

RESUME

Olin Thompson Mefford IV

PERSONAL DATA

Associate Professor
Department of Materials Science and Engineering
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DOB: May 16, 1981, Florence, AL, USA
Citizenship: USA

EDUCATION

- 2003 BSc. Polymer and Textile Chemistry; Minor: Philosophy, Clemson University, Clemson, SC
- 2007 Ph. D. Macromolecular Science and Engineering, "Physical Properties of Macromolecule-Metal Oxide Nanoparticle Complexes: Magnetophoretic Mobility, Size, and Interparticle Potentials" Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA

PROFESSIONAL EXPERIENCE

- 05/2014-Present Associate Professor, Department of Material Science and Engineering, Clemson University
- 07/2008-05/2014 Assistant Professor, Department of Material Science and Engineering, Clemson University
- 2007-2008 Post-Doctoral Researcher, Department of Chemistry, The Ohio State University, Columbus, Ohio
- 2003-2007 Research Assistant, Macromolecules and Interfaces Institute, Virginia Tech Blacksburg, VA,

MEMBERSHIPS

- ACS – 2005 to Present
MRS – 2008 to Present
AIChE – 2012 to Present

PROFESSIONAL ACTIVITIES

- Co-organizer of the *Frontiers in BioMagnetic Particles V*, Asheville, NC, June 5-7, 2017.
Co-organizer of the *Frontiers in BioMagnetic Particles IV*, Telluride, CO, June 23-26, 2015.
Co-organizer of the *Frontiers in BioMagnetic Particles III*, Telluride, CO, June 2-5, 2013.
Co-organizer of the *Frontiers in BioMagnetic Particles II*, Charleston, SC, May 15-18, 2011

Co-organizer on the symposium on *Bioactive Polymers and Polymer Surfaces*, Fall 2010 National meeting of the American Chemical Society, Boston, MA, August 22-26, 2010

Co-organizer of the *Frontiers in the characterization and control of magnetic carriers*, Clemson University, Clemson, SC, April 26-28, 2009.

Guest editor for MRS Bulletin

Guest editor for International Journal of Molecular Science

PUBLICATIONS:

Refereed Journal Publications

1. Kathleen Davis, Michael Vidmar, Airat Khasanov, Brian Cole, Melanie Ghelardini, Justin Mayer, Christopher Kitchens, Amar Nath, Brian A Powell, O Thompson Mefford, The Effect of Post-Synthesis Aging on the Ligand Exchange Activity of Iron Oxide Nanoparticles, *Journal of colloid and interface science*, **2018**, 511, 374-382.
2. Siyam M Ansar, Benjamin Fellows, Patrick Mispireta, O Thompson Mefford, Christopher L Kitchens, pH Triggered Recovery and Reuse of Thiolated Poly(acrylic acid) Functionalized Gold Nanoparticles with Applications in Colloidal Catalysis, *Langmuir*, **2017**, 33 (31) 7642-7648.
3. Hongyu Chen, Fenglin Wang, Thomas Lee Moore, Bin Qi, Dino Sulejmanovic, Shiou-Jyh Hwu, Olin Thompson Mefford, Frank Alexis, Jeffrey N Anker, Bright X-ray and up-conversion nanophosphors annealed using encapsulated sintering agents for bioimaging applications, *Journal of materials chemistry. B*, **2017**, 5, 27, 5412-5424
4. Yash S Raval, Benjamin D Fellows, Jamie Murbach, Yves Cordeau, Olin Thompson Mefford, Tzuen-Rong J Tzeng, Multianchored Glycoconjugate-Functionalized Magnetic Nanoparticles: A Tool for Selective Killing of Targeted Bacteria via Alternating Magnetic Fields, *Advanced Functional Materials*, **2017**, 27, 26, 1701473.
5. Kathleen Davis, Brian Cole, Melanie Ghelardini, Brian A. Powell, and O. Thompson Mefford, Quantitative Measurement of Ligand Exchange with Small-Molecule Ligands on Iron Oxide Nanoparticles via Radioanalytical Techniques, *Langmuir*, **2016**, 32 (51), pp 13716–13727
6. Pauline Amaral; Erin Partlan; Mengfei Li; Flavio Lapolli; O. Thompson Mefford; Tanju Karanfil; David A Ladner Superfine powdered activated carbon (S-PAC) coatings on microfiltration membranes: Effects of milling time on contaminant removal and flux *Water Research*, **2016**, 100, 429-438.
7. Siyam M. Ansar, Fiaz S. Mohammed, Gregory von White, II, Maeve Budi, Kristin Conrad Powell, O. Thompson Mefford, and Christopher L. Kitchens,

Effect of Postsynthesis Purifications on Gold and Silver Nanoparticle Ligand Coverage, *Journal of Physical Chemistry C*, **2016**, 120 (12), 6842-6850.

8. Longfei Ye, Tanner Pearson, Yves Cordeau, O. Thompson Mefford, Thomas M. Crawford Triggered self-assembly of magnetic nanoparticles, *Scientific Reports*, **2016**, 6, 23145
9. Longfei Ye, Tanner Pearson, Cory Dolbashian, Philip Pstrak, AR Mohtasebzadeh, Ben Fellows, O Thompson Mefford, Thomas M Crawford, *Advanced Functional Materials*, **2016** 26, 3983.
10. William Glasgow, Ben Fellows, Bin Qi, Taghi Darroudi, Christopher Kitchens, Longfei Ye, Thomas M Crawford, O Thompson Mefford, Continuous synthesis of iron oxide (Fe₃O₄) nanoparticles via thermal decomposition, *Particuology*, **2016**, 26, 47.
11. Erin Partlan, Kathleen Davis, Yiran Ren, Onur Guven Apul, O Thompson Mefford, Tanju Karanfil, David A Ladner, Effect of bead milling on chemical and physical characteristics of activated carbons pulverized to superfine sizes, *Water Research*, **2016**, 89, 161-170.
12. Bokharaei, Mehrdad; Schneider, Thomas; Dutz, Silvio; Stone, Roland; Mefford, O. Thompson; Hafeli, Urs, Production of Monodispersed Magnetic Polymeric Microspheres in a Microfluidic Chip and 3D Simulation, *Microfluidics and Nanofluidics*, **2016**, 20 (1), 1-14.
13. R.C. Stone, B.D. Fellows, B. Qi, D. Trebatowski, B. Jenkins, Y. Raval, T.R. Tzeng, T.F. Bruce, T. Mcnealy, M.J. Austin, T.C. Monson, D.L. Huber, O.T. Mefford, Highly Stable Multi-Anchored Magnetic Nanoparticles for Optical Imaging within Biofilms, *Journal of Colloid and Interface Science*, **2015**, 459, 175-182.
14. Yash Raval, Roland Stone, Benjamin Fellows, Bin Qi, Gouhui Huang, O. Thompson Mefford, and Tzuen-Rong J Tzeng, Synthesis and application of glycoconjugate-functionalized magnetic nanoparticles as potent anti-adhesion agents for reducing enterotoxigenic Escherichia coli infections. *Nanoscale* **7**, 8326–8331 (2015).
15. Lindsey Sanders, Roland Stone, C. Kenneth Webb, O. Thompson Mefford, and Jiro Nagatomi, Mechanical Characterization of a Bi-functional Tetronic Hydrogel Adhesive for Soft Tissues, *Journal of Biomedical Materials Research: Part A*, **2015**, 103 (3) 861-868. (*Society for Biomaterials Student Award Winner in the Graduate Degree Category, 2015 Annual Meeting and Exposition, Charlotte, NC, April 15–18, 2015*)

16. Kathleen Marie Davis, Bin Qi, Michael Witmer, Christopher L Kitchens, Brian A Powell, O Thompson Mefford, Quantitative measurement of ligand exchange on iron oxide nanoparticles via radiolabeled oleic acid, *Langmuir*, **2014**, 30 (36), 10918-10925.
17. Roland Stone, Bin Qi, David Trebatoski, Ragini Jetty, Iurii Bandera, Stephen Foulger, and Olin Thompson Mefford, A Versatile Stable Platform for Multifunctional Applications: Synthesis of NitroDOPA-PEO-Alkyne Scaffolding for Iron Oxide Nanoparticles, *Journal of Materials Chemistry B*, 2 (2014) 4789
18. Steven L Saville, Bin Qi, Jonathon Baker, Roland Stone, Robert E Camley, Karen L Livesey, Longfei Ye, Thomas M Crawford, and O Thompson Mefford, The formation of linear aggregates in magnetic hyperthermia: Implications on specific absorption rate and magnetic anisotropy, *Journal of Colloid and Interfacial Science*, **2014**, 424, 141-151.
19. Hongyu Chen, Bin Qi, Thomas Moore, Fenglin Wang, Daniel C. Colvin, Duminda Sanjeeva, John C. Gore, Shiou-Jyh Hwu, O. Thompson Mefford, Frank Alexis, and Jeffrey N. Anker Multifunctional yolk-in-shell nanoparticles for pH-triggered drug release and imaging, *Small*. **2014**, 10 (1), 160-168.
20. Hongyu Chen, Dino Sulejmanovic, Thomas Moore, Daniel C. Colvin, Bin Qi, O. Thompson Mefford, John C. Gore, Frank Alexis, Shiou-Jyh Hwu, and Jeffrey N. Anker, Iron-Loaded Magnetic Nanocapsules for pH-Triggered Drug Release and MRI Imaging, *Chemistry of Materials*, **2014**, 26 (6), 2105-2112.
21. Ye, L., Qi, B., Pearson, T., Cordeau, Y., Mefford, O. T., & Crawford, T. M. Real time monitoring of superparamagnetic nanoparticle self-assembly on surfaces of magnetic recording media. *Journal of Applied Physics*, **2014**, 115 (17), 17B513.
22. H. P. Emerson, A. E. Hart, Baldwin J. A., T. C. Waterhouse, C. L. Kitchens, O. T. Mefford, and B. A Powell. Characterization of physical transformations of iron oxide and silver nanoparticles from an intermediate scale field transport study. *Journal of Nanoparticle Research*, **2014**, 16, 2258.
23. Néstor G. González-Pereyra , William Glasgow, Alexander Parenzan, Julia L. Sharp, and O. Thompson Mefford, Investigation of the Etching of Silicon under Subcritical Water Conditions, *Industrial and Engineering Chemistry Research*, **2014**, 53 (1), 173.
24. Raftery, T. D., Kerscher, P., Hart, A. E. Saville, S. L., Qi, B., Kitchens, C. L., Mefford, O. T., Mcnealy, T. L., Discrete nanoparticles induce loss of *Legionella pneumophila* biofilms from surfaces. *Nanotoxicology*. **2014**, 8(5), 477-484

25. Sara A. Majetich, Tianlong Wen, and O. Thompson Mefford, Magnetic Nanoparticles (Guest Editors Introduction Article), *MRS Bulletin*, **2013**, 38, pp 899-903. doi:10.1557/mrs.2013.230.
26. Hongyu Chen, Bin Qi, Daniel C Colvin, Thomas Moore, Frank Alexis, John C Gore, Thomas M. Crawford, O Thompson Mefford, and Jeffrey N Anker Synthesis of brightly luminescent magnetic up-conversion nanophosphors for deep tissue and dual MRI imaging, *Small*. **2013**, 10(1), 160-168.
27. Stone, R., Hipp, S., Barden, J., Brown, P. J., Mefford, O. T., Highly Scalable Nanoparticle-Polymer Composite Fiber via Wet Spinning, *Journal of Applied Polymer Science*. **2013**, 130 (3), 1975-1980.
28. Qi, B., Ye, L., Stone, R., Dennis, C., Crawford, T., Mefford, O.T., Influence of ligand-precursor molar ratio on the size evolution of modifiable iron oxide nanoparticles, *Journal of Physical Chemistry: C*. **2013**, 117 (10), 5429-5435
29. Hongyu Chen, Daniel C Colvin, Bin Qi, Thomas Moore, Jian He, O Thompson Mefford, Frank Alexis, John C Gore, and Jeffrey N Anker, Monitoring pH-triggered drug release from radioluminescent nanocapsules with X-ray excited optical luminescence. *ACS Nano*, **2013**, 7 (2), 1179-1187.
30. Saville, S., Woodward, R. C., House, M. J., Tokarev, A., Hammers, J., Qi, B., St. Pierre, T. G., Mefford, O. T., The effect of magnetically induced linear aggregates on proton transverse relaxation rates of aqueous suspensions of polymer coated nanoparticles. *Nanoscale*, **2013**, 5 (5), 2152 - 2163
31. L. Ye, B. Terry, O. T. Mefford, C. Rinaldi, and T. M. Crawford, All-nanoparticle concave diffraction gratings fabricated by self-assembly onto magnetically-recorded templates, *Optics Express*. **2013**, 21 (1), 1066-1075.
32. Saville, S. L, Stone, R. C., Qi, B., Mefford, O. T., Investigation of the Stability of Catechol Based Ligands in Phosphate Buffered Saline, *Journal of Materials Chemistry*, **2012**, 22, 24909.
33. Hongyu Chen, Daniel C Colvin, Bin Qi, Thomas Moore, Jian He, O Thompson Mefford, Frank Alexis, John C Gore, and Jeffrey N Anker, Magnetic and optical properties of multifunctional core-shell radioluminescence nanoparticles. *Journal of Materials Chemistry*, **2012**, 22, 12802.
34. Stone, R.; Willi, T.; Roseri, Y.; Mefford, O. T.; Alexis, F.; Targeted Magnetic Hyperthermia. *Targeted Delivery* **2011**, 2(6): 815-838.
35. Ahrentorp, F.; Astalan, A. P.; Jonasson, C.; Blomgren, J.; Qi, B.; Mefford, O. T.; Yan, M.; Coutois, J.; Berret, J. F.; Fresnais, J.; Sandre, O.; Dutz, S.; Müller, R.; Johansson, C., Sensitive High Frequency AC Susceptometry in Magnetic

Nanoparticle Applications. *American Institute of Physics: Conference proceedings: 8th International Conference on Scientific and Clinical Applications of Magnetic Carriers* **2010**, 1311, 213-223

36. Miles, W. C.; Goff, J. D.; Huffstetler, P. P.; Mefford, O. T.; Riffle, J. S.; Davis, R. M., The Design of Well-Defined PDMS-Magnetite Complexes. *Polymer* **2010**, 51, 482-491.
37. Mefford, O. T.; Saville, S.; Qi, B., Controlled surface functionalization of iron-oxide nanoparticles for field responsive biomedical applications. *PMSE Preprints* **2009**, 101, 1569.
38. Mefford, O. T.; Vadala, M. L.; Carroll, M. R. J.; Mejia-Ariza, R.; Caba, B. L.; St. Pierre, T. G.; Woodward, R. C.; Davis, R. M.; Riffle, J. S., Stability of Polydimethylsiloxane-Magnetite Nanoparticles Against Flocculation: Interparticle Interactions of Polydisperse Materials. *Langmuir* **2008**, 24(9), 5060-5069.
39. Mefford, O. T.; Carroll, M. R. J.; Vadala, M. L.; Goff, J. D.; Mejia-Ariza, R.; Saunders, M.; Woodward, R. C.; St. Pierre, T. G.; Davis, R. M.; Riffle, J. S., Size Analysis of PDMS-Magnetite Nanoparticles Complexes: Experiment and Theory. *Chemistry of Materials* **2008**, 20, 2184-2191.
40. Mefford, O. T.; Woodward, R. C.; Goff, J. D.; Vadala, T. P.; St. Pierre, T. G.; Dailey, J. P.; Riffle, J. S., Field Induced Motion of Ferrofluids through Immiscible Viscous Media: Testbed for Restorative Treatment of Retinal Detachment. *Journal of Magnetism and Magnetic Materials* **2007**, 311, 347-353.
41. Zhang, Q.; Thompson, M. S.; Carmichael, A. Y.; Caba, B. L.; Zalic, M. A.; Lin, Y. N.; Mefford, O. T.; Davis, R. M.; Riffle, J. S., Experiments and Theory of Aqueous Dispersions of Magnetite Nanoparticles Complexed with Copolyether Dispersants. *Langmuir* **2007**, 23, 6927-6936.
42. Sarles, S. A.; Bullion, T.; Mefford, O. T.; Riffle, J. S.; Leo, D.; Brink, A. B.; Brink, M. H., Carbon Fiber Reinforced Rigidizable Space Structures. *Material and Devices for Smart Systems II* **2006**, 888, 55-60.

Conference Proceeding (Reviewed on Entire Paper)

1. Ahrentorp, F.; Astalan, A. P.; Jonasson, C.; Blomgren, J.; Qi, B.; Mefford, O. T.; Yan, M.; Coutois, J.; Berret, J. F.; Fresnais, J.; Sandre, O.; Dutz, S.; Müller, R.; Johansson, C., Sensitive High Frequency AC Susceptometry in Magnetic Nanoparticle Applications. *American Institute of Physics: Conference proceedings: 8th International Conference on Scientific and Clinical Applications of Magnetic Carriers* **2010**, 1311, 213-223

2. Alvarez, E.; DesJardins, J.; Saville, S.; Mefford, O. T. In *The Use of Conference Preparatory Principles and Practices (Writing and Presentation Skills) To Teach Interdisciplinary Laboratory Courses*, 2010 Annual Conference and Exposition of the American Society of Engineering Education, 2010.
3. Mefford, O. T.; Saville, S. L.; Qi, B., Controlled Surface Functionalization of Iron-Oxide Nanoparticles for Field Responsive Biomedical Applications, *PMSE division ACS Fall Meeting*, Washington, DC, August 2009

Conference Proceedings (Unreviewed) based on abstract only

1. Saville, S.; Qi, B.; Woodward, R.; St. Pierre, T; Mefford, O. T., Reversible relaxation mechanisms of polymer stabilized MRI contrast agents, *Frontiers in BioMagnetic Particles II, Charleston, SC May 15-19, 2011*
2. Mefford, O. T., Surface Functionalization of Iron-Oxide Nanoparticles, *Frontiers in the Characterization and Control of Magnetic Carriers*, Clemson, SC, April 2009
3. Mefford, O. T.; Woodward, R. C.; Goff, J. D.; Vadala, T. P.; St. Pierre, T. G.; Dailey, J. P.; Riffle, J. S., Magnetohydrodynamics of Ferrofluids, *Scientific and Clinical Applications of Magnetic Carriers*, Krems Austria, May 2006

PRESENTATIONS (Posters)

1. Ghobrial, Nardine, Fellows, Benjamin, Mefford, O. Thompson, Dean, Delphine "Assessing Uptake of Magnetite Nanoparticles by Fibroblasts Using TEM" Annual meeting of the Biomedical Engineering Society in Minneapolis, MN, P-Sat-517, Oct. 2016
2. Alejos MF, Webb K, Mefford OT and Nagatomi J (2016). Controlling thermal gelation properties of novel Tetronic hydrogel-based tissue adhesive. *Front. Bioeng. Biotechnol. Conference Abstract: 10th World Biomaterials Congress*. Montréal, Canada, 17 May - 22 May, 2016
3. Elliott Mappus, Benjamin Fellows, O. Thompson Mefford, Delphine Dean, "Magnetic Nanoparticles in the Prevention of Neointimal Hyperplasia" MES 2015 Annual Meeting, scheduled for October 7-10, 2015 in Tampa, Florida
4. Jamie Murbach, Ben Fellows, Modi Wetzler, and O. Thompson Mefford, "Seeking alternative polymer coatings and functionality for magnetic nanoparticles" *Frontiers in Biomagnetic Particles*, Telluride, CO June 23-25, 2015.
5. Sarah Howell, Bradley Burden, Morgan Cantley, Ian DeMass and O. Thompson Mefford, "Purification and Quantification of Magnetite Nanoparticles for

Biological Applications” Frontiers in Biomagnetic Particles, Telluride, CO June 23-25, 2015.

6. Matthew Bell, Tanner Pearson, Cameron Frazier, Ben Fellows, Bin Qi, Longfei Ye, Thomas M. Crawford, O. Thompson Mefford, “The Formation and Isolation of Nanostructures through Directed Magnetic Assembly of Nanoparticle Patterns using Disk Drive Recording Media” Frontiers in Biomagnetic Particles, Telluride, CO June 23-25, 2015.
7. Yash Raval, Benjamin Fellows, Roland Stone, O. Thompson Mefford, Tzuen-Rong J. Tzeng, “Magnetic Hyperthermia Induced Inactivation of Enterotoxigenic *Escherichia coli* in Presence of Multi-Functional Glycoconjugate-Functionalized Magnetic Nanoparticles” Frontiers in Biomagnetic Particles, Telluride, CO June 23-25, 2015.
8. Yash Raval, Benjamin Fellows, Roland Stone, O. Thompson Mefford, Tzuen-Rong J. Tzeng, “Magnetic Hyperthermia Induced Inactivation of Enterotoxigenic *Escherichia coli* in Presence of Multi-Functional Glycoconjugate-Functionalized Magnetic Nanoparticles” American Society for Microbiology 2015, New Orleans, LA, May 30-June 2, 2015.
9. Yash Raval, Roland Stone, Benjamin Fellows, Bin Qi, Guohui Huang, O. Thompson Mefford, Tzuen-Rong J. Tzeng, “Interaction of Enterotoxigenic *Escherichia coli* with Porcine Intestinal Epithelial Cells in the Presence of Bio-Functionalized Iron-Oxide Nanoparticles” International Conference on Frontiers in Nano Science Technology and Applications, Prashantinilayam, AP, India, December 20-22, 2014 (*Best Poster Presentation Award" - Life Sciences Category*)
10. Roland Stone, Yash Raval, Bin Qi, Terri Bruce, Tamara Mcnealy, Tzen Rong Jeremy Tzeng, O. Thompson Mefford, Synthesis of a heterbifunctional polymer platforms for “tailored” multimodal theranostic magnetic particles. 10th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, Dresden, Germany June 10-14, 2014
11. Mehrdad Bokharaei, Silvio Dutz, Katayoun Saatchi, O. Thompson Mefford, Roland Stone, Urs O. Häfeli, Encapsulation of Hydrophilic and Lipophilic Magnetic Nanoparticles in PLA Microspheres using a Microfluidics Chip, 10th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, Dresden, Germany June 10-14, 2014
12. Haley Hunt, Ben Fellows, Lucía Gutiérrez, M. Puerto Morles, O. Thompson Mefford, Measurement of the size effect on on the biodistribution of polymer sterically stabilized magnetic nanoparticles. 10th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, Dresden, Germany June 10-14, 2014

13. Stone, R. L., Qi, B., Trebatoski, D., Mefford, O.T., Synthesis of Heterobifunctional Poly(ethylene oxide) Scaffolds for Biomedical Magnetic Nanoparticles Systems, Ceramic, Composite and Optical Materials Center, Spring 2013 Industrial Advisory Board Meeting Poster Session, Clemson University, Clemson, SC, September 18, 2013. (*Selected as #1 poster of meeting*)
14. Kathleen Davis, Bin Qi, Michael Witmer, Christopher Kitchens, Brian Powell, O. Thompson Mefford, Quantitative Measurement of Ligand Exchange via Radiolabeled $^{55}\text{Fe}_3\text{O}_4$ coated with ^{14}C oleic acid Ceramic, Composite and Optical Materials Center, Spring 2013 Industrial Advisory Board Meeting Poster Session, Clemson University, Clemson, SC, September 18, 2013. (*Selected as #2 poster of meeting*)
15. Saville, S. L., Baker, J., Cabbage, E., Qi, B., Stone, R., Ye, L., Crawford, T.M., Mefford, O.T., The importance of colloidal stability in magnetic hyperthermia. Cancer Nanotechnology, Gordon Research Conference, West Dover, VT, July 14-19, 2013.
16. Y. Cordeau, B. Qi, L. Ye, T. G. Lawton, T.M. Crawford, O.T. Mefford, Directed Magnetic Assembly of Nanoparticle Patterns using Digital Recording Media, Frontiers in BioMagnetic Particles III, Telluride, CO, June 2-4, 2013.
17. Will Glasgow, Alan Marionneaux, Andrew Crites, Bin Qi, Jerad Wilcox, and O. T. Mefford, Continuous Synthesis Reactor for Magnetite, Frontiers in BioMagnetic Particles III, Telluride, CO, June 2-4, 2013.
18. Kathleen Davis, Bin Qi, Michael Witmer, Christopher Kitchens, Brian Powell, O. Thompson Mefford, Quantitative Measurement of Ligand Exchange via Radiolabeled $^{55}\text{Fe}_3\text{O}_4$ coated with ^{14}C oleic acid, Frontiers in BioMagnetic Particles III, Telluride, CO, June 2-4, 2013.
19. Saville, S.L., Qi, B., Stone, R., Woodward, R., House, M., St. Pierre, T., Mefford O.T., The influence of the stabilizing polymer brush on the formation of linear aggregates: implications of interparticle interactions, MRS Spring Meeting, San Francisco, CA, April 1-5, 2013.
20. Emerson, H.P., Hart, A., Mefford, O.T., Kitchens, C.L., and Powell, B.A. Vadose Zone Transport of Iron and Silver Nanoparticles: A Field Lysimeter Study. 7th International Conference on the Environmental Effects of Nanoparticles and Nanomaterials, Banff, Alberta Canada, September 10, 2012.
21. Saville, S.L., Qi, B., Stone, R., Woodward, R., House, M., St. Pierre, T., Mefford O.T., The influence of the stabilizing polymer brush on the formation of linear aggregates: implications of interparticle interactions. MRS Spring Meeting, San Francisco, CA, April 1-5, 2013

22. Saville, S.L., Qi, B., Stone, R., Woodward, R., House, M., St. Pierre, T., Mefford O.T., The influence of the stabilizing polymer brush on the formation of linear aggregates. Spring Clemson MRS/OSA Research Symposium, Clemson, SC, March 11, 2013. (*Selected as #1 poster of meeting*)
23. Roland Stone, Bin Qi, Steven Saville, O. Thompson Mefford, Synthesis and End Group Modification of Heterobifunctional Poly(ethylene oxide) Scaffolds for Biomedical Magnetic Nanoparticle Systems. Spring Clemson MRS/OSA Research Symposium, Clemson, SC, March 11, 2013. (*Selected as #2 poster of meeting*)
24. Budi, M., Stimson, M., Saville, S., Qi, B., Mefford, O.T., Comparative Analysis of Phosphate and Nitro- DOPA Anchoring Strength on Magnetite Nanoparticles, 9th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, May 22-26, 2012. (*Selected as #1 poster of meeting*)
25. Lawton, T., Marionneaux, A., Glasgow, W., Qi, B., Mefford, O. T., Magnetic Characterization and Synthesis of Magnetite Nanoclusters. 9th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, May 22-26, 2012.
26. Mefford, O. T., Saville, S., Stone, R. Qi, B., The Stability of Poly(ethylene glycol) Stabilized Iron Oxide Nanoparticles: A study on ligand displacement under biological conditions. 9th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, May 22-26, 2012
27. Qi, B., Mefford, O. T. The Effect of Ligand Molecule Length on the Size of Synthesized Iron Oxide, 9th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, May 22-26, 2012
28. D'Unger, D., Mefford, O. T., Evaluation of Nanoparticle Behavior as they Transitions from Natural to Engineered Systems using FRET MRS Spring Meeting, San Francisco, CA. April 9-13, 2012
29. Stone, R, Barden, J., Brown, P. J., Mefford, O. T., Incorporation of Magnetic Nanoparticles into Fibers by Wet Spinning, AATCC Meeting, Charleston, SC October 11-14, 2011
30. Size effects of polymer-nanoparticle systems in magnetic hyperthermia and MRI, Gordon Research Conference on Cancer Nanotechnology, Colby College, July 17-22, 2011
31. Wadhwa, R., Qi, B., Mefford, O. T. Heating efficiency of magnetite nanoparticles exposed to AC magnetic field for Magnetic Hyperthermia, Frontiers in BioMagnetic Particles II, Charleston, SC May 15-19, 2011

32. Qi, B., Mefford, O. T., Kinetics Process of Synthesis of Size and Shape Tunable Magnetite Nanoparticles, *Frontiers in BioMagnetic Particles II*, Charleston, SC May 15-19, 2011
33. Stone, R, Barden, J., Brown, P. J., Mefford, O. T., Incorporation of Magnetic Nanoparticles into Fibers by Wet Spinning, *Frontiers in BioMagnetic Particles II*, Charleston, SC May 15-19, 2011
34. Mefford, O. T.; Saville, S. L.; Qi, B.; Wadhwa, R.; Size effects on magnetic nanoparticles on the heating rate in magnetic hyperthermia, *Biomedical Engineering and Science Meeting*, Austin, TX, October 2010.
35. Stone, R.; Saville, S. L.; Qi, B.; Mefford, O. T.; Modification of Magnetic Nanoparticle Surfaces for Biomedical Applications, *NTC/AATCC Advances in Multi-Functional Materials Symposium*, Greenville, SC, September 2010.
36. Mefford, O. T.; Saville, S. L.; Qi, B.; Wadhwa, R.; Size effects on magnetic nanoparticles on the heating rate in magnetic hyperthermia, *Scientific and Clinical Applications of Magnetic Carriers*, Rostock, Germany, May 2010.
37. Rogalski, M.; Qi, B.; Mefford, O. T.; Anker, J. Synthesis and Characterization of Magnetic and Plasmonic Particles. *Federation of Analytical Chemistry and Spectroscopy Societies*, Louisville, KY, October 2009.
38. Mefford, O. T.; Goff, J. D.; Vadala, M. L.; Woodward, R. C.; St. Pierre, T. G.; Dailey, J. P.; Riffle, J. S. Determination of the size and stability of polydisperse polymer-magnetite complexes: Experiment and Theory *Scientific and Clinical Applications of Magnetic Carriers*, Vancouver, Canada, May 2008

PRESENTATIONS (Oral Presentations)

1. Benjamin D. Fellows, Jessica A. Bigner, Amy Goodling, Sarah Timmins, Ethan D. Kirkland, Martin Saunders, O. Thompson Mefford, Beyond Magnetite: Evaluation of Substituted Ferrites in MagMED, *Magnetics North V*, University of Colorado, Colorado Springs, June 26-30, 2016
2. Kathleen Marie Davis, Bin Qi, Michael Witmer, Christopher L Kitchens, Brian A Powell, O Thompson Mefford, Direct measurement of the functionalization of metal oxide nanoparticles through radioanalytical methods. Spring 2016 National Meeting of the American Chemical Society, San Diego, CA, March 12-16, 2016
3. Lindsey Sanders, Kenneth Webb, Thompson Mefford, Jiro Nagatomi, "Biocompatibility Evaluation of Modified Tetronic Adhesive for Soft Tissue Applications" *BMES 2015 Annual Meeting*, scheduled for October 7-10, 2015 in Tampa, Florida

4. Mefford, O. T. Integrated approach for the fabrication of multifunctional metal and metal oxide nanoparticles, *Frontiers in Biomagnetic Particles*, Telluride, CO, June 23-25, 2015
5. Ye, L., Pearson, T., Cordeau, Y., Mefford, O. T., Crawford, T. M., Monitoring nanoparticle self-assembly dynamics in extreme magnetic field gradients. 10th International Conference on the Scientific and Clinical Applications of Magnetic Carriers, Dresden, Germany June 10-14, 2014
6. Mefford, O. T. Integrated approach for the fabrication of multifunctional metal and metal oxide nanoparticles, Center for Integration of Nanotechnology (CINT), Sandia National Laboratory, Albuquerque, NM, May 28, 2014.
7. Mehrdad Bokharaei, Silvio Dutz, Thompson Mefford, Roland Stone, Urs O. Häfeli Production of monosized magnetic microspheres by microfluidic flow focusing. International Workshop on Magnetic Particle Imaging, March 27-29, 2014 in Berlin, Germany
8. Erin T. Partlan, Mengfei Li, Anna M. Crumbley, Connor R. Bilchak, O. Thompson Mefford, Tanju Karanfil, and David A. Ladner, Interactions of Super-Fine Powdered Activated Carbon and Graphene Adsorbents with Microfiltration and Ultrafiltration Membranes, 2013 Water Quality Technology Conference and Exposition (WQTC), November 3-7, 2013.
9. Mefford, O. T., Kitchens, C. L., Lessons Learned from Teaching an Introductory Nanotechnology Course to Undergraduates, Sustainable Nanotechnology Organization (SNO) 2013 Conference, Santa Barbara, CA, November 3-5, 2013.
10. Mefford, O. T., The effect of magnetically induced colloidal arrangements on the biomedical applications of magnetite. *Frontiers in BioMagnetic Particles III*, Telluride, CO, June 2-4, 2013.
11. Mefford, O. T., Saville, S.L. The effect of linear chain formation on MRI contrast enhancement. AICHE National Meeting, Pittsburg, PA, October 28-November 2, 2012.
12. Mefford, O. T., Kitchens, C., Green tire panel, LANXESS Mobility Day, Charlotte, NC, September 18, 2012.
13. Mefford, O. T., Saville, S. L., Qi, B., Lawton, T. The role of collective magnetic nanoparticle interactions in magnetic hyperthermia and MRI contrast agents. 86th ACS Colloid and Surface Science Symposium, John Hopkins University, June 10-13, 2012.
14. Saville, S., Tokarev, A., Qi, B., Woodward, R., St. Pierre, T., Mefford, O. T., The effect of linear chain formation on MRI contrast enhancement, 9th International

Conference on the Scientific and Clinical Applications of Magnetic Carriers, May 22-26, 2012

15. Stone, R., Bin Qi, Mefford, O. T., Synthesis of Heterobifunctional Poly(ethylene oxide) and Modification of Magnetic Nanoparticles for both Imaging and Therapy, MRS Spring Meeting, April 9-13, 2012
16. Saville, S. L., Mefford, O. T. The Effect of Particle and Ligand Size on MRI Contrast Enhancement Agents. Frontiers in BioMagnetic Particles II, Charleston, SC May 15-19, 2011
17. Qi, B.; Mefford, O. T. Kinetic processes in the synthesis of size tunable magnetite nanoparticles for biomedical applications. Fall 2010 National Meeting of the American Chemical Society, Boston, MA, August 22-26, 2010
18. Saville, S. L.; House, M., Qi, B.; Mefford, O. T. Use of magnetite nanoparticles for various therapeutic applications. Fall 2010 National Meeting of the American Chemical Society, Boston, MA, August 22-26, 2010

PRESENTATIONS (Invited Talks)

1. Mefford, O.T., Evaluation of Substituted Ferrites in Magnetically Modulated Energy Delivery (MagMED) via SAXS, The 68th Southeastern Regional Meeting of the American Chemical Society Oct 23-26, 2016, Columbia, SC
2. Mefford, O.T., "Integrated approach for the fabrication of multifunctional metal and metal oxide nanoparticles." Magnetically stimulated soft materials meeting. University of Georgia, Athens, GA, May 11-12, 2015
3. Mefford, O.T., "Integrated approach for the fabrication of multifunctional metal and metal oxide nanoparticles." Macromolecules and Interfaces Institute, Virginia Tech, March 31, 2015
4. Mefford, O.T., "Integrated approach for the fabrication of multifunctional metal and metal oxide nanoparticles." Department of Macromolecular Science and Engineering, Case Western Reserve University, February 6, 2015
5. Mefford, O.T., "Synthesis of a polymer-magnetic particle platform for "tailored" multimodal materials for imaging and treatment" 2014 AIChE Annual Meeting, Atlanta, GA November 16-21, 2014
6. Mefford, O. T. "Integrated approach for the fabrication of multifunctional metal and metal oxide nanoparticles", 81st Annual Meeting of the APS Southeastern Section, Columbia, SC, November 12-15, 2014

7. Mefford, O. T. "Multifunctional metal and metal oxide nanoparticles: particle synthesis, heterobifunctional polymers, interface design, and biomedical applications." Department of Materials Science and Engineering, North Carolina State University, November 1, 2013.
8. Mefford, O. T. "Surface coatings for colloidal stability in high ionic strength solutions and elevated temperatures." *Ceramic, Composite and Optical Materials Center, Spring 2013 Industrial Advisory Board Meeting*, Clemson University, Clemson, SC, September 19, 2013.
9. Mefford, O. T. "Multifunctional metal and metal oxide nanoparticles: particle synthesis, heterobifunctional polymers, interface design, and biomedical applications." Western Carolina Chapter of the American Chemical Society, Clemson, SC, February 5, 2013.
10. Mefford, O. T. "Integrated approach for the fabrication of multifunctional metal and metal oxide nanoparticles", Colorado IEEE Magnetics Society, University of Colorado – Colorado Spring, Colorado Springs, CO, January 24, 2013.
11. Mefford, O. T. "Integrated approach for the fabrication of multifunctional metal and metal oxide nanoparticles", Colorado IEEE Magnetics Society, University of Colorado, Boulder, CO, January 24, 2013.
12. Mefford, O. T. "Integrated approach for the fabrication of multifunctional metal and metal oxide nanoparticles: particle formation, heterobifunctional polymers, interface design, and biomedical applications", Department of Material Science and Engineering, University of Florida, September 26, 2012.
13. Mefford, O. T. "Homebrewing: A Chemist Prospective", AIChE Regional Conference, Clemson University, May 31, 2012.
14. Mefford, O. T. "Synthesis and functionalization of iron oxide nanomaterials for biomedical applications", Department of Material Science and Engineering, University of Florida, December 2, 2011.
15. Mefford, O. T. "Synthesis and functionalization of iron oxide nanomaterials for biomedical applications", Department of Physics and Astronomy, University of South Carolina, November 10, 2011
16. Mefford, O. T. "Synthesis and functionalization of iron oxide nanomaterials for biomedical applications", Department of Chemical Engineering, University of Alabama, October 13, 2011.
17. Mefford, O. T. "Magnetic Nanocomposites", *Ceramic, Composite and Optical Materials Center, Spring 2011 Industrial Advisory Board Meeting*, Rutgers University, New Brunswick, NJ, April 2011

18. Mefford, O. T. "Magnetic Fibers and Beyond" *AATCC 2011 International Conference*, Charleston, SC, March 2011
19. Mefford, O. T. "Polymer-Magnetite Nanoparticle Complexes and Constructs: Platform for Imaging, Detection, and Therapy" *Appalachian State Department of Chemistry*, Boone, NC, November 2010.
20. Mefford, O. T. "Polymer-Magnetite Nanoparticle Complexes and Constructs: Platform for Imaging, Detection, and Therapy" *NTC/AATCC Advances in Multi-Functional Materials Symposium*, Greenville, SC, September 2010.
21. Mefford, O. T. "Controlled Surface Functionalization of Iron-Oxide Nanoparticles" Seminar Speaker, NASA Glenn Research Center, March 2010
22. Mefford, O. T. "Controlled Surface Functionalization of Iron-Oxide Nanoparticles" New Analytical Techniques for Nanotechnology Workshop, AMRL, Anderson, SC September 2009
23. Mefford, O. T. "Controlled Surface Functionalization of Iron-Oxide Nanoparticles" Division of Metallurgy, National Institute for Standards and Testing, August 2009
24. Mefford, O. T. "Synthesis and surface modification of metal oxide nanostructures" Department of Chemical Engineering, Clemson University, March 2009
25. Mefford, O. T. "Synthesis and surface modification of magnetic nanostructures" Department of Chemistry, Clemson University, February 2009
26. Mefford, O. T. "Synthesis and surface modification of magnetic nanostructures" Greenville Professional Chapter, ASM international, February 2009.

HONORS AND AWARDS

Clemson University College of Engineering and Science Murray Stokey Award for Engineering Education 2015-2016
 Clemson University College of Engineering and Science Young Alumni Award 2015
 Phi Psi (MSE honor fraternity) – Teacher of the Year 2012, 2015, 2016, and 2017
 Clemson University National Scholars – Award of Distinction 2012
 Clemson University College of Engineering and Science Collaboration Award 2010-2011
 Virginia Tech Graduate Man of the Year 2007
 National Science Foundation Integrated Graduate Education Research Training (IGERT) Fellowship
 National Science Foundation Graduate Fellowship - Honorable Mention

EXTERNAL SPONSORED RESEARCH

- a. Workgroup for the Characterization and Control of Magnetic Carriers, SC EPSCoR, Co-PI, \$45,000 (\$22,500), (2009)
- b. Preparation of a Graphitic Carbon Foam Current Collector for Rechargeable Battery Applications, Michigan Technology University (via DOE), PI, \$21,345 (\$17,076), (2008-2009)
- c. Magnetically Modulated Porous Membranes for Filtration of Bioreactor Effluent During Long Space Missions, SC Space Grant Consortium, PI \$16,000 (\$16,000), (2009)
- d. Crosslinking of Magnetic Nanoparticles for Use in Filtration Membranes – Fellowship for Steven Saville, SC Space Grant Consortium, PI \$10,000 (\$10,000), (2009-2010)
- e. Frontiers in the Characterization and Control of Magnetic Carriers, SC EPSCoR, PI, \$7,500 (\$3,750), (2009)
- f. Investigations of the Size Effects on the Relaxation Rates of Polymer Coated Magnetic Nanoparticles for Hyperthermia, NSF, PI, \$290,000 (\$290,000), (2009-2012)
- g. Macromolecule-Magnetite Nanocomposites for Long Space Flight Missions, SC Space Grant Consortium, PI \$30,000 (\$30,000), (2009-2010)
- h. Magnetically Modulated Porous Membranes to Meet NASA Objectives for Filtration, Insulation, and Vibrational Damping, SC Space Grant Consortium, PI \$16,000 (\$16,000), (2010)
- i. Symposium – Bioactive Polymers and Polymer Surfaces, NSF, PI \$4,000 (\$4,000), (2010)
- j. Feasible Fiber-Nanoparticle Systems for Commercial Applications, NTC, PI \$59,331 (\$44,498.25) (2010-2011)
- k. Evaluation of nanoparticle behavior during transitions from engineered to natural systems, NSF, PI \$525,000 (\$178,500) (2010-2014)
- l. REU Site: Interfaces and Surfaces: Exploring and Experiencing Science (I SEE Science), Co-PI \$296,163 (\$7,996) (2011-2014)
- m. REU Site: Advanced Functional Membranes, NSF, Co-PI \$287,880 (\$14,394) (2011-2014)
- n. Symposium – Frontiers in BioMagnetic Particles, NSF, PI \$3,000 (\$3,000), (2011)

- o. Nanostructured Surfaces and Surface Coatings for Magnetically Modulated Separations and Solar Arrays, SC Space Grant Consortium, PI \$21,200 (\$21,200), (2011)
- p. Pattern Transfer Nanomanufacturing with Magnetically-Recorded Nanotemplates, NSF, PI \$224,000, (\$224,000), (2011)
- q. Collaborative Research: Pattern Transfer Nanomanufacturing with Magnetically-Recorded Nanotemplates – REU Supplemental, NSF, PI \$6,000, (\$6,000), (2012)
- r. Nanostructured Surfaces and Surface Coatings for Solar Arrays, SC Space Grant Consortium, PI \$18,000 (\$13,500), (2012)
- s. Coupling Small-particle Adsorbents with Membranes for Trace-containment Removal in Water Treatment, NSF, Co-PI, \$325,285, (\$65,057)
- t. Travel Scholarships for Frontiers in BioMagnetic Particles 2013, NSF, PI \$4,000, (\$2,000), (2012-2013)
- u. Enhanced Nitrogen Use Efficiency through a Protein Byproduct Delivery Mechanism, The Virtual Fertilizer Research Center (VFRC), Co-PI \$370,552 (\$55,582), (2012-2014)
- v. Travel Scholarships for Frontiers in BioMagnetic Particles 2013, NIH, Co-PI \$6,000, (\$3,000), (2012-2013)
- w. Travel Scholarships for Frontiers in BioMagnetic Particles 2015, NIH, Co-PI \$6,000, (\$3,000), (2015-2016)
- x. Travel Scholarships for Frontiers in BioMagnetic Particles 2015, NSF, PI \$4,000, (\$2,000), (2015-2016)
- y. REU Site: Interfaces and Surfaces, NSF, Co-PI \$330,000, (\$10,890), (2015-2018)
- z. Collaborative Research: I/UCRC for the Ceramic, Composite and Optical Materials Center, NSF, Co-PI \$325,000, (\$81,250), (2015-2020)
- aa. South Carolina Materials Assembly and Design (SC MADE), NSF thru USC, Co-Investigator, \$5,929,989, (\$59,300), (2017-2022)

GRADUATE STUDENT ADVISING

Current Graduate Advising

Benjamin Fellows (PhD), “Multifunctional magnetic nanoparticles for imaging and therapy”, (August 2018)

Zichun (Tony) Yan (PhD), “Synthesis of star-polymers with controlled LCST properties”, (May 2020)

Daniel Turner (PhD), “Molecular diffusion in semi-crystalline polymers” (May 2021)

Clayton Culbreath (PhD), “Quantification of processing parameters in additive manufacturing for bioreabsorbable applications” (May 2021)

Former Graduate Advising

Dan D’Dunger (MS), “Ligand exchange rates of anthropogenic and naturally occurring on engineered nanoparticles.” (Graduated August 2012)

Steven Saville (PhD), “Synthesis and Characterization of PEO based polymers for functionalization of metal oxide nanoparticles”, (May 2013)

Bin Qi (PhD), “Synthesis and Characterization of Metal/Metal-Oxide Nanoparticles”, (August 2013)

Roland Stone (PhD), “Synthesis and Characterization of PEO for nanoparticle surface functionality”, (December 2013)

Akeem Cruickshank (MS), “Fabrication and Characterization of Magnetic Nanoparticle Composite Membranes”, (December 2014) – Co-advised with Dr. Molly Kennedy

Nestor Gonzalaz (PhD), “Subcritical Anisotropic Etching of Silicon”, (May 2015)

Kathleen Davis (PhD), “Ligand exchange on metal oxide surfaces”, (August 2017)

TEACHING

Courses Taught

HON 206, Introduction to Nanotechnology, F10, S12, S13, S14, S16, S17

CME 241, Metrics Laboratory, F08, S09, S10, F10, S11

MSE 319, Materials Processing I, F11, F13, F14, F15, F16

MSE 415/H415/615, Introduction to Polymer Science and Engineering, F11, F12, F14, F15, F16

MSE 455, Polymer and Fiber Lab, F11, F12, F13, F14, F15, F16

MSE 490, Creative Inquiry, F11, S12, F12, S13, F13, S14, F14, S15, F15, S16, F16, S17

MSE 491, Senior Research, F09, S10, F10, S11, F11

MSE 3000/8000/8010, Graduate Seminar F15, S15

PFC 840, Analytical Methods, S10, S11, S12, S13, S14

CME 890/ENTOX 863, Special topics in Nanotechnology, S11

Courses Developed

HON 206, Introduction to Nanotechnology, F10, S12, S13, S14, S16

CME 890/ENTOX 863, Special topics in Nanotechnology, S11

UNIVERSITY AND PUBLIC SERVICE

Committees

Department: Member, Graduate Committee (2008 - 2011)
Member, Undergraduate Committee (2011 – 2014, 2015 -)
Member, Building Committee (2011 - 2014)
Member, Search and Screen Committee (2010-2011) (2014-2015)
Member, Search Committee (Sirrinc Polymer Chair) (2011-2012)
Member, Search Committee (Sirrinc Inorganic Chair) (2015)
Chair, Promotion and Outreach (2014 -2015)

College: Member, Search Committee (Associate Dean for Research) (2013)
Member,

University: Member, Honors College Admissions Board (2008 -)
Member, National Scholars Selection Committee (2010 -)
Member, Ombudsman Advisory Committee (2015 -)

Other Service

Faculty Advisor, Materials Research Society, Student Chapter (2008 -).
Dixon Fellows Senior Fellow – (2012 -)
Faculty Representative to the Board of Trustees (2015 -)

Updated November 6, 2017