

Vincent M. Rotello

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Updated 1/29/10

Education:

Ph.D., Yale University, New Haven, CT, June 1990
M.S., Yale University, New Haven, CT, 1986
B.S. (Honors) Illinois Institute of Technology, Chicago, IL, 1985

Professional Experience

Charles A. Goessmann Professor of Chemistry, 2005-present, University of Massachusetts-Amherst
Professor, Program in Molecular and Cell Biology, *Adjunct Professor*, Department of Polymer Science and Engineering, 2001-present, University of Massachusetts-Amherst
Associate Professor, 1998-2001, *Assistant Professor*, University of Massachusetts-Amherst, 1993-1998
NSF Postdoctoral Fellow, Massachusetts Institute of Technology, 1990-1993

Honors and Awards:

2009: Fellow, American Association for the Advancement of Science
2007: Fellow, Royal Society of Chemistry (UK)
2006: University of Massachusetts Chancellor's Medal
2006: College of Natural Sciences and Mathematics Distinguished Researcher Award.
2005: Invited Professor, Ecole Normale Supérieure de Cachan.
2003-2004: Samuel F. Conte University Distinguished Faculty Fellowship
1998-2000: Alfred P. Sloan Fellow
1997-2002: Camille Dreyfus Teacher-Scholar
1997: NSF CAREER Award
1996: American Chemical Society, Connecticut Valley Section, John Burlew Award in Research
1996-2001: Research Corporation Cottrell Scholar
1996-1997: Lilly Teaching Fellow, University of Massachusetts
1990-1993: National Science Foundation Postdoctoral Fellow
1985: American Chemical Society Undergraduate Award in Analytical Chemistry

Named/Plenary/Keynote Lectures:

2009: *Keynote Speaker*, Fall ACS National Meeting, Hybrid Colloids, Interfaces, and Nanomaterials, Washington D.C.
Keynote Speaker, 42nd IUPAC International Conference, Glasgow Scotland. *Keynote Speaker*, Gold 2009, Heidelberg Germany. *Plenary Speaker*, International Conference on the Environmental Implications and Applications of Nanotechnology, Amherst, MA. **2007:** *Plenary Speaker*, Bio-Physicochemical Interactions of Engineered Nanomaterials Workshop, UCLA. *Keynote Speaker*, Lorentz Conference, Magnetic Nanoparticles: Challenges and Future Prospects, Leiden, Netherlands, *Cherry Emerson Lecture*, Georgia Tech. **2006:** *Distinguished Faculty Lecture*, University of Massachusetts; *Plenary Lecture*; Particles 2006. **2005:** *Distinguished Faculty Lecture*; Indiana University. **2004:** *Keynote Speaker* Particles 2004. **2002:** *Distinguished Lecture Series* Dept of Materials & Nuclear Eng., University of Maryland; *Keynote Speaker*, Macromolecular Science and Engineering Symposium. University of Michigan, **2000:** *R.T. Major Co-Lecturer*, University of Connecticut. **1999:** Williams College, *Organic Syntheses Lecture*; **1997:** *Nora Harrington Lecture*, Elms College, Springfield, MA. **1996:** *Closs Lecture*, University of Chicago.

Professional Service

Editorial:

- 2009-2012: **Executive Editor**, *Advanced Drug Delivery Reviews*
2009-2013: **Associate Editor for North America**, *Journal of Materials Chemistry*
2010-2013: **Editorial Advisory Board**, *Chemical Research in Toxicology*
2010: **Guest Co-Editor**, *Current Opinions in Chemical Biology*, issue on “Array Based Sensing”
2009: **Guest Editor**, *International Journal of Molecular Sciences* special issue “Molecular Recognition”
2009-2112: **Editorial Board**, *International Journal of Green Nanotechnology*
2008: **Guest Editor**, *Journal of Materials Chemistry* feature issue “Biology in the Service of Materials”
2008: **Guest Editor**, *Advanced Drug Delivery Reviews* focus issue “Inorganic Particles in Drug Delivery”
2007: **Co-Editor**, *Polymers Today* special issue “Recognition mediated Self-Assembly of Polymers”
2006-2009: **Editorial Board**, *Journal of Materials Chemistry*
2009-2111: **Editorial Board**, *International Journal of Molecular Sciences*
2005- **Editorial Advisory Board**, *Chemical Biology & Drug Design*
2002- **Editorial Advisory Board**, *Mini-Reviews in Organic Chemistry*, *Letters in Organic Chemistry*, *Drug Design Reviews*, *Medicinal Chemistry*, *Current Organic Synthesis*
2001- **Analyst**, *Faculty of 1000* research highlighting service
2001: **Editor**, *Tetrahedron* Symposium in Print “Self-Assembly of Organic Molecules”
2001: **Co-Editor** “Organic Cofactors” Forum Issue of *Antioxidants and Redox Signaling*

Scientific Advisory Boards

- 2009-2010: European Institute of Chemistry and Biology
2009-2011: OmegaGenesis Inc

Panels/Study Sections

NIH Panel Standing Membership: 2010-2011: *Chair*, F14 Fellowship Panel. 2002-2006: *Member*, Medicinal Chemistry (MCHA/SBCA) Study Section.

Ad Hoc NIH Service: 2009: F14 Fellowship Panel (Fall), *Co-Chair*, Special Topics in Bioengineering, (ZRG1 BST-J) (Fall) *Chair*, Technologies in Cell Biology (ZRG1 CB-N) (Spring) Microscopic Imaging (MI) Special Emphasis Panel (ZRG1 BST-Q)(Spring) 2008: Microscopic Imaging (MI) (Fall), Microscopic Imaging (MI) Special Emphasis Panel (ZRG1 BST-Q)(Summer). 2007: *Chair*; Microscopic Imaging (MI); Special Emphasis Panel (ZRG1 BST-Q, Spring); Molecular Probes for Microscopy (BST-R). 2006: F14 Fellowship Panel; Program Project Grant Evaluation. 2005: Nanomedicine Design Centers (NDC); Biomedical Sensing and Instrumentation (SBIB-K). Small Business Bioengineering and Physiology (SSSMI-K); Bioengineering Nanotechnology Initiative (SBIB-S 50R); *Chair* R13 Conference Grants (OSR-C); Sepsis and CAP: Partnerships for Diagnostics Development (SR-M M1); Microarrays and Nanoparticles (BST-A). 2004: Prokaryotic Cell and Molecular Biology (PCMB) Study Section. 2003: COBRE Biomedical Center Panel; Medical Imaging (SSS7) Study Section. 2002: Special Emphasis Panel; F32 Special Emphasis Panel. 2001: Medicinal Chemistry (Spring, Fall); Bioorganic and Natural Products (Summer).

NSF: 2004: Nanotechnology Science and Engineering Center (NSEC) reverse site visit panel; Organic Optoelectronics

EPSRC: 2006-2009: Member, EPSRC Peer Review College

Argonne National Lab: 2007-2010: Proposal Evaluation Board, Center for Nanoscale Materials

Symposium Organizing:

ACS: 2010: Session Organizer, “Engineering the Materials-Biology Interface” Division of Polymer Chemistry, Spring National Meeting of the ACS, San Francisco, CA; 2006: Session co-organizer “Nanoparticles and Microparticles” Division of Polymer Chemistry; “Organic Nanotechnology” Division of Organic Chemistry Fall National Meeting of the ACS, San Francisco, CA.. 2005: “Molecular Recognition using Polymeric Materials”, Division of Polymer Chemistry, Fall National Meeting of the ACS, Washington, DC; 2003: “Supramolecular Chemistry and Molecular Recognition”, Division of Organic Chemistry, “Molecular Recognition using Polymeric Materials” Division of Polymer Chemistry, Fall National Meeting of the ACS, New York, NY; “Polymer Design Using Noncovalent Methods”, Division of Polymer Chemistry, Spring National Meeting of the ACS, New Orleans, LA; 2000: Session Organizer, “Nanoscale Materials and Devices”, New England Region of the ACS, Storrs, CT

MRS: Symposium co-organizer: 2009: “Biological Imaging and Sensing using Nanoparticle Assemblies” Symposium XX, Materials Research Society Fall Meeting, Boston MA. 2007: “Biomolecular and Biologically-Inspired Interfaces and Assemblies”, Symposium MM, 2005: “Nanomaterials in the Environment” (Symposium O) Materials Research Society Fall Meeting, Boston MA.

NSF: 2006-2008 National Science Foundation, “Workshop on Physical Organic Chemistry”, (S. David and M. Garcia-Garibay co-organizers)

Current/Recent Funding (Total Costs)

Current: National Institutes of Health, “Tailored Magnetic Nanoparticles for Cell Alignment and Tissue Engineering” GM077173-03S1 (Supplement), 7/17/09-7/16/10, \$235,078 (VR P.I., E. Alsberg, B. Yellen, Co-P.I.)

BAE Systems “Bacterial Sensors” 1/1/09-12/31/09, \$36,600.

National Science Foundation “Bionanocomposites through Protein-Mediated Assembly of Nanoparticles” (CHE-0808945), 8/1/08-7/31/11, \$397,000.

National Institutes of Health, “Detection of Bacteria using Nanoparticle-Polymer Sensors” R21 AI073425-01, 4/1/08-3/31/10, \$423,489 (VR P.I., U. Bunz, Co-P.I.)

Department of Energy “Hyperbranched Conjugated Polymers and their Nanodot Composites as Universal Bioinspired Architectures” (DE-FG02-04ER46141) 4/4/07-4/3/10, \$494,691 (\$199,000 to VR) (U. Bunz P.I.)

National Institutes of Health, “Recognition and Presentation of α -Helices using Nanoparticle Receptors” R01 GM077173, 4/1/07-3/31/11, \$1,061,000.

National Science Foundation, “Workshop on Physical Organic Chemistry”, 8/1/06-7/31/09, (CHE-633924), \$62,544, (Co-PI with S. David and M. Garcia-Garibay)

National Science Foundation, “Center for Hierarchical Manufacturing”, 4/1/06-3/31/12, (DMI-0531171) \$4,000,000 (\$78,000/year to VR)(J. Watkins, M. Tuominen, P.I.’s)

National Science Foundation, “Materials Research Science and Engineering Center on Polymers”, 8/1/08-12/31/13, DMR-0820506 \$4,092,000 (\$32,000/year to VR)(T. Russell, P.I.)

National Science Foundation, “IGERT: Research and Innovation in Nanoscale Device Development”, 8/1/05-7/31/10, DUE-044852, \$3,189,732 (co-P.I., J. Watkins, P.I.)

Recent: National Science Foundation, “Recognition-Controlled Polymer Self-Assembly” CHE-0518487 8/1/05-7/31/08, \$365,000. National Institutes of Health, “Nanoparticles with Tailored Monolayers for DNA Transfection” R21 EB004503-01, 8/1/05-7/31/07, \$416,000. Office of Naval Research “Nanoparticle Assemblies as New Highly Efficient Extraction Materials”, 1/1/2005-12/31/07, \$1,250,000 (R. Vachet, P.I., 1 other investigator). National Academies Keck Futures Initiative “Integrated Nanoparticle-Protein Nanocomposite Systems” 4/1/05-3/31/07, \$50,000 (V. Rotello P.I., M. Tuominen Co-PI). Army Research Office, “Targeting of Breast Tumors and Tumor Cells using Inductive Magnetic Heating of Metallic Nanoparticles”, BC021171, 4/1/03-3/31/06, \$460,500. National Institutes of Health, “Nanoparticles: Model Systems for Flavoenzyme Activity” RO1 GM59249-04, 4/1/02-3/31/06, \$921,000. National Science Foundation, “The Interdependence of Redox and Recognition Processes” CHE-0213354 8/1/02-7/31/05, \$348,000. National Science Foundation NIRT grant, “Copolymer Templates: A Self-Assembling Route to High-Density Arrays of Functional Nanostructures” 6/1/01-5/31/05, DMI-0103024, \$1,250,000 (M. Tuominen, P.I., 3 other investigators). National Institutes of Health, “Specific Recognition of Biomacromolecules using Self-Optimizing Nanoparticles”, 6/1/01-5/31/04, R01 GM62998, \$946,000

Books/Software

Rotello, V. M.; Thayumanavan, S., eds. “Molecular Recognition and Polymers: Control of Polymer Structure and Self-Assembly” Wiley: New York, 2008.

Bull, R.; Rotello, V. M.; Reckhow, D.; Bull, O. M.; Kim, J. *Use of Toxicological and Chemical Models to Prioritize DBP Research*, AWWA: Denver, 2007.

Rotello, V., ed. *Nanoparticles: Building Blocks for Nanotechnology*, Kluwer: New York, 2004.

Vining, W.; Rotello, V. M.; Bak, D. “Harcourt Interactive Organic Chemistry” (CD-ROM) Harcourt: New York, 2001.

Publications

295) Kim, B.; Han, G.; Toley, B.; Kim, C.K.; Rotello, V. M. “Tuning Payload Delivery in Tumor Cyndroids using Gold Nanoparticles” *Nature Nanotech.*, in press.

294) Ghosh, P.; Yang, X.; Arvizo, R.; Zhu, Z.J.; Mo, Z.; Rotello, V. M. “Intracellular Delivery of a Membrane-Impermeable Enzyme in Active Form using Functionalized Gold Nanoparticles” *J. Am. Chem. Soc.*, in press.

293) Bunz, U. H. F.; Rotello, V. M. “Gold-Nanoparticle-Fluorophore Complexes: A Sensitive and Discerning “Nose” for Biosystems Sensing” *Angew. Chemie*, in press.

292) Bajaj, A.; Miranda, O. R.; Phillips, R.; Kim, I.K.; Jerry, D. J.; Bunz, U. H. F.; Rotello, V. M. “Array Based Sensing of Normal, Cancerous and Metastatic Cells using Conjugated Fluorescent Polymers” *J. Am. Chem. Soc.*, in press.

- 291) Ofir, Y.; Moran, I. W.; Subramani, S.; Carter, K. R.; Rotello, V. M. "Nanoimprint Lithography for Functional Three Dimensional Patterns" *Adv. Mat.*, in press.
- 289) Uzun, O.; Sanyal, A.; Jeong, Y.; Rotello, V. M. "Molecular Recognition Induced Self-Assembly of Diblock Copolymers: Microspheres to Vesicles" *Macromol. Biosci.* in press.
- 288) Yu, X.; Subramani, C.; Yang, X.; Kim, C.Y.; Rotello, V. M. "A Versatile and Direct Method for Polymer Surface Functionalization through Amine-Aldehyde Chemistry" *Macromol. Rapid Comm.*, in press.
- 287) Erb, R. M.; Krebs, M. D.; Alsberg, E.; Samanta, B.; Rotello, V. M.; Yellen, B. B.; "Beyond Diffusion-Limited Aggregation Kinetics in Microparticle Suspensions" *Phys. Rev. E.*, **2009**, *80* 051402
- 286) Yan, B.; Zhu, Z.-J.; Miranda, O.R.; Chompoosor, A.; Rotello, V. M.; Vachet, R.W. "Laser Desorption/Ionization Mass Spectrometry Analysis of Monolayer-Protected Gold Nanoparticles" *Anal. Bioanal. Chem.*, in press.
- 285) Jordan, B. J.; Hong, R.; Han, G.; Rana, S.; Rotello, V. M. "Modulation of Enzyme-Substrate Selectivity using Tetraethylene Glycol Functionalized Gold Nanoparticles" *Nanotechnology*, **2009**, *20*, 43004.
- 284) Kim, C.-K., Ghosh, P.; Rotello, V. M. "Multimodal Drug Delivery using Gold Nanoparticles" *Nanoscale*, **2009**, *1*, 61-67.
- 283) De, M.; Rana, S.; Akpınar, H.; Miranda, O.R.; Arvizo, R. R.; Bunz, U. H. F.; Rotello, V. M. "Sensing of proteins in human serum using conjugates of nanoparticles and green fluorescent protein" *Nature Chem.* **2009**, *1*, 461-465.
- 282) Zhu, Z.-J.; Rotello, V. M.; Vachet, R. W. "Engineered Nanoparticle Surfaces for Improved Mass Spectrometric Analyses", *Analyst*, **2009**, *134*, 2183-2188.
- 281) Rotello, V. M. "Sniffing out Cancer using "Chemical Nose" Sensors" *Cell Cycle*, **2009**, *22*, 3615-3616.
- 280) Bajaj, A.; Miranda, O. R.; Kim, I.-K.; Phillips, R. L.; Jerry, D. J.; Bunz, U. H. F.; Rotello, V. M. "Detection and Differentiation of Normal, Cancerous, and Metastatic Cells using Nanoparticle-Polymer Sensor Arrays" *Proc. Nat. Acad. Sci.*, **2009**, *106*, 10912-10916.
- 279) Samanta, B.; Yang, X.-C.; Ofir, Y.; Park, M.-H.; Patra, D.; Agasti, S.; Miranda, O. R.; Mo, Z.-H. Rotello, V. M. "Catalytic Microcapsules through Assembly of Enzyme-Nanoparticle Conjugates at Oil-Water Interfaces" *Angewandte Chemie*, **2009**, *48*, 5341-5344.
- 278) Rotello, V. M. "Hot and Sticky; Cold and Aloof (Commentary)" *Nature Mat.* **2009**, *8*, 539-540.
- 277) Patra, D.; Ozdemir, F.; Miranda, O.R.; Samanta, B.; Sanyal, A.; Rotello, V. M. "Formation and Size Tuning of Colloidal Microcapsules via Host-Guest Molecular Recognition at the Liquid-Liquid Interface" *Langmuir*, **2009**, *25*, 13852-13854.
- 276) Subramani, C.; Ofir Y.; Patra, D.; Jordan, B. J.; Moran, I. W.; Park, M.-H.; Carter, K. C.; Rotello, V. M. "Nanoimprinted Polyethyleneimine: A Multimodal Template for Nanoparticle Assembly and Immobilization" *Adv. Func. Mat.*, **2009**, *19*, 2937-2942.
- 275) Patra, D.; Pagliuca, C.; Subramani, C.; Samanta, B.; Agasti, S. S.; Zainalabdeen, N.; Caldwell, S. T.; Cooke, G.; Rotello, V. M. "Molecular Recognition at the Liquid-Liquid Interface of Colloidal Microcapsules" *Chem. Comm*, **2009**, 4248-4250.
- 274) De, M.; Rana, S.; Rotello, V. M. "Nickel-Ion-Mediated Control of the Stoichiometry of His-Tagged Protein/Nanoparticle Interactions" *Macromol. Biosci.* **2009**, *9*, 174-178.
- 273) Agasti, S.; Chompoosor, A.; You, C.-C.; Ghosh, P.; Kim, C.-Y., Rotello, Vincent M. "Photoregulated Release of Caged Anticancer Drugs from Gold Nanoparticles" *J. Am. Chem. Soc.*, **2009**, *131*, 5728-5729.
- 272) Krebs, M. D.; Erb, R. M.; Yellen, B. B.; Samanta, A.; Bajaj, A.; Rotello, V. M.; Alsberg, E. "Formation of Ordered Cellular Structures in Suspension via Label-Free Negative Magnetophoresis" *Nano Lett.*, **2009**, *9*, 1812-1817.
- 271) Bajaj, A.; Samanta, B.; Yan, H.; Jerry, D. J.; Rotello, V. M. "Stability, Toxicity and Differential Cellular Uptake of Protein Passivated-Fe₃O₄ Nanoparticles" *J. Mater. Chem.*, **2009**, *19*, 6328-6331.
- 270) Du, K.; Knutson, C. R.; Glogowski, E.; McCarthy, K. D.; Shenhar, R.; Rotello, V. M.; Tuominen, M. T.; Emrick, T.; Russell, T. P.; Dinsmore, A. D. "Self-Assembled Electrical Contact to Nanoparticles Using Metallic Droplets" *Small* **2009**, *5*, 1974-1977.
- 269) Son, H.S.; Erb, R. M.; Samanta, B.; Rotello, V. M.; Yellen, B. B. "Magnetically Actuated Assembly of Colloidal Superstructures with Multipole Symmetry" *Nature*, **2009**, *457*, 999-1002.
- 268) Carver, A. M.; De, M.; Bayraktar, H.; Rana, S.; Rotello, V. M.; Knapp, M. J. "Intermolecular Electron-Transfer Catalyzed on Nanoparticle Surfaces" *J. Am. Chem. Soc.*, **2009**, *131*, 3798-3799.
- 267) De, M.; Miranda, O. R.; Rotello, V. M. "Size and Geometry Dependent Protein-Nanoparticle Self-Assembly" *Chem. Comm.*, **2009**, 2157-2159.
- 266) Caldwell, S. T.; Farrugia L. J.; Hewage, S. G.; Kryvokhyzha, N.; Rotello, V. M.; Cooke, G. "Model Systems for Flavoenzyme Activity: An Investigation of the Role Functionality Attached to the C(7) Position of the Flavin Unit has on Redox and Molecular Recognition Properties" *Chem. Comm.*, **2009**, 1350-1352.
- 265) Kim, C.-K.; Ghosh, P.; Pagliuca, C.; Zhu, Z.-J.; Menichetti, S.; Rotello, V. M. "Entrapment of Hydrophobic Drugs in Nanoparticle Monolayers with Efficient Release into Cancer Cells" *J. Am. Chem. Soc.*, **2009**, *131*, 1260-1361.

- 264) Santore, M. M.; Zhang, J.; Srivastava, S.; Rotello, V. M. "Beyond Molecular Recognition: Using a Repulsive Field to Tune Interfacial Valency and Binding Specificity between Adhesive Surfaces" *Langmuir*, **2009**, *25*, 84-96.
- 263) Park, M.-H.; Ofir, Y.; Samanta, B.; Rotello, V. M. "Robust and Responsive Dendrimer-Gold Nanoparticle Nanocomposites via Dithiocarbamate Cross-linking" *Adv. Mat.* **2009**, *21*, 2323-2327. .
- 262) Aniagyei, S. E.; Kennedy, C. J.; Stein, B.; Willits, D. A.; Douglas, T.; Young, M. J.; De, M.; Rotello, V. M.; Srisathiyannarayanan, D.; Kao, C. C.; Dragnea, B. "Synergistic Effects of Mutations and Nanoparticle Templating in the Self-Assembly Of Cowpea Chlorotic Mottle Virus Capsids" *Nano Letters*, **2009**, *9*, 393-398.
- 261) Samanta, B.; Patra, D.; Subramani, C.; Ofir, Y.; Yesilbag, G.; Sanyal, A.; Rotello, V. M. Stable Magnetic Colloidosomes via "Click" Mediated Crosslinking of Nanoparticles at Water-Oil Interfaces" *Small*, **2009**, *5*, 685-688.
- 260) Bria, M.; Bigot, J.; Cooke, J.; Lyskawa, J.; Rabani, G.; Rotello, V. M.; Woisel, P. "Synthesis of a Polypseudorotaxane, Polyrotaxane, and Polycatenane using 'Click' Chemistry" *Tetrahedron*, **2009**, *65*, 400-4007.
- 259) Kim, I.-B.; Han, M. H.; Phillips, R. L.; Samanta, B.; Rotello, V. M.; Zhang, Z. J, Bunz, U.H.F. "Nano-Conjugate Fluorescence Probe for the Discrimination of Phosphate and Pyrophosphate" *Chem. Eur. J.* **2009**, *15*, 449-456.
- 258) Zhu, Z.-J. Ghosh, P.S.; Miranda, O.R.; Vachet, R. W.; Rotello, V. M. "Multiplexed Screening of Cellular Uptake of Gold Nanoparticles Using Laser Desorption/Ionization Mass Spectrometry (LDI-MS)" *J. Am. Chem. Soc.*, **2008**, *130*, 14139-14143.
- 257) Caldwell, S. T.; Cooke, G.; Fitzpatrick, B. Long, D.L.; Rabani, G.; Rotello, V. M. "A Flavin-Based [2]Catenane" *Chem. Comm.* **2008**, 5912-5914
- 256) Yu, X.; Samanta, B.; Xu, H.; Arumugam, P.; Ofir, Y.; Jordan, B. J.; Rotello, V. M. "Fabrication and Functionalization of Supramolecular Microgel Arrays through Complementary Hydrogen Bonding Interactions" *Small*, **2009**, *5*, 86-89.
- 255) Ghosh, P. S.; Kim, C.-K.; Han, G.; Forbes, N. S.; Rotello, V. M. "Efficient Gene Delivery Vectors by Tuning the Surface Charge Density of Amino Acid-Functionalized Gold Nanoparticles" *ACS Nano*, **2008**, *2*, 2213-2218.
- 254) Caldwell, S. T.; Cooke, G.; Hewage, S. G.; Mabruk, S.; Rabani, G.; Rotello, V. M.; Smith, B. O.; Subramani, C.; Woisel, P. "Model Systems for Flavoenzyme Activity: Intramolecular Self-Assembly of a Flavin Derivative via Hydrogen Bonding and Aromatic Interactions" *Chem. Comm.*, **2008**, 4126-4128.
- 253) Phillips, R.L.; Miranda O. R.; Mortenson, D. E.; Subramani, C.; Rotello, V. M.; Bunz, U. H. F. "Gold Nanoparticle-PPE Constructs as Biomolecular Material Mimics: Understanding the Electrostatic and Hydrophobic Interactions" *Soft Matter*, **2009**, *5*, 607-612.
- 252) Santore, M. M.; Zhang, J.; Srivastava, S.; Rotello, V. M. "Adhesive Specificity at the Micron Scale without Molecular Recognition: Tuning Valency with Repulsive Fields" *Langmuir*, **2008**, *24*, 6404-6408.
- 251) Chen, H.-T.; Crosby, T.; Park, M.H.; Nagarajan, S.; Rotello, V. M. "Control of Nanoparticle Diffusion using Size Exclusion Channels within Patterned Mesoporous Silica Films prepared using Supercritical Carbon Dioxide-Mediated Replication of Block Copolymer Templates" *J. Mat. Chem.*, **2009**, *19*, 70-74.
- 250) Samanta, B.; Ofir, Y.; Patra, D.; Rotello, V. M. "Self-assembly of Fluorocarbon Coated FePt Nanoparticles for Controlling Structure and Wettability of Surfaces" *Soft Matter*, **2009**, *5*, 1247-1250.
- 249) De, M.; Ghosh, P.; Rotello, V. M. "Applications of Nanoparticles in Biology", *Adv. Mat.*, **2008**, *20*, 4225-4241.
- 248) Jordan, B. J.; Ofir, Y.; Patra, D.; Caldwell, S.T.; Joubanian, S.; Rabani, G.; Cooke, G.; Rotello, V.M. "Controlled Self-Assembly of Organic Nanowires and Platelets using Dipolar and Hydrogen Bonding Interactions" *Small*, **2008**, *4*, 2074-2078.
- 247) Park, M-H.; Ofir, Y.; Samanta, B.; Arumugam, P.; Miranda, O. R.; Rotello, V.M. "Nanoparticle Immobilization on Surfaces via Activatable Heterobifunctional Dithiocarbamate Bond Formation" *Adv. Mat.*, **2008**, *20*, 4185-4188..
- 246) Agasti, S.; Caldwell, S. T.; Cooke, G.; Jordan, B. J.; Rana, S.; Kennedy, A.; Rabani, G.; Sanyal, A.; Rotello, V. M. "Dendron-Based Mimic of Flavoenzyme Activity: Towards a New Class of Synthetic Flavoenzymes" *Chem. Comm.*, **2008**, 4123-4125.
- 245) Rotello, V. M. "Biology in the Service of Materials" *J. Mat. Chem.* **2008**, *18*, 3739-3740.
- 244) Arumugam, P.; Patra, D.; Samanta, B.; Agasti, S. S.; Subramani, C.; Rotello, V. M. "Self-Assembly and Crosslinking of FePt Nanoparticles at Planar and Colloidal Liquid-Liquid Interfaces" *J. Am. Chem. Soc.*, **2008**, *130*, 10046-10047.
- 243) Rotello, V. M. "Preface: Inorganic Nanomaterials in Drug Delivery" *Adv Drug Del. Rev* **2008**, *60*, 1225-1225.
- 242) Chompoosor, A.; Han, G.; Rotello, V. M. "Charge Dependence of Ligand Release on Gold Nanoparticles by Biogenic Thiols" *Bioconjugate Chem.* **2008**, *19*, 1342-1345.
- 241) Rotello, V. M. "Crown Ether-Peptide Construct Kills Cancer Cells (Commentary)" *Chem. Biol. Drug Des.* **2008**, *72*, 1-2.
- 240) Zhang, J.; Srivastava, S.; Duffandar, R.; Davis, J. M.; Rotello, V. M.; Santore, M. M. "Manipulating Microparticles with Single Surface-Immobilized Nanoparticles" *Langmuir*, **2008**, *24*, 6404-6408.
- 239) De, M.; Rotello, V. M. "Synthetic "Chaperones": Nanoparticle-Mediated Refolding of Thermally Denatured Proteins" *Chem. Comm.* **2008**, 3504-3506.

- 238) Ofir, Y.; Samanta, B.; Rotello, V. M. "Polymer Mediated Self-Assembly of Gold Nanoparticles" *Chem. Soc. Rev.*, **2008**, *37*, 1814-1825.
- 237) Caldwell, S.T.; Cooke, G.; Cooper, A.; Nutley, M.; Rabani, G.; Rotello, V.M.; Smith, B. O.; Woisel, P. "Tuneable pseudorotaxane formation between a biotin-avidin bioconjugate and CBPQT4+" *Chem. Comm.* **2008**, 2650-2652.
- 236) Ghosh, P.; Han, G.; De, M.; Kim, C. K.; Rotello, V. M. "Gold Nanoparticles in Delivery Applications" *Adv Drug Del. Rev.* **2008**, *60*, 1307-1315.
- 235) McGrier, P.L.; Solntsev, K. M.; Miao, S.; Tolbert, L. M.; Miranda, O. R.; Bunz, U.H.F. Rotello, V. M. "Hydroxycruciforms: Amine-Responsive Fluorophores" *Chem. Eur. J.* **2008**, *14*, 4503-4510.
- 234) Ofir, Y.; Samanta, B.; Xiao, Q.; Jordan, B. J.; Xu, H.; Arumugam, P.; Arvizo, R.; Tuominen, M. T.; Rotello, V. M. "Polyelectrolyte Negative Resist Patterns as Templates for the Electrostatic Assembly of Nanoparticles and Electroless Deposition of Metallic Films" *Adv. Mat.*, **2008**, *20*, 2561-2566.
- 233) Rotello, V. "Inspiration (and Perspiration) from Biology" *ACS Nano*, **2008**, *2*, 4-6.
- 232) Phillips, R. L.; Miranda, O. R.; You, C.-C.; Rotello, V. M.; Bunz, U. H. F. "Rapid and Efficient Identification of Bacteria Using Gold Nanoparticle-Conjugated Polymer Constructs" *Angewandte Chemie*, **2008**, *47*, 2590-2594.
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- 9) Hong, J. I.; Feng, Q.; Rotello, V.; Rebek, J. "Competition, Cooperation, and Mutation - Improving a Synthetic Replicator By Light Irradiation" *Science* **1992**, *255*, 848-850.
- 8) Wasserman, H. H.; Ennis, D. S.; Blum, C. A.; Rotello, V. M. "The Conversion of Carboxylic-Acids to Keto Phosphorane Precursors of 1,2,3-Vicinal Tricarbonyl Compounds" *Tetrahedron Lett.* **1992**, *33*, 6003-6006.

- 7) Wasserman, H. H.; Rotello, V. M.; Krause, G. B. "Oxidation of Alpha-Ylido, Beta-Keto Amides to Vicinal Tricarbonyls - Synthesis of a Diketopiperazine Precursor of Bicyclomycin" *Tetrahedron Lett.* **1992**, 33, 5419-5422.
- 6) Rotello, V.; Hong, J. I.; Rebek, J. "Sigmoidal Growth in a Self-Replicating System" *J. Am. Chem. Soc.* **1991**, 113, 9422-9423..
- 5) Wasserman, H. H.; Frechette, R.; Rotello, V. M.; Schulte, G. "Singlet Oxygen Reactions of 2-Carbalkoxy-3-Methoxypyrroles" *Tetrahedron Lett.* **1991**, 32, 7571-7574.
- 4) Wasserman, H. H.; Rotello, V. M.; Williams, D. R.; Benbow, J. W. "Synthesis of the Tricarbonyl Region of Fk-506 Through an Amidophosphorane" *J. Org. Chem.* **1989**, 54, 2785-2786.
- 3) "The Chemistry of Vicinal Tricarbonyl Compounds. Use of Vinyl Tricarbonyl Esters in the Formation of 3-Hydroxypyrrole-2-Carboxylates" H. H. Wasserman, J. D. Cook, J. M. Fukuyama, V. M. Rotello, *Tetrahedron Lett.*, **1989**, 30, 1721.
- 2) Wasserman, H. H.; Fukuyama, J.; Murugesan, N.; Vanduzer, J.; Lombardo, L.; Rotello, V.; McCarthy, K. "The Chemistry of Vicinal Tricarbonyls - a Stable Vinyl Tricarbonyl Hydrate As a Dielectrophile and Trielectrophile" *J. Am. Chem. Soc.* **1989**, 111, 371-372.
- 1) Garner, P.; Park, J. M.; Rotello, V. "An Enantioselective Synthesis of the Carzinophilin Degradation Product (2s,3s) 4-Amino-2,3-Dihydroxy-3-Methylbutyric Acid" *Tetrahedron Lett.* **1985**, 26, 3299-3302.

Patents

- 4) Non-Provisional Patent Application 12/313,116, filed on 11/17/2008, "Methods and Compositions for Protein Detection Using Fluorescent Polymer Sensors." Inventors: Vincent Rotello, Uwe Bunz, Chang-Cheng You, Oscar Miranda and Ik-Bum Kim
- 3) United States Non-Provisional Patent Application 12/313,137, filed on 11/17/2008, "Methods and Compositions for Pathogen Detection Using Fluorescent Polymer Sensors." Inventors: Vincent Rotello, Uwe Bunz, Ronnie Phillips, Oscar Miranda and Chang-Cheng You.
- 2) United States Non-Provisional Patent Application 60/956,515 filed on 8/18/08, "Direct Incident Beam Lithography for Patterning Nanoparticles, and the Articles Formed Thereby" Yuval Ofir, Qijun Xiao, Bappaditya Samanta, Vincent M. Rotello
- 1) "MIP/QCM Sensors for High Sensitivity Sensing of Small Molecules in Solution" Penelle, J.; Rotello, V. M.; Das, K. US Patent 6,890,486.

Invited Presentations:

2010

Tulane University, New Orleans, LA
 American Chemical Society, Spring National Meeting, four talks, San Francisco, CA
 11th European Symposium on Controlled Drug Delivery, Egmond aan Zee, Netherlands
 Particles 2010, Orlando, FL
 PacificChem, two talks, Honolulu, HI

Tufts University, Medford, MA
 University of Minnesota, St. Paul, MN
 Argonne National Labs, Argonne, IL
 MRS Workshop on Biomedical Applications of Nanomaterials, Denver, CO

2009

American Chemical Society, Fall National Meeting, three talks, Washington, DC.
 2nd Aquitaine Conference on Polymers, Arcachon, France
 University of California-San Diego
 Scripps Research Institute, La Jolla, CA
 University of Massachusetts, Lowell, MA
 International Institute for Nanotechnology (IIN) 2009 Symposium on Nanotechnology in Biology and Medicine, Evanston, IL

University of California-Irvine
 California Institute of Technology, Pasadena, CA
 42nd IUPAC International Conference, Glasgow Scotland.
 Gold 2009, Heidelberg Germany.
 Int. Conf. on the Environmental Implications and Applications of Nanotechnology, Amherst, MA.
 SERMACS 2009, San Juan, PR

2008

University of Florida, Gainesville FL
 American Chemical Society, Spring National Meeting, (PMSE), two talks, New Orleans, LA.
 International Symposium on Macrocyclic and Supramolecular Chemistry, Las Vegas, NV
 University of Maryland, College Park, MD
 University of Michigan, Ann Arbor, MI

Arizona State University, Tempe AZ
 Particles 2008, Orlando, FL, two talks.
 Canadian Society of Chemistry, two talks, Edmonton AL, Canada
 Polymers in Life Science 2008, Zurich, Switzerland
 American Chemical Society, Fall National Meeting, (POLY), Philadelphia, PA

2007

Rennselear Institute of Technology, Troy, NY
University of Puerto Rico, Rio Piedras, PR
Lorentz Conference: Magnetic Nanoparticles:
Challenges and Future Prospects, Leiden, Netherlands
Purdue University, West Lafayette, IN
Gordon Research Conference: Supramolecules and
Assemblies”, Il Ciocco, Italy
New York University, New York, NY
Georgia Institute of Technology, Atlanta, GA
Materials Research Society, Fall National Meeting,
Boston, MA,: Symposium PP and Symposium
MM/PP Tutorial

2006

University of Miami, Coral Gables Fl
Organic Structure and Properties Gordon Conference
American Chemical Society, Spring National Meeting,
(PMSE)
Johnson and Johnson, Spring House, PA
Xerox Material Research Center, Mississauga, ON
American Chemical Society, Fall National Meeting, 3
talks (POLY, COLL, and ORGN)
Particles 2006, *Plenary Lecture*, Orlando, CA
Skidmore College, Saratoga Springs, NY
3M Corporation, St. Paul, MN
Mayo Clinic, Rochester, MN

2005

University of Texas, Arlington, TX
Ohio State University, Columbus, OH
University of Buffalo, Buffalo, NY
American Chemical Society Spring National Meeting,
San Diego, CA (ANYL, Applications of
Nanomaterials)
Self-Assembled Nanomaterials Workshop, Argonne
National Labs, Argonne, IL.
University of Vermont, Burlington, VT
Indiana University, Bloomington, IN
American Chemical Society, Fall National Meeting, 3
talks (POLY, COLL, and ANYL)

2004

Duke University, Durham, NC
Research Triangle ACS Polymer Discussion Group,
Durham, NC
13th International Symposium on Supramolecular
Chemistry, South Bend ND
Georgia State University, Atlanta, GA
North Dakota State University, Fargo, ND
NSF Workshop “Models of Thought Processes:
Insights toward Chemical Systems” Washington, DC
Indiana University, Bloomington, IN
Naval Research Labs, Washington, DC
Mass. Medical Society, Waltham MA

2003

Clemson University, Clemson, SC
Green Chemistry in Practice, Andover MA
American Chemical Society Spring National Meeting,
(POLY, Non-Covalent Assembly of Polymers)

Department of Chemistry and Biochemistry, University
of California, Los Angeles CA
California NanoSystems Institute, University of
California, Los Angeles, CA
Department of Materials Science and Eng. University
of California, Los Angeles, CA.
University of Eindhoven, Netherlands
University of Twente, Netherlands
Radboud University of Nijmegen, Netherlands
Johns Hopkins University, Baltimore, MD
University of Central Florida, Orlando, FL

University of Montreal, Montreal, QC
Laval University, Québec, QC
McGill University
Brigham Young University, Provo, UT
University of Utah, Salt Lake City, UT
SUNY-Albany, Albany, NY
Gordon Conference : Macromolecular Organization and
Cell Function: Cellular Systems Biology, South
Hadley, MA
Northwestern University, Evanston, IL
Indo-US Symposium on Nanotechnology in Advanced
Drug Delivery, Punjab, India

Simon Fraser University, Vancouver BC
University of Victoria, Victoria, BC
Lehigh University, Bethlehem, PA
University of Connecticut, Storrs, CT.
Era of Hope Breast Cancer Symposium, Philadelphia,
PA
Materials Research Society, Fall National Meeting,
Boston, MA, 3 talks: Symposia O, Q, and CC
Dartmouth College, Hanover NH
Biologically Inspired Nanomaterials ICAM workshop,
Penn State University, State College, PA

North Carolina State University, Raliegh, NC
NSF Workshop on Supramolecular Chemistry,
Sanibel Island, Fl
Keynote Speaker, Particles 2004, Orlando, Fla
Nanotechnology Research Institute, The National
Institute of AIST, Tsukuba, Japan
Tokyo University, Tokyo, Japan
American Chemical Society Spring National Meeting,
(POLY, Metal-Mediated Assembly of Materials)
American Chemical Society Spring National Meeting,
(COLL, Nanoscience and Nanotechnology)
Eastern Analytical Symposium, (Bionanomaterials)

Montana State University, Bozeman MT
American Chemical Society Fall National Meeting
(POLY, Self-Assembly of Nanostructures)
American Chemical Society Fall National Meeting

Materials Research Society, Fall National Meeting,
Boston MA (Nanostructured Organic Materials),
Boston, MA
Southern Illinois University, Carbondale, IL
Yale University, New Haven, CT
Lawrence Livermore National Laboratories, Livermore,
CA

2002

20th International Symposium on the Organic
Chemistry of Sulfur, Flagstaff, AZ
Purdue University, West Lafayette, IN
Northwestern University, Evanston, IL
University of Notre Dame, Notre Dame, IN
University of Illinois, Urbana, IL
University of South Carolina, Columbia, SC
Macromolecular Science and Engineering Symposium,
University of Michigan, Ann Arbor, MI

2001

University of Texas, Austin, TX
NSF Workshop on Materials Chemistry
MRSEC-HOMRC (Korea) Joint Workshop, Amherst,
MA
Southeastern Regional Meeting of the American
Chemical Society, (Biomimetic Chemistry and
Nanostructured Materials sessions) Savannah, GA
Emory University, Atlanta, GA
University of Washington, Seattle, WA
University of Toledo, Toledo, OH
Bowling Green State University, Bowling Green, OH

2000

Third International Symposium on Atomic Scale
Processing and Novel Properties in Nanoscopic
Materials, Osaka, Japan
R.T. Major Lecturer, University of Connecticut, Storrs,
CT
Wayne State University, Detroit, MI
Mount Holyoke College, South Hadley, MA
Case-Western Reserve University, Dept. of
Macromolecular Sciences, Cleveland, OH
University of Maine, Orono ME

1999

CUMIRP Fall Meeting, Amherst, MA
University of Maryland-Baltimore County, Baltimore,
MD
NSF Workshop on Materials Chemistry
Fullerenes in Polymer Chemistry, ACS National
Meeting (Presented by F. Ilhan)
Flavins and Flavoproteins 1999, Konstanz (Germany)
University of New Orleans, New Orleans, LA

1998

Brown University, Providence, RI
University of California, Irvine, CA
University of Nevada, Reno NV

(POLY, Molecular recognition using Polymeric
Materials)
American Chemical Society Fall National Meeting
(ORGN, Supramolecular Chemistry)
Sandia National Laboratories, Albuquerque, NM

Tulane University, New Orleans, LA
Louisiana State University, Baton Rouge LA
Sandia National Labs, Albuquerque NM
University of North Carolina, Chapel Hill NC
Texas A&M University, College Station, TX
Distinguished Lecture Series, Dept of Materials &
Nuclear Eng. , University of Maryland, College Park
MD
NSF Physical Organic Workshop, Hilton Head, SC
Colorado State University, Fort Collins CO

Georgia Institute of Technology, Atlanta, GA
Tufts University, Medford, MA
University of Massachusetts, Department of Polymer
Science and Engineering, Amherst, MA
Polytechnic University, Brooklyn, NY
Materials Research Society, Symposium Z-Patterning
Soft Materials, San Francisco, CA
Materials Research Society, Symposium Y-
Applications of Nanostructures, San Francisco, CA

AIChE National Meeting, Los Angeles, CA
Gordon Conference (Bioorganic Chemistry), Plymouth,
NH
Gordon Conference (Polymers East), Short Talk
(Presented by F. Ilhan)
Material Res. Society Spring Meeting, San Francisco,
CA
Vanderbilt University, Nashville, TN
Wesleyan University, Middletown, CT

Johns Hopkins University, Baltimore, MD
Organic Syntheses Lecturer, Williams College,
Williamstown, MA
NSF New England Workshop on Molecular Modeling,
Amherst, MA
Temple University, Philadelphia, PA

North Carolina State University, Raleigh, NC
University of Pittsburgh, Pittsburgh, PA
University of Durham, Durham (UK)

Scripps Institute, La Jolla, CA
San Diego State University, San Diego, CA

1997

Merrimack College, North Andover, MA
CUNY- City College, New York, NY
SUNY Stonybrook, Stonybrook, NY
Union College, Schenectady, NY

1996

University of Wisconsin, Milwaukee, WI
University of Wisconsin, Madison WI
University of Maryland, College Park MD
Case-Western Reserve University, Cleveland, OH
Cross Lecturer, University of Chicago, Chicago, IL
Illinois Institute of Technology, Chicago, IL

1995

University of Massachusetts Medical School,
Worcester, MA
Amherst College, Amherst, MA
University of Sheffield, Sheffield (U.K.)
University of Leeds, Leeds (U.K.)
University of East Anglia (U.K.)

University of Northumbria, Newcastle (UK)
Virginia Commonwealth University, Richmond, VA

University of Teeside, Teeside (UK)
Tufts University, Medford, MA
Nora Harrington Lecturer, Elms College, Springfield,
MA

University of California, Los Angeles, CA
Mount Holyoke College, South Hadley, MA
Electrochemical Society National Meeting-Fullerene
section, Los Angeles, CA
CUNY- Brooklyn College, New York, NY

Parke-Davis Research Laboratories, Cambridge (U.K.)
Institute for Science Instruction and Study, New
Haven, CT
Gordon Conference (Bioorganic Chemistry), Plymouth,
NH
Fairfield University, Fairfield, CT

Courses Taught:

Chem 263: Organic Chemistry-Non-Majors
Chem. 551: Advanced Organic Chemistry
Chem 756: Organic Synthesis
Chem 791A: Molecular Recognition (proposed and developed)
Chem 791H: Graduate Core Course (proposed and developed)
NS&M 121A: Undergraduate Seminar

Service Responsibilities:

2008-2009 Chair, Head Search Committee
NSM Awards Committee
Graduate Studies Committee
Inorganic Search Committee
Co-leader, Center for Hierarchical Materials TRG 3 (Bionanotechnology)

2007-2008 Distinguished Faculty Lecture Series Selection Panel
Member, Executive Committee, Chemistry-Biology Interface Training Grant
Graduate Studies Committee
Graduate Recruiting Committee
NSM Awards Committee
Co-leader, Center for Hierarchical Materials TRG 3 (Bionanotechnology)

2006-2007 Chair, Combined Inorganic Materials, Bioorganic, and Device Searches
Co-leader, Center for Hierarchical Materials TRG 3 (Bionanotechnology)
Member, CVIP Patent Evaluation Committee
Member, Executive Committee, Chemistry-Biology Interface Training Grant
Faculty Advisor, MassNanoTech
Member, Head's Advisory Committee

2005-2006 Member, Device Search Committee
Member, CVIP Patent Evaluation Committee
Member, Executive Committee, Chemistry-Biology Interface Training Grant
Faculty Advisor, MassNanoTech
Member, Head's Advisory Committee

2004-2005 Member, Biological Search Committee
Member, CVIP Patent Evaluation Committee
Member, Executive Committee, Chemistry-Biology Interface Training Grant
Faculty Advisor, MassNanoTech
Member, NSM Awards Committee
Member, Departmental Personnel Committee
Member, Graduate Program Committee

2003-2004 Member, Biological Search Committee
Member, Center for Emergency Preparedness Faculty Leadership Committee
Member, CVIP Patent Evaluation Committee
Member, Executive Committee, Chemistry-Biology Interface Training Grant
Member, MCB recruiting committee
Faculty Advisor, MassNanoTech

2002-2003 *Vice-Chair*, Organic/Physical Search Committee
Member, Center for Emergency Preparedness Faculty Leadership Committee
Member, Graduate Studies/Recruiting Committee
Member, CVIP Patent Evaluation Committee

2001-2002 Member, Executive Committee, Chemistry-Biology Interface Training Grant
Vice-Chair, Organic/Inorganic Search Committee
Member, Graduate Studies/Recruiting Committee
Member, CVIP Patent Evaluation Committee

2000-2001 Member, Executive Committee, Chemistry-Biology Interface Training Grant
Chair, Symposium on Nanoscience and Technology
Organizer, Nanotechnology Initiative
Chair, Faculty Search Committee
Member, Graduate Studies, Recruiting and Admissions Committee

1999-2000 Member, Advisory Committee to the Head

1998-1999 Member, Graduate Studies Committee
Member, Future Planning Committee

1997-1998 Member, Organic Search Committee;
Member, Graduate Studies Committee;
Director, Howard Hughes Biological Chemistry REU;

1996-1997 *Chair*, Graduate Curriculum Reform Committee;
Chair, Bioorganic Search Committee;
Faculty Mentor, PSITAP;
Director, Howard Hughes Biological Chemistry REU;
Member, Graduate Studies Committee;
Co-Chair, LSSC bioanalytical faculty proposal committee

1995-1996 *Faculty Mentor*, PSITAP
Assistant Director, Howard Hughes Biological Chemistry REU;
Member, Graduate Studies Committee;
Member, Eugene Eisenberg Curriculum Development Committee

1994-1995 *Faculty Mentor*, Physical Sciences Talent Advancement Program (PSITAP)
Assistant Director, Howard Hughes Biological Chemistry REU
Member, Space Committee

1993-1994 Member, Computer Committee