

**James Zachary Hilt**  
**Gill Eminent Professor of Chemical Engineering, University of Kentucky**  
**Lexington, KY 40506-0046**  
**Phone: (859) 257-9844; Fax: (859) 323-1929**  
**e-mail: [hilt@uky.edu](mailto:hilt@uky.edu)**

**PROFESSIONAL PREPARATION:**

Miami University, Oxford, OH	Chemistry	B.S., 1999
Miami University, Oxford, OH	Physics	B.S., 1999
Purdue University, West Lafayette, IN	Chemical Engineering	M.S., 2002
University of Texas, Austin, TX	Chemical Engineering	Ph.D, 2004

**APPOINTMENTS:**

Professor, Chemical & Mat. Engineering, University of Kentucky, 2015–present.  
Associate Professor, Chemical & Mat. Engineering, University of Kentucky, 2010–2015.  
Assistant Professor, Chemical & Mat. Engineering, University of Kentucky, 2004–2010.  
Thrust Graduate Research Fellow, Chemical Engineering, University of Texas, 2003-2004.  
NSF IGERT Graduate Research Fellow, Chemical Eng., Purdue University, 2000-2002.  
Director of Undergraduate Studies, Dept of Chemical Engineering, 2013-2014.  
Faculty Associate, Center of Membrane Sciences, University of Kentucky, 2009-present.

**PRODUCTS: Undergraduate students noted with \***

***Five Most Relevant to Current Project (out of >95 total publications).***

S. Tang, M. Floy\*, R. Bhandari, M. Sunkara, A.J. Morris, T.D. Dziubla, J.Z. Hilt. Synthesis and Characterization of Thermoresponsive Hydrogels Based on N-Isopropylacrylamide Crosslinked with 4,4'-Dihydroxybiphenyl Diacrylate. *ACS Omega*, 2, 8723-8729, 2017.

A.M. Hauser, M.I. Mitov, E.F. Daley\*, R.C. McGarry, K.W. Anderson, J.Z. Hilt. Targeted iron oxide nanoparticles for the enhancement of radiation therapy. *Biomaterials*, 105, 127-135, 2016.

S.A. Meenach, A.N. Tsoras\*, R.C. McGarry, H.M. Mansour, J.Z. Hilt, K.W. Anderson. Development of three-dimensional lung multicellular spheroids in air- and liquid-interface culture for the evaluation of anticancer therapeutics. *International Journal of Oncology*, 48, 1701-1709, 2016.

A.M. Hauser, R. Mathias\*, K.W. Anderson, J.Z. Hilt. The effects of synthesis method on the physical and chemical properties of dextran coated iron oxide nanoparticles. *Materials Chemistry and Physics*, 160, 177-186, 2015.

R.J. Wydra, C.E. Oliver\*, K.W. Anderson, T.D. Dziubla, J.Z. Hilt. Accelerated generation of free radicals by iron oxide nanoparticles in the presence of an alternating magnetic field. *RSC Advances*, 5, 18888-18893, 2015.

**Five other related publications: Undergraduate students noted with \***

R.J. Wydra, A.M. Kruse\*, Y. Bae, K. Anderson, J.Z. Hilt. Synthesis and characterization of PEG-iron oxide core-shell composite nanoparticles for thermal therapy. *Materials Science and Engineering C*, 33, 4660-4666, 2013.

A.M. Hawkins, M.E. Tolbert\*, B. Newton\*, T. Milbrandt, D.A. Puleo, J.Z. Hilt. Tuning biodegradable hydrogel properties via synthesis procedure. *Polymer*, 54, 4422-4426, 2013.

S.A. Meenach, J.M. Shapiro\*, J.Z. Hilt, K.W. Anderson. Characterization of PEG-iron oxide hydrogel nanocomposites for dual hyperthermia and paclitaxel delivery. *Journal of Biomaterials Science-Polymer Edition*, 24, 1112-1126, 2013.

A.M. Hawkins, C.E. Bottom\*, Z. Liang\*, D.A. Puleo, J.Z. Hilt. Magnetic Nanocomposite Sol-Gel Systems for Remote Controlled Drug Release. *Advanced Healthcare Materials*, 1, 96-100, 2012.

Z. He\*, N.S. Satarkar, T. Xie, YT Cheng, J.Z. Hilt. Remote Controlled Multi-Shape Polymer Nanocomposite with Selective Radiofrequency Actuators. *Advanced Materials*, 23, 3192-3196, 2011.

**SYNERGISTIC ACTIVITIES:**

*Innovations in Teaching and Training*

- (1) Mentor both undergraduate and graduate students on multidisciplinary projects that are at the convergence of engineering, chemistry, pharmaceutical science, environmental science, and biology.
- (2) Mentored more than 100 undergraduate students on research projects, with these undergraduate researchers winning many awards/recognitions (>60) for their research and many (>20) have been authors on refereed publications.
- (3) Director of the UK Superfund Training Core – organize and oversee training activities of 20+ graduate students and post-docs that are trainees within the Superfund Center at UK. This includes novel internship experiences within the various cores of the center (community outreach, research translation, etc.)
- (4) The development of the following courses and related curricular materials:  
**CME 599/CHE 580 – Bionanotechnology: Interfaces and Devices**  
*Instructor (with Prof. S. Daunert)*  
Senior/Graduate Level Course, Univ. of Kentucky, Fall 2008, Fall 2009, Fall 2010; Spring 2013; Fall 2015; Fall 2017

The objective is to introduce the broad impact of small-scale biological and synthetic structures and resulting miniature technologies on the biological and medical fields, focusing on interfaces and devices.

*Service to the Scientific and Engineering Community*

- (5) Have served in various leadership roles within the scientific community including:

2007-2009	Secretary/Treasurer of the Drug Delivery SIG, Society for Biomaterials
2007-2010	Co-Chair, AIChE Area 22b, Bionanotechnology
2008-	Associate Editor, International Journal of Nanomedicine (IJN)
2011-2012	Programming Chair, AIChE Nanoscale Science and Engineering Forum
2013-2015	Chair, AIChE Nanoscale Science and Engineering Forum
2014- 2015	Long Range Planning Committee, Society for Biomaterials
2015- 2017	Education & Professional Development Committee, Society for Biomaterials
2015-2017	Past-Chair, AIChE Nanoscale Science and Engineering Forum
2018-present	Chemical Technology Operating Council (CTOC) Member, AIChE