CURRICULUM VITAE

Personal Data

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Education

The University of New South Wales (Australia), BSc (Hons I) Industrial Chemistry, 1993
The University of New South Wales (Australia), Ph.D. Chemical Engineering, 2000

Employment History

2011 – Present: **Associate Professor,** *Department of Chemistry and Geochemistry, Colorado School of Mines, Golden CO.* Major Responsibilities: Graduate and undergraduate student advising; Proposal preparation and submission; Development of independent research program; Departmental and university committee service and community outreach; Taught CHGN 430/MLGN 530 Introduction to Polymer Science, CHEN 415 Polymer Science and Technology, CHGN 536/MLGN 536 Advanced Polymer Synthesis, CHGN 505 Advanced Organic Chemistry, CHGN 222 Organic Chemistry II, CHGN 490 Synthesis and Characterization, CHGN 223 Organic Chemistry Lab I, and CHGN 224 Organic Chemistry Lab II.

2005 – 2011: **Assistant Professor,** *Department of Chemistry and Geochemistry, Colorado School of Mines, Golden CO.* Major Responsibilities: Graduate and undergraduate student advising; Proposal preparation and submission; Development of independent research program; Departmental and university committee service and community outreach; Taught CHGN 430/MLGN 530 Introduction to Polymer Science, CHEN 415 Polymer Science and Technology, CHGN 536/MLGN 536 Advanced Polymer Synthesis, CHGN 505 Advanced Organic Chemistry, CHGN 222 Organic Chemistry II, CHGN 490 Synthesis and Characterization, CHGN 223 Organic Chemistry Lab I, and CHGN 224 Organic Chemistry Lab II.

2003 – 2005: **Assistant Professor**, *School of Polymers and High Performance Materials, University of Southern Mississippi, Hattiesburg MS.* Major Responsibilities: Graduate and undergraduate student advising; Taught PSC 740 Polymer Kinetics and PSC 191 Introduction to Polymer Science; Team taught in PSC 702 Graduate Organic Polymer Chemistry II; Departmental and university committee service and community outreach; Proposal preparation and submission; Development of independent research programs in polymer science.

2001 – 2003: **Postdoctoral Research Associate**, *Department of Polymer Science, University of Akron, Akron OH.* Major Responsibilities: Preparation of stimuli-responsive triblock copolymer brushes via atom transfer radical polymerization; Synthesis of semi-fluorinated diblock copolymer brushes via atom transfer radical polymerization; Production of metallic nanoparticles using diblock copolymer brushes as templates; Assist with graduate and undergraduate student supervision.

1993 – 1996: **Project Leader**, *Comalco Research and Technology, Melbourne, Australia*. Major Responsibilities: Process engineer on the kaolin processing plant; Lead research scientist in the development of the Torbed^{TM} Reactor for the treatment of spent cell lining; Process plant commissioning for the treatment of spent cell lining; Project leader for market development of treatment process for spent cell lining; Research scientist and technician supervision and career development.

Membership in Professional Societies

2001 – Present: Member of the American Chemical Society (including both the Polymer Chemistry division and the Polymeric Materials: Science and Engineering division).

2005 – Present: Member of the International Union of Pure and Applied Chemistry

Professional Activities and Service

- For 2 years (2002 and 2003), served as a judge in the Northeast Ohio Regional Science Fair, Akron, OH
- For 1 year (2003), performed demonstration for high school students at the Northeast Ohio Regional Science Fair, Akron, OH
- Member of the advisory board for the Colorado Translational Research Imaging Center based at the University of Colorado, Denver Health Sciences Center. Advisor on nanotechnology and imaging probe development for the human imaging, animal imaging, molecular imaging, and quantitative image analysis cores.
- Editorial Board Member of the Journal of Nanomedicine and Nanotechnology – commenced July 2010.
- Faculty participant in the NSF-funded Integrative Graduate Education and Research Traineeship (IGERT) Institute – entrepreneurship at the interface of polymer science and medicinal chemistry (jointly funded between the University of Southern Mississippi and The University of Mississippi). Participation included supervising an IGERT fellow,

promotion of the program to graduate and undergraduate students, high school science teachers and their students, and the local community, participation in planning, curriculum, and strategy meetings, and assisting in the organization of joint poster session between the universities involved.

- Faculty participant in the NSF Materials Research Science and Engineering Center (MRSEC) – Center for Response Driven Polymeric Films (University of Southern Mississippi). Participation included supervising both graduate and undergraduate students supported by the center, promotion of the program to graduate and undergraduate students, high school science teachers and their students, and the local community, supervising and lecturing to students involved in the Research Experience for Undergraduates (REU) program associated with the MRSEC, assisting in a poster session for the students involved in the MRSEC to be presented to the visiting scientific and industrial advisory board.
- Faculty participant in the NSF Renewable Energy MRSEC at the Colorado School of Mines. Participation included supervising both graduate and undergraduate students supported by a seed grant provide by the center, teaching in the K – 12 teacher renewable energy education program, and supervising an undergraduate student in the REU program associated with the center.
- Co-organizer of symposium titled "Advances in Polymer Brushes" at Washington DC National American Chemical Society Meeting, August 2005. This Polymer Chemistry Division (POLY) sponsored symposium was devoted exclusively to polymer brushes and included sessions on synthesis, characterization, and applications. The symposium was co-chaired by Professor Stephen Boyes (Colorado School of Mines), Professor William Brittain (The University of Akron), and Professor Daniel Dyer (Southern Illinois University). The principal focus of this symposium was on recent advances in the field of polymer brushes, including individual sessions where the main themes were the synthesis, characterization and applications of polymer brushes. This format allowed for interaction between a wide variety of organic chemists, engineers, and chemical physicists. In preparing the program, the organizers made a concerted effort to include both young and established scientists in the field from academia and industry. This was achieved by a total of 31 oral presentations, each lasting 30 minutes, of which 25 were, invited speakers and 6 were contributed. In conjunction to the oral presentations, a poster session was also held with 36 posters being presented by a variety of industrial researchers, academic researchers, graduate students, and undergraduate students.
- External reviewer for 2 Ph.D. dissertations from the School of Chemical Sciences and Engineering at the University of New South Wales, Sydney, Australia.
- Reviewer for the following text books – Polymer Chemistry: An Introduction, 4th Edition by Malcolm Stevens (Oxford Press) and Advances in Polymer Science and Engineering, 1st Edition (E-book) published by Bentham Science.
- Reviewer for the following journals – Macromolecules, Biomacromolecules, Langmuir, Chemistry of Materials, Journal of the American Chemical Society, Macromolecular Rapid Communications, Macromolecular Chemistry and Physics, Journal of Materials Science, Journal of Macromolecular Science, Journal of Polymer Science Part A: Polymer Chemistry, Applied Surface Science, European Polymer Journal, Biomaterials, Polymer, Advanced Materials, and Small.

- Reviewed proposals for the following agencies – National Science Foundation, American Chemical Society Petroleum Research Fund, Army Research Office, Department of Energy, and Air Force Office of Scientific Research.

Teaching and Related Activities

Courses Taught –

University of Southern Mississippi:

PSC 740 – Polymer Kinetics (graduate class)
PSC 191 – Introduction to Polymer Science (undergraduate class)
PSC 702 – Graduate Organic Polymer Chemistry II (graduate class)

Colorado School of Mines:

CHGN 430/ MLGN 530 – Introduction to Polymer Chemistry (combined undergraduate and graduate class)
CHEN 415 – Polymer Science and Technology (undergraduate class – cross listed with CHGN 430/MLGN 530)
CHGN 536/MLGN 536 – Advanced Polymer Synthesis (graduate class)
CHGN 222 – Organic Chemistry II (undergraduate class)
CHGN 223 – Organic Chemistry I Laboratory (undergraduate lab)
CHGN 224 – Organic Chemistry II Laboratory (undergraduate lab)
CHGN 505 – Advanced Organic Chemistry (graduate class)
CHGN 495 – Senior Research (supervised undergraduate students)
CHGN 490 – Synthesis and Characterization (taught polymer section of field session)
CHGN 298 – Special Topics in Chemistry (undergraduate class)

Course Development Activities -

- Developed a polymer section of field session (CHGN 490) which was taught for the first time in the summer of 2007 and repeated in the summers of 2008 and 2010. The course focused on various aspects of polymer science including monomer synthesis, free radical polymerization, atom transfer radical polymerization, reversible addition-fragmentation chain transfer polymerization, and polymer characterization via gel permeation chromatography, Fourier transform infrared spectroscopy, and nuclear magnetic resonance spectroscopy. The course was taken by two students.
- Developed a special topics in chemistry (CHGN 298) class entitled ‘Synthetic Polymer Research’ which was taught in Spring 2008, 2009 and 2010. The main focus of the class was to teach students laboratory techniques in polymer chemistry with an emphasis on RAFT polymerization techniques. The course has been taken by 8 undergraduate students in total.

Research

Unfunded Research –

1. **Surface Initiated RAFT Polymerization for Diblock Copolymer Brush Formation** - This research focused on the synthesis of novel functional diblock copolymer brush systems by exploiting the inherent advantages of living radical polymerization (LRP) techniques. Reversible addition-fragmentation chain transfer (RAFT) polymerization was employed in the synthesis of functional and non-functional block copolymer systems via the 'grafting from' approach. This project resulted in two papers, both published in *Macromolecules*. Dates: July 2004 – July 2007. Students: Misty Rowe (Konopacki), Ph.D. and Brent Hammer, B.S.

Funded Research –

1. **Nanoscale Theragnostic Devices for Targeted Imaging of Kidney Disease** – Denver Health Medical Center, PI: Stephen Boyes. *Amount Funded:* $25,000 *Grant Dates:* 08/01/2010 – 01/31/2011. The goal of this project is to assist Denver Health Medical Center with the synthesis and in vitro testing of nanoparticles for the targeted imaging and diagnosis of kidney disease. This project is being conducted in collaboration with researchers at Denver Health Medical Center. Students: Misty Rowe, Postdoctoral research associate.
2. **Gadolinium Nanoparticles for Targeted Imaging and Therapy of Prostate Cancer** – Cancer League of Colorado – Cancer Research Grant Program, PI: Priya Werahera, co-PI: Stephen Boyes. *Amount Funded:* $60,000 *Grant Dates:* 07/01/2010 – 06/30/2011. The goal of this project is to develop a multimodal nanoparticle construct for the targeted imaging and treatment of prostate cancer. This project is being conducted in collaboration with researchers at the University of Colorado, Denver Health Sciences Center. Students: Liping Zhu, Ph.D.
3. **Nanoscale Theragnostic Devices for Targeted Imaging of Cancer** – University of Colorado, Denver Cancer Center, PI: Stephen Boyes. *Amount Funded:* $15,357 *Grant Dates:* 05/01/2010 – 10/31/2010. The goal of this project is to assist the University of Colorado, Denver Cancer Center with the synthesis and in vitro testing of nanoparticles for the targeted imaging and diagnosis of cancer. Students: Misty Rowe, Postdoctoral research associate.
4. **Polymer-Modified Nanoparticles for the Targeted Imaging of Tubercular Granulomas** – Bill and Melinda Gates Foundation – CSU Subcontract, PI: Stephen Boyes. *Amount Funded:* $14,520 *Grant Dates:* 03/9/2010 – 10/31/2010. The goal of this project is to develop a new nanoscale multifunctional diagnostic device capable of the specific molecular targeting of *Mycobacterium tuberculosis* (Mtb), diagnostic imaging, and enhancing biodistribution of the device. These devices will be based upon Gd nanoparticles which have been surface modified with multifunctional, well-defined polymers that will allow for the incorporation of a wide range of targeting ligands with unprecedented control over the final architecture of the nanoscale devices. This project is being conducted in collaborations with researchers at Colorado State University. Students: Chia Chih (George) Chang, B.S., and Talia Sanchez, B.E.

5. **Exploration of a Novel Microparticle-Based Gene Therapy Approach for Treating Diseases of the Central Nervous System** - University of Colorado Copilot Proposals, PI: Linda Watkins, coPIs: Mellisa Mahoney, Wendy Macklin, Natalie Serkova, Stephen Boyes. *Amount Funded:* $50,000 *Grant Dates:* 02/01/2010 – 01/31/2011. The goal of this project is to optimize the bioengineering of the microparticles to (i) control their extent of spread in spinal cord & brain & (ii) improve gene expression and explore whether this therapy is also relevant to CNS diseases involving neuronal death & demyelination. This project is being conducted in collaboration with researchers at the University of Colorado, Boulder and at the University of Colorado, Denver Health Sciences Center. Students: Talia Sanchez, B.E.
6. **Zipcode Based Nano-Imaging of Hypertensive Pulmonary Arteries** – National Institutes of Health - Trans-NIH Recovery Act Research Support, PI: Rubin Tudor, co-PIs: Renata Pasqualini, Natalie Serkova, Serpil Erzurum, Wadih Arap, Stephen Boyes (consultant). *Amount Funded:* $1,000,000 *Grant Dates:* 09/30/2009 – 09/29/2011. The goal of this project is to discover unique peptide/receptor pairs that will permit the development of nanodevices for pulmonary vascular delivery of diagnostic reagents to pulmonary vascular lesions in SPH. This project is being conducted in collaboration with researchers at the University of Colorado, Denver Health Sciences Center and MD Anderson Cancer Center. Students: Liping Zhu, Ph.D., and Chia Chih (George) Chang, B.S.
7. **MRI: Acquisition of High Field NMR Instrumentation for the Colorado School of Mines with Outreach to the Denver Metro Region** – National Science Foundation Major Research Instrumentation, PI: Daniel Knauss, co-PIs: Stephen Boyes, Steven Dec, Carolyn Koh, Andrew Herring. *Amount Funded:* $584,183 *Grant Dates:* 09/01/2009 – 08/31/2012. The goal of this proposal was to obtain funds for the purchase of a new 500 MHz NMR spectrophotometer, a 400 MHz NMR spectrophotometer replacement console, and a pulsed-field gradient diffusion probe. The specific aim for this project is to improve the research and teaching NMR facilities both at the Colorado School of Mines and in the Denver metro region. Students: None.
8. **Synthesis and Assembly of Hybrid Polymer/Nanorod-Quantum Dot Structures** - REMRSEC – Colorado School of Mines Seed Grant, PI: Stephen Boyes, co-PI: Matthew Liberatore. *Amount Funded:* $81,005 *Grant Dates:* 09/01/2009 – 08/31/2011. The goal of this proposal is to assemble films with novel network nanostructures using hybrid polymer/nanorod-quantum dot building blocks. While the proposed structures have tremendous potential for application in third generation photovoltaic devices, the focus of this one year seed proposal was on developing model systems to understand the structure-property relationship of these new structures. Students: Melissa Kern, Ph.D.
9. **Nanoscale Theragnostic Devices for Targeted Treatment and Imaging of Cancer –** State of Colorado Bioscience Discovery Program, PI: Stephen Boyes. *Amount Funded:* $135,000 *Grant Dates:* 06/01/2009 – 05/31/2010. This project aims to develop novel nanoscale theragnostic devices, capable of performing each of the above functions, along with providing multimodal imaging and targeting capabilities. Our nanoscale theragnostic devices will be based on gadolinium nanoparticles (GdNPs) which have been surface modified with multi-functional polymers. This project was conducted under collaboration with Professor Natalie Serkova at the University of Colorado Denver Health Sciences

Center. Students: Misty Rowe, Postdoctoral research associate, and Chia Chih (George) Chang, B.S.

10. **Synthesis of Functionalized Bisphosphonates** – Cerapedics, PI: Reed Ayers, co-PI: Stephen Boyes. *Amount Funded:* $25,075 *Grant sates:* 12/01/2008 – 03/01/2009. This industrial sponsored research project aims to develop novel protein conjugated bisphosphonates both as small molecules and polymeric species. The conjugated bisphosphonates will then be used to modify the surface of various calcium compounds to provide targeted species for bone re-growth. This project was conducted in collaboration with Professor Reed Ayers in the Department of Materials Science at the Colorado School of Mines and Dr. Jim Benedict at Cerapedics. Students: Misty Rowe, Ph.D.
11. **Multicomponent Surface Modified Nanostructures for Targeted Drug Delivery and Imaging in Cancer Treatment** – CSU Cancer Supercluster RFP, co-PIs: Stephen Boyes, Douglas Thamm, Susan Kraft. *Amount Funded:* $50,000 *Grant Dates*: 04/01/2008 – 03/31/2009. This research project focuses on the surface modification of gold and gadolinium nanorods with RAFT prepared polymers that contain specific cancer cell targeting moieties and cancer treatment drugs. This project is being conducted under collaboration with Professor Douglas Thamm and Professor Susan Kraft at the Animal Cancer Center at CSU. This project has result in a manuscript being submitted to *Biomacromolecules*. Dates: July 2007 – present. Students: Misty Rowe (Konopacki), Ph.D., Whitney Svoboda, B.S., Willa Maksaereekul, Ph.D., and Chia Chih (George) Chang, B.S.
12. **Ordered Hybrid Polymer-Nanorod Composites for Renewable Energy** - ACS PRF Type AC, PI: Stephen Boyes. *Amount Funded:* $90,000 *Grant Dates:* 07/01/2007 – 08/31/2009. The focus of this research involves the surface modification of both semi-conducting and gold nanorods *via* immobilization of polymer chains followed by the ordering of the particles within a diblock copolymer system. The focus of this research involves the surface modification of both semi-conducting and gold nanorods *via* immobilization of polymer chains followed by the ordering of the particles within a diblock copolymer system. This project has resulted in a paper published in *Chemistry of Materials* and a manuscript recently submitted to *Chemistry of Materials*. Students: Jay Hotchkiss, Ph.D., Benjamin Mohr, B.S., and Daniel Mieritz, B.S.
13. **Hydrophilic Cross-linkable Polymers Containing Linkages Susceptible to Photolysis** - Bausch and Lomb – Polymer and Surface Sciences, PI: Stephen Boyes. *Amount Funded:* $70,498 *Grant Dates:* 10/16/2007 – 10/15/2008. This research focuses on the design of new RAFT agents that are capable of producing hydrogels with UV cleavable cross-links in order to control the modulus of the material. Students: Misty Rowe (Konopacki), Ph.D. and Michael Wray, B.E.
14. **Smart Surfaces and Interfaces** - Air Force Office of Scientific Research, PI: John Moore, coPIs: Daniel Knauss, David Wu, Ryan O'Hayre, Stephen Boyes. *Amount Funded:* $955,500 *Grant Dates:* 11/01/2007 – 10/31/2009. This research will focus on the development of polymer modified surfaces with unique tribological properties. Students: Misty Rowe (Konopacki), Ph.D. and Melissa Kern, Ph.D.
15. **Request for Instrument Purchase for Undergraduate Instruction** - CSM Technology Fee RFP, co-PIs: Stephen Boyes and Daniel Knauss *Amount Funded:* $60,500 *Grant*

Dates: 07/01/2007. This grant was secured for the purchase of a new gel permeation chromatography system for the department. Students: None.

16. **Support for a symposium on "Advances in Polymer Brushes"** – ACS PRF SE, PI: Stephen Boyes *Amount Funded:* $3,600 *Grant Dates:* 06/01/2005 – 10/31/2005. This grant provides travel support for overseas speakers to attend the Polymer Brush Symposium at the Washington DC National American Chemical Society Meeting, August 2005. Students: None.
17. **Catalytic Nanoparticles in Tethered Block Copolymer Brushes: Synthesis and Catalytic Activity** – USM Dean's Research Initiative, PI: Stephen Boyes *Amount Funded:* $10,000 *Grant Dates:* 01/01/2004 – 12/31/2004. This research focused on the use of atom transfer radical polymerization (ATRP) for the synthesis of tethered block copolymer brushes and the subsequent formation of inorganic nanoparticles with in these systems. Students: Previous USM graduate student.

Students Advised –

Graduate Students:

Misty D. Rowe, Ph.D. – 'Modification of Planar and Nanoparticle Surfaces Utilizing Reversible Addition-Fragmentation Chain Transfer Polymerization'; Defense Date: 1 April 2008, Graduation Date: 16 May 2008.

Jay Hotchkiss, Ph.D. – 'Polymer Modification of Gold Nanorods and their use in the Templated Polymerization of Pyrrole and Thiophene and for the Synthesis of Metallic and Semi-conducting Nanoparticles'; Defense Date: 27 May 2008, Graduation Date: 12 December 2008.

Willa Maksaereekul, M.S. – 'Influence of Hydrotropes on Gadolinium Nanoscale Metal-Organic Framework Nanoparticles for Application as a Contrast Agent'; Defense Date: April 2009, Graduation Date: May 2009.

Melissa Kern, Ph.D. – joined the Boyes Research Group in January 2008. Expected graduation date: December 2011.

Liping Zhu, Ph.D. - joined the Boyes Research Group in December 2009.

Patrizia Smith, Ph.D. – joined the Boyes Research Group in December 2010.

Richard Oates, Ph.D. – joined the Boyes Research Group in December 2010.

Chixia Tian, Ph.D. – joined the Boyes Research Group in December 2010.

Undergraduate Students:

David Chio – 'Targeted Nanoparticles for the Multimodal Imaging of Prostate Cancer'. Colorado School of Mines undergraduate research student; joined the Boyes Research Group in January 2011.

Theresa Li – ‘pH Responsive Nanoparticle for Smart MRI Contrast Agents’. Colorado School of Mines senior research student; joined the Boyes Research Group in May 2010.

Mikaela Murphy – ‘Synthesis of Glycopolymer via RAFT Polymerization for the Surface Modification of Nanoparticles’. Colorado School of Mines undergraduate research student; joined the Boyes research group in January 2010.

Liz Hunter – ‘Polymer Modified Gadolinium Nanoparticles for the Targeted Imaging and Treatment of Breast Cancer’. Colorado School of Mines sophomore biochemistry student; joined the research group in May 2009.

Chia Chih (George) Chang – ‘Synthesis of Gadolinium Nanoparticles’. Colorado School of Mines undergraduate researcher and senior research student; Research Completion Date: 1 July 2010.

Curtis Wilson – ‘Synthesis and Assembly of Hybrid Polymer/Nanorod-Quantum Dot Structures’. REMRSEC REU student; Research Completion Date: 13 August 2010.

Talia Sanchez – ‘PEG-Modified Gadolinium Nanoparticles for Imaging Gene Therapy for Treating Diseases of the Central Nervous System’. Colorado School of Mines, chemical engineering senior; Research Completion Date: 1 May 2010

Alex Shilling – ‘Polymer Modified Gadolinium Nanoparticles for Targeted Imaging and siRNA Delivery for Cancer Treatment’. Colorado School of Mines senior research student; Research Completion Date: 1 May 2009.

Ann Newman – ‘Polymer Modified Gadolinium Nanoparticles for the Targeted Imaging and Treatment of Breast Cancer’. Colorado School of Mines senior research student; Research Completion Date: 1 May 2009.

Brent Hammer – ‘Modification of Flat Silicon Surfaces with Stimuli Responsive Diblock Copolymers Utilizing Surface Initiated RAFT Polymerization and ATRP Techniques’. Colorado School of Mines senior research student; Research Completion Date: 4 May 2007.

Daniel Mieritz – ‘Surface Modification of Gold Nanorods’. Colorado School of Mines senior research students; Research Completion Date: 4 May 2007.

Whitney Svoboda – ‘Polymer Modified Gadolinium Nanoparticles for the Targeted Imaging and Treatment of Cancer’. Colorado School of Mines senior research students; Research Completion Date: 2 May 2008.

Benjamin Mohr – ‘Polymer Modified Gold Nanorods as Templates for the Formation of Metallic Nanoparticles’. Colorado School of Mines senior research students; Research Completion Date: 2 May 2008.

Michael Wray – 'Design of New RAFT Agents'. Colorado School of Mines undergraduate researcher. Colorado School of Mines special topics research course; Research Completion 2 May 2008.

Brady Pitts – 'pH Responsive Polymer Brushes'. University of Southern Mississippi undergraduate researcher. Performed research from the summer of 2004 until August 2005.

Neil Treat – 'Synthesis of Acid Functional Polymer Brushes'. University of Southern Mississippi undergraduate researcher. Performed research from the summer of 2004 until August 2005.

James Whittemore – 'Stimuli Responsive Diblock Copolymer Brushes Prepared by ATRP'. University of Southern Mississippi REU Student; summer of 2005.

Patrick Heggarty – 'Formation of Biopolymer Brushes via RAFT Polymerization'. University of Southern Mississippi REU Student; summer of 2004.

Collaborators & Other Affiliations –

Internal Collaborators:

- Dr. Matthew Liberatore, Department of Chemical Engineering, Colorado School of Mines
- Dr. Reed Ayres, Department of Metallurgical and Materials Engineering, Colorado School of Mines

External Collaborators:

- Dr. Fernando Kim M.D., Chief of Urology, Denver Health Medical Center
- Dr. Erica Pierce, Department of Anesthesiology, Pharmacology and Radiology, University of Colorado Health Sciences Center
- Dr. Mike Glode, Professor and Robert Rifkin Chain, Department of Medicine, University of Colorado Cancer Center
- Dr. Rubin Tudor, Division of Pulmonary and Critical Care Medicine, Department of Medicine, University of Colorado Health Sciences Center
- Dr. Joshua Thurman, Department of Renal Medicine, University of Colorado Health Sciences Center
- Dr. Natalie Serkova, Department of Anesthesiology, Pharmacology and Radiology, University of Colorado Health Sciences Center
- Dr. Douglas Thamm, School of Veterinary Science, Colorado State University
- Dr. Susan Kraft, School of Veterinary Science, Colorado State University
- Dr. Joseph Harmon, School of Veterinary Science, Colorado State University
- Dr. Mercedes Gonzalez-Juarrero, Department of Microbiology, Immunology and Pathology, Colorado State University
- Dr. Randall Basaraba, Department of Microbiology, Immunology and Pathology, Colorado State University

- Dr. Mark Brown, Department of Radiology, University of Colorado Health Sciences Center
- Dr. Priya Werahera, Department of Pathology, University of Colorado Denver, Anschutz Medical Campus
- Dr. Brent Sumerlin, Department of Chemistry, Southern Methodist University
- Dr. Stephen Z.D. Cheng, Department of Polymer Science, University of Akron
- Dr. Robert E. Cohen, Department of Chemical Engineering, Massachusetts Institute of Technology
- Dr. Mark D. Foster, Department of Polymer Science, University of Akron
- Dr Andrew B. Lowe, Department of Chemistry and Biochemistry, University of Southern Mississippi

Graduate and Postdoctoral Advisors:

- Dr William J. Brittain, Department of Polymer Science, University of Akron (postdoctoral advisor)
- Dr Rodney P. Chaplin, School of Chemical Sciences and Engineering, University of New South Wales (graduate co-advisor)
- Dr. Tom P. Davis, School of Chemical Sciences and Engineering, University of New South Wales (graduate co-advisor)

Graduate Committees –

Active Committees:

Rebecca Shircliff – Ph.D. Chemistry, Colorado School of Mines
Nate Rebeck – Ph.D. Materials Science, Colorado School of Mines
Casey McAlpin – Ph.D. Chemistry, Colorado School of Mines
Patrizia Smith – Ph.D. Chemistry, Colorado School of Mines
Yifan Li – Ph.D. Chemistry, Colorado School of Mines
Yating Yang – Ph.D. Chemistry, Colorado School of Mines

Completed Committees:

Joshua Lau – M.S. Chemical Engineering, Colorado School of Mines
Nick Wyatt – Ph.D. Chemical Engineering, Colorado School of Mines
Li Zhi – Ph.D. Chemistry, Colorado School of Mines
Ray Runyon – Ph.D. Chemistry, Colorado School of Mines
Justin Engle – M.S. Chemistry, Colorado School of Mines
John Fennell – M.S. Chemistry, Colorado School of Mines
Justin Holm – M.S. Chemistry, Colorado School of Mines
Kevin McNamee – M.S. Chemistry, Colorado School of Mines
David Rankin – Ph.D. Chemistry, University of Southern Mississippi
Ran Wang – Ph.D. Chemistry, University of Southern Mississippi

Publications

Peer Reviewed Publications (Papers and Book Chapters):

1. Hotchkiss, J.W., Mohr, B.G.R., Boyes, S.G. **Poly(acrylic acid) Surface Modified Gold Nanorods as a Template for the Oxidative Polymerization of Pyrrole and Thiophene** submitted to *J. Nanopart. Res.* **2011**.
2. Maksaereekul, W., Sanchez, T.J., Rowe, M.D., Liberatore, M.W., Serkova, N.J., Boyes, S.G. **Synthesis of Gadolinium Nanoscale Metal Organic Frameworks with Hydrotropes: Manipulation of Particle Size and Magnetic Resonance Imaging Capability** submitted to *ACS Appl. Mater. Interfaces* **2011.**
3. Boyes, S.G., Rowe, M.D., Serkova, N.J., Kim, F.J., Lambert, J.R., Werahera, P.N. **Polymer Modified Gadolinium Nanoparticles for Targeted Magnetic Resonance Imaging and Cancer Therapy** accepted by *NanoLIFE* **2011**.
4. Boyes, S.G., Rowe, M.D., Chang, C.-C., Sanchez, T.J., Serkova, N.J., Werahera, P.N., Kim, F.J. **Polymer-Modified Nanoparticles as Targeted In Vivo Imagine Agents** In *Multifunctional Nanoparticles for Medical Applications – Imaging, Targeting, and Drug Delivery*; Svenson, S. and Prud'homme, R. Eds; *Nanostructure Science and Technology*; Springer Publishing, accepted, **2010**.
5. Hotchkiss, J.W., Mohr, B.G.R., Boyes, S.G. **Gold Nanorods Surface Modified with Poly(acrylic acid) as a Template for the Synthesis of Metallic Nanoparticles** *J. Nanopart. Res.* **2010**, *12*, 915 – 930.
6. Boyes, S.G., Rowe, M.D., Chang, C.-C., Thamm, D.H., Kraft, S.L., Harmon, J.F., Serkova, N.J., Vogt, A.P., Sumerlin, B.S. **Surface Modification of Positive Contrast Nanoparticle Agents with RAFT Polymers Towards the Targeted Imaging and Treatment of Cancer** In *Polymeric Delivery of Therapeutics*; Morgan, S.E. and Lochhead, R.Y Eds.; *ACS Symp. Series, Vol. 1053*; American Chemical Society: Washington, DC, **2010**, 65 - 101.
7. Rowe, M.D., Chang, C.-C., Thamm, D.H., Kraft, S.L., Vogt, A.P., Sumerlin, B.S., Boyes, S.G. **Tuning the Magnetic Resonance Imaging Properties of Positive Contrast Agent Nanoparticles by Surface Modification with RAFT Polymers** *Langmuir* **2009**, *25*, 9487 – 9499.
8. Rowe, M.D., Thamm, D.H., Kraft, S.L.; Boyes, S.G. **Polymer Modified Gadolinium Nanoparticles Used as Multifunctional Nanomedicines for the Targeted Imaging and Treatment of Cancer** *Biomacromolecules* **2009**, *10*, 983 – 993.
9. Rowe, M.D.; Hammer, B.A.G.; Boyes, S.G. **Synthesis of Surface Initiated Stimuli Responsive Diblock Copolymer Brushes Utilizing a Combination of ATRP and RAFT Polymerization Techniques** *Macromolecules* **2008**, *41*, 4147 – 4157.
10. Konopacki, M.D.; Boyes, S.G. **Synthesis of Surface Initiated Diblock Copolymer Brushes from Flat Silicon Substrates Utilizing the RAFT Polymerization Technique** *Macromolecules* **2007**, *40*, 879 – 888.
11. Hotchkiss, J.W.; Lowe, A.B.; Boyes, S.G. **Surface Modification of Gold Nanorods with RAFT Synthesized Polymers** *Chem. Mater.* **2007**, *19*, 6-13.
12. Ayres, N.; Boyes, S.G.; Brittain, W.J. **Stimuli-Responsive Polyelectrolyte Polymer Brushes Prepared via Atom-Transfer Radical Polymerization** *Langmuir* **2007**, *23*, 182-189.

13. Kopesky, E.T.; Treat, N.D.; Boyes, S.G.; Cohen, R.E.; McKinley, G.H. **Thermorheological Properties Near the Glass Transition of Oligomeric Poly(Methyl Methacrylate) Blended with Acrylic Polyhedral Oligomeric Silsesquioxane Nanocages** *Rheologica Acta* **2006**, *46*, 971 – 981.
14. Akgun, B.; Baum, M.; Blickle, C.; Boyes, S.G.; Granville, A.M.; Mirous, B.; Zhao, B.; Brittain, W.J. **Surface Rearrangement of Diblock Copolymer Brushes – Stimuli-Responsive Films** In *Surface-Initiated Polymerization II*; Jordan, R. Ed.; *Adv. Polym. Sci. 198*; Springer Berlin/Heidelberg, **2006**, 125 – 147.
15. Treat, N.D.; Ayres, N.; Boyes, S.G.; Brittain, W.J. **A Facile Route to Poly(Acrylic Acid) Brushes using Atom Transfer Radical Polymerization** *Macromolecules* **2006**, *39*, 26-29.
16. Granville, A.M.; Boyes, S.G.; Akgun, B.; Constable, A. Brittain, W.J.; Foster, M.D. **Stimuli-Responsive Semi-Fluorinated Polymer Brushes** In *Responsive Polymer Materials: Design and Application*, Minko, S. Editor.; Wiley-Blackwell Publishing, January **2006**.
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23. Boyes, S.G.; Akgun, B.; Brittain, W.J.; Foster, M.D. **Synthesis, characterization and properties of polyelectrolyte block copolymer brushes prepared by atom transfer radical polymerization and their use in the synthesis of metal nanoparticles** *Macromolecules* **2003**, *36*, 9539-9548.
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Published in Conference Proceedings (Preprints):

1. Rowe, M.D., Chang, C.-C., Serkova, N.J., Boyes, S.G. **Polymer-modified gadolinium nanoparticles for the targeted imaging of cancer** *Am. Chem. Soc., Div. Polym. Mater. Sci. Eng.* Accepted **2010**.
2. Rowe, M.D., Chang, C.-C., Boyes, S.G. **Polymer modified gadolinium nanoparticles as theragnostic devices for the targeted imaging and treatment of cancer** *Am. Chem. Soc. Div. Polym. Chem.* **2009**, *50(1)*, 341-342.
3. Chang, C.-C., Rowe, M.D., Boyes, S.G. **Polymer modified gold/gadolinium nanoparticles for targeted multimodal imaging and photothermal treatment.** *Am. Chem. Soc. Div. Polym. Chem.* **2009**, *50(1)*, 531-532.
4. Rowe, M.D.; Svoboda, W.; Maksaereekul, W.; Chang, C.-C.; Boyes, S.G. **Polymer Modified Nanoparticles for Targeted Imaging and Therapy** *Am. Chem. Soc. Div. Polym. Chem.* **2008**, *49(2)*, 1071-1072.
5. Hotchkiss, J.W.; Mohr, B.G.R.; Boyes, S.G. **Surface Modification of Gold Nanorods for Ordering, Oxidative Polymerization of Pyrrole, and Metal Nanoparticle Synthesis** *Am. Chem. Soc. Div. Polym. Chem.* **2008**, *49(1)*, 379-380.
6. Mohr, B.G.R.; Hotchkiss, J.W.; Boyes, S.G. **Polymer Modified Gold Nanorods as Templates for the Formation of Metal Nanoparticles and the Oxidative Polymerization of Pyrrole** *Am. Chem. Soc. Div. Polym. Chem.* **2008**, *49(1)*, 1141-1142.
7. Konopacki, M.D.; Boyes, S.G. **Polymer Modified Gold and Gadolinium Nanoparticles for Targeted Imaging and Treatment of Cancer** *Am. Chem. Soc. Div. Polym. Chem.* **2007**, *48(2)*, 968-969.
8. Boyes, S.G. **Surface Modification of Silicon Substrates and Metallic Nanorods Using RAFT Polymerization: "Grafting From" and "Grafting To"** *International Conference on Polymer Synthesis Abstracts* **2006**, IL 65.
9. Hotchkiss, J.; Boyes, S.G. **Surface Modification of Metallic Nanorods With RAFT Generated Polymers via the "Grafting To" Technique** *International Conference on Polymer Synthesis Abstracts* **2006**, P 55.
10. Konopacki, M.D.; Boyes, S.G. **Synthesis of Surface Initiated Diblock Copolymer Brushes Utilizing RAFT Polymerization** *International Conference on Polymer Synthesis Abstracts* **2006**, IL 58.
11. Hotchkiss, J.W.; Rowe, M.D.; Stempka, J.E.; Pitts, B.W.; Treat, N.D.; Boyes, S.G. **Applications for Block Copolymer Brushes Prepared via Controlled/"Living" Free Radical Polymerization Techniques** *Am. Chem. Soc. Div. Polym. Chem.* **2005**, *46(2)*, 7-8.
12. Pitts, B.W.; Rowe, M.D.; Boyes, S.G. **Surface Immobilization of RAFT Chain Transfer Agents** *Am. Chem. Soc. Div. Polym. Chem.* **2005**, *46(2)*, 89-90.
13. Hotchkiss, J.W.; Treat, N.D.; Higgins, B.A.; Lowe, A.B.; Boyes, S.G. **Surface Modification of Gold Nanorods with PDMAEMA** *Am. Chem. Soc. Div. Polym. Chem.* **2005**, *46(2)*, 91-92.

14. Rowe, M.D.; Pitts, B.W.; Lowe, A.B.; Boyes, S.G. **Synthesis of Diblock Copolymer Brushes via Surface Immobilized RAFT Chain Transfer Agents** *Am. Chem. Soc. Div. Polym. Chem.* **2005**, *46(2)*, 106-107.
15. Treat, N.D.; Stempka, J.E.; Boyes, S.G. **Synthesis of Poly(Acrylic Acid) Brushes via Hydrolysis of Poly(tert-Butyl Acrylate) Brushes** *Am. Chem. Soc. Div. Polym. Chem.* **2005**, *46(2)*, 114-115.
16. Stempka, J.E.; Boyes, S.G. **Synthesis of Nanoparticles within Tethered Diblock Copolymer Brush Systems** *Am. Chem. Soc. Div. Polym. Chem.* **2005**, *46(2)*, 110-111.
17. Boyes, S.G.; Mirous, B.K.; Brittain, W.J. **Synthesis and characterization of polyelectrolyte brushes** *Am. Chem. Soc. Div. Polym. Chem.* **2004**, *45(2)*, 286-287.
18. Boyes, S.G.; Akgun, B.; Brittain, W.J.; Foster, M.D. **Synthesis and characterization of polyelectrolyte brushes and their use in the synthesis of metal nanoparticles** *Am. Chem. Soc., Div. Polym. Mater. Sci. Eng.* **2004**, *90*, 326-327.
19. Boyes, S.G.; Granville, A.M.; Mirous, B.K.; Akgun, B.; Brittain, W.J. **Adaptive films based on block copolymer brushes** *Am. Chem. Soc., Div. Polym. Mater. Sci. Eng.* **2004**, *90*, 217.
20. Boyes, S.G.; Granville, A.M.; Brittain, W.J. **Responsive thin films based on surface-immobilized block copolymer brushes** *Am. Chem. Soc., Div. Polym. Mater. Sci. Eng.* **2004**, *90*, 33.
21. Boyes, S.G.; Granville, A.M.; Mirous, B.K.; Akgun, B.; Brittain, W.J. **Recent advances in the synthesis and rearrangement of block copolymer brushes** *Am. Chem. Soc., Div. Polym. Chem.* **2003**, *44(1)*, 420-421.
22. Boyes, S.G.; Mirous, B.K.; Brittain, W.J. **Synthesis and characterization of polyelectrolyte brushes** *Am. Chem. Soc., Div. Polym. Chem.* **2003**, *44(1)*, 523-524.
23. Granville, A.M.; Boyes, S.G.; Brittain, W.J. **Characterization of stimuli-responsive semifluorinated polymer brushes** *Am. Chem. Soc., Div. Polym. Chem.* **2003**, *44(1)*, 506
24. Akgun, B.; Boyes, S.G.; Granville, A.M.; Brittain, W.J. **Effect of initiator deposition technique and spacer length on monolayer and polymer brush formation** *Am. Chem. Soc., Div. Polym. Chem.* **2003**, *44(1)*, 514-515.
25. Baum, M.; Boyes, S.G.; Granville, A.M.; Mirous, B.K.; Sedjo, R.; Brittain, W.J. **Synthesis and nanomorphology of multiblock polymer brushes** *Am. Chem. Soc., Div. Polym. Chem.* **2002**, *43(2)*, 72-73.
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27. Boyes, S.G.; Granville, A.M.; Brittain, W.J. **Synthesis and characterization of semifluorinated polymer brushes** *Am. Chem. Soc., Div. Polym. Chem.* **2002**, *43(2)*, 273-274.
28. Boyes, S.G.; Granville, A.M.; Brittain, W.J. **Synthesis and characterization of multiblock polymer brushes** *International Conference on Polymer Synthesis: Warwick 2002*, Warwick, UK, July, **2002**.
29. Boyes, S.G.; Brittain, W.J. **Synthesis, characterization, and properties of ABA type triblock copolymer brushes of styrene and methyl acrylate** *Am. Chem. Soc., Div. Polym. Chem.* **2001**, *43(1)*, 549-550.

Other Publications –

1. Konopacki, M.D.; Boyes, S.G. **Analysis of Polymer Brush Formation on Si Wafers by GATR-FTIR** *Harrick Scientific Applications Note No. 070101* **2007** http://www.harrricksci.com/accessories/Analysis_of_Polymer_Brush_Formation_on_Si_wfr.pdf
2. Boyes, S.G.; Konopacki, M.D.; Hotchkiss, J.; Thamm, D.H.; Kraft, S.L. **Gadolinium and Gold Nanoparticle Conjugates, and Uses Thereof** *U.S. Provisional Patent Application No. 60/957,208* filed August 22, 2007.
3. Boyes, S.G.; Rowe, M.D.; Thamm, D.H.; Kraft, S.L. **Lanthanide Nanoparticle Conjugates, and Uses Thereof** *U.S. Patent Application No. 12/197,061* filed August 22, 2008.
4. Boyes, S.G.; Rowe, M.D.; Hotchkiss, J. **Gold Nanoparticle Conjugates, and Uses Thereof** *U.S. Patent Application No. 12/197,044* filed August 22, 2008.
5. Boyes, S.G.; Rowe, M.D. **Hybrid Lanthanide and Gold Nanoparticle Conjugates, and Uses Thereof** *U.S. Provisional Patent Application* February 18, 2009.

Presentations

Invited Talks –

1. Boyes, S.G. **Polymer-modified gadolinium nanoparticles for the targeted imaging of cancer** *American Chemical Society Midwest Regional Meeting* **28 October 2010**
2. Rowe, M.D., Chang, C.-C., Serkova, N.J., Boyes, S.G. **Polymer-modified gadolinium nanoparticles for the targeted imaging of cancer** *Am. Chem. Soc., Div. Polym. Mater. Sci. Eng.* **2010**. *National ACS Meeting, Boston, MA*
3. Boyes, S.G. **RAFT Polymerization for the Surface Modification of Nanoparticles: From Hybrid Nanostructures to Novel Nanomedicines** *Department of Physics and Nanomaterials Program, Arizona State University, Phoenix AZ* **19 April 2010**
4. Boyes, S.G. **RAFT Polymerization for the Surface Modification of Nanoparticles to Produce Novel Nanomedicines** *Department of Medicine – Pulmonary Division, University of Colorado, Denver Anschutz Medical, Aurora CO* **19 November 2009**
5. Boyes, S.G. **Living Radical Polymerization for the Modification of Surfaces: From Hybrid Nanostructures to Novel Nanomedicines** *Ian Wark Research Institute, University of South Australia, Adelaide SA* **7 October 2009**
6. Rowe MD, Chang CC, Boyes SG. **Polymer modified gadolinium nanoparticles as theragnostic devices for the targeted imaging and treatment of cance**. *Am Chem Soc Div Polym Chem. 50(1),* 341-342, **2009**. *National ACS Meeting, Salt Lake City, UT*
7. Boyes, S.G. **RAFT Polymerization for the Surface Modification of Nanoparticles: From Hybrid Nanostructures to Novel Nanomedicines** *Department of Chemical and Biochemical Engineering, Colorado School of Mines, Golden CO* **6 March 2009**
8. Boyes, S.G. **RAFT Polymerization for the Surface Modification of Nanoparticles: From Hybrid Nanostructures to Novel Nanomedicines** *Department of Chemistry, Southern Methodist University, Dallas TX* **17 October 2008**

9. Boyes, S.G. **Polymer Modified Nanoparticles for *in vivo* Image-Guided Cancer Intervention** *Colorado State University – Cancer Supercluster Retreat* **16 September 2008**
10. Rowe, M.D.; Svoboda, W.; Maksaereekul, W.; Chang, C.-C.; Boyes, S.G. **Polymer Modified Nanoparticles for Targeted Imaging and Therapy** *Am. Chem. Soc. Div. Polym. Chem.* **2008**, *49(2)*, 1071-1072. *National ACS Meeting, Philadelphia PA*
11. Boyes, S.G. **Surface Modification Using RAFT Polymerization: "Grafting From" and "Grafting To"** *Department of Chemical and Biological Engineering, Colorado State University, Fort Collins CO* **4 April 2008**
12. Boyes, S.G. **Polymer Modified Nanoparticles for Targeted Imaging and Treatment of Cancer** *Department of Pathology, University of Colorado Health Sciences Center, Aurora CO* **12 February 2008**
13. Konopacki, M.D.; Boyes, S.G. **Polymer Modified Gold and Gadolinium Nanoparticles for Targeted Imaging and Treatment of Cancer** *Am. Chem. Soc. Div. Polym. Chem.* **2007**, *48(2)*, 968-969. *National ACS Meeting, Boston MA*
14. Boyes, S.G. **Surface Modification Using RAFT Polymerization: "Grafting From" and "Grafting To"** *Department of Polymer Science, University of Massachusetts, Amherst, MA* **23 February 2007**
15. Boyes, S.G. **Surface Modification Using RAFT Polymerization: "Grafting From" and "Grafting To"** *Bausch & Lomb Research, Rochester NY* **16 February 2007**
16. Boyes, S.G. **Surface Modification of Silicon Substrates and Metallic Nanorods Using RAFT Polymerization: "Grafting From" and "Grafting To"** *International Conference on Polymer Synthesis, Warwick, United Kingdom* **August 2006**
17. Boyes, S.G. **Synthesis and Application of Polymer Brushes** *Chemistry Seminar Program, Colorado State University, Fort Collins CO* **March 22, 2006**
18. Hotchkiss, J.W.; Rowe, M.D.; Stempka, J.E.; Pitts, B.W.; Treat, N.D.; Boyes, S.G. **Applications for Block Copolymer Brushes Prepared via Controlled/"Living" Free Radical Polymerization Techniques** *Am. Chem. Soc. Div. Polym. Chem.* **2005**, *46(2)*, 7-8. *National ACS Meeting, Washington D.C.*
19. Boyes, S.G.; Akgun, B.; Brittain, W.J.; Foster, M.D. **Synthesis and characterization of polyelectrolyte brushes and their use in the synthesis of metal nanoparticles** *Am. Chem. Soc., Div. Polym. Mater. Sci. Eng.* **2004**, *90*, 326-327. *National ACS Meeting, Anaheim CA*

Other Presentations –

1. Rowe, M.D.; Boyes, S.G. **Polymer Modified Nanoparticles for Targeted Imaging and Treatment of Cancer** *Colorado State University – Cancer Supercluster Retreat* **30 April 2010**, *Fort Collins, CO*
2. Boyes, S.G. **Polymer Modified Nanoparticles for Targeted Imaging and Treatment of Cancer** *Colorado State University – Cancer Supercluster Retreat* **9 November 2007**, *Fort Collins, CO*
3. Konopacki, M.D.; Boyes, S.G. **Polymer Modified Nanoparticles for Targeted Imaging and Treatment of Cancer** *Colorado Bioscience Conference* **25 October 2007**, *Denver, CO*

4. Konopacki, M.D.; Boyes, S.G. **Polymer Modified Nanoparticles for Targeted Imaging and Treatment of Cancer** *Rocky Mountain Nanotechnology Showcase* **18 September 2007**, *Denver CO*
5. Hotchkiss, J.; Boyes, S.G. **Polymer Modified Metallic Nanorods** *Rocky Mountain Regional ACS Meeting* **30 August 2007**, *Denver CO*
6. Konopacki, M.D; Boyes, S.G. **Polymer Modified Gold and Gadolinium Nanoparticles for Targeted Imaging and Treatment of Cancer** *Rocky Mountain Regional ACS Meeting* **30 August 2007**, *Denver CO*
7. Konopacki, M.D.; Boyes, S.G. **Polymer Modified Nanoparticles for Targeted Imaging and Treatment of Cancer** *Colorado Medical Device Symposium* **August 2007**, *Denver CO*
8. Hotchkiss, J.; Boyes, S.G. **Surface Modification of Metallic Nanorods With RAFT Generated Polymers via the "Grafting To" Technique** *International Conference on Polymer Synthesis Abstracts* **August 2006**, *Warwick, United Kingdom*
9. Konopacki, M.D.; Boyes, S.G. **Synthesis of Surface Initiated Diblock Copolymer Brushes Utilizing RAFT Polymerization** *International Conference on Polymer Synthesis Abstracts* **August 2006**, *Warwick, United Kingdom*

Honors and Awards

- Best Poster Award at *International Conference on Polymer Synthesis: Warwick 2002*
- Outstanding Faculty Award 2007 – 2008, Presented by the Order of Omega, Colorado School of Mines

Committee Service

Departmental Committees -

1. Faculty Search Committee (Chair) – CSM, Fall 2009 – Spring 2010
2. NMR Manager Search Committee – CSM, Fall 2009 – Spring 2010
3. Faculty Search Committee – CSM, Fall 2008 – Spring 2009
4. Graduate Affairs Committee – CSM, Fall 2008 – Present
5. Faculty Search Committee – CSM, Fall 2007 – Spring 2008
6. Seminar Committee (co-Chair) – CSM, Spring 2006 – Present
7. Lecturer Search Committee – CSM, Fall 2005 – Spring 2006
8. Departmental Goals Committee – CSM, Summer 2007 – Fall 2007
9. Graduate Recruitment Committee – USM, Spring 2004 – Summer 2005
10. Graduate Curriculum Committee – USM, Spring 2004 – Summer 2005

Campus Committees –

1. NMR Committee – CSM, Fall 2009 – Present
2. Technology Fee Committee – CSM, Fall 2008 – Present
3. College of Science and Technology Goals Committee – USM, Fall 2004 – Spring 2005
4. College of Science and Technology Awards and Scholarships Committee – USM, Fall 2004 – Spring 2005