Thomas J. Mullen III

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Education

The Pennsylvania State University, University Park, PA, Ph.D. in Chemistry, graduated August 2008
Thesis Advisor: Paul S. Weiss, Thesis Title: Nanoscale Self- and Directed Assemblies

University of Florida, Gainesville, FL, B.S. in Chemistry, S*umma cum Laude*, graduated May 2003
Thesis Advisor: Kevin Powers, Thesis Title: Synthesis and Characterization of High-Aspect-Ratio Au Platelets

Research Experience

Postdoctoral Researcher, University of California-Davis, 2008-present

Working with Prof. Gang-yu Liu, I am investigating methodologies to characterize surface structures and chemistries related to biochemical signaling and cellular behavior.

Graduate Research Assistant for the Department of Chemistry, Penn State University, 2003-2008

Working with Prof. Paul S. Weiss, I developed novel self- and directed assembly strategies to increase the sophistication and to enhance the precision of chemical patterning techniques.

Research Intern for the Office of Navy Research, Naval Research Laboratory, 2002-2003

Working with Dr. Kathryn J. Wahl, I employed new methodologies and custom analyses extending nanoindentation to measure and to understand dynamic mechanical properties of thin film polymers and adhesives.

Undergraduate Research Assistant for Particle Engineering Research Center, University of Florida, 2001-2003

Working with Dr. Kevin W. Powers, I synthesized macroscopic high-aspect-ratio gold platelets via solution, sol-gel, and surfactant chemistries and characterized them utilizing optical microscopy and spectroscopy techniques.

Activities

Graduate Think Tank Member, Penn State University, 2005-2006

The "graduate think tank" is a committee, which works with faculty to improve the quality of the graduate chemistry experience. We discussed and evaluated various aspects of the current graduate program including recruitment, orientation, and course requirements and suggested improvements in these areas.

Laboratory Renovation Coordinator, Penn State University, 2004-2008

I spearheaded a complete renovation of our laboratory research space. This included designing the layout of 15 individual laboratories (four of which are new) to accommodate current and future research projects, collaborating with vendors to acquire cabinetry, desks, and other equipment, communicating with university staff to set up facilities such as internet and phones, and managing the move of laboratory equipment from the old to the new laboratory space.

Teaching Assistant for Problem Solving in General Chemistry, Penn State University, 2003

I developed lesson plans and taught lectures for a problem solving course complementary to the general chemistry course offered at Penn State. This course allowed me to develop and to adapt lesson plans, which fit my extroverted personality.

Instructor for Action Potential Science Experience Summer Camps, Penn State University, 2003-2006

I developed and led interactive lectures, demonstrations, and "hands-on" projects for week-long summer camp programs geared towards middle school students. For the first two summer programs, I instructed "The Adventure of the Apprentice's Stone," where art and history were integrated with nanoscience. In my last summer, I taught "Burger 'N Fry Chemistry," where the components of a hamburger and french-fry lunch were examined from the perspective of an analytical chemist.

Center of Nanoscale Science Outreach Volunteer, Penn State University, 2003-2008

I developed and presented a science road show demonstrating the "micro" mechanisms behind unusual materials such as aerogels, shape-memory alloys, and electronic inks and presented it at high schools, festivals, and museums across Pennsylvania.

Particle Engineering Research Center Outreach Volunteer, University of Florida, 2001-2003

I presented a particle science show to middle school students in north-central Florida consisting of an interactive lecture and "hands-on" activities, which highlighted various aspects of particle science in everyday life.

Affiliations

American Chemical Society, American Vacuum Society, Materials Research Society, Sigma Xi

Awards

Schering-Plough Science and Innovation Award for Excellence in Analytical Chemistry, PSU, 2008
Department of Chemistry Graduate Student Leadership and Service Award, PSU, 2007
Miller Fellowship, PSU, 2007
American Vacuum Society, Dorothy M. and Earl S. Hoffman Top Graduate Student Award, PSU, 2007
Rustum and Della Roy Innovation in Materials Research Award, PSU, 2007
Department of Chemistry Graduate Student Travel Award, PSU, 2007
American Chemical Society, Division of Analytical Chemistry Graduate Fellowship, PSU, 2007-2008
Lubrizol Award, PSU, 2007-2008 (full graduate fellowship declined)
Braucher Award, PSU, 2006
Geiger Fellowship, PSU, 2006
Rohm & Haas Graduate Student Award, PSU, 2006
Department of Chemistry Graduate Student Travel Award, PSU, 2005
Dan H. Waugh Memorial Teaching Award, PSU, 2004
Braddock Graduate Fellowship, PSU, 2003-2005
Particle Engineering Research Center Outstanding Service Award, UF, 2003
Particle Engineering Research Center Paper Contest Upper Division 3rd place, UF, 2003
Particle Engineering Research Center Paper Contest Lower Division 2nd place, UF, 2002
Particle Engineering Research Center Research Scholarship, UF, 2002-2003
Florida Academic Scholar Award, UF, 1999-2003

Publications

14. "High-Resolution Near-Field Scanning Optical Microscopy by Apertureless Bright Photoluminescent Probes" W. F. Lin, **T. J. Mullen**, V. Lulevich, G. Y. Liu, *in preparation for the Journal of Physical Chemistry.*

13. "Regulating the Lateral Heterogeneity of Self-Assembled Monolayers by Nanografting" Dong-Lei, **T. J. Mullen**, G. Y. Liu, *in preparation for ACS Nano.*

12. "Hybrid Strategies in Nanolithography," H. M. Saavedra, **T. J. Mullen**, P. P. Zhang. C. Srinivasan, P. S. Weiss, *Reports on Progress in Physics,* (2009) *in press*.

11. "Combining Electrochemical Desorption and Metal Deposition on Patterned Self-Assembled Monolayers," **T. J. Mullen**, P. P. Zhang, C. Srinivasan, P. S. Weiss, *Journal of Electroanalytical Chemistry* **621**, 229-237 (2008).

10. "Hybrid Approaches to Nanometer-Scale Patterning Exploiting Tailored Intermolecular Interactions," **T. J. Mullen**, C. Srinivasan, M. J. Shuster, M. W. Horn, A. M. Andrews, P. S. Weiss, *Journal of Nanoparticle Research* **10**, 1231-1240 (2008).

9. "Scanning Electron Microscopy of Nanoscale Chemical Patterns," C. Srinivasan, **T. J. Mullen**, J. N. Hohman, M. E. Anderson, A. A. Dameron, A. M. Andrews, E. C. Dickey, M. W. Horn, P. S. Weiss, *ACS Nano* **1**, 191-201 (2007).

8. "1-Adamantanethiolate Monolayer Displacement Kinetics Follow a Universal Curve," H. M. Saavedra, C. M. Barbu, A. A. Dameron, **T. J. Mullen,** V. H. Crespi, P. S. Weiss, *Journal of the American Chemical Society* **129**, 10741-10746 (2007).

7. "Origins of Displacement in 1-Adamantanethiolate Self-Assembled Monolayers," A. A. Dameron, **T. J. Mullen**, R. W. Hengstebeck, H. M. Saavedra, P. S. Weiss, *Journal of Physical Chemistry C* **111**, 6747-6752 (2007).

6. "Dynamics of Solution Displacement in 1-Adamantanethiolate Self-Assembled Monolayers," **T. J. Mullen**, A. A. Dameron, H. M. Saavedra, M. E. Williams, P. S. Weiss, *Journal of Physical Chemistry C* **111**, 6740-6746 (2007).

5. "Microcontact Insertion Printing," **T. J. Mullen**, C. Srinivasan, J. N. Hohman, S. D. Gillmor, M. J. Schuster, M. W. Horn, A. M. Andrews, P. S. Weiss, *Applied Physics Letters* **90**, 063114 (2007).

4. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, A. A. Dameron, A. M. Andrews, P. S. Weiss, *Aldrichimica Acta* **40**, 19-31 (2007).

3. "Displaceable Monolayers and Microdisplacement Printing: 1-Adamantanethiol Assembly and Application," **T. J. Mullen**, J. N. Hohman, A. A. Dameron, J. R. Hampton, S. D. Gillmor, P. S. Weiss, *Materials Matters* **1** (2), 8-10 (2006). *unrefereed publication*.

2. "Directed Assembly and Separation of Self-Assembled Monolayers via Electrochemical Processing," **T. J. Mullen**, A. A. Dameron, P. S. Weiss, *Journal of Physical Chemistry B* **110**, 14410-14417 (2006).

1. "Microdisplacement Printing," A. A. Dameron, J. R. Hampton, R. K. Smith, **T. J. Mullen**, S. D. Gillmor, P. S. Weiss, *Nano Letters* **5**, 1834-1837 (2005).

Presentations

17. "Imaging Engineered Nanoscale Surfaces for Biological Applications with Nearfield Scanning Optical Microscopy," **T. J. Mullen**, W. F. Lin, V. Lulevich, G. Y. Liu, Charles Wade Symposium at IBM Almaden Research Center, San Jose, CA, 2 October 2009. (poster)

16. "Imaging Engineered Nanoscale Surfaces for Biological Applications with Nearfield Scanning Optical Microscopy," **T. J. Mullen**, W. F. Lin, V. Lulevich, G. Y. Liu, American Chemical Society National Meeting, Salt Lake City, UT, 22-26 March 2009. (oral)

15. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, C. Srinivasan, M. J. Shuster, S. E. Brunker, L. M. Dominak, J. N. Hohman, A. A. Dameron, M. W. Horn, A. M. Andrews, P. S. Weiss, Foundations of Nanoscience: Self-assembled Architectures and Devices, Snowbird, UT, 22-25 April 2008. (poster)

14. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, C. Srinivasan, M. J. Shuster, J. N. Hohman, M. W. Horn, A. M. Andrews, P. S. Weiss, Materials Research Society Fall Meeting, Boston, MA, 26-30 November 2007. (oral)

13. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, C. Srinivasan, M. J. Shuster, J. N. Hohman, M. W. Horn, A. M. Andrews, P. S. Weiss, American Vacuum Society Annual Meeting, Seattle, WA, 14-19 October 2007. (oral)

12. "Insertion Patterning in Monolayers," **T. J. Mullen**, A. M. Moore, C. Srinivasan, J. N. Hohman, M. J. Shuster, A. M. Andrews, M. W. Horn, P. S. Weiss, A. M. Andrews, Center for Nanoscale Science (MRSEC) Seminar, University Park, PA, 2 July 2007. (oral)

11. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, C. Srinivasan, M. J. Shuster, J. N. Hohman, A. A. Dameron, S. D. Gillmor, A. Vaish, M. W. Horn, A. M. Andrews, and P. S. Weiss, NSTI Nanotech 2007, Santa Clara, CA, 20-24 May 2007. (poster)

10. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, C. Srinivasan, M. J. Shuster, J. N. Hohman, A. A. Dameron, S. D. Gillmor, A. Vaish, M. W. Horn, A. M. Andrews, and P. S. Weiss, Materials Day 2007, University Park, PA, 10-11 April 2007. (poster)

9. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen** and P. S. Weiss, Lion Lectures, University Park, PA, 29 March 2007. (oral)

8. "Patterned Neurotransmitters: Novel Approaches through Soft Lithography," **T. J. Mullen** and P. S. Weiss, Graduate Exhibition, University Park, PA, 23-25 March 2007. (poster)

7. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, C. Srinivasan, M. J. Shuster, J. N. Hohman, A. A. Dameron, S. D. Gillmor, A. Vaish, M. W. Horn, A. M. Andrews, and P. S. Weiss, Gordon Research Conference, Ventura, CA, 11-16 February 2007. (poster)

6. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, A. A. Dameron, J. R. Hampton, J. N. Hohman, S. G. Gillmor, R. K. Smith, P. S. Weiss, American Vacuum Society Annual Meeting, San Francisco, CA, 12-17 November 2006. (oral)

5. "Advances in the Creation, Development, and Application of Patterned Neurotransmitter-Functionalized Surfaces," **T. J. Mullen**, M. J. Shuster, A. Vaish, C. Srinivasan, J. N. Hohman, A. A. Dameron, S. D. Gillmor, J. R. Hampton, M. W. Horn, P. S. Weiss, A. M. Andrews, Center for Nanoscale Science (MRSEC) Seminar, University Park, PA, 30 October 2006. (oral)

4. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, A. A. Dameron, J. R. Hampton, J. N. Hohman, S. G. Gillmor, R. K. Smith, P. S. Weiss, Penn State CrossOver 2006, University Park, PA, 12 October 2006. (poster)

3. "Selecting and Driving Nanoscale Assembly in Monolayer Films through Tailored Intermolecular Interactions," **T. J. Mullen**, A. A. Dameron, J. R. Hampton, P. A. Lewis, J. N. Hohman, S. G. Gillmor, R. K. Smith, P. S. Weiss, Gordon Research Conference, Tilton, NH, 16-21 July 2006. (poster)

2. "Directed assembly and separation of self-assembled monolayers via electrochemical processing," **T. J. Mullen**, A. A. Dameron, J. R. Hampton, P. S. Weiss, American Vacuum Society Annual Meeting, Boston, MA, 31 October - 4 November 2005. (oral)

1. "Directed assembly and separation of self-assembled monolayers via electrochemical processing," **T. J. Mullen**, A. A. Dameron, J. R. Hampton, P. S. Weiss, American Chemical Society National Meeting, Washington, DC, 28 August - 1 September 2005. (oral)

References

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