 2012)
Scientist of the Month – Association for Women in Science, Chicago Chapter (October 2011)
Northwestern Alumnae Gift Awardee (August 2011)
American Society for Engineering Education Fellow (MIT), 2001-2004
Society for Biomaterials
Tissue Engineering and Regenerative Medicine International Society
Association for Women in Science, *President of Outreach* (2010-2012)
Society for Women Engineers

SYNERGYSTIC ACTIVITIES

- 10/14** Developed and executed a Science Café workshop at the Chicago Museum of Science and Industry on *3D Printing of Materials*.
- 10/14** Participated in strategic planning breakout session on Clean Manufacturing during the Institute for Sustainability and Energy at Northwestern (ISEN) semiannual Executive Council meeting.
- 07/14** Developed and taught a new Center for Talent Development Equinox highschool course, "Engineering Strategies in Tissue Engineering and Regenerative Medicine", Summer 2014.
- 06/10-07/12** Member of the Program Planning Committee for the *Women in Science Symposium in 2012*.

RAMILLE N. SHAH, Ph.D.

Assistant Professor

Departments of Materials Science & Engineering and Surgery, Northwestern University

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- 01/10-09/12** Served as the Vice President for Outreach in the Association for Women in Science – Chicago Chapter.
- 10/11** Co-organized symposium entitled, “Mechanics of Mineralized Tissues and Implants” for the *48th Annual Technical Meeting of Society of Engineering Sciences 2011*.
- 03/11** Participated as a Special Awards judge for the Association for Women in Science – Chicago Chapter at the *61st Annual Chicago Public School Student Science Fair* held at the Museum of Science and Industry.
- 10/10** Lectured in a *Continuing Adult Education Program* course sponsored by Northwestern’s Alumnae Board on “Nanotechnology in Medicine”.
- 06/10** Participated in a panel for Science Careers in the *Opportunities for the Future Conference* sponsored by Northwestern’s Center for Talent Development.
- 04/10** Gave invited talk at the *Women in Science Symposium 2010: Building an Identity Program* sponsored by Women in Science and the Chicago Council on Science and Technology.
- 03/10** Developed a new Materials Science and Engineering course in “Design of Biomaterials for Tissue Engineering and Regenerative Medicine”, Spring 2010.
- 02/10** Participated in the *39th Annual Career Day for Girls*, an outreach event to promote female student interests in science and engineering sponsored by Northwestern’s McCormick School of Engineering.

SERVICE

- 06/14** Reviewer for the NIH Skeletal Biology Structure and Regeneration study section (grant review meeting 6/12/14-6/13/14)
- 06/14** Reviewer for the Office for Research’s Spring 2014 Equipment Proposal competition
- 02/13** Reviewer for the NSF Biomaterials Panel (grant review meeting 2/25/13-2/26/13)
- 05/12** Reviewer for the PESO NSF-NCI Panel (grant review meeting 5/29/12-5/31/12)
- 2013-pres** Member of the Committee on Animal Resources (CAR)
- 2012-pres** Member of the editorial board for the journal *Organogenesis*
- 2012-pres** Materials Science Undergraduate Advisor
- 2011-pres** Chair of MSE Undergraduate Recruiting Committee
- 2011-pres** Faculty Advisory Committee for Advancing the Biophysical and Biochemical Sciences
- 2010-pres** Biotechnology Training Program Steering Committee
- 2010-pres** Simspson Querrey Institute (SQI) for BioNanotechnology Executive Committee
- 2009-pres** SQI Faculty Advisor of the Core Facilities
- 2009-12** NuFab Advisory Committee
- 2010-12** Scientific Grant Committee – Orthopaedic Surgery Department (NU)
- 2010-11** McCormick Freshman Advisor
- 2009-10** Materials Science & Engineering (MSE) graduate admissions committee
- 2009** Member of qualifying committee for Matt Duch, “Structure, Properties, and Processing of Biofunctionalized Carbon Nanotubes” (Mark Hersam Lab)

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RESEARCH SUPERVISION

Postdoctoral Fellows:

Eunji Chung-Yoo (2011-2012)
Karpagavalli Ramji (2009-2012)

Graduate Students:

Jimmy Su
Alexandra Rutz
Shannon Taylor
Phillip Lewis
Jonathan Rosini
Sungsoo (Seth) Lee (graduate PhD December 2014)
Adam Jakus (graduate PhD December 2014)
Mark Enselmen (graduate MS June 2014)
Karen Chien (graduate PhD March 2013)
An-Tu Xie (graduate MS 2011)
Mayank Vijayvergia (graduate MS 2011)

Undergraduate Students:

Nicholas Geisendorfer
Aalap Herur-Raman
John Jeevarajan
Katie Jaycox
Kelly Hyland
Christopher Lee
Vikram Kalkarni
Sung Chan Yoo
Emmanuella Makridakis
Divya Kathuria
Alex Evanoff (Graduated June 2013)
Mirasbek Kuterbekov (Graduated June 2013)
Siddarth Dalta (Spring 2011)
Rachel Edwards (Graduated June 2011)
Wang Sheng (Summer 2011)
Justin Liu (Graduated June 2011)
Alexandra Davis (Graduate June 2010)

Medical School Students:

Adam Edelstein
Thomas (TJ) Smith (Summer 2011)

High School Students:

Nilesh Kavthekar (2009-2011)

GRADUATE STUDENT COMMITTEES

Linda Guiney
Min Zhang
Ethan Secor

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Emilie Campbell

Nikhita Mansukhani

Kayla Culver

Sungsoo Lee (November 2014)

Catherine Tupper (May 2014)

Ching-Hsuan Wu (October 2013)

Christina Newcomb (December 2012)

Stuart Kaltz (Masters - October 2010)