

Juan Pablo Hinestrosa

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Education

Clemson University, Clemson, SC, USA	Chemical & Biomolecular Engineering	Ph.D., 2010
Universidad del Valle, Cali, Colombia	Chemical Engineering	B.S. (1 st in Class) 2004

Professional Experience

7/2011 - present	Postdoctoral Research Associate, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory.
5/2010 – 6/2011	Postdoctoral Fellow, École Polytechnique Fédérale de Lausanne, Switzerland.
2/2008-5/2010	Visiting Scientist, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory.
8/2005-5/2010	Doctoral Student, Department of Chemical and Biomolecular Engineering, Clemson University.
09-12/ 2004	Special Projects Assistant Engineer, Quimica Basica Colombiana S.A., Colombia.

Honors and Awards

2010	Excellence in Graduate Polymer Research by the Polymer division of the American Chemical Society (ACS).
2009	Scholarship for ACS Summer School in Green Chemistry and Sustainability.
2008	Scholarship for 10 th National School in Neutron and X-Ray Scattering.
2008	Scholarship for 14 th Summer School in Fundamentals of Neutron Scattering.

Publications Full list follows CV

Research Interests

Polypeptide and Polypeptoid Brushes

We are exploring the intrinsic responsiveness, due to phase transitions, of polypeptides and polypeptoid brushes as well as their properties as antibacterial and biocompatible platforms. By combining two or more peptide monomers, new properties and responses can be accessed. Complex patterned layers of these protein-like materials are created by combining lithographic and vapor-phase polymerization techniques.

Characterization of Functional Polymer Architectures

We take advantage of scattering (neutron and light) and microscopic (atomic force and scanning electron) techniques to understand the effects of composition, architecture and environmental conditions in the behavior of precisely synthesized architecturally complex and functional copolymers. We have been able to determine a direct correlation between the property-structure relationships of the material and their overall organization and performance. This allows for tailor-synthesis of new polymeric systems.

Mimics of Biomineralization Processes

We use synthetic strategies such as layer-by-layer templated assembly in order to replicate the natural process of biosilification as an alternative to create hybrid organic-inorganic substrates. In addition, the use of nanopatterns to direct the silicification help to shed light into the 'size' limitations of the process and possible strategies to control the assembly at the molecular level.

Smart Coatings and Nanopatterning for Inorganic Substrates

We use bi- or tri- functional block copolymers to create smart (performance) coatings on inorganic substrates. For properly anchoring the material, epoxy-based polymers is use and in a block conformation an azlactone- or ethylene oxide- based polymer is used to modify responsiveness of the layer to external stimuli such as pH, temperature or solvent conditions. In addition these materials can be rendered biocompatible by post-modification with small peptides, proteins and other functional polymers.

Graduate and Postdoctoral Advisors

Graduate: Prof. Dr. S. Michael Kilbey, II (Clemson University)

Postdoctoral: Prof. Dr. Harm-Anton Klok (École Polytechnique Fédérale de Lausanne)

Dr. Jamie Messman (Oak Ridge National Laboratory)

Dr. Scott Retterer (Oak Ridge National Laboratory)

Peer-Reviewed Publications

8. **Hinestrosa, J.P.**; Uhrig, D.; Pickel, D.L.; Kilbey S.M. “Hydrodynamics of Polystyrene-Polyisoprene Miktoarm Star Copolymers in a Selective and a Non-Selective Solvent” *Soft Matter* **2012**, *8*, 10061.
7. Lokitz, B.S.; Wei, J.; **Hinestrosa, J. P.**; Ivanov. I.; Browning, J. F.; Ankner, J. F.; Kilbey, S. M.; Messman, J. M. “Manipulating Interfaces through Surface Confinement of Poly(glycidyl methacrylate)-*block*-poly(vinylidimethylazlactone), a Dually Reactive Block Copolymer” *Macromolecules* **2012**,*45*, 6438.
6. Schüwer, N.; Geue, T.; **Hinestrosa, J.P.**; Klok, H.-A. “Neutron Reflectivity Study on the Postpolymerization Modification of Poly (2-hydroxyethyl methacrylate) Brushes” *Macromolecules* **2011**, *44*, 6868.
5. Soto-Cantu, E.; **Hinestrosa, J.P.**; Lokitz, B.; Deodhar, C.; Messman, J.; Ankner, J.; Kilbey, S.M. “Versatility of Alkyne-Containing Poly (Glycidyl Methacrylate) Layers for Click Reactions” *Langmuir* **2011**, *27*, 5986.
4. He, L.; **Hinestrosa, J.P.**; Pickel, J.; Zhang, S.; Bucknall, D.; Kilbey, S.M.; Mays, J.; Hong, K “Fluorine-Containing Linear Triblock Terpolymers: Synthesis and Self-assembly in Solution” *J. Polym. Sci. Pol. Chem.* **2011**, *49*, 414.
3. **Hinestrosa, J.P.**; Alonzo, J.; Osa, M.; Kilbey, S. M. “Solution Behavior of Polyisoprene-Polystyrene Miktoarm Block Copolymers in a Selective Solvent for Polyisoprene” *Macromolecules* **2010**, *43*, 7294.
2. Lokitz, B.S.; Messman, J.; **Hinestrosa, J.P.**; Alonzo, J.; Verduzco, R.; Osa, M.; Brown, R.; Ankner, J.; Kilbey, S. M. “Dilute Solution Properties and Surface Attachment of RAFT Pol[Journal Pre-proof Dimethylazlactone (VDMA)” *Macromolecules* **2009**, *42*, 9018. Juan Pablo Hinestrosa 3
1. **Hinestrosa, J.P.**; Alonzo, J.; Mays, J; Kilbey, S. M. “Role of Surface Reorganization on Preferential Adsorption of Macromolecular Ensembles at the Solid/Fluid Interface” *Macromolecules* **2009**, *42*, 7913.

Manuscripts in preparation

- i. **Hinestrosa, J. P.**; Sutton, J.; Alison, D.; Doktycz, M.; Messman, J. M.; Retterer, S. T. “Layer-by-Layer Templated Assembly of Silica at the Nanoscale” submitted to *Langmuir*.
- ii. Alonzo, J.; **Hinestrosa, J.P.**; Mays, J.; Kilbey, S.M. “Kinetics of Preferential Adsorption of Amphiphilic Star Block Copolymers that Tether by their Corona Blocks at the Solid/Fluid Interface” to be submitted to *Macromolecules*