Tania Betancourt, Ph.D.

Assistant Professor, Department of Chemistry and Biochemistry

tania.betancourt@tx.state.edu

CENT 340D

512-245-7703

EDUCATIONAL BACKGROUND AND TRAINING:

Postdoctoral Fellow, Department of Chemical Engineering, The University of Texas at Austin (2008)

Ph.D. Biomedical Engineering, The University of Texas at Austin (2007)

M.S. Biomedical Engineering, The University of Texas at Austin (2005)

B.S. Chemical Engineering, Texas A&M University (2002)

BIOSKETCH:

Dr. Betancourt leads the research of the Biomaterials and Nanomedicine laboratory, which focuses on the development of functional polymeric nanostructures for the detection, monitoring, and treatment of cancer and other diseases.

Prior to joining Texas State University in 2011, Dr. Betancourt worked at InnoSense LLC, a technology company serving the aerospace, energy, defense, and health care market. During her three-year tenure at InnoSense, Dr. Betancourt held the positions of Research Scientist, Team Leader, and Deputy Director-R&D. At InnoSense, Dr. Betancourt was responsible for developing novel technologies in the areas of biosensors, biomaterials, therapeutics, theranostics, contrast agent, drug delivery, and specialty materials. She secured funding for support of R&D of biomedical and specialty material technologies as a Principal Investigator through small business innovation research (SBIR) grants from federal agencies, including two Phase I SBIRs from the National Institutes of Health totaling $384k, and two Phase I and one Phase II SBIR grants from NASA totaling $800k.

Dr. Betancourt is currently a recipient of a grant by the Research Corporation for the Advancement of Science, and is co-PI in a NSF PREM grant (2012). Additional awards include the David and Mary Miller Fellowship (2006-2007), NSF IGERT Graduate Research Fellowship (2004-2006), Thrust 2000 Fellowship (2003-2007), Lindsay Scholarship (2001-2002), and the American Chemical Society Scholars Program scholarship (1999-2002). During her graduate studies, Dr. Betancourt was recipient of the Schlumberger Grand Award for best paper and presentation and Schlumberger Centaur Award in Nano/Microelectronics and MEMS in the Graduate and Industry Networking Conference (2006), and the Best Paper award in the Nano-Night 2005 Scientific Forum in Nanotechnology (2005). Dr. Betancourt graduated Magna Cum Laude with her B.S. in Chemical Engineering. She also participated in Omega Chi Epsilon Chemical Engineering Honor Society, Tau Beta Pi Engineering Honor Society, and Phi Theta Kappa International Honor Society.

Dr. Betancourt's work has been documented in four peer-reviewed publications, two review articles, two book chapters, and multiple professional presentations.

RESEARCH SUMMARY/STATEMENT:

Dr. Betancourt's research focuses on capturing the promise of nanomaterials for the development of new strategies for the detection and treatment of diseases. Specifically, her group develops functional nanostructures that can act as highly specific contrast agents for bioimaging, *in vitro* and *in vivo* biosensors, targeted and intracellular drug delivery systems, and externally controlled delivery systems. These responsive nanomaterials incorporate functional nucleic acid linkers, enzymatically cleavable linkers, polyelectrolytes, and amphiphilic copolymers to mediate physico-chemical changes in the polymeric networks upon interaction with target molecules, leading to the desired material response. Work in the laboratory encompasses the synthesis and characterization of copolymers and nanoparticles, *in vitro* confirmation of stimuli-responsive behavior, and the evaluation of the particle functionality on cultured human cells. Dr. Betancourt's group collaborates with academic and industrial researchers for preclinical evaluation of the compatibility and efficacy of the developed biomaterials and technology transfer.

Current projects in Dr. Betancourt's laboratory include the development of: (1) aptamer-based responsive nanostructures that can be activated by disease-specific molecules, and on the study of the applications of these functional materials in targeted drug delivery, bioimaging, and biomolecular sensing; (2) highly specific nanoparticle-based near infrared contrast agents for optical detection and monitoring of cancer; (3) amyloid-based hybrid materials that can self-assemble into highly organized structures; (4) self-assembled nanostructures based on amphiphilic copolymers.

LABORATORY WEBSITE:

https://sites.google.com/site/betancourtresearchlaboratory/