

# Five New Faces in Chemical Engineering Department at Texas Tech University



**Dr. Harvinder Gill**  
Assistant Professor  
(Fall 2009)

Dr. Gill has a bachelor's degree in chemical engineering from Panjab University, India (Summa Cum Laude, 1994) and a doctoral degree in bioengineering from Georgia Institute of Technology (2007). His postdoctoral training was in the field of influenza vaccines at Emory University (2007-2009). Dr. Gill's research has included development of drug and vaccine coated microneedles to enable painless vaccination through the skin and characterization of virus-like particles and adjuvants to develop improved influenza vaccines. He has invented a novel micro-dip-coating process to produce precision coatings on microneedles and it has been patented and licensed to a US-based company for commercialization. Dr. Gill has also worked in the petroleum and chemical industry from 1994-2001. Dr. Gill's current research interests are in the fields of micro and nanotechnologies for biomedical applications and for solving pressing problems in human health. His laboratory works in a highly interdisciplinary environment integrating principles and tools of engineering, microfabrication and molecular biology to conduct both fundamental and translational research in the areas of drug and vaccine delivery and immunology. One of his major research thrust is to develop novel delivery technologies to overcome the transport barrier of mucosal surfaces to enable mucosal vaccination and thereby significantly advance the field of vaccines.

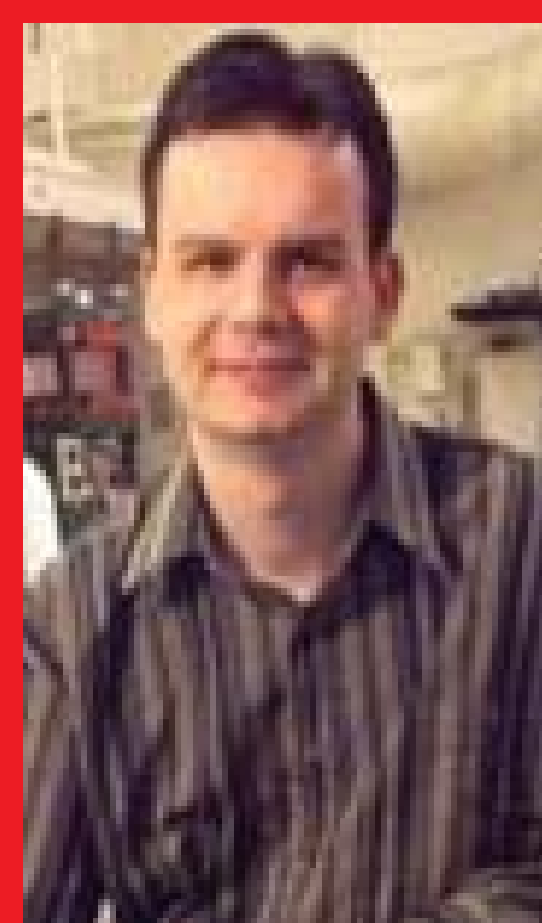


**Dr. Micah Green**  
Assistant Professor  
(Fall 2009)

Micah J. Green completed his Ph.D. at MIT in 2007 on the topic of phase transitions, interfaces, and rheology of rod-like liquid crystals under the supervision of Professors Robert C. Armstrong and Robert A. Brown. Concurrent with his doctoral work, he also studied religious history at Harvard Divinity School. In 2007, he was awarded the J. Evans Attwell-Welch postdoctoral research fellowship at the Richard E. Smalley Institute for Nanoscale Science and Technology at Rice University, where he worked with Professor

Matteo Pasquali. His postdoctoral work at Rice focused on both modeling and experimental studies of the phase behavior of carbon nanotube dispersions and their application to nanotube-based fibers and films.

In 2009, he began an appointment as an Assistant Professor in the Department of Chemical Engineering at Texas Tech University. His current research combines both experimental and computational studies, with two main research threads: (1) The dispersion, rheology, phase behavior, and processing of nanomaterials and nanocomposites; (2) Multiscale modeling of the dynamics of dispersed nanomaterials and active polymers.



**Dr. Ronald C. Hedden**  
Associate Professor  
(Fall 2009)

Prof. Ronald Hedden earned his Ph.D. in Chemical Engineering from Cornell University in 2000. After three years of postdoctoral work in Polymers Division at NIST (Gaithersburg, MD), he became Asst. Professor of Materials Science and Engineering at Penn State University. Prof. Hedden joined Chemical Engineering Dept. Texas Tech in Fall of 2009, where he teaches Unit Operations Lab and Polymer Processing, and will serve as the faculty advisor for the Society of Plastics Engineers starting in

spring of 2010.

Prof. Hedden's group studies polymer science and engineering fundamentals. One research focus is the molecular basis for mechanical, optical, and swelling phenomena in polymer gels and elastomers. Current work is examining physical properties of liquid crystalline elastomers, pH-responsive gels, porous gels, and photoresponsive gels. A second research focus is on developing novel nanoinfusion and nanotemplating processes for production of polymer-metal nanocomposites. Structural characterization of cross-linked polymers and nanocomposites by techniques such as dynamic mechanical analysis, X-ray diffraction and scattering, and neutron scattering is conducted to connect morphological features with macroscopic physical phenomena. Dr. Hedden's work is currently supported by the National Science Foundation, the American Chemical Society, and Bayer MaterialScience.



**Dr. Raghunathan Rengasamy**  
Professor  
(Spring 2009)

Prof. Rengasamy received his Ph. D. in Chemical Engineering from Purdue University in 1995, and B. Tech. in Chemical Engineering from the IIT Madras, India, in 1990. Prior to joining Texas Tech, he worked in the department of Chemical and Biomolecular Engineering at Clarkson University, USA as a Professor (July -Dec 2008) and as an Associate Professor (Jan 2002 - June 2008). He worked as an Assistant Professor at

the Department of Chemical Engineering at IIT Bombay from Jan 1996 - Dec 2000. He has been a visiting professor at University of Delaware (summer of 1999), Purdue University (Jan-Dec, 2001), and University of Alberta (summer of 2002).

Prof. Rengasamy works in the area of fuel cells and process systems engineering with his graduate students at Texas Tech. A major research focus of his group is on modeling, optimization, diagnostics and control of Proton Exchange Membrane and Solid Oxide fuel cells. His research group is also working in several areas under the broad umbrella of systems engineering. His research has been funded by federal and state agencies such as the NSF, ACS-PRF, NYSERDA and several companies. Prof. Rengasamy has published around 100 journal and conference papers and his work has been cited more than 1100 times (SCOPUS).



**Dr. Siva A. Vanapalli**  
Assistant Professor  
(Fall 2008)

Dr. Siva Vanapalli earned a Ph.D. in Chemical Engineering from the University of Michigan, M. S. in Food Science from Penn State University and B. Tech in Agricultural and Food Engineering from IIT Kharagpur. He conducted post-doctoral research in the Physics of Complex Fluids Group at the University of Twente, Netherlands. He joined Texas Tech University in Fall 2008.

Our group's research interests lie at the intersection of soft materials and bioengineering. Soft materials such as biopolymers, living cells and foods exhibit intriguing mechanical properties. We seek to understand the fundamental physical principles governing the mechanical behavior of soft materials by probing their microscopic structure and dynamics. We also manipulate these materials using microfluidic devices. Understanding derived from such integration of soft materials in microfluidic devices allows us to engineer novel lab-on-chip technologies for cell and biomolecule analysis.

## Contact Information

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