Matthew D McDermott

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Education

Interdisciplinary Biomedical Sciences Graduate Program **2010- Present**
College of Veterinary Medicine and Biomedical Engineering,
Weldon School of Biomedical Engineering
Purdue University, West Lafayette, IN
GPA 3.67

B.S. Degree in Biochemistry (ACS), Biology Minor **2003 – 2007**
Purdue University, West Lafayette, IN
Graduated with Honors
GPA 3.42

Research Fellowships and Educational Awards

- Magoon Teaching Assistant Award **2014**
- Committee for the Education of Teaching Assistants (CETA) Teaching Award **2012**
- Lynn Fellowship **2010**
- Margerum Award Winner for outstanding undergraduate research in Chemistry **2007**
- Summer Undergraduate Research Fellowship (SURF) **2006**
- R.S. Tobias Merit Scholarship **2005**
- School of Science Alumni-Outstanding Achievement Award **2004, 2005**

Teaching Assignments

- GTA BME 488,489—Preliminary Senior Project Design , Senior Design Project Lab **F '12, F'13**
- GTA BME 489—Senior Design Project Lab **S'13**
- GTA BME 206— Biomechanics and Biomaterials Lab **S '12, S '14**
- GTA BME 205—Analytical Methods for Biomolecular and Cellular Systems **F '11**

Leadership and Mentorship

- President BMEGSA (Biomedical Engineering Graduate Student Association) **2013- Present**
- Graduate Student Representative BMEGSA **2012-2013**
- Second Year Representative BMEGSA **2011-2012**
- First Year Representative BMEGSA **2010-2011**
- SROP (Purdue Summer Research Opportunities Program) Mentor **2007, 2011**
- Undergraduate Research Mentor **2010 –2014**

Professional Experience

Visiting Scholar, University of Florida Gainesville, FL **2014-Present**
- Graduate Student Researcher
- Lab Purchasing Officer
- Lab Safety Manager

Technical Advisor, Samyang Inc. Daejeon, Korea **2010**
- Demonstrated proper fabrication technique
- Provided technical support in fabrication
- Addressed problems concerning fabrication and purification

Research Scientist, Akina Inc. **West Lafayette, IN** **2008 –2010**

- Developed hydrogel template strategy to produce homogeneous micro/nano constructs for drug delivery
- Microfabricated micro/nano features on silicon wafers by photolithography
- Studied the drug release kinetics from drug loaded PLGA micro/nano particles by HPLC
- Presently studying the tumor cell uptake of nanoparticles by confocal fluorescence imaging
- New employee training and materials management

Laboratory Technician **West Lafayette, IN** **2007- 2008**

Advisor: Prof. Suresh Mittal
Department of Comparative Pathobiology, Purdue University

- Cell Culture of MBK, PK1, and HE1 Cell lines
- Harvest of membrane bound and internal proteins for analysis *via* VOPBA and Western Blot
- PAd3 infection inhibition studies of PK1 Cells
- Preparation of Minimum Essential Medium (MEM), Phosphate Buffered Saline (PBS), and trypsin solutions

Undergraduate Researcher **Purdue University** **2004 –2007**

- Advisor: Prof. David H. Thompson
- Department of Organic Chemistry, Purdue University
- Synthesized B-Cyclodextrin (BCD) monoamine library, BCD-monothiols, and PEG-(NH2)2 polymer chains
- Formulated BCD-monoamine Pseudo-rotaxanes for DNA/RNA delivery studies
- Formulated BCD-monothiol Pseudo-rotaxanes for Gold-HIS microparticle adhesion studies
- Synthesized materials characterized by NMR, IR, UV, and Mass Spectrometry
- Purification *via* HPLC, Flash Column and Ion Exchange Chromatography

Research Publications

1. **McDermott**, Zhang, and Otto. Improving the Brain Machine Interface Via Multiple Tetramethyl Orthosilicate Sol-Gel Coatings on Microelectrode Arrays. *Proceedings of the 7th International IEEE EMBS Conference on Neural Engineering,* 2015.

2. Ghanashyam Acharya, **Matthew McDermott**, Soo Jung Shin, Haesun Park, Kinam Park, "Hydrogel Templates for the Fabrication of Homogeneous Polymer Microparticles." Chapter in Biomedical Nanotechnology (Methods in Molecular Biology Series), Sarah J. Hurst, Ed. Springer, **2011.**

3. Ghanashyam Acharya, Crystal S. Shin, **Matthew McDermott**, Himanshu Mishra, Haesun Park, Ick Chan Kwon, and Kinam Park. "The Hydrogel Template Method for Fabrication of Homogeneous Nano/Micro Particles" *J. Control. Rel*. **2010**, *141*, 314.
4. Ghanashyam Acharya, Crystal S. Shin, Kumar Vedantham, **Matthew McDermott**, Thomas Rish, Keith Hansen, Yurong Fu, and Kinam Park, "A Study of Drug Release from Homogeneous PLGA Microstructures" *J Control Rel.* **2010**. 146, 201.

Oral Presentations

1. **Matthew McDermott,** Johnny Zhang, Kevin Otto. "The Effect of Multiple Thin-Film Coatings of Tetramethyl Orthosilicate upon Brain-Implanted Microelectrode Array Performance." Materials Research Symposium Annual Meeting, April 24, **2014**.

Poster Presentations

1. McDermott, Zhang, and Otto. Improving the Brain Machine Interface Via Multiple Tetramethyl Orthosilicate Sol-Gel Coatings on Microelectrode Arrays. 7th International IEEE EMBS Conference on Neural Engineering, Montpellier, France Apr **2015**.

2. Lee, H. C., Gaire, J., **McDermott, M. D.**, Zhang, J., & Otto, K. J. Improving the Performance of Intracortical Microelectrodes via Structural Modifications and Biochemical Intervention Strategies. BMES Annual Meeting. Oct **2014**.

3. **Matthew D McDermott**, Anna Filley, Kevin J Otto. "A Sol-Gel Model for Protein Delivery from the Surface Microelectrodes" Society for Biomaterials Annual Meeting, Denver, CO. April 16, **2014**.

4. Janak Gaire, **Matthew D McDermott**, Salah Sommakia, Andrew Ready, Hugh Chang Lee, K. J. Otto. "PEG and TMOS Coatings for Mitigation of the Foreign Body Response to Neural Interfaces." Darpa Meeting, Phoenix, AR. Feb 12, **2014**.

5. **Matthew McDermott**, Emile Vieta, Kevin Otto. "Controlled Release to Manipulate Foreign Body Response."Poster presentation at 2012 Sigma Xi Graduate Student Research Awards Competition Poster Session, Purdue University, Feb 14, **2012**.

6. Emile Vieta, **Matthew McDermott**, and Kevin Otto. "Elution and Structural Studies on Tetramethyl Orthosilicate Gels as Coatings for Neural Microelectrode Arrays." Poster presentation at Annual Biomedical Research Conference for Minority Students (ABRCMS); St. Louis, Mo. Nov. 9-12, **2011**.

7. Matthew McDermott, Michael Xavier, and Kevin Otto, " TMOS sol-gel films for drug delivery over the microelecrode/brain interface." Interdisciplinary Graduate Program (IGP) Spring Reception, Purdue University, April 20, **2011**.

8. Matthew McDermott, Crystal S. Shin, Ghanashyam Acharya, and Kinam Park. "Fabrication of homogeneous drug delivery systems via hydrogel template strategy." 7th International Nanomedicine and Drug Delivery Symposium (NanoDDS'09), Indianapolis, October 5-6, **2009**.

9. Thomas Rish, **Matthew McDermott**, Crystal S. Shin, Keith Hansen, Kyle Amick, Ghanashyam Acharya, and Kinam Park. "Hydrogel template strategy for the fabrication of microstructures of complex geometries." 7th International Nanomedicine and Drug Delivery Symposium (NanoDDS'09), Indianapolis, October 5-6, **2009**.

10. Crystal S. Shin, Thomas Rish, Keith Hansen, **Matthew McDermott**, Sarah Skidmore, Yourong Fu, Ghanashyam Acharya, and Kinam Park. "Fabrication of homogeneous drug delivery systems with controlled release kinetics." 7th International Nanomedicine and Drug Delivery Symposium (NanoDDS'09), Indianapolis, October 5-6, **2009**.

11. Ghanashyam Acharya, **Matthew McDermott**, Crystal S. Shin, Kyle Amick, and Kinam Park. "Fabrication of multifunctional drug delivery devices." BME Op Open House, Purdue University, February 20, **2009**.