Ralm Gerick Ricarte

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Education

Ph.D., Chemical Engineering — Expected 2016
University of Minnesota-Twin Cities, Minneapolis, MN
Dissertation: "Structure-property relationships of polymeric solid dispersions"
Research advisors: Timothy P. Lodge and Marc A. Hillmyer

B.S. with High Special Honors, Chemical Engineering — 2011
The University of Texas at Austin, Austin, TX
Honors thesis: "Permeability and Sorption Characterization of PEGDA/Ag^+ Nanocomposite Polymer Membranes"
Research advisor: Benny D. Freeman

Awards and Honors

Milliken Graduate Research Symposium Invited Lecturer	2015
Robert V. Mattern Fellowship	2011
National Science Foundation Graduate Research Fellowship	2011
University of California, Berkeley Amgen Scholar	2010
Omega Chi Epsilon Chemical Engineering Honor Society	2009
Tau Beta Pi Engineering Honor Society	2009
John Philip Sousa Award	2007

Research interests

Polymer nanostructures in both solution and bulk, polysaccharides, oral drug delivery, dynamics of glassy materials, electron microscopy, electron and X-ray scattering, spectroscopy, calorimetry, crystallography

Publications

Ricarte, R.G.; Lodge, T.P.; Hillmyer, M.A. "Elucidation of the spatial distribution of small molecules in amorphous polymer matrices by electron energy-loss spectroscopy." *In preparation.*

Ricarte, R.G.; Lodge, T.P.; Hillmyer, M.A. "Detection of pharmaceutical drug crystallites in solid dispersions by transmission electron microscopy." *Molecular Pharmaceutics* **2015,** 12, 983.

Ricarte, R. "Permeability and sorption characterization of PEGDA/AG+ nanocomposite polymer membranes." Undergraduate honors thesis, UT Austin, Austin, TX, 2011.

Presentations

Ricarte, R.G.; Lodge, T.P.; Hillmyer, M.A. "Characterization of nanoscale spatial distribution of small molecules in amorphous polymer matrices." Future oral presentation at American Physical Society March Meeting, Baltimore, MD, 2016.

Ricarte, R.G., Lodge, T.P., Hillmyer, M.A. "Electron diffraction and energy-loss spectroscopy of soft pharmaceutical materials." Invited talk at Industrial Partnership for Research in Interfacial Materials and Engineering Mid-Year Workshop, Minneapolis, MN, 2016.

Ricarte, R.G., Lodge, T.P., Hillmyer, M.A. "Elucidation of pharmaceutical drug nanostructures using transmission electron microscopy." Poster presentation at Gordon Research Conference: Pre-clinical Form and Formulation, Waterville Valley, NH, 2015.

Ricarte, R.G., Lodge, T.P., Hillmyer, M.A. "Characterization of polymeric solid dispersions by transmission electron microscopy." Oral presentation at Industrial Partnership for Research in Interfacial Materials and Engineering Annual Meeting, Minneapolis, MN, 2015.

Ricarte, R.G., Lodge, T.P., Hillmyer, M.A. "Characterization of polymeric solid dispersions using electron microscopy." Invited talk at Milliken Graduate Research Symposium, Spartanburg, SC, 2015.

Ricarte, R.G.; Lodge, T.P.; Hillmyer, M.A. "Detection of pharmaceutical crystals in polymer particles by transmission electron microscopy." Oral presentation at American Physical Society March Meeting, San Antonio, TX, 2015.

Ricarte, R.G.; Lodge, T.P.; Hillmyer, M.A. "Electron microscopy characterization of solids state drug/polymer dispersions." Poster presentation at Industrial Partnership for Research in Interfacial Materials and Engineering Annual Meeting, Minneapolis, MN, 2014.

Ricarte, R. "Permeability characterization of PEGDA/AG+ nanocomposite polymer Membranes." Oral presentation at UT Austin Cockrell School of Engineering Honors Symposium, 2011.

Ricarte, R.; Landau, G.; Radke, C. "A method for determining the diffusion coefficient of soft contact lens materials." Oral presentation at UC Berkeley Amgen Scholars Seminar, 2010.

Ricarte, R.; Landau, G.; Radke, C. "A novel method for determining the diffusion coefficient of soft contact lens materials." Poster presentation at UC Berkeley Amgen Scholars Seminar, 2010.

Ricarte, R.; McCloskey, B.; Freeman, B. "A bio-inspired surface modification to reduce membrane scaling." Poster presentation at UT Austin Chem. Eng. Undergraduate Poster Competition, 2010.

Research experience

Graduate Research Assistant, University of Minnesota-Twin Cities 2011-Present
Identify structure-property relationships of polymer-drug blends
Design novel polymer excipients to improve efficacy of polymer-drug blends
Develop methods to characterize polymer-drug nanoparticles in both solution and bulk

Summer Research Assistant, University of California, Berkeley 2010

Derived theoretical models to describe diffusion of salts through soft contact lenses
Created novel methods to measure permeation of salts through soft contact lenses

Undergraduate Research Assistant, The University of Texas at Austin 2009-2011
Analyzed effect of salt fouling on water filtration polymer membranes
Elucidated thermodynamic and transport properties of novel polymer nanocomposite membranes

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Outreach and Leadership Experience

Founder and President, UMN Science for All Outreach Program 2014-Present
Started a non-profit organization dedicated to teaching science to urban K-12 students
Created lessons and hands-on experiments to teach students about the scientific method
Secured funding from UMN departments and NSF sponsored organizations
Coordinated communication between organization board members

President, American Institute of Chemical Engineers, UT Austin Chapter 2010
Fostered a social and networking community for undergraduate chemical engineers
Communicated concerns in the undergraduate chemical engineering community to faculty
Created new extracurricular programs for undergraduate chemical engineers
Obtained funding from UT Austin Chem. Eng. department and industrial partners

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Teaching Experience

Recitation Instructor, Mass Transport and Separation Processes, UMN Twin Cities 2015
Led recitation lectures for a class with approximately 20 students
Designed lesson plans that emphasize the core principles of mass transport
Wrote exam questions that tested students' understanding of mass transport

Teaching Assistant, Chemical Engineering Process Design, UMN Twin Cities 2013
Acted as liaison between students and lead course instructor
Served as a substitute recitation instructor
Advised students on design of their senior projects and presentations

Teaching Assistant, Reaction Kinetics and Reaction Engineering, UMN Twin Cities 2012
Acted as liaison between students and lead course instructor
Led exam reviews for 120 students
Graded problem sets, quizzes, and exams

Grader, Transport Processes, UT Austin 2011
Graded assignments and quizzes for an undergraduate chemical engineering course

Tutor, Transport Phenomena, UT Austin 2010
Tutored students in an undergraduate engineering course
Led exam reviews for 50 students

Grader, Introduction to Chem. Eng. Analysis, UT Austin 2009
Graded assignments and quizzes for an undergraduate chemical engineering course

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Professional Societies

American Chemical Society	since 2015
American Physical Society	since 2014
American Institute of Chemical Engineering	since 2008