

BIOGRAPHICAL SKETCH

NAME Elizabeth LeBleu (Hedberg) Dirk		POSITION TITLE Assistant Professor	
EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
SUNY Stony Brook, New York, USA	N/A	1990-1992	General engineering
UC Santa Barbara, California, USA	BS	1993-1997	Chemical engineering, emphasis in biomaterials
Rice University, Houston Texas, USA	PhD	1998-2004	Bioengineering; tissue engineering
University of Colorado, Boulder, Colorado, USA	Post-doc	2004-2006	Biomaterials and tissue engineering (heart valve)

Personal Statement

My research focuses on the design and implementation of three-dimensional synthetic environments for the generation of living, functional tissues. Members of my laboratory are involved in polymer synthesis, materials fabrication and characterization, bioreactor design, cell culture, and biological assays. Since arriving at UNM, I have mentored students in many different fellowship programs from both the national and university level. My first PhD student and my third MS student will graduate in December, 2013.

A. Variance from Ordinary Career Progression

In October 2005, I was married and changed my legal last name from HEDBERG to DIRK. I publish as Elizabeth L. Hedberg-Dirk.

B. Positions and Honors.**Positions and Employment**

1997-1998	Scientist I, Brita Water filtration, Clorox Services Company, Pleasanton, California
1998-2004	Graduate Student, Department of Bioengineering, Rice University, Houston, Texas (advisor: Antonios G. Mikos)
1999-2004	Adjunct Researcher, Chrysalis Biotechnologies, Inc., Galveston, Texas
2002-2003	Visiting Research Associate, Department of Biomaterials, University Medical Center, Nijmegen, The Netherlands
2004-2006	Post-Doctoral Research Associate, Department of Chemical and Nuclear Engineering, University of Colorado, Boulder (advisor: Kristi Anseth)
2006-present	Associate Professor, Department of Chemical and Biological Engineering, University of New Mexico School of Engineering
2006-present	Researcher, Center for Biomedical Engineering, University of New Mexico

2012-present Adjunct Assistant Professor, Department of Pharmaceutical Science, University of New Mexico School of Pharmacy

Other Experience and Professional Memberships

1993-present Member, Society of Women Engineers
1999-present Member, Materials Research Society
2000-present Member, Biomedical Engineering Society
2000-present Member, Society for Biomaterials
2000-2004 Member, Society for Controlled Release
2001-2002 Founder and Chair, Bioengineering Graduate Student Association
2004-present Member, American Institute of Chemical Engineers
2006-present co-Director, Engineering Multi-User Tissue Culture Facility
2007-2008 Director, UNM Center for Biomedical Engineering Biomaterials K12 Outreach Program
2007-2009 Faculty Mentor, UNM American Institute of Chemical Engineers Student Chapter
2007-2009 Faculty Mentor, Nanoscience and Microsystems NSF/NCI IGERT Fellowship Program
2007-2010 Faculty Mentor, Integrating Nanoscience with Biology and Neuroscience NSF IGERT Fellowship Program
2007-present Faculty Mentor, UNM-Initiatives to Maximize Student Diversity (IMSD) Program (NIH)
2009-present Member, American Chemical Society
2010-present Faculty Mentor, UNM Minority Access to Careers (MARC) Program (NIH)

Honors

2001-2002 NIH Biotechnology Training Grant Trainee
2001 Student Travel Grant, Materials Research Society
2002 Student Award for Excellence in Tissue Engineering, Tissue Engineering Special Interest Group, Society for Biomaterials
2003 Student Travel Grant, Biomedical Engineering Society
2008 Ralph E. Powe Junior Faculty Enhancement Award Recipient
2012 Chemical and Nuclear Engineering Nominee for School of Engineering Outstanding Teaching Award

Patents/ Patent Applications

T.S. Corbitt, E.L. Hedberg-Dirk, K.S. Shanze, K.N. Cicotte, D.G. Whitten. "Antimicrobial Nonwoven Materials," patent application 12/49613, August 2012.
S. Buerger, S.M. Dirk, E.L. Hedberg-Dirk, K.N. Cicotte, "Porous Conducting Biocompatible Non Woven Mats," patent application filed.
S.M. Dirk, E.L. Hedberg-Dirk., Cicotte, K.N., "Synthesis of Poly(Butylene Fumarate)-co-(Butylene Maleate), Controlling the Fumarate to Maleate Ratio for Tuning the Rate of Degradation," patent application 61/471,580, April 4, 2011.
A.T. Leonard, E.L. Hedberg-Dirk., Cicotte, K.N., "Method of Assembly to Construct Tailorable Three Dimensional Micro/Nano Patterned Tissue Scaffolds, patent application 13/077,469, March 31, 2011.
S.M. Dirk, E.L. Hedberg-Dirk, K.N. Cicotte, "Electrospun Fiber Mats from Low Tg Polymers," patent application 12/943,803, November 10, 2010.
J. Wadsworth, W.P. Conley, D.T. Carty, F.G. Doolittle, E.B. Rinker, K.A. Johnson, E.L. Hedberg, C. Kling, "Faucet Mounted Water Filter," Pat. No. 5,576,362, Sept. 26, 2000.
J. Wadsworth, W.P. Conley, D.T. Carty, F.G. Doolittle, E.B. Rinker, K.A. Johnson, E.L. Hedberg, C. Kling, "Faucet Mounted Water Filter," Pat. No. 6,123,837, Nov. 2, 1999.

C. Selected peer-reviewed publications (in chronological order).

(16 refereed publications in print, h factor = 11, 36 average citations per item)

Elizabeth L. Dirk, PhD

- E.L. Hedberg, A. Tang, R.S. Crowther, D.H. Carney, A.G. Mikos, "Controlled Release of an Osteoinductive Peptide from Injectable Biodegradable Polymeric Composites," *Journal of Controlled Release* 84, 137-150, 2002.
- P.Q. Ruhe[‡], E.L. Hedberg[‡], N.T. Padron, P.H.M. Spauwen, J.A. Jansen, A.G. Mikos, "rhBMP-2 Release from Injectable Poly(DL-Lactic-co-Glycolic Acid)/Calcium Phosphate Cement Composites," *The Journal of Bone and Joint Surgery* 85A, 75-81, 2003. [‡] Both authors contributed equally.
- E.L. Hedberg, C.K. Shih, L. Solchaga, A.I. Caplan, A.G. Mikos, "Controlled Release of Hyaluronan Acid Oligomers from Biodegradable Polymeric Microparticles," *Journal of Controlled Release*, 100, 257-266, 2004.
- J.A. Jansen, J.W.M. Vehof, P.Q. Ruhé, H. Kroeze-Deutman, Y. Kuboki, H. Takita, E.L. Hedberg, A.G. Mikos, "Growth Factor-Loaded Scaffolds for Bone Engineering," *Journal of Controlled Release*, 101, 127-136, 2005.
- E.L. Hedberg, C.K. Shih, M.D. Timmer, J.J. Lemoine, M.A.K. Liebschner, J.A. Jansen, A.G. Mikos, "*In Vitro* Degradation of Porous Poly(Propylene Fumarate)/(Poly(DL-Lactic-co-Glycolic Acid) Composite Scaffolds," *Biomaterials*, 26, 3215-3225, 2005.
- E.L. Hedberg, H.C. Kroese-Deutman, C.K. Shih, R.S. Crowther, D.H. Carney, A.G. Mikos, J.A. Jansen, "Effect of Varied Release Kinetics of the Osteogenic Thrombin Peptide TP508 from Biodegradable, Polymeric Scaffolds on Bone Formation *In Vivo*," *Journal of Biomedical Materials Research*, 72, 343-353, 2005.
- E.L. Hedberg, H.C. Kroese-Deutman, C.K. Shih, R.S. Crowther, D.H. Carney, A.G. Mikos, J.A. Jansen, "*In Vivo* Degradation of Porous Poly(Propylene Fumarate)/Poly(DL-Lactic-co-Glycolic Acid) Composite Scaffolds," *Biomaterials*, 26, 4616-4623, 2005.
- P.Q. Ruhe, E.L. Hedberg, N.T. Padron, P.H.M. Spauwen, J.A. Jansen, A.G. Mikos, "Biocompatibility and degradation of Poly(DL-Lactic-co-Glycolic Acid)/Calcium Phosphate Cement Composites," *Journal of Biomedical Materials Research*, 74A, 533-544, 2005.
- E.L. Hedberg, H.C. Kroese-Deutman, J.J. Lemoine, C.K. Shih, M.J. Miller, A.W. Yasko, R.S. Crowther, M.A.K. Liebschner D.H. Carney, A.G. Mikos, J.A. Jansen, "A Comparative Analysis of Radiography, Micro-Computed Tomography, and Histology for Bone Tissue Engineering," *Tissue Engineering*, 11, 1356-1367, 2005.
- P.Q. Ruhe, E.L. Hedberg-Dirk, P.H.M. Spauwen, J.A. Jansen, A.G. Mikos, "Porous Poly(DL-Lactic-co-Glycolic Acid)/Calcium Phosphate Cement Composites for Bone Tissue Reconstruction," *Tissue Engineering*, 12, 789-800, 2006.
- K.N.Cicotte, S.M. Dirk, E.L. Hedberg-Dirk*, "Poly(1,3-Butylene Fumarate) and Poly(1,3-Butylene Fumarate)-co-(1,3-Butylene Maleate) as Electrospun Scaffold Materials," In R. Narayan, S. Jayasinghe, S Jin, W Mullins, D Shi, eds., *Micro- and Nano-Scale Processing of Biomaterials*, Mat. Res. Soc. Symp. Proc., Materials Research Society, 2009.
- E.L. Hedberg-Dirk*, K.N. Cicotte, S.M. Dirk, "Esters of Maleic Anhydride as Both a New and Old Material for Tissue Engineering," In S. Bhatia, S. Bryant, J.A. Burdick, J. M. Karp, K. Walline, eds., *Engineering Biomaterials for Regenerative Medicine*, Mat. Res. Soc. Symp. Proc., Materials Research Society, 2009.
- E.L. Hedberg-Dirk*; U.A. Martinez, "Large-Scale Protein Arrays Generated with Interference Lithography for Spatial Control of Cell-Material Interactions," *Journal of Nanomaterials*, 2010, Article ID 176750, 9 pages, 2010.
- K.N.Cicotte, E.L. Hedberg-Dirk*, S.M. Dirk*, "Synthesis and Electrospun Fiber Mats of low T_g Poly(Propylene Fumarate-co-Propylene Maleate)," *Journal of Applied Polymer Science*, 117, 1984-1991, 2010.

H.E. Canavan, S. Weisburd, E.L. Hedberg-Dirk, M. Stanton, D. Petsev, J. Fulghum, K. Hollar, G.P. Lopez, "An Laterally and Vertically Integrated Outreach Program to Increase Participation in Biomaterials-Related Engineering," *Journal of Materials Education*, 2012.

C. Research Support

Ongoing Research Support

UNM School of Engineering and Dept. of Chem. & Nuc. Engineering Dirk(PI)

Biomaterials Laboratory Start-Up

This is unrestricted funding for the start-up and running of my research in the area of synthetic, polymeric biomaterials.

Completed Research Support During the Past Year

American Heart Association, South Central Affiliate Beginning-Grant-in-Aid Dirk(PI) 2010 – 2013

Three-Dimensional Synthetic Environments for Heart Valve Tissue Engineering

This funding supports research on the effects of material chemistry on cells of the aortic heart valve in both 2 and 3 dimensions.

NSF/DMR 0611616 Lopez (PI) 2006-2012

University of New Mexico/Harvard Partnership for Research and Education in Materials: Leadership in Biomaterials

This funding allows for collaborations between UNM and Harvard to further underrepresented student education and collaboration. Funds are available for studies on the effects of material compliance on valvular interstitial cell function.

Role: co-PI

NSF/ DUE 0920640 Falconer (PI) 2009-2012

Conceptests and Screencasts for Core Chemical Engineering Courses

This sub-contract is for assisting in the development and dissemination of novel teaching materials for core chemical engineering courses.

Role: UNM PI