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Education:

Ph.D., Organic Chemistry, University of Massachusetts, Amherst, MA, September 2002

Thesis Advisor: Vincent M. Rotello

M.S., Organic Chemistry, North Carolina State University, Raleigh, NC, December 1998

Thesis Advisor: David A. Shultz

B.S., Chemistry (Minor: English), North Carolina State University, Raleigh, NC, May 1996

Employment History:

2004-present. Fellow, NASA Astrobiology Institute, University of Hawai'i, Honolulu, HI.

Astrobiology Program Principal Investigator: Karen J. Meech, Institute for Astronomy

2002-2004. Postdoctoral Research Associate, Sandia National Labs, Albuquerque, NM.

Research Advisor: Bruce C. Bunker, Organization 01141- Biomolecular Materials and Interfaces

Honors and Awards:

2001: University Graduate School Fellowship

2000: American Chemical Society Division of Organic Chemistry / Boehringer Ingelheim Pharmaceuticals, Inc. Graduate Fellowship

1997: Outstanding Graduate Teaching Assistant Award

1996: Merck Index Award for Excellence in Undergraduate Research

1995, 1996: Burroughs-Wellcome Undergraduate Research Scholarship

Professional Experience:

NASA Astrobiology Institute, University of Hawai'i at Manoa, Honolulu, HI, 2004-present

-Biomolecular Astrobiology. Developed an interdisciplinary, collaborative research program aimed at the exploration of structural aspects of protein adaptation to extreme environments as well as to explore for the possibility of endemic protein structures in specific extreme environmental locations. Initial work on this program involved the assembly of a large database of protein α -helix sequences taken from crystal structures of proteins from mesophilic and thermophilic organisms. This database allowed for a detailed survey of the differences in α -helix structure between these organisms to better understand the molecular level mechanisms of stability in thermophilic organisms. Currently, a larger database is being developed via collaboration with members of the computer science department that will allow for similar studies on other extremophilic organisms. Other studies planned include the acquisition of environmental DNA for the development of a metagenomic analysis of specific environmental situations as well as the design of model peptide systems to better understand structure-property relationships between sequence and stability.

-Guest Lecturer for AST 734 (Graduate Astrobiology Seminar, Fall 2004, Spring 2006), AST 281 (Undergraduate Astrobiology, Spring 2005), UH NAI Ali'i Teacher Workshop (Summer 2005), and ICS 691 (Graduate Computational Astrobiology, Fall 2005).

-Organized and moderated the Astrobiology Journal Club, Fall 2004 and Spring 2005.

-Helped in the directing of graduate student thesis projects.

Sandia National Labs, Albuquerque, NM, 2002-2004

-Integrated Nanotechnology. In conjunction with a diverse group of scientists, studied various aspects of the integration of nanoscale inorganic materials, motor proteins, and microfluidic devices for the directed assembly of nanomaterials. Developed the chemical means by which microtubule transport could be confined in a microchannel environment by using a combination of monolayer chemistry and chemically distinct surfaces to spatially regulate the absorption of the motor protein kinesin. Developed a covalent crosslinking strategy by which the inherently unstable microtubule polymer could be stabilized against denaturation caused by thermal processes or the presence of divalent metal ions. Demonstrated the application of microtubules as templates for the synthesis of high aspect ratio inorganic nanorods. Aided in the development of conjugation strategies by which quantum dots and metal nanoparticles can be reversibly attached to microtubules as well as the design of several microfluidic platforms. Established empirical design rules of surface interfaces capable of absorbing active molecular motors.

-Helped in the training and directing of graduate and undergraduate research interns.

University of Massachusetts-Amherst, MA, 1998-2002

-Nanoscale Supramolecular Chemistry. Studied host-guest interactions between solution phase small molecule guests and hosts attached to inorganic nanoparticles via self-assembled monolayers. Synthesis of monolayer protected gold nanoparticles and organic thiols for attachment to gold nanoparticles, characterized surface mobility of thiols in the directed templation of multivalent binding sites in the monolayer, characterized the effect of the radial nature of nanoparticle based monolayer on *intra*-monolayer hydrogen bonding and in the formation of multivalent binding sites. Developed a ligand system, based on 2,2-dialkyl-1,3-propane diols, and corresponding monolayer derivitization chemistry to form robust monolayer coated γ -Fe₂O₃ nanoparticles. Studied the interaction between molecular recognition element functionalized organic macromolecules (polymers and dendrimers) and their complimentary nanoparticles for the preparation of nanoparticle aggregates with controlled architecture. Applied nanoparticle self-assembly techniques to γ -Fe₂O₃ nanoparticles in the preparation of magnetic materials with designed magnetic properties.

-Teaching Assistant for Chem 290A, Organic Chemistry Laboratory, 1998-1999.

-Helped in the training and directing of junior graduate and undergraduate researchers.

North Carolina State University, NC, 1994-1998

-Structure-Property Relationships in Organic Biradicals. Synthesized a series of trimethylenemethane type stable organic biradicals. These compounds were structurally (X-Ray crystallography) and magnetically (EPR and VT-EPR) characterized to evaluate the effect of steric interactions within the molecule on the electron-electron interactions in the biradicals. Synthesized of coordination polymers based on diaryl nitroxides. Synthesis of metalloporphyrins bearing stable organic radicals. Studied the transition metal coordination chemistry of bis-semiquinones.

-Teaching Assistant for CH121 and CH127, General Chemistry Laboratory sequence, 1996-1997.

-Helped in the training and directing of undergraduate researchers.

Funding History:

1) Center for Integrated Nanomaterials, Sandia and Los Alamos National Labs: "Directed Engineering of Thermostable Motor Proteins" Boal, A. K., Principle Investigator, Bachand, G. D., CINT Scientist \$amolut (2006)

Book Chapters:

1) "Synthesis and Applications of Magnetic Nanoparticles" Boal, A. K. in "Nanoparticles: Building Blocks for Nanotechnology" Rotello, V. M., Ed., Kluwer:New York 2004.

Journal Articles:

NASA Astrobiology Institute, University of Hawai'i at Manoa, Honolulu, HI.

- 32) "Repulsive Electrostatic Interactions and α -helical Stability" Boal, A. K. *Extremeophiles*, **2006**, Manuscript in Preparation
- 31) "Motif Tree Analysis of Microbial Genomes" Boal, A. K.; Brown, M. V., Binsted, K. Manuscript in Preparation.
- 30) "Structure of α -helices from Extremophilic Microorganisms" Boal, A. K.; Hall, C. M.; Saw, J. H. W.; Binsted, K.; Brown, M. V. Manuscript in Preparation
- 28) "An Analysis of the Distribution of Intra-Helical Salt Bridges in the Proteins of Mesophilic and Thermophilic Organisms" Boal, A. K.; Brown, M. V.; Binsted, K.; Manuscript in Preparation.

Sandia National Labs, Albuquerque, NM.

- 27) "Monolayer Engineered Microchannels for Motor Protein Transport Devices" Boal, A. K.; Bauer, J. M.; Rivera, S. B.; Manley, R. G.; Manginell, R. P.; Bachand, G. D.; Bunker, B. C Manuscript in Preparation.
- 26) "Stability of Chemically Crosslinked Microtubules" Boal, A. K.; Rivera, S. B.; Miller, N. E.; Bachand, G. D.; Bunker, B. C. *Small* **2006**, In Press.
- 25) "Interactions Between Cargo-Carrying Biomolecular Shuttles" Boal, A. K.; Rivera, S. B.; Bachand, G. D.; Bunker, B. C. *Nanotechnology* **2006**, *17*, 349-354.
- 24) "Assembly and Transport of Nanocrystal CdSe Quantum Dots Structures using Microtubules and Kinesin" Bachand, G. D.; Rivera, S. B.; Boal, A. K.; Gaudioso, J.; Liu, J.; Bunker, B. C. *Nano Lett.* **2004**, *4*, 817-821.
- 23) "Microtubule-Templated Growth of Lepidocrocite" Boal, A. K.; Headly, T. J.; Tissot, R. G.; Bunker, B. C. *Adv. Funct. Mater.* **2004**, *1*, 19-24.

Department of Chemistry, University of Massachusetts, Amherst, MA.

- 22) "Direct Control of Magnetic Interaction between Iron Oxide Nanoparticles through Dendrimer-Mediated Self-Assembly" Frankamp, B. L.; Boal, A. K.; Tuominen, M. T.; Rotello, V. M. *J. Am. Chem. Soc.* **2005**, *127*, 9731-9735.
- 21) "Modulation of Spacing and Magnetic Properties of Iron Oxide Nanoparticles through Polymer-Mediated "Bricks and Mortar" Self-assembly" Boal, A. K.; Frankamp, B. L.; Uzun, O.; Tuominen, M. T.; Rotello, V. M. *J. Am. Chem. Soc.* **2004**, *126*, 3252-3256.
- 20) "Controlled Interparticle Spacing through Self-Assembly of Au Nanoparticles and Poly(amidoamine) Dendrimers" Frankamp, B. L.; Boal, A. K.; Rotello, V. M. *J. Am. Chem. Soc.* **2002**, *124*, 15146-15147.
- 19) "Supramolecular Assembly on Surfaces: Manipulating Conductance in Noncovalently Modified Mesoscale Structures" Credo, G. M.; Boal, A. K.; Galow, T. H.; Das, K.; Rotello, V. M.; Feldheim, D. L.; Gorman, C. B. *J. Am. Chem. Soc.* **2002**, *124*, 9036-9037.
- 18) "Monolayer Chemistry of Fe₂O₃ Nanoparticles" Boal, A. K.; Das, K.; Gray, M.; Rotello, V. M. *Chem. Mater.* **2002**, *14*, 2628-2636.
- 17) "Radial Control of Recognition and Redox Processes using Multivalent Nanoparticle Hosts" Boal, A. K.; Rotello, V. M. *J. Am. Chem. Soc.* **2002**, *124*, 5019-5024.
- 16) "Recognition-Mediated Assembly of Nanoparticles into Micellar Structures with Diblock Copolymers" Frankamp, B. L.; Uzun, O.; Ilhan, F.; Boal, A. K.; Rotello, V. M. *J. Am. Chem. Soc.* **2002**, *124*, 892-893.
- 15) "'Bricks-and-Mortar' Self-Assembly of Nanoparticles" Boal, A. K.; Gray, M.; Ilhan, F.; Clavier, G. M.; Kapitzky, L.; Rotello, V. M. *Tetrahedron* **2002**, *58*, 756-770.
- 14) "Binary and Ternary Polymer-Mediated "Bricks-and-Mortar" Self-Assembly of Gold and Silica Nanoparticles" Boal, A. K.; Galow, T. H.; Ilhan, F.; Rotello, V. M. *Adv. Funct. Mater.* **2001**, *11*, 461-467.
- 13) "Inhibition of DNA Transcription using Cationic Mixed Monolayer Protected Gold Clusters" McIntosh, C. M.; Esposito, E. A. III; Boal, A. K.; Simard, J. M.; Martin, C. T.; Rotello, V. M. *J. Am. Chem. Soc.* **2001**, *123*, 7626-7629
- 12) "Self-Assembly of Nanoparticles into Giant Spherical Arrays." Boal, A. K.; Ilhan, F.; DeRouchey, J. E.; Thurn-Albrecht, T.; Russell, T. P.; Rotello, V. M. *Nature* **2000**, *404*, 746-748.

- 11) "Intra- and Inter-Monolayer Hydrogen Bonding in Amide Functionalized Alkanethiol SAMs on Gold Nanoparticles" Boal, A. K.; Rotello, V. M. *Langmuir* **2000**, *16*, 9527-9532.
- 10) "Formation and pH-Controlled Assembly of Amphiphilic Gold Nanoparticles" Simard, J.; Briggs, C.; Boal, A. K.; Rotello, V. M. *Chem. Comm.* **2000**, 1945-1955.
- 9) "A 'Building Block' Approach to Mixed-Colloid Ensembles through Electrostatic Self-Organization" Galow, T. H.; Boal, A. K.; Rotello, V. M. *Adv. Mater.* **2000**, *8*, 576-579.
- 8) "Fabrication and Self-Optimization of Multivalent Receptors on Nanoparticle Scaffolds" Boal, A. K.; Rotello, V. M. *J. Am. Chem. Soc.* **2000**, *122*, 734-735.
- 7) "Divergent Monolayer Synthesis Using Acid Fluoride Functionalized SAMs." Niemz, A.; Jeoung, E.; Boal, A. K.; Deans, R.; Rotello, V. *Langmuir* **2000**, *16*, 1460-1462.
- 6) "Redox-Modulated Recognition of Flavin by Functionalized Gold Nanoparticles." Boal, A. K.; Rotello, V. M. *J. Am. Chem. Soc.* **1999**, *121*, 4914-4915.

Department of Chemistry, North Carolina State University, Raleigh, NC.

- 5) "Structure-Property Relationships in Trimethylenemethane-Type Biradicals. 2. Synthesis and EPR Spectral Characterization of Dinitroxide Biradicals." Shultz, D. A.; Boal, A. K.; Lee, H.; Farmer, G. T. *J. Org. Chem.* **1999**, *64*, 4386-4396.
- 4) "Synthesis of Bis(semiquinone)s and their Electrochemical and Electron Paramagnetic Resonance Spectral Characterization." Shultz, D. A.; Boal, A. K.; Farmer, G. T. *J. Org. Chem.* **1998**, *63*, 9462-9469.
- 3) "Effect of Aliphatic Amine Bases on the Aggregation of Alkali Metal Salts of 3,5-Di-*tert*-butyl semiquinone (3,5-DBSQ)." Shultz, D. A.; Boal, A. K.; Campbell, N. P. *Inorg. Chem.* **1998**, *37*, 1540-1543.
- 2) "The Biradical, Bis(3,5-Di-*tert*-butyl-4-phenoxy)methyleneadamantane, Exhibits Matrix-Dependent EPR Spectra Suggesting Rotomer Bisstability with Differential Exchange Coupling." Shultz, D. A.; Boal, A. K.; Farmer, G. T. *J. Am. Chem. Soc.* **1997**, *119*, 3846-3847.
- 1) "Preparation and Characterization of a Bis-semiquinone- A Bidentate Dianion Biradical." Shultz, D. A.; Boal, A. K.; Driscoll, D. J.; Kitchin, J. R.; Tew, G. N. *J. Org. Chem.* **1995**, *60*, 3578-3579.

Conference Proceedings Articles:

NASA Astrobiology Institute, University of Hawai'i at Manoa, Honolulu, HI.

- 17) "Protein Structural Adaptations to Extreme Environments" Boal, A. K.; Brown, M. V.; Binsted, K. *Astrobiology*, **2006**, *6*, 142.

Sandia National Labs, Albuquerque, NM.

- 16) "Nanoscale Transport and Assembly with Motor Proteins and Microtubules" Bauer, J. M.; Boal, A. K.; Rivera, S. B.; Manley, R. G.; Bachand, G. D.; Liu, J.; Manginell, R. P.; Bunker, B.C. *Proc. TAS.* **2004**, *1* 18-20.
- 15) "Stability of Chemically Crosslinked Microtubules" Boal, A. K.; Rivera, S. B.; Miller, N. E.; Bachand, G. D.; Bunker, B. C. *Mat. Res. Soc. Symp. Proc.* **2004**, *826E*, V3.1.1.
- 14) "Microtubule Templated Synthesis of Inorganic Nanomaterials" Boal, A. K.; Headley, T. J.; Tissot, R. G.; Bunker, B. C. *Mat. Res. Soc. Symp. Proc.* **2004**, *823*, W4.3.1.
- 13) "Monolayer Engineered Microchannels for Motor Protein Transport Platforms" Boal, A. K.; Bauer, J. M.; Rivera, S. B.; Manley, R. G.; Manginell, R. P.; Bachand, G. D.; Bunker, B. C. *Poly. Preprints.* **2004**, *xxxx-xxxx*.
- 12) "Developing Nanoscale Materials Using Biomimetic Assembly Processes" Bachand, G. D.; Rivera, S. B.; Boal, A. K.; Bauer, J. M.; Koch, S. J.; Manginell, R. P. *Mat. Res. Soc. Symp. Proc.* **2003**, *782*, A1.1.1.
- 11) "Incorporation of Bioactive Materials into Integrated Systems" Bunker, B. C.; Huber, D. L.; Manginell, R. P.; Kim, B. I.; Boal, A. K.; Bachand, G. D.; Rivera, S. B.; Bauer, J. M.; Matzke, C. *Proc. SPIE* **2003**, *5220*, 23-36.

Department of Chemistry, University of Massachusetts, Amherst, MA.

- 10) "Dendrimer Mediated 'Bricks And Mortar' Self-Assembly of Nanoparticles" Frankamp, B. L.; Boal, A. K.; Rotello, V. M. *Mat. Res. Soc. Symp. Proc.* **2002**, *739*, H7.38.1.
- 9) "Substrate Based "Bricks-and-Mortar" Self-Assembly of Spherical Nanoparticle Aggregates" Boal, A. K.; Ilhan, F.; Rotello, V. M. *Mat. Res. Soc. Symp. Proc.* **2001**, *676*, Y8.5.1.

- 8) "A Building Block Approach to Mixed-Colloid Systems Through Electrostatic Self-Organization" Galow, T. G.; Boal, A. K.; Ilhan, F.; Rotello, V. M. *Mat. Res. Soc. Symp. Proc.* **2001**, 676, Y3.2.1.
- 7) "'Bricks-and-Mortar' Self-Assembly of Nanoparticle Aggregates" Boal, A. K.; Ilhan, F.; Russell, T. P.; Rotello, V. M. *Mat. Res. Soc. Symp. Proc.* **2001**, 635, C1.3.1.
- 6) "Intra-Monolayer Hydrogen-Bonding in Monolayer Protected Gold Clusters" Boal, A. K.; Rotello, V. M. *Mat. Res. Soc. Symp. Proc.* **2001**, 635, C4.19.1.
- 5) "A 'Building Block' Approach to Mixed-Colloid Ensembles Through Electrostatic Self-Organization" Galow, T. H.; Boal, A. K.; Rotello, V. M. *Mat. Res. Soc. Symp. Proc.* **2001**, 635, C4.46.1.
- 4) "Nitroxide Functionalized Ligands: Building Blocks for Molecular Magnets" Boal, A. K. This review was part of the application for the 2000-2001 American Chemical Society, Division of Organic Chemistry Fellowship application. It is available online at <http://www.chem.unt.edu/acs/fellowsh.htm>.
- 3) "Polymer-Mediated 'Bricks-and-Mortar' Self-Assembly of Nanoparticles into Discrete Structural Arrays" Ilhan, F.; Boal, A. K.; Rotello, V. M. *Poly. Preprints.* **2000**, 1348-1349.

Department of Chemistry, North Carolina State University, Raleigh, NC.

- 2) "Preparation of Paramagnetic Ligands for Coordination-Complexes and Networks With Interesting Magnetic Properties." Shultz, D. A.; Boal, A. K.; Driscoll, D. J.; Farmer, G. T.; Hollomon, M. G.; Kitchin, J. R.; Miller, D. B.; Tew, G. N. *Mol. Cryst. Liq. Cryst.* **1997**, 305, A303-A310.
- 1) "Nitroxyl-galvinoxyl- A new biradical." Shultz, D. A. and Boal, A. K. *Mol. Cryst. Liq. Cryst.* **1995**, 271, A75-A79.

Invited Talks:

February 2006: "Protein Structural Adaptations to Extreme Environments" Boal, A. K. Delivered to the Microbiology Department Seminar Series, University of Hawaii.

Contributed Conference Presentations:

- March 2006: "Protein Structural Adaptations to Extreme Environments" Boal, A. K.; Brown, M. V.; Binsted, K. Paper 339 at the Astrobiology Science Conference 2006, Washington D.C. (Oral Presentation)
- August 2005: "Variations of the helical components of proteins from mesophilic, thermophilic, and halophilic microorganisms" Boal, A. K.; Binsted, K.; Brown, M. V.; Gaidos, E. Paper BIOL239 at the 230th National American Chemical Society Meeting. Washington, D. C. (Poster Presentation)
- April 2005: "Biom mineralization of Nonsilica Elements by Diatoms" Boal, A. K.; Brown, M. V.; Chizmadia, L. J.; Gaidos, E. Paper 789 at the NAI2005, 2005 Biennial Meeting of the NASA Astrobiology Institute, Boulder, CO (Poster Presentation)
- April 2005: "University of Hawaii Lead Team: Evolution of Water" Meech, K.; Andreson, F. S.; Binsted, K.; Cowen, J.; Gaidos, E.; Jewitt, D.; Kaiser, R.; Karl, D.; Keil, K.; Krot, A.; Kudrtizki, R.; Mottl, M.; Owen, T.; Reipurth, B.; Scott, E.; Taylor, J.; Williams, J.; Boal, A.; Brown, M.; Chizmadia, L.; Delsanti, A.; Glazer, B.; Haghypour, N.; Schorghofer, N.; Shkolnik, E.; Zheng, W. UH NAI group poster at the NAI2005, 2005 Biennial Meeting of the NASA Astrobiology Institute, Boulder, CO (Poster Presentation)
- April 2004: "Engineered Microchannels for Active Nanomaterials Assembly" Boal, A. K.; Bauer, J. M.; Rivera, S. B.; Manley, R. G.; Bachand, G. B.; Manginell, R. P.; Bunker, B. C. Paper W2.3 at the Spring 2004 Materials Research Society Meeting, San Francisco, CA. (Oral Presentation)
- April 2004: "Stability of Chemically Crosslinked Microtubules" Boal, A. K.; Rivera, S. B.; Miller, N. E.; Bachand, G. D.; Bunker, B. C. Paper V3.1 at the Spring 2004 Materials Research Society Meeting, San Francisco, CA. (Poster Presentation)
- April 2004: "Microtubule Templated Synthesis of Inorganic Nanomaterials" Boal, A. K.; Headley, T. J.; Tissot, R. G.; Bunker, B. C. Paper W4.3 at the Spring 2004 Materials Research Society Meeting, San Francisco, CA. (Poster Presentation) *Nominated for a "Best Poster Award"*.
- March 2004: "Monolayer Engineered Microchannels for Motor Protein Transport Platforms" Boal, A. K.; Bauer, J. M.; Rivera, S. B.; Manley, R. G.; Manginell, R. P.; Bachand, G. D.; Bunker, B. C. Paper POLY-51 at the 227th National American Chemical Society Meeting. Anaheim, CA. (Oral Presentation)
- March 2004: "Microtubule Templated Synthesis of Inorganic Nanomaterials" Boal, A. K.; Headley, T. J.; Tissot, R. G.; Bunker, B. C. Paper INOR-545 at the 227th National American Chemical Society Meeting. Anaheim, CA. (Poster Presentation)

July 2003: "Engineered Mmicrochannels for Active Nanomaterials Assembly" Boal, A. K.; Bauer, J. M.; Rivera, S. B.; Manley, R. G.; Bachand, G. B.; Manginell, R. P.; Bunker, B. C. Poster 46 at the American Society for Microbiology / Institute of Electrical and Electronics Engineers Conference on Bio-,Micro-and Nanosystems. New York, NY. (Poster Presentation)

June 2001: "Supramolecular Chemistry on the Nanometer Scale" Boal, A. K.; Rotello, V. M. Paper number 3 presented at the 2001 National Organic Symposium, Bozeman, MT. (Poster Presentation) *This poster was presented in conjunction with the ACS Division of Organic Chemistry Graduate Research Fellowship.*

April 2001: "Substrate Based "Bricks-and-Mortar" Self-Assembly of Spherical Nanoparticle Aggregates" Boal, A. K.; Ilhan, F.; Rotello, V. M. Paper Y8.5 at the Spring 2001 Materials Research Society Meeting, San Francisco, CA. (Poster Presentation)

November 2000: "Effect of Chain Length on *Intra*-monolayer Noncovalent Interactions on SAMs on Gold Nanoparticles" Boal, A. K.; Rotello, V. M. Paper C4.19 at the Fall 2000 Materials Research Society Meeting. Boston, MA. (Poster Presentation) *Nominated for a "Best Poster Award".*

August 2000: "Effect of Chain Length on *Intra*-monolayer Noncovalent Interactions on SAMs on Gold Nanoparticles" Boal, A. K.; Rotello, V. M. Paper 241-ORGN at the 220th National American Chemical Society Meeting. Washington, D. C. (Poster Presentation)

August 2000: "'Bricks and Mortar' Self-Assembly of Nanoparticles: A Combinatorial Approach to Materials Synthesis" Boal, A. K.; Ilhan, F.; Gray, M.; Rotello, V. M. Paper 519-ORGN at the 220th National American Chemical Society Meeting. Washington, D. C. (Oral Presentation)

August 1998: "Spin-spin Coupling in Radical Substituted Metalloporphyrins" Boal, A. K.; Lee, H. Y.; Shultz, D. A. Paper 397-INOR at the 216th National American Chemical Society Meeting. Boston, MA. (Poster Presentation)

August 1998: "Structure-property Relationships in Trimethylenemethane-type Di-nitroxide Biradicals" Boal, A. K.; Farmer, G. T.; Shultz, D. A. Paper 400-INOR at the 216th National American Chemical Society Meeting. Boston, MA. (Poster Presentation)

August 1994: "Synthesis and Characterization of New Galvinoxyl Radical Derivatives" Boal, A. K.; Farmer, G. T.; Shultz, D. A. Paper 268-ORGN at the 216th National American Chemical Society Meeting. Washington, D. C. (Poster Presentation)

Journal Article Referee

I have reviewed articles for the following journals: Macromolecules.

Artistic Work

In addition to my science efforts, I am also a practicing artist. My main background here is in painting, which I have been following seriously since 1993. I work in photography as well, something that I have been doing consistently since 2002. My work covers a large area of techniques and styles and has been exhibited in several locations throughout the United States and my work resides in the private collections of people from around the world. I also work a little in graphic design that, above the normal work associated with publications or presentations, has resulted in my research being presented on several inside or outside covers of journals.

Group Gallery Exhibitions:

Fort 105 Studios. Albuquerque, NM. June 2004. Exhibition of five paintings as part of the Lovely One show.

Exhibitions in Non-gallery Venues:

Soho Tea and Coffee. Washington, DC. February 2006. Solo exhibition of a collection of photographs at a café/gallery.

North Carolina State University Department of Chemistry. Raleigh NC. Spring 2002. Display of *An Artists (mis)Interpretation of the Periodic Table of the Elements* as part of an ongoing exhibition which highlights research done in the chemistry department.

Franklin Medical Center. Greenfield, MA. Spring 2002. Display of several paintings as part of the Healing Arts project.

Juried Art Shows and Festivals:

Waikiki Zoo Art-on-the-Fence. Honolulu, HI. July-August 2005. Weekly exhibition and sales of various paintings and photographs as part of the ongoing art show.

Crooked Fences. Honolulu, HI. July 2005. Exhibition of several paintings in a group show at an outdoor venue.

Go! Art Festival. Albuquerque, NM. September 2003. Exhibition of a painting at the Magnifico! Gallery and several paintings in a street booth.

Downtown Growers Market. Albuquerque, NM. Summer 2003. Exhibition of paintings on weekends during the Downtown Growers Market for local farmers and artists.

Graphic Design Work:

UH NAI logo. December 2004. Designed the logo for the NASA Institute for Astrobiology run through the Institute for Astronomy, University of Hawaii.

Journal Cover Designs:

Advanced Functional Materials. Designed the front cover for Volume 14, Issue 1 which accompanied "Microtubule-Templated Growth of Lepidocrocite" Boal, A. K.; Headly, T. J.; Tissot, R. G.; Bunker, B. C. *Adv. Funct. Mater.* **2004**, *1*, 19-24.

Advanced Functional Materials. Designed the front cover for Volume 11, Issue 8 which accompanied "Binary and Ternary Polymer-Mediated "Bricks-and-Mortar" Self-Assembly of Gold and Silica Nanoparticles" Boal, A. K.; Galow, T. H.; Ilhan, F.; Rotello, V. M. *Adv. Funct. Mater.* **2001**, *11*, 461-467.

Advanced Materials. Designed the front cover for Volume 8, Issue 12 which accompanied "A 'Building Block' Approach to Mixed-Colloid Ensembles through Electrostatic Self-Organization" Galow, T. H.; Boal, A. K.; Rotello, V. M. *Adv. Mater.* **2000**, *8*, 576-579.

Art Related Publications:

1) "Title Here" Boal, A. K. in "Book title" name, x. y. ;name, x. y. Eds. *In Press.*

Literary Writing

Paragraph about fiction works

Fiction Publications, Novels:

None, yet

Fiction Publications, Short Works:

None, yet

Screen Plays:

None, yet

Essays:

None, yet

Nonfiction Books:

None, yet

Professional References:

Dr. Karen J. Meech

(Astrobiology Program Principal Investigator)

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Dr. Bruce C. Bunker

(Postdoctoral Advisor)

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Fax: (505) 844-5470

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Dr. Vincent M. Rotello

(Ph.D. Thesis Advisor)

Professor

Department of Chemistry

Department of Polymer Science and Engineering

Program in Molecular and Cell Biology

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Amherst, MA 01003

Voice: (413) 545-2058

Fax: (413) 545-4490

Email: rotello@chem.umass.edu

Dr. David A. Shultz

(Undergraduate/Masters Thesis Advisor)

Professor of Chemistry

Department of Chemistry

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