EBEN ALSBERG ABBREVIATED CV

February 23, 2014

Case Western Reserve University
Department of Biomedical Engineering
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ACADEMIC POSITIONS

2012 – present **Associate Professor, Division of General Medical Sciences, National Center for Regenerative Medicine**
Case Western Reserve University, Cleveland, OH

2011 – present **Associate Professor, Department of Orthopaedic Surgery**
Case Western Reserve University, Cleveland, OH

2011 – present **Associate Professor with Tenure, Department of Biomedical Engineering**
Case Western Reserve University, Cleveland, OH

2007 – 2011 **Assistant Professor, Department of Orthopaedic Surgery**
Case Western Reserve University, Cleveland, OH

2005 – 2011 **Assistant Professor, Department of Biomedical Engineering**
Case Western Reserve University, Cleveland, OH

EDUCATION

2002 – 2005 **Postdoctoral Fellow**
Harvard Medical School, Boston, MA
Mentor: Donald E. Ingber, Ph.D., M.D.

1998 – 2002 **Ph.D. in Biomedical Engineering**
University of Michigan, Ann Arbor, MI
Advisor: David J. Mooney, Ph.D.
Thesis title: Development of Novel Hydrogels with Controlled Adhesion and Degradation Properties for Bone Tissue Engineering

1995 – 1998 **M.S.E. in Biomedical Engineering**
M.S.E. in Mechanical Engineering
University of Michigan, Ann Arbor, MI
Advisors: Steve A. Goldstein, Ph.D. and Scott J. Hollister, Ph.D.

1991 – 1994 **B.S.E. in Biomedical Engineering, *cum laude***
B.S.E. in Mechanical Engineering and Materials Science, *cum laude*
Duke University, Durham, NC

RESEARCH EXPERIENCE

2002 – 2005 **Postdoctoral Fellow**
Department of Pathology, Harvard Medical School

1998 – 2002 **NIH-NIDCR Graduate Fellow**
Department of Biomedical Engineering, University of Michigan

1995 – 1998 **Graduate Student Research Assistant**
Orthopaedic Research Laboratory, University of Michigan

1995 **Biomedical Engineer**
Department of Biomedical Engineering, Duke University

1993-1994	**National Science Foundation/Engineering Research Center Fellow** Department of Biomedical Engineering, Duke University

ACADEMIC HONORS AND AWARDS

2013	Nominated for Case School of Engineering Research Award
2011	Nominated for Case School of Engineering Undergraduate Teaching Award
2010	Glennan Fellows Award for Teacher/Scholars
2010	Nominated for Case School of Engineering Research Award
2010	Finalist for the 2010 John S. Diekhoff Graduate Student Teaching/Mentoring Award
2009	Crain's Cleveland Business 2009 Forty Under 40 Award
2009	Nominated for the Carl F. Wittke Award for Excellence in Undergraduate Teaching
2009	Nominated for the Tau Beta Pi Srinivasa P. Gutti Memorial Engineering Teaching Award
2008	Ellison Medical Foundation New Scholar in Aging
2005	Case Presidential Research Initiative Award
2004	Gordon Research Conference Chairman's Travel Award
2003	American Association for Dental Research William J. Gies Award for best paper published in the *Journal of Dental Research*
2002	International Association for Dental Research/Lion Dental Research Award for Junior Investigators in the Periodontal Research Category
2002	2nd Place in International Association for Dental Research/Warner-Lambert Hatton Award Competition
2002	1st Place in American Association for Dental Research/Warner-Lambert Hatton Award Competition
2001	Biovalley Young Investigator Award at the 4th International Meeting of the Tissue Engineering Society International (TESI)
2001	Rackham International Travel Grant
2001	Co-recipient of the Grand Prize (basic science division) for the best poster at University of Michigan Research Clinic Day
2000	Co-recipient of the Merle Lawrence Award for the Most Outstanding Basic Science Research Paper at the 24th Annual Frank A. Lamberson Lectureship annual competition
1998-2002	NIH-NIDCR Graduate Fellowship
1994	IEEE/EMBS Whitaker Foundation Graduate Student Paper Competition Finalist
1994	Whitaker Foundation Theo C. Pilkington Memorial Award in Biomedical Engineering
1993-1994	National Science Foundation/Engineering Research Center Fellowship

PUBLICATIONS

Supervised students and researchers indicated by underline *throughout this document.*

PEER-REVIEWED JOURNAL PUBLICATIONS

1. Fu AS, Solorio LD, **Alsberg E**, Saidel GM: Mathematical modeling of glycosaminoglycan production by stem cell aggregates incorporated with growth factor-releasing polymer microspheres. *Journal of Tissue Engineering and Regenerative Medicine (in press, 2013).*
2. Cheng C, Solorio LD, **Alsberg E**: Decellularized tissues for orthopaedic tissue engineering. *Biotechnology Advances (in press, 2013).*
3. Yu X, Dang PD, **Alsberg E**, Murphy WL: Multilayer inorganic microparticles for tunable dual growth factor delivery. *Advanced Functional Materials (in press, 2013).*
4. Nguyen K, **Alsberg E**: Bioactive factor delivery strategies from engineered polymer hydrogels for therapeutic medicine. *Progress in Polymer Science (in press, 2013).*
5. Jeon O, Alt D, Ahmed SM, Linderman S, **Alsberg E**: Biochemical and physical signal gradients in hydrogels to control stem cell behavior. *Advanced Materials (in press, 2013).*
6. Jeon O, Samorezov J, **Alsberg E**: Dual-crosslinked oxidized methacrylated alginate/PEG hydrogels for bioadhesive applications. *Acta Biomaterialia* (*in press, 2013*).
7. Jeon O, **Alsberg E**: Regulation of stem cell fate in a three-dimensional micropatterned dual-crosslinked hydrogel system. *Advanced Functional Materials (in press, 2013).* **Highlighted as Frontispiece.**
8. Andersen T, Markussen C, Dornish M, Heier-Baardson H, Melvik JE, **Alsberg E**, Christensen BE: *In situ* gelation for cell immobilization and culture in alginate foam scaffolds. *Tissue Engineering, Part A (in press, 2013).*
9. Andersen T, Melvik J, Gåserød O, **Alsberg E**, Christensen B: Ionically gelled alginate foams: Physical properties controlled by type, amount and source of gelling ions. *Carbohydrate Polymers (in press, 2013).*
10. Heylman CM, Saidel GM, **Alsberg E**, Muschler GF: Modeling and experimental methods to predict optimal oxygen distribution for tissue regeneration in bone defects *Medical and Biological Computing and Engineering (in press, 2013).*
11. Saquing C, Tang C, Monian B, Bonino C, Manasco J, **Alsberg E**, Khan S: Alginate-PEO blend nanofibers and the role of carrier polymer in electrospinning. *Industrial & Engineering Chemistry Research (in press, 2013).*
12. Jeon O, **Alsberg E**: Photofunctionalization of alginate hydrogels to promote adhesion and proliferation of human mesenchymal stem cells. *Tissue Engineering, Part A (in press, 2013).*
13. Corn DJ, Kim Y, Krebs MD, Mounts T, Molter J, Gerson S, **Alsberg E**, Dennis JE, Lee Z: Imaging early stage osteogenic differentiation of mesenchymal stem cells. *Journal of Orthopaedic Research (in press, 2013).*
14. Solorio L, Vieregge E, Dhami C, **Alsberg E**: High density cell systems incorporating polymer microspheres as microenvironmental regulators in engineering cartilage tissues. *Tissue Engineering, Part B (in press, 2013).*
15. Nyugen K, Dang PN, **Alsberg E**: Functionalized, biodegradable hydrogels for control over sustained and localized siRNA delivery to incorporated and surrounding cells. *Acta Biomaterialia*, 9(1):4487-95, 2013.
16. Andersen T, Melvik J, Gåserød O, **Alsberg E**, Christensen B: Ionically gelled alginate foams: Physical properties controlled by operational and macromolecular parameters. *Biomacromolecules*, 13(11):3703-10, 2012.
17. Jeong SI, Jeon O, Krebs MD, Hill MC, **Alsberg E**: Biodegradable photocrosslinked alginate nanofiber scaffolds with tunable physical properties, cell adhesivity, and growth factor release. *eCells and Materials*, 24:331-43, 2012.
18. Solorio LD, Vieregge EL, Dhami CD, **Alsberg**: Spatiotemporal regulation of chondrogenic differentiation with controlled delivery of TGF-β1 from gelatin microspheres in mesenchymal stem cell aggregates. *Stem Cells Translational Medicine*, 1(8):632-9, 2012. (Listed as a Top 10 most read SCTM article)
19. Chim H, Miller E, Gliniak C, **Alsberg E**: Stromal-cell-derived factor (SDF) 1-alpha in combination with BMP-2 and TGF-β1 induces site-directed cell homing and osteogenic and chondrogenic

differentiation for tissue engineering without the requirement for cell seeding. *Cell and Tissue Research*, 350(1):89-94, 2012.

20. Bonino CA, Efimenko K, Jeong SI, Krebs MD, **Alsberg E**, Khan SA: Three-dimensional electrospun alginate mats *via* tailored charge repulsions. *Small*, 8(12):1928-36, 2012.
21. Jeon O, Alt D, Ahmed SM, **Alsberg E**: The effect of oxidation on the degradation of photocrosslinkable alginate hydrogels. *Biomaterials*, 33(13):3503-14, 2012.
22. Solorio LD, Vieregge EL, Dhami CD, Dang PN, **Alsberg E**: Engineered cartilage via self-assembled hMSC sheets with incorporated biodegradable gelatin microspheres releasing chondrogenic growth factor. *Journal of Controlled Release,* 158(2):224-32, 2012.
23. Lee Z, Dennis J, **Alsberg E,** Krebs MD, Welter J, Caplan A: Imaging stem cell differentiation for cell-based tissue repair. *Methods Enzymol*., 506:247-63, 2012.
24. Bonino CA, Samerozev JE, Jeon O, **Alsberg E**, Khan SA: Real-time in situ rheology of alginate hydrogel photocrosslinking. *Soft Matter,* 7(24):11510-17, 2011.
25. Lee JB, Jeong SI, Bae MS, Heo DN, Kim CH, **Alsberg E**, Kwon IK: Highly porous electrospun nanofibers enhanced by ultra-sonication for improved cellular infiltration. *Tissue Engineering,* 17(21-22):2695-702, 2011.
26. Jeon O, Powell C, Solorio L, Krebs MD, **Alsberg E**: Affinity-based growth factor delivery from biodegradable, photocrosslinked heparin-alginate hydrogels. *Journal of Controlled Release,* 154(3):258-66, 2011.
27. Bonino CA, Krebs MD, Saquing CD, Jeong SI, Shearer KL, **Alsberg E**, Khan SA: Electrospinning alginate-based nanofibers: From blends to crosslinked low molecular weight alginate-only systems. *Carbohydrate Polymers*, 85(1):111-119, 2011.
28. Jeon O, Krebs MD, **Alsberg E**: Controlled and sustained gene delivery from injectable, porous PLGA scaffolds. *Journal of Biomedical Materials Research-A*, 98A(1):72-79, 2011.
29. Krebs MD, **Alsberg E**: Localized, targeted and sustained silencing RNA Delivery. *Chemistry – A European Journal*, 17(11):3054-3062, 2011. (One of most accessed articles in 2011)
30. Jeong SI, Krebs MD, Bonino CA, Samorezov JE, Khan SA, **Alsberg, E**: Electrospun chitosan-alginate nanofibers with in situ polyelectrolyte complexation for use as tissue engineering scaffolds. *Tissue Engineering: Part A*, 17(1-2):59-70, 2011.
31. Sasaki JI, Asoh TA, Matsumoto T, Egusa H, Yatani H, Akashi M, **Alsberg E**, Sohmura T: Fabrication of 3D cell constructs using temperature-responsive hydrogel. *Tissue Engineering: Part A*, 16(8):2497-2504, 2010.
32. Jeon O, Powell C, Ahmed SM, **Alsberg E**: Biodegradable, photocrosslinked alginate hydrogels with independently tailorable physical properties and cell adhesivity. *Tissue Engineering: Part A*, 16(9):2915-2925, 2010.
33. Jeong SI, Krebs MD, Bonino CA, Khan SA, **Alsberg E**: Electrospun alginate nanofibers with controlled cell adhesion for tissue engineering. *Macromolecular Biosciences*, 10(8):934-943, 2010.
34. Solorio LD, Fu AS, Hernandez-Irizarry R, **Alsberg E**: Chondrogenic differentiation of human mesenchymal stem cell aggregates via controlled release of TGF-β1 from incorporated polymer microspheres. *Journal of Biomedical Materials Research-A*, 92(3): 1139-1144, 2010.
35. Krebs MD, Salter E, Chen E, Sutter KA, **Alsberg E**: Calcium phosphate-DNA nanoparticle gene delivery from alginate hydrogels induces in vivo osteogenesis. *Journal of Biomedical Materials Research-A*, 92(3): 1131-1138, 2010.
36. Erb RM, Krebs MD, **Alsberg E**, Samanta B, Rotello VM, Yellen BB: Beyond diffusion-limited aggregation kinetics in microparticle suspensions. *Physical Review E*, 80(5 Pt 1), 2009.
37. Krebs MD, Jeon O, **Alsberg E**: Localized and sustained delivery of silencing RNA from macroscopic biopolymer hydrogels. *Journal of the American Chemical Society,* 131(26): 9204-9206, 2009.
38. Krebs MD, Erb RM, Yellen BB, Samanta B, Bajaj A, Rotello VM, **Alsberg E**: Formation of ordered cellular structures in suspension via label-free negative magnetophoresis. *Nanoletters*, 9(5): 1812-1817, 2009.
39. Krebs MD, Sutter K, Lin AS, Guldberg RE, **Alsberg E**: Injectable poly(lactic-co-glycolic) acid scaffolds with *in situ* pore formation for tissue engineering. *Acta Biomaterialia*, 5(8): 2847-2859, 2009.
40. Jeon O, Mansour JM, **Alsberg E**: Photocrosslinkable alginate hydrogels with tunable biodegradation rates and mechanical properties. *Biomaterials*, 30(14): 2724-2734, 2009.

41. Grikscheit TC, Sala FG, Ogilvie J, Bower KA, Ochoa ER, **Alsberg E**, Mooney DJ, Vacanti JP: Tissue-engineered spleen protects against overwhelming pneumococcal sepsis in a rodent model. *Journal of Surgical Research*, 149(2): 214-218, 2008.
42. Matsumoto T, Sasaki JI, **Alsberg E**, Egusa H, Yatani H, Sohmura T: Three-dimensional cell and tissue patterning in a strained fibrin gel system. *PLoS ONE,* 2(11): e1211, 2007.
43. **Alsberg E**, von Recum HA, Mahoney MJ. Environmental cues to guide stem cell fate decision for tissue engineering applications. *Expert Opinion on Biological Therapy*, 6(9):847-866, 2006.
44. **Alsberg E**, Feinstein E, Joy MP, Prentiss M, Ingber DE: Magnetically-guided self-assembly of fibrin matrices with ordered nanoscale structure for tissue engineering. *Tissue Engineering*, 12(11): 3247-3256, 2006. **(Chosen for cover)**
45. Xia S, Hunt TP, Mayers BT, **Alsberg E**, Whitesides GM, Westervelt R, Ingber DE. Combined micromagnetic-microfluidic separation of living cells in continuous flow. *Biomedical Microdevices*, 8(4): 299-308, 2006.
46. Overby DR, Matthews BD, **Alsberg E**, Ingber DE: Novel dynamic rheological behavior of individual focal adhesions measured within single cells using electromagnetic pulling cytometry. *Acta Biomaterialia*, 1(3): 295-303, 2005.
47. Lee H, Liu Y, **Alsberg E**, Ingber DE, Westervelt RM, Ham D: An IC/microfluidic hybrid microsystem for 2D magnetic manipulation of individual biological cells. *IEEE Int. Solid State Circuits*, 80-81, 2005.
48. Kong HJ, Polte TR, **Alsberg E**, Mooney DJ: FRET measurements of cell-traction forces and nano-scale clustering of adhesion ligands varied by substrate stiffness. *Proceedings of the National Academy of Sciences*, 102(12): 4300-4305, 2005.
49. Moore KA, Polte T, Huang S, Shi B, **Alsberg E**, Sunday ME, Ingber DE: Control of basement membrane remodeling and epithelial branching morphogenesis in embryonic lung by Rho and cytoskeletal tension. *Developmental Dynamics*, 232(2): 268-281, 2005.
50. Lee KY*, **Alsberg E***, Hsiong S, Mooney DJ: Nanoscale adhesion ligand organization regulates osteoblast proliferation and differentiation. *Nanoletters*, 4(8): 1501-1506, 2004. ***Shared first authorship.**
51. Kong HJ, **Alsberg E**, Kaigler D, Lee KY, Mooney DJ: Controlling degradation of hydrogels via size of crosslinked junctions. *Advanced Materials*, 16(21): 1917-1921, 2004.
52. Grimmer JF, Gunnlaugsson CB, **Alsberg E**, Murphy HS, Kong HJ, Mooney DJ, Weatherly RA: Tracheal reconstruction using tissue-engineered cartilage. *Archives of Otolaryngology - Head and Neck Surgery*, 130(10): 1191-1196, 2004.
53. Grikscheit TC, Siddique A, Ochoa ER, Srinivasan A, **Alsberg E**, Holden RA, Vacanti JP: Tissue-engineered small intestine improves recovery after massive small bowel resection. *Annals of Surgery*, 240(5): 748-754, 2004.
54. Simmons CA*, **Alsberg E***, Hsiong S, Kim WJ, Mooney DJ: Dual growth factor delivery and controlled scaffold degradation enhance *in vivo* bone formation by transplanted bone marrow stromal cells. *Bone*, 35(2): 562-569, 2004. ***Shared first authorship.**
55. Thornton AJ, **Alsberg E**, Hill EE, Mooney DJ: Shape retaining injectable hydrogels for minimally invasive bulking. *Journal of Urology*, 172(2): 763-768, 2004.
56. Thornton AJ, **Alsberg E**, Albertelli M, Mooney DJ: Shape-defining scaffolds for minimally invasive tissue engineering. *Transplantation*, 77(12): 1798-1803, 2004.
57. **Alsberg E**, Kong HJ, Hirano Y, Smith MK, Albeiruti A, Mooney DJ: Regulating bone formation via controlled scaffold degradation. *Journal of Dental Research,* 82(11): 903-908, 2003.
58. Grikscheit TC, Ochoa ER, Ramsanahie A, **Alsberg E**, Mooney DJ, Whang EE, Vacanti JP: Tissue engineered large intestine resembles native colon with appropriate *in vitro* physiology and architecture. *Annals of Surgery*, 238(1): 35-41, 2003.
59. **Alsberg E**, Anderson KW, Albeiruti A, Rowley JA, Mooney DJ: Engineering growing tissues. *Proceedings of the National Academy of Sciences*, 99(19): 12025-12030, 2002.
60. Grikscheit TC, Ogilvie JB, Ochoa ER, **Alsberg E**, Mooney DJ, Vacanti, JP: Tissue-engineered colon exhibits function *in vivo*. *Surgery*, 132(2): 200-204, 2002.
61. **Alsberg E**, Anderson KW, Albeiruti A, Franceschi RT, Mooney DJ: Cell-interactive alginate hydrogels for bone tissue engineering. *Journal of Dental Research*, 80(11): 2025-29, 2001.
62. Lee KY, **Alsberg E**, Mooney DJ: Degradable and injectable poly(aldehyde guluronate) hydrogels for bone tissue engineering. *Journal of Biomedical Materials Research-A*, 56(2): 228-33, 2001.

63. Bouhadir KH, **Alsberg E**, Mooney DJ: Hydrogels for combination delivery of antineoplastic agents. *Biomaterials*, 22(19): 2625-33, 2001.
64. Bouhadir KH, Lee KY, **Alsberg E**, Damm KL, Anderson KW, Mooney DJ: Degradation of partially oxidized alginate and its potential application for tissue engineering. *Biotechnology Progress*, 17(5): 945-50, 2001.
65. **Alsberg E**, Hill EE, Mooney DJ: Craniofacial tissue engineering. *Critical Reviews in Oral Biology and Medicine*, 12(1): 64-75, 2001.
66. Brown AN, Kim BS, **Alsberg E**, Mooney DJ: Combining chondrocytes and smooth muscle cells to engineer hybrid soft tissue constructs. *Tissue Engineering*, 6(4): 297-305, 2000.
67. Richards M, Wineman AS, **Alsberg E**, Goulet JA, Goldstein SA: Viscoelastic characterization of mesenchymal gap tissue and consequences for tension accumulation during distraction. *Journal of Biomechanical Engineering*, 121: 116-123, 1999.

BOOK CHAPTERS

1. Nguyen K, Samorezov J, **Alsberg E**. Hydrogels in bone tissue engineering. In: Khademhosseini A, et al., eds. Applications of Hydrogels in Regenerative Medicine *(in preparation, 2013).*
2. Andersen T, Strand BL, Formo K, **Alsberg E**, Christensen BE. Alginates as biomaterials in tissue engineering. In: Rauter AP, ed. Carbohydrate Chemistry Vol. 37: Chemical and Biological Approaches – Glycosciences for Human Health and Disease. London, England: Royal Society of Chemistry, 2011: 227-258.
3. **Alsberg E**, Moore K, Huang S, Polte T, Ingber DE. The mechanical and cytoskeletal basis of lung morphogenesis. In: Massaro D, et al., eds. Lung Development and Regeneration. Vol. 190. New York, NY: Marcel Dekker, Inc., 2004: 247-274.

NON PEER-REVIEWED JOURNAL PUBLICATIONS

1. **Alsberg E**, Rowley J: Technologies for enhancing tissue engineering: Materials and environments for guiding stem cell function. *Tissue Engineering*, 15(2): 203-204, 2009.

NOTABLE PUBLICATIONS AND CITATIONS IN THE LITERATURE AND POPULAR PRESS

1. Mayhood K: New material system permits 3-D patterning to regulate stem cell behavior. http://www.eurekalert.org/pub_releases/2013-04/cwru-scp041113.php, April 11, 2013.
2. Mayhood K: Precise and Persistent Cell Sabotage: Control of siRNA Could Aid Regenerative Medicine, Cancer Therapy. http://www.sciencedaily.com/releases/2012/08/120827094351.htm, August 27, 2012.
3. Erdmann J: Helping damaged joints heal. http://www.arthritistoday.org/conditions/osteoarthritis/beyond-the-basics/damaged-cartilage.php, January, 2012.
4. Mayhood K: Engineering cartilage replacements. http://blog.case.edu/think/2011/12/02/engineering_cartilage_replacements, December 2, 2011.
5. Segal M: Top down Bottom Up: Blood Ties. *Nature Nanotechnology*, 4(6): 339, 2009.
6. Brindley L: Cells get in line. http://www.rsc.org/chemistryworld/News/2009/April/07040902.asp, April 7, 2009.
7. DeAngelis C: Magnetic nano-'shephards' organize cells. Eurekalert.org, March 31, 2009.
8. Studeny J, **Alsberg E**. Biomedical engineering professor receives prestigious Ellison Medical Foundation New Scholar in Aging Award (blog.case.edu/case-news/2008/11/05/ebenalsberg); November 5, 2008.
9. **Alsberg E**. Letter to the Editor: comment clarification. *Science News*, 168(8), August 20, 2005.
10. Brownlee C. Boning up: tissue for grafts grown inside the body. *Science News*, 168(5): 68, July 30, 2005.
11. Beckman M. Faux bones get organized. *Science NOW*, 906(3), Sept 6, 2002.

RESEARCH SUPPORT

Active Principal Research Support

NIH 8/01/12-7/30/17
1R01AR063194
Role: PI

NIH 4/11/12-3/31/14
1R21AR061265-A1
Role: Co-PI

NIH 8/01/12-7/30/13 (in no cost ext.)
1R56DE022376-A1
Role: PI

DOD W81XWH-11-PRORP-TRPA 9/30/12-9/29/15
OR110196
Role: PI

AO Foundation 1/1/12-12/31/13 (in no cost ext.)
AOER Collaborative Research Program Large Bone Defect Healing
Role: PI

NIH 7/01/13-6/30/17
1R01AR053733-01A1
Role: co-I (PI: George Muschler)

NIH 8/17/12-6/30/17
R01CA129359
Role: Collaborator (PI: Schiemann)

Completed Research Support

The Ellison Medical Foundation 7/01/08-6/30/13
New Scholar in Aging Grant
Role: PI

Case Western Reserve University 7/1/10-6/30/13
Glennan Fellows Award for Teacher/Scholars
Role: PI

Coulter-Case Translation and Innovation Partnership Grant 4/01/12-5/31/13
Case Western Reserve University and the Coulter Foundation
Role: PI

Plastic Surgery Educational Foundation 7/1/10-6/30/11
PSEF Pilot Research Grant
Role: Co-PI (PI: Harvey Chim)

NIH 9/30/09-8/31/12
5RC1HL100105
Role: Co-I (PI: K Laurita)

NIH 7/16/09-6/30/10
GM077173-S1 (supplement)

Role: Co-PI (PI: V Rotello)

Ohio Biomedical Research Commercialization Program 4/28/09-10/27/12
Center for Stem Cell and Regenerative Medicine Project Grant (09-071)
Role: PI

The Musculoskeletal Transplant Foundation 1/01/09-12/31/10
MTF Grant
Role: PI

Ohio Biomedical Research Commercialization Program 8/01/08-1/31/12
Clinical Tissue Engineering Center Project Grant (BRTT 08-081)
Role: PI

The Coulter Foundation 8/01/08-1/31/09; 7/01/09-12/06/09
Coulter-Case Translational Research Partnership Pilot Grant
Role: PI

Ohio BRTT Partnership Award 1/01/07-6/30/08
Clinical Tissue Engineering Center Project Grant
.
Role: PI

Case Western Reserve University 7/01/06-6/30/08
Presidential Research Initiative Grant
Role: PI

National Brain Tumor Foundation 7/01/06-6/30/07
The Steven J. Bryant Grant
Role: PI

Case Western Reserve University 3/01/06
Library Opportunity Fund Award
Role: PI

INTELLECTUAL PROPERTY

Dr. Alsberg has submitted 23 Invention Disclosures and 7 Provisional or Full US Patent Applications.
MORE INFORMATION IS AVAILABLE UPON REQUEST.

TEACHING EXPERIENCE

- Dr. Alsberg currently teaches the equivalent of about 2 classes per year. He is the primary instructor for 1 undergraduate class and 1 graduate class and is involved a number of others.

Tissue Engineering Undergraduate Specialty Sequence

Dr. Alsberg has been the Coordinator for the Tissue Engineering Undergraduate Specialty Sequence since 2005, with primary responsibilities including the curriculum, teaching 1 BME senior-level sequence class, reviewing program of study issues for the BME Undergraduate Education Committee and advising students in the sequence. This sequence is the most highly subscribed sequence in the BME department, with 143 (42%) of the 341 BME undergraduates in this sequence in 2008. Due to the large popularity of the sequence, Dr. Alsberg organized and spearheaded a sequence re-evaluation and restructuring in the fall of 2008. Since his arrival at Case, he has focused effort on developing courses and the curriculum for this student population.

The 8-class sequence covers the following: CHEM 223 Intro. to Organic Chemistry, EMAC 270 Intro. to Polymers, BIOL 362 Developmental Biology, EBME 350 Quantitative Molecular Bioengineering, EBME 325 Intro. to Tissue Engineering, and 3 Technical Electives in Biotransport, Biomaterials, Drug Delivery, Tissue Regeneration, or an individualized area.

EBME 325 Intro. to Tissue Engineering (Spring Senior year): Capstone class for the sequence.

Biological principles of tissue structure/function relationships and formation during morphogenesis, the cellular processes underlying these events with an emphasis on microenvironment regulation of cell behavior, biomimetic approaches to controlling cell function and tissue formation via the development of biomaterial systems, case studies of regeneration strategies for specific tissues, special current topics in tissue engineering, NIH-type grant proposal group design project with written and oral reports.

Dr. Alsberg developed and implemented EBME 325 as a **new** undergraduate course in the fall of 2006 as part of his efforts in curriculum development and has taught it every year since. The course aims to help the students integrate their prior course material and apply it to real world problems in tissue engineering. He is the primary instructor. It is the required capstone course in the Tissue Engineering Sequence.

In Spring 2006, Dr. Alsberg submitted a Library Opportunity Fund Award Proposal to acquire additional library materials to support the research projects undertaken in EBME 325 in the areas of tissue engineering, biomaterials, and drug delivery. The proposal was funded and the library purchased $4,064 in new reference books.

In Spring 2010, Dr. Alsberg was awarded a CWRU Glennan Teaching Fellowship to fund an educational enrichment supplement EBME 325. Unfortunately, even by their senior year, undergraduates in the tissue engineering sequence have had little, if any, hands-on experience. As there are few jobs in this area requiring a B.S. degree that are purely theoretical in nature, there is great need for student exposure to the experimental aspects of tissue engineering. The funds secured are helping incorporate such a component into EBME 325.

EBME 425 Tissue Engineering and Regenerative Medicine (Spring Senior year elective or graduate standing) 50%

Breakthroughs in biomaterial design, micro- and nano-fabrication, therapeutic angiogenesis, gene therapy, mechanotransduction and mechanical stimulation, stem cell biology and its role in development, advanced coverage of tissue engineering with a focus on stem cell-based research and therapies, modeling of stem cell function, controlling stem cell behavior by engineering materials and their microenvironment, stem cells' trophic character, state-of-the-art stem cell implementation in tissue engineering and other therapeutic strategies, major individual project with written and oral reports.

There was a critical need for a graduate level stem cell bioengineering and regenerative medicine course. While full evaluation of BME instructor resources and programmatic needs both within BME and the biomaterials group delayed approval, Dr. Alsberg successfully established such a permanent class, EBME 425, as part of his efforts in curriculum development. Dr. Alsberg developed and implemented EBME 425 as a **new** graduate course in the spring of 2009. He is the primary instructor and teaches 50% of the lectures.

Dr. Alsberg has revised the sequence based on suggestions by students and faculty. Improvements include:

- Introduction of EBME 325, which is restricted to graduating seniors to allow capstone integration, and EBME 425, which is an advanced elective for undergraduates as well as serving the graduate student population.
- A major grant writing project component was integrated into EBME 325 to provide students more experience in team efforts, public speaking, reading and researching the primary literature, and report writing.
- Dr. Alsberg recently determined the courses required to allow students to obtain a minor in Polymer Science and Engineering.

Dr. Alsberg assists with a number of other courses:

EBME 105 Introduction to Biomedical Engineering (Fall)

EBME 105 is an open elective for BME students. Dr. Alsberg was a term paper advisor for 15, 5, and 3 students in EBME 105 during the Fall 2005, Fall 2006, and Fall 2007 semesters, respectively. This advising included providing direction on choosing a biomedical engineering topic, constructing a scientific review outline, and writing the paper. He sat on a biomaterials faculty in-class panel in 2005. Dr. Alsberg also has given 1 lecture a year since Fall 2008, on tissue engineering.

EBME 306 Introduction to Biomaterials (Fall)

EBME 306 is a required core class for every BME undergraduate student. Dr. Alsberg has given 1-3 lectures every year since Fall 2005, on hydrogels for orthopaedic tissue engineering.

EBME 318/319 BME Laboratory I/II (Fall/Spring)

Dr. Alsberg has offered a **new** hands-on biomaterial and tissue engineering wet 'Megalab' experience for 16-39 students every academic year since 07-08. This was the first tissue engineering Megalab designed to address a critical shortage of EBME 318/319 labs. Dr. Alsberg set up and designed the entire undergraduate wetlab for this learning experience as "a great contribution for the department" (Prof. David Wilson, 12/17/07), and the students gave extremely positive feedback including "Altogether this was by far my favorite lab from both EBME 318 and 319."

EBME 328/329 Research Training I/II (Fall/Spring)

Dr. Alsberg has advised students in these courses every semester since their inception in Fall 2008.

	EBME 328 Project Academic Advisor for:
2014, Spring	Emma Headley
2013, Fall	Lauren Phillips
2012, Fall	Chris Mosher
2012, Spring	Caitlin Bowerman
2011, Fall	Colin Morlock
2010, Fall	Michael Hill
2009, Fall	Chirag Dhami
2009, Spring	Caitlin Powell
2008, Fall	Misty Ahmed
	EBME 329 Project Academic Advisor for:
2012, Spring	Colin Morlock
2011, Spring	Michael Hill
2010, Spring	Chirag Dhami
2009, Fall	Caitlin Powell
2009, Spring	Misty Ahmed

EBME 398/399 Senior Research Projects & EBME 380 Design for Biomedical Engineers

Every year since Dr. Alsberg's arrival at Case, he has advised and mentored students pursuing independent laboratory research experiences or group senior projects. He has been the project academic and research advisor for numerous students working on their EBME 398/399 capstone projects. He also assisted the undergraduate researchers in his laboratory in successfully securing stipend support for research from SOURCE, SPUR, the BME NSF-REU, the Alcoa Research Fellowship, and the Glenn-Stokes Academic Year Internship. Dozens of undergraduate researchers in his lab have had their work recognized on abstracts to international conferences and/or peer-reviewed manuscripts.

EBME 398 Project Academic Advisor for:

2013, Fall	Chris Mosher
2013, Spring	Juliana Kim
2012, Fall	Caitlin Bowerman (also Research Advisor)
2012, Fall	Colin Morlock (also Research Advisor)
2012, Fall	Michael Hill (also Research Advisor)
2010, Fall	Misty Ahmed (also Research Advisor)
2010, Fall	Chirag Dhami (also Research Advisor)
2010, Fall	Caitlin Powell (also Research Advisor)
2010, Spring	Stephan Nieuwoudt
2009, Fall	Douglas Voelker
2009, Spring	Kenneth Nguyen
2009, Spring	Rachael Radgowski
2009, Spring	Ashley McKee
2009, Spring	Eric Chen (also Research Advisor)
2008, Fall	Kathleen Sutter (also Research Advisor)
2008, Fall	Sean Arlauckas
2008, Fall	Jim Kirk
2008, Fall	Kevin McHugh
2008, Fall	Caroline Hamman
2008, Spring	Tricia Welly
2007, Fall	Matthew McShane
2007, Fall	Justyna Mach
2007, Spring	Seetal Mishra
2006, Fall	Kevin Davis
2006, Fall	Erin Salter (also Research Advisor)
2006, Fall	Jessica Dequach
2005, Fall	Arti Patel

EBME 399 Project Academic Advisor for:

2009, Fall	Rachael Radgowski

EBME 380 Project Research Advisor for:

2006, Fall	Chris Bowley, Matthew Gruss, Saif Quaderi, Daniel Johnson, Niral Patel

EBME 402 Organs / Systems (Spring)
EBME 402 is a required core class for every BME graduate student. Dr. Alsberg has given 5 lectures every year from Spring 2011, on Musculoskeletal Physiology and Biomechanics.

EBME 405 Materials for Prosthetics and Orthotics (Fall)
Dr. Alsberg gave 2 lectures in 2005 on biopolymers for bone and cartilage tissue regeneration.

EBME 452 Tissue and Organ Systems Physiology (Spring)
EBME 452 was a required core class for every BME graduate student. Dr. Alsberg taught 2-3 lectures every year from Spring 2006-10, on Musculoskeletal Physiology and Biomechanics.

IBMS 500 On Being a Professional Scientist: The Responsible Conduct of Research (Spring)
Dr. Alsberg taught a 2 hours roundtable discussion on managing conflict of interest and ownership of data and intellectual property in 2011.

EBME 611/612 BME Graduate Seminar (Fall/Spring)
Dr. Alsberg has presented on his research to the department in this seminar series in 2005 and 2010.

TRAINING/ADVISING/MENTORING EXPERIENCE

Graduate and Postdoctoral Advising

	Mentored graduate student and postdoctoral awards received while in Alsberg lab
2013	Khanh Nguyen, 2013 TERMIS WFIRM Young Investigator Award
2013, Fall	Michael Hill, TERMIS Travel Award for top 25 abstract ($330)
2013	Christina Cheng, Best Poster Award at NE OH Musculoskeletal Research Retreat
2013	Julia Samorezov, Society For Biomaterial's (SFB) Student Travel Achievement Recognition (STAR) Award
2012-present	Christina Cheng, OREF Research Residency Grant
2012-present	Daniel Alt, NIH-NIAMS T32 Graduate Fellowship ($21,600/yr + partial tuition)
2012-present	Christina Cheng, Allen Fellowship
2012	Phuong Dang, LBDH Exchange Visit Fellowship (2,200 DHF)
2012	Julia Samorezov, Material Research Society Student Travel Award
2011	Melissa Krebs, 2011 TERMIS WFIRM Young Investigator Award
2011	Alia Hdeib, Society for Neurological Surgeons Resident Award ($5,000 research grant; 7/1/11-6/30/12)
2011	Melissa Krebs, 2011 Doctoral Excellence Award for Best Dissertation in the CWRU Department of Biomedical Engineering
2011	Melissa Krebs, American Cancer Society Postdoctoral Fellowship ($50,000/yr for 3 years)
2010-2013	Phuong Dang, National Science Foundation Graduate Fellowship ($30,000/yr + partial tuition)
2010-2013	Julia Samorezov, National Defense Science and Engineering Graduate Fellowship ($30,000/yr + full tuition)
2010-2013	Julia Samorezov, National Science Foundation Graduate Fellowship ($30,000/yr + partial tuition)
2010	Melissa Krebs, Society For Biomaterial's (SFB) Student Travel Achievement Recognition (STAR) Award Honorable Mention
2009	Loran Vieregge, 2nd place in poster competition, Center for Stem Cell and Regenerative Medicine Retreat
2008	Melissa Krebs, Society For Biomaterial's (SFB) Student Travel Achievement Recognition (STAR) Award
2008	Loran Vieregge, Travel Award to 8th World Biomaterials Congress (400 E)
2007-2008	Andrew Fu, Medtronic Graduate Fellowship ($40,000)
2007-2010	Loran Vieregge, NIH-NIAMS T32 Graduate Fellowship ($21,600/yr + partial tuition)
2007	Melissa Krebs, Ford Foundation Graduate Fellowship (declined)
2007-2010	Melissa Krebs, National Science Foundation Graduate Fellowship ($30,000/yr + partial tuition)
2006, Fall	Melissa Krebs, 2006 Innovation Incentive Fellowship award ($20,000)
2005-present	**Medical Scientist Training Program mentor**
2013-present	Alexandra McMillan
2012, Spring	Alexandra McMillan (rotation)
2011-present	Daniel Alt
2010, Fall	Maritza Rosales (rotation)
2010, Summer	Zach Nevin (rotation)
2010, Summer	Daniel Alt (rotation)
	Graduate student academic advisor
2013-present	Alexandra McMillan
2012-2013	Michael Hill
2011-present	Anna Dikina
2011-2013	Chris Heylman

2011-present	Daniel Alt
2010-present	Edward Kwee
2009-present	Phuong Dang
2009-present	Julia Samorezov
2007-2008	Andrew Fu
2006-2010	Melissa Krebs
2006-2012	Loran Solorio
2005-2007	Linda Zhang
Graduate student research advisor (M.S.)	
2014-present	Zijie Zheng
2012-2013	Michael Hill
Graduate student research advisor (Ph.D.)	
2012-present	Alexandra McMillan
2011-present	Anna Dikina
2011-present	Daniel Alt
2009-present	Phuong Dang
2009-present	Julia Samorezov
2007-2008	Andrew Fu
2006-2010	Melissa Krebs
2006-2012	Loran Solorio
2005-2006	Saejeong (Sage) Kim (Primary advisor: Dr. von Recum)
Visiting Ph.D. student research advisor	
2014	Ane Garate (Research advisor: Dr. Gorka Orive)
M.S. student committee member	
2013-present	Alex Gilewski
2012-2013	Michael Hill
2009-2011	Katie Hallahan (Research advisor: Andrew Rollins)
2009-2011	Brian Conway
2009-2011	Timothy Wong (Research advisor: Dr. Anirban sen Gupta)
2009-2011	Jonathon Shaul (Research advisor: Dr. Anirban sen Gupta)
2007	Sara McBride (Research advisor: Dr. Melissa Knothe Tate)
2005-2007	Tom Falls (Research advisor: Dr. Melissa Knothe Tate)
2005-2006	Joshua Savrin (Research advisor: Dr. Melissa Knothe Tate)
2005-2007	Jeff Beamish (Research advisor: Dr. Roger Marchant)
Ph.D. student committee member	
2012-present	Alexandra McMillan
2012	Youyun Liang (Research advisors: Dr. Hyun Joon Kong and Dr. Yen Wah Tong, NUS-UIUC)
2012-present	Zhao Liu (Research advisor: Dr. Kevin Donahue)
2011-2013	Hana Chang (Research advisor: Dr. Melissa Knothe Tate)
2011-present	Jennifer Bastijanic (Research advisor: Dr. Roger Marchant)
2011-2013	Chris Heylman (Research advisor: Dr. George Muschler)
2011-present	Anna Dikina
2011- present	Daniel Alt
2010-2012	Min Jae Song (Research advisor: Dr. Melissa Knothe Tate)
2009-2010	Seetha Kummari (Research advisor: Dr. Chris Hernandez)
2009-present	Phuong Dang
2009-present	Julia Samorezov
2008-2012	Lindsay Bonsignore (Research advisor: Dr. Ed Greenfield)
2008-present	Adam Whitney (Research advisor: Dr. Jim Dennis)
2007-2013	Therese Anderson (Research advisor: Dr. Bjorn Christensen, Norwegian University of Science and Technology)
2007-2009	Jeff Beamish (Research advisor: Dr. Roger Marchant)
2006-2011	LiKang Chin (Research advisor: Dr. Kathe Derwin)
2006-2010	Zhilei Liu (Research advisor: Dr. Steven Eppell)
2006-2012	Loran Solorio

2006-2010	Melissa Krebs
	CCLCM Medical School Research Year mentor
2010-2011	Rachel Randall
	Case Western Reserve University Medical Student Research mentor
2012-2013	Ari Shapiro (at the Hospital for Special Surgery)
2010-2011	Sharon Santoso
2010-2011	Eran Vieregge
2009	Yu Kan Au
	Medical Resident Research mentor
2012-2013	Dr. Christina Cheng (Orthopaedics)
2010-2012	Dr. Alia Hdeib (Neurology)
	Postdoctoral mentor
2013-present	Dr. Truc Cong Huynh
2012-2013	Dr. Loran Solorio
2010-present	Dr. Minh Khanh Nguyen
2010-2011	Dr. Charles Drinnan
2010-2012	Dr. Melissa Krebs (Assistant Professor at Colorado School of Mines)
2009-2010	Dr. Sean Zuckerman (Employed by CardioInsight)
2008-2011	Dr. Sung In Jeong (Employed by Korean Atomic Energy Research Institute)
2008-present	Dr. Oju Jeon
2008	Dr. Jose F. Alvarez-Barreto (currently faculty member at the Instituto de Estudios Avanzados in Venezuela)
	Research Assistant Professor mentor
2011-2012	Dr. Melissa Krebs (Assistant Professor at Colorado School of Mines)

Undergraduate advising

2003-present	**Advisor for Biomaterials Track**
2005-2013	**Coordinator for Tissue Engineering Sequence**
	* Organized and spearheaded sequence re-evaluation and restructuring (Fall 2008)
2005-2013	**Advisor for Orthopaedic Biomaterials and Polymer Biomaterials Sequences**
2006-2012	**BME Premed Advisor (with Prof. Roger Marchant)**
2006-present	**SOURCE Program mentor**
2006-2013	**REU Program mentor**
2007-2012	**SPUR Program mentor**
	Mentored undergraduate student awards received while in Alsberg lab
2013, Fall	Emma Healey, Choose Ohio First Scholarship ($5,200)
2013, Summer	Bradley Lai, SOURCE Summer Research Scholarship ($3,500)
2013, Summer	Neha Dwivedi, SOURCE Summer Research Scholarship ($3,500)
2013, Summer	Daniel Schapira, ENGAGE Summer Research Scholarship ($3,500)
2013, Summer	Lauren Phillips, SOURCE Summer Research Scholarship ($3,500, declined)
2013, Summer	Lauren Phillips, Case REU Research Fellowship ($4,900)
2013, Spring	Colin Morlock, BME Scholarship Award
2013, Spring	Caitlin Bowerman, BME Scholarship Award
2013, Spring	Emma Healey, Choose Ohio First Scholarship ($2,000)
2013	Lauren Phillips, Alcoa Research Fellowship ($600)
2012, Summer	Chris Mosher, ENGAGE Summer Research Scholarship ($3,500, declined)
2012, Summer	Chris Mosher, SOURCE Summer Research Scholarship ($3,500)
2012, Summer	Michael Hill, SOURCE Summer Research Scholarship ($4,000)
2012, Summer	Colin Morlock, UIC REU Research Fellowship ($4,300)
2012, Summer	Colin Morlock, Case REU Research Fellowship ($4,900, declined)
2012, Summer	Caitlin Bowerman, Case REU Research Fellowship ($4,900)
2012, Spring	Michael Hill, Case Senior Project Award

2012, Spring	Caitlin Bowerman, Dr. Jennie S. Hwang award from the YWCA Greater Women of Cleveland Awards
2011, Summer	Colin Morlock, SOURCE Summer Research Scholarship ($3,500)
2011, Summer	Michael Hill, SOURCE Summer Research Scholarship ($3,500)
2011, Spring	Misty Ahmed, EBME 398 Senior Presentation Award, 2nd place
2010, Summer	Caitlin Powell, NIH Summer Fellowship
2010, Summer	Caitlin Powell, Case REU Research Fellowship ($4,900, declined)
2010, Summer	Michael Hill, SOURCE Summer Research Scholarship ($3,500)
2010, Summer	Michael Hill, ENGAGE Summer Research Scholarship ($3,500, declined)
2010, Summer	Chirag Dhami, SOURCE Summer Research Scholarship ($3,500)
2010, Summer	Chirag Dhami, ENGAGE Summer Research Scholarship ($3,500, declined)
2010, Summer	Misty Ahmed, SOURCE Summer Research Scholarship ($3,500)
2010, Summer	Jake Hemberger, Case REU Research Fellowship ($4,900)
2009, Fall	Caitlin Powell, awarded prestigious Goldwater Scholarship
2009, Summer	David Ciufo, Case REU Research Fellowship ($4,900)
2009, Summer	Stephen Linderman, Case REU Research Fellowship ($4,900)
2009, Summer	Caitlin Powell, Case REU Research Fellowship ($4,900, declined)
2009, Summer	Caitlin Powell, Summer Program in Undergraduate Research ($4,500)
2009, Summer	Caitlin Powell, SOURCE Summer Research Scholarship ($3,500, declined)
2009, Spring	Kathleen Sutter, Case Biomedical Engineering Chairman's Award
2009, Spring	Kathleen Sutter, 1st place in the Engineering Poster Competition at the SOURCE Symposium & Poster Session
2008, Fall	Kathleen Sutter, BMES travel award from Case Alumni Association
2008, Summer	Eric Chen, Case REU Research Fellowship ($4,900)
2008, Summer	Kathleen Sutter, Summer Program in Undergraduate Research ($4,500)
2008, Summer	Eric Chen, 2008 SOURCE Summer Research Scholarship ($3,500, declined)
2008, Summer	Kathleen Sutter, 2008 SOURCE Summer Research Scholarship ($3,500, declined)
2007-2008	Eric Chen, Alcoa Research Fellowship ($1,400)
2007, Summer	Eric Chen, 2007 SOURCE Summer Research Scholarship ($3,500)
2007, Summer	Roberto Hernandez Irizarry, Case REU Research Fellowship ($4,000)
2006-2007	Roberto Hernandez Irizarry, Glenn-Stokes Academic Year Internship
2006, Summer	Erin Salter, 2006 SOURCE Summer Research Scholarship ($3,500)

Undergraduate student research advisor

2013-present	Robyn Marks
2013-present	Lucy Tan
2013-present	Chris Everett
2013, Summer	Elissa Welle
2013-present	David Wolfson
2013-present	Emma Headley
2013-present	Neha Dwivedi
2012-present	Lauren Phillips
2012-present	Bradley Lai
2012	Monica Clark
2012-present	Daniel Schapira
2012, Summer	Ian Kinstlinger (Washington University)
2012, Summer	Roger Zou (Duke University)
2011-present	Chris Mosher
2011-2013	Caitlin Bowerman
2011	Pooja Rambhia
2010-2013	Colin Morlock
2010, Fall	Michiel Pot (University of Twente, The Netherlands)
2010, Summer	Jake Hemberger (Iowa State University; REU student)

2009-2012	Michael Hill
2009-2011	Chirag Dhami
2009, Summer	Stephen Linderman (Cornell University; REU student)
2009, Summer	David Ciufo (University of Rochester; REU student)
2008, Fall-2011	Caitlin Powell (currently MD/PhD student at Georgia Tech/Emory)
2008, Summer	Rachel Manthe (University of Akron; REU student)
2008-2011	Misty Ahmed
2007-2009	Kathleen Sutter
2007-2009	Eric Chen
2006-2007	Roberto Hernandez Irizarry (currently med student at U of Puerto Rico)
2005-2007	Erin Salter (currently graduate student in Johns Hopkins BME)
2005-2006	Marjon (Negean) Mobasseri

Lab technician advisor

2012-present	Angela Kaczowska
2009-2012	Kevin Li

Primary undergraduate academic advisor

2013, Fall	13 students
2013, Spring	19 students
2012, Fall	19 students
2012, Spring	20 students
2011, Fall	20 students
2011, Spring	20 students
2010, Fall	20 students
2010, Spring	19 students
2009, Fall	19 students
2009, Spring	24 students
2008, Fall	24 students
2008, Spring	22 students
2007, Fall	19 students
2007, Spring	20 students
2006, Fall	32 students
2006, Spring	27 students
2005, Fall	20 students

SERVICE

PROFESSIONAL SERVICE

CONFERENCE ORGANIZATION AND SERVICE

2014	Session Chair for Symposium, Biomaterials for Stem Cell Differentiation TERMIS-AP Annual Meeting, Daegu, South Korea
2015-2018	Americas Council of TERMIS
2014	Track Chair, Translational Biomedical Engineering Biomedical Engineering Society Annual Meeting, San Antonio, TX
2014	European Society for Biomaterials International Scientific Advisory Board
2013-2014	Scientific Advisory Committee (SAC) for the 2014 TERMIS-AM Annual Meeting
2014	Co-organizer of 4 day symposium entitled "Functional Biomaterials for Regenerative Engineering" at the Materials Research Society meeting in San Francisco.
2013-2015	Founding Chair of the TERMIS Scaffolds, Matrices and Biomaterials Thematic Working Interest Group) TWIG
2013	Chairman, Cell Culture World Congress, Boston, MA
2013	Session Chair for the following sessions -Directing Stem Cell Differentiation -Biomaterials for Controlled Cell Environment II -Nucleic Acid Delivery I Biomedical Engineering Society Annual Meeting, Seattle, WA
2013	Organizer and Session Chair, Paracrine/Trophic Delivery TERMIS-AM Annual Meeting, Atlanta, GA
2013	Judge for Society for Biomaterials "Biomaterials Education Challenge" sponsored by the Education and Professional Development Committee at the annual conference
2013-2014	Membership Committee, Tissue Engineering and Regenerative Medicine International Society-North American
2012	Tissue Engineering Breakout Session Co-Leader Ohio State University Center for Regenerative Medicine and Cell Based Therapies 1st Annual Retreat, Mohican State Park Lodge, OH
2012	Session Chair, Translation of Novel Biomaterials to the Clinic Biomedical Engineering Society Annual Meeting, Atlanta, GA
2012	Poster Session Chair for Specific Biomaterials as Basis of TERM: Bioinspiration and Biomimetics in TERM TERMIS 2012 World Congress, Vienna, Austria
2012	TERMIS 2012 World Congress Advisory Board
2011	Session Chair for Stem Cells in Regenerative Medicine Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Boston, MA
2011-2012	Membership Committee, Society of Biomaterials
2011	Session Chair for the following sessions -Orthopaedic Biomaterials -Novel Biomaterials and Scaffolds II Biomedical Engineering Society Annual Meeting, Hartford, CT
2011	Organizer and Session Chair, Spatially Patterned Biomaterials for Tissue Engineering Society for Biomaterials Annual Meeting, Orlando, FL
2010	European Society for Biomaterials International Scientific Advisory Board
2010	Session Chair for Sensors and Sensing I Materials Research Society Workshop Series: Functionalized Nanobiomaterials for Medical Applications, Denver, CO
2010	Session Chair for the following sessions -Cell- and Gene-Based Therapeutics

-Stem Cells and Tissue Engineering II
Biomedical Engineering Society Annual Meeting, Austin, TX

2010 Session Chair, the Mini Network Nanomedicine Panel
Midwest Biomedical Engineering Conference, Cleveland, OH

2010 Organizer and Chair for the following sessions
-Controlled release and presentation systems for regulating cell behavior
-Biomaterials as stem cell niche
Society for Biomaterials Annual Meeting, Seattle, WA

2010 Session Chair, Novel Biomaterials for Directing Cell and Tissue Response
American Chemical Society Annual Meeting, San Francisco, CA

2009 Session Chair, Tunable Scaffolds and Stem Cells
Biomedical Engineering Society Annual Meeting, Pittsburgh, PA

2009 Organizer and Chair for the following sessions
- Environmentally Responsive Biomaterials
- Spatially Patterned Biomaterials
- Cellular Responses to Their Microenvironments
- Stem Cells: Engineering the Niche
Society for Biomaterials Annual Meeting, San Antonio, TX

2009 Scientific Program Committee, 8th Midwest Tissue Engineering Consortium, Pittsburgh, PA

2008 Session Chair, Tissue Engineering & Regenerative Medicine: Musculoskeletal I
Biomedical Engineering Society Annual Meeting, St. Louis, MO

2008-2009 Program Chair, Tissue Engineering Special Interest Group
Society for Biomaterials

2008-2009 Vice Chair, Cell/Organ Therapies Special Interest Group
Society for Biomaterials

2008 Session Chair, Novel Biomaterials
Co-Organizer, Technology Rapid Fire Sessions 2, 3, and 4
Society for Biomaterials Annual Meeting, Atlanta, GA

2008 Editor of Special Issue of *Tissue Engineering* Journal with Jon Rowley, Ph.D.
"Technologies for enhancing tissue engineering: materials and environments for guiding stem cell function"

2008 Symposium Organizer and Chair
Biologically Inspired Hydrogel-Based Materials for Tissue Engineering
8th World Biomaterials Congress, Amsterdam RAI, The Netherlands
Keynote Speaker: Jeffrey Hubbell; Proposal chosen out of 117 submissions

2007-2008 Program Chair, Tissue Engineering Special Interest Group
Society for Biomaterials

2007-2008 Vice Chair, Cell/Organ Therapies Special Interest Group
Society for Biomaterials

2007 Session Chair, Orthopaedic Tissue Engineering
Biomedical Engineering Society Annual Meeting, Los Angeles, CA

2007 Session Chair, Polysaccharide-Based Biomaterials
Society for Biomaterials Annual Meeting, Chicago, IL

2006 Session Chair, Scaffold Design for Tissue Engineering
Biomedical Engineering Society Annual Meeting, Chicago, IL

GRANT REVIEWER

2013 NIH Musculoskeletal Tissue Engineering Study Section (Ad Hoc Reviewer)

2012 American Cancer Society (ACS) Cancer Drug Development grant review panel

2011 NSF CAREER Award Biomaterials study section

2011-present Kansas University Medical Center IDeA Network of Biomedical Research Excellence (K-INBRE)

2010-present National Center for Regenerative Medicine

2010-present U.S.-Israel Binational Science Foundation

2010-present AO Foundation

2010	Health Research Board of Ireland Health Research Awards
2009-present	Musculoskeletal Transplant Foundation Grants

PROFESSIONAL MEMBERSHIPS

International

2010-present	Materials Research Society
2010-present	American Chemical Society
2002-present	Society for Biomaterials
2000-present	TERMIS (formerly Tissue Engineering Society International)
1999-present	International Association for Dental Research
1998-present	Biomedical Engineering Society
1997-present	Orthopaedic Research Society
1994, 2002	IEEE / Engineering in Medicine and Biology
1994-present	Pi Tau Sigma (International Mechanical Engineering Honor Society)
1993-1994	The American Society of Mechanical Engineers (some memberships are intermittent)

Local

2011-present	Associate Investigator with the Advanced Platform Technology (APT) Center of Excellence at the Louis Stokes Cleveland Department of Veteran Affairs Medical Center (Cleveland, OH)
2007-present	Case Comprehensive Cancer Center (Cleveland, OH)
2007-2010	Case School of Medicine BRTT Center, Targeted Nanoparticles for Imaging and Therapeutics (Cleveland, OH)
2006-present	Clinical Tissue Engineering Center (Cleveland, OH)
2006-present	The National Center for Regenerative Medicine / The Center for Stem Cell and Regenerative Medicine (Cleveland, OH)

JOURNAL EDITORIAL BOARDS

2014-present	Tissue Engineering (Parts A, B & C)
2013-present	JSM Nanotechnology & Nanomedicine (Founding Member)
2013-present	JSM Biotechnology & Biomedical Engineering (Founding Member)
2013-present	Journal of Biomedical Technology and Research (Founding Member)
2013-present	Scientific Reports - Nature
2013-present	Bioengineering (Founding Member)
2011-2014	American Journal of Bioengineering and Biotechnology (Founding Member)
2011-present	Journal of Regenerative Medicine and Tissue Engineering (Founding Member)
2010-present	Recent Patents on Regenerative Medicine (Founding Member)
2010-present	Journal of Nanoscience Letters (Founding Member)
2010-present	Journal of Tissue Science and Engineering (Founding Member)

AD HOC MANUSCRIPT REVIEWER

Journals

2013-present	Nature Materials
2013-present	Cell and Tissue Research
2012-present	Stem Cells Translational Medicine
2012-present	Journal of Drug Targeting
2012-present	Ageing Research Reviews
2012-present	Progress in Polymer Science
2012-present	Biotechnology Advances
2011-present	Advanced Drug Delivery Reviews
2011-present	Soft Matter
2011-present	Nature
2011-present	Advanced Materials
2011-present	Small
2011-present	Gene Therapy

2011-present	Molecular Pharmaceutics
2011-present	Journal of the American Chemical Society
2011-present	Biotechnology and Bioengineering
2010-present	ACS Nano
2010-present	Journal of Controlled Release
2010-present	Proceedings of the National Academy of Sciences
2010-present	Polymers
2009-present	eCells and Materials
2009-present	Journal of Materials Chemistry
2008-present	Advanced Functional Materials
2008-present	Langmuir
2008-present	Biomacromolecules
2007-present	Journal of Tissue Engineering and Regenerative Medicine
2007-present	Journal of Biomaterials Science: Polymer Edition
2007-present	Journal of Cellular and Molecular Medicine
2007-present	Biomaterials
2007-present	Cell Stem Cell
2007-present	Tissue Engineering
2006-present	Biotechnology Progress
2006-present	Annals of Biomedical Engineering
2006-present	Bone
2006-present	Journal of Biomedical Materials Research: Part A
2006-present	Journal of Biomedical Materials Research: Part B- Applied Biomaterials
2006-present	Journal of Biological Macromolecules
2004-present	Acta Biomaterialia
2004-present	Expert Opinion on Biological Therapy
2004-present	Journal of Dental Research
	Abstracts
2012	3rd TERMIS World Congress
2011	9th World Biomaterials Congress
2011	24th Annual European Society for Biomaterials Conference
2011-present	TERMIS
2009-present	American Chemical Society
2007-present	Orthopaedic Research Society
2007	8th World Biomaterials Congress
2006-present	Biomedical Engineering Society
2003-present	Society for Biomaterials

I have written 2 letters for promotion to Associate Professor with tenure.

UNIVERSITY, SCHOOL, AND DEPARTMENTAL SERVICE

Committees and Service Assignments

2013	Barry M. Goldwater Scholarship CWRU Review Committee
2013-present	CSE Biomaterials Strategic Hiring Committee
2012-2013	Vice-chair of BME Graduate Education Committee
2012	Leader of Cases AFIRM team
2011-2012	Case BME ABET Committee
2010-2012	Constellation Hiring Committee
2010-2012	Case School of Engineering Undergraduate Studies Committee
2009-2010	Case School of Engineering Research Committee
2009-2011	Research Administration Assessment Group
2009-2012	Chair of Undergraduate BME Awards Committee
2009-2012	Faculty Advisor for the CWRU Chapter of BMES
2009	2009 CSCRM Retreat Organizing Committee
2009-present	CWRU Advanced Materials Alliance: Biomaterials Subcommittee

2009-present	Choose Ohio First Engaged Scholarship in Biosciences and Healthcare Review Committee
2009	Organized "Leaders in Tissue Engineering" special seminar series with 8 internationally recognized expert guest speakers from across the USA
2009	Charged with identifying 2009 BME Alumni Awardees
2008-2010	Organizer and Leader of new Dept. of BME Tissue Engineering, Biomaterials, and Bioactive Factor Delivery Journal Club
2008-2010	Department of Biomedical Engineering Molecular Imaging faculty search committee
2008-2010	Advisory Committee on Research Computing
2007-present	Support of Undergraduate Research and Creative Endeavors (SOURCE) Advisory Board
2007-present	Resident applicant interviewer for Department of Orthopaedic Surgery
2006-2009	Faculty Senate Standing Committee: Committee on Research
2006-present	Conflict of Interest Committee (for Dr. Kenneth Gustafson)
2005-present	MSTP applicant interviewer
2005	Barry M. Goldwater Scholarship CWRU Review Committee
2005-2012	BME Undergraduate Education Committee -"Experience Case" presentations to incoming students
2005-present	BME Primary Faculty Committee
2005-2008	Oversaw conversion of one room in Wickenden animal housing facility into SPF room
2005-2008	Spearheaded effort for establishment of 3 new classes: EBME 315, EBME 325, and EBME 425
2005-2007	Oversaw BME undergraduate wet lab renovations and setup

INVITED LECTURES/TALKS

1. TERMIS-ASMB symposium "Engineering Cell-Matrix Interactions for Musculoskeletal Tissue Engineering" at the American Society for Matrix Biology Biennial Meeting, October 12-15, 2014 (Cleveland, OH). (declined due to sabbatical in Israel)
2. Keynote lecture in symposium session "Spatially patterned bio-signal presentation in biomaterials." TERMIS-AP Annual Meeting, September 24-27, 2014 (Daegu, South Korea).
3. Seoul National University, September 23, 2014 (Seoul, South Korea).
4. University of Illinois, Champaign-Urbana, September 9, 2014 (Champaign-Urbana, IL).
5. World Congress of Biomechanics, July 6-11, 2014 (Boston, MA)
6. 5th Conference on Tissue Engineering, June 20-25, 2014 (Kos, Greece).
7. TERMIS-EU Annual Meeting, June 10-13, 2014 (Genova, Italy).
8. Annual Materials Week Symposium, The Ohio State University, May 7, 2014 (Columbus, OH).
9. "Guiding stem cell fate for tissue engineering applications via spatiotemporally controlled signal presentation." Annual meeting for Experimental Biology: Symposium on Bioengineering and Regenerative Medicine, April 26-30, 2014 (San Diego, CA).
10. University of Akron, April 10, 2014 (Akron, OH).
11. "Modular, spatially patterned hydrogels for controlling the cellular microenvironment." National Center for Regenerative Medicine Retreat, December 2, 2013 (Cleveland, OH).
12. "Guiding stem cell fate for tissue engineering applications via spatiotemporally controlled signal presentation." Advanced Platform Technology Center Seminar, Case Western Reserve University, October 29, 2013 (Cleveland, OH).
13. "Guiding stem cell fate for tissue engineering applications via spatiotemporally controlled signal presentation." Tissue Engineering and Regeneration Training Grant (TEAM) Seminar, The University of Michigan, October 10, 2013 (Ann Arbor, MI).
14. "In vivo implantation of microsphere-incorporated cartilage sheets." The AO Foundation, September 6, 2013 (Davos, Switzerland).
15. "Enhanced Vascularized Bone Regeneration." The AO Foundation, September 3, 2013 (Davos, Switzerland).
16. "Biomaterial systems with controlled temporal and spatial signal presentation for regulating stem cell behavior and tissue engineering." MSC 2013: Adult Stem Cell Therapy & Regenerative Medicine Conference, August 19-21, 2013 (Cleveland, OH).
17. "Biomaterial systems with controlled temporal and spatial signal presentation for regulating stem cell behavior." NSF International Conference on Stem Cell Differentiation: The Influence of Biomaterials and Biomechanics, June 3-6, 2013 (Shanghai, China).
18. "Systems and microenvironments with controlled temporal and spatial signal presentation for driving regenerative processes." Department of Biology, CWRU, April 4, 2013 (Cleveland, OH).
19. "Systems and microenvironments with controlled temporal and spatial signal presentation for driving regenerative processes." Department of Surgery, University of Chicago, March 19, 2013 (Chicago, IL).
20. "Systems and microenvironments with controlled temporal and spatial signal presentation for driving regenerative processes." Department of Chemical and Biological Engineering, Colorado School of Mines, February 1, 2013 (Golden, CO).
21. "New biomaterials, bioactive factor delivery systems, and cell microenvironments to regulate cell behavior for therapeutic medicine." Department of Biomedical Engineering, Worcester Polytechnic Institute, January 30, 2013 (Worcester, MA).
22. "Systems and microenvironments with controlled temporal and spatial signal presentation for driving regenerative processes." Department of Biomedical Engineering, Rensselaer Polytechnic Institute, January 23, 2013 (Troy, NY).
23. "Enhanced Vascularized Bone Regeneration." The AO Foundation, November 6, 2012 (Homburg, Germany).
24. "Examining the role of temporal and spatial signal presentation on regenerative processes." Department of Biomedical Engineering, Ohio State University, October 18, 2012 (Columbus, OH).
25. "Functionalized, biodegradable hydrogels for control over sustained and localized siRNA delivery to incorporated and surrounding cells." Oligonucleotide Delivery: Biology, Engineering and Development, October 7-11, 2012 (Vienna, Austria).
26. "Tissue Engineering by Controlling Stem Cell Fate in a High Cell Density System." Ohio State

University Center for Regenerative Medicine and Cell Based Therapies (CRMCBT) 1st Annual Retreat, August 17-18, 2012 (Mohican State Park Resort, OH).

27. "New biomaterials, bioactive factor delivery systems, and cell microenvironments to regulate cell behavior for therapeutic medicine." Medical Scientist Training Program seminar, Case Western Reserve University, June 14, 2012 (Cleveland, OH)
28. "Controlling Stem Cell Fate in High-Density Stem Cell Systems." Invited talk for session on "Application of Biomaterials in Tissue Engineering," The First International Conference on Advanced Materials Research (ICAMR), May 11, 2012 (Toledo, OH).
29. "New biomaterials, bioactive factor delivery systems, and cell microenvironments to regulate cell behavior for therapeutic medicine." Department of Biomedical Engineering, University of Wisconsin, November 28, 2011 (Madison, WI).
30. "New Biomaterials and Bioactive Factor Delivery System Tools for Therapeutic Medicine and Studying Cell Behavior" Merck Industrial Partnership Seminar, October 5, 2011 (West Point, PA).
31. "New biomaterials, bioactive factor delivery systems, and cell microenvironments to regulate cell behavior for therapeutic medicine." Department of Biomedical Engineering, Texas A&M University, October 3, 2011 (College Station, TX).
32. "Guiding stem cell fate in high-cell density hMSC systems with incorporated bioactive microspheres for cartilage tissue engineering." Musculoskeletal Transplant Foundation, September 23, 2011 (Chicago, IL).
33. "Guiding Stem Cell Fate in High-Density hMSC Systems with Incorporated Bioactive Microspheres for Cartilage Tissue Engineering" Minisymposia paper for the 33rd Annual International IEEE EMBS Conference, September 3, 2011 (Boston, MA).
34. "New Biomaterials and Bioactive Factor Delivery System Tools for Both Therapeutics and Studying Cancer Biology" Case Comprehensive Cancer Center Annual Retreat, July 8, 2011 (Warrensville Heights, OH).
35. "New strategies and engineered biomaterial systems for tissue regeneration." Children's Hospital Los Angeles, May 19, 2011 (Los Angeles, CA).
36. Glennan Fellow Talk, Case Western Reserve University, Apr. 27, 2011 (Cleveland, OH).
37. "Replacement tissues: Basic concepts and new strategies." Grand Rounds, Department of Orthopaedic Surgery, Case Western Reserve University, Apr. 27, 2011 (Cleveland, OH).
38. "Human mesenchymal stem cell aggregates laden with chondrogenic polymer microspheres for repair of cartilage defects." National Center for Regenerative Medicine Retreat, Nov. 5, 2010 (Cleveland, OH).
39. "New strategies and engineered biomaterial systems for tissue regeneration." Keynote Lecture, Biomaterials Symposium at the University of Akron, Oct. 27, 2010 (Akron, OH).
40. "Guiding Cellular Behavior and Organization for Tissue Engineering using Nanobiomaterials." Nanomedicine Summit, Oct. 19, 2010 (Cleveland, OH).
41. "Guiding Cellular Behavior and Organization for Tissue Engineering using Nanobiomaterials." Heal Ohio Conference, NEOUCOM, October 21, 2010 (Rootstown, OH).
42. "Guiding Cellular Behavior and Organization." Materials Research Society Workshop Series: Functionalized Nanobiomaterials for Medical Applications, Oct. 4-7, 2010 (Denver, Colorado).
43. "New strategies and engineered biomaterial systems for tissue regeneration." Department of Biomedical Engineering, Ohio State University, May 26, 2010 (Columbus, OH).
44. "New strategies and engineered biomaterial systems for tissue regeneration." Department of Orthopaedic Surgery, Case Western Reserve University, Apr. 13, 2010 (Cleveland, OH).
45. "New strategies and engineered biomaterial systems for tissue regeneration." Department of Biomedical Engineering, Case Western Reserve University, Apr. 1, 2010 (Cleveland, OH).
46. "New strategies and engineered biomaterial systems for tissue regeneration." Skeletal Research Center, Case Western Reserve University, Mar. 29, 2010 (Cleveland, OH).
47. "Microenvironments and biomaterial systems for controlling cell behavior and engineering tissues." CSCRM Retreat, Nov 6, 2009 (Hunting Valley, OH).
48. "Stem cell aggregate-based tissue engineering technology." CCTRP Fireside Chat, Feb 19, 2009 (Cleveland, OH).
49. "Controlling stem cell differentiation for orthopaedic tissue engineering." Annual Meeting of the Orthopaedic Trauma Association, Oct 16, 2008 (Denver, CO).

50. "Scaffold design and fabrication strategies." Cartilage Innovation Summit 2008, CCF, May 9, 2008 (Cleveland, OH).
51. "Microenvironments for controlling cell behavior with applications for orthopaedic tissue engineering." Department of Orthopaedics, CWRU, Mar. 25, 2008 (Cleveland, OH).
52. "Engineering replacement tissues: The current state of the field and future directions." Case/CCF Musculoskeletal Research Seminar Series, CWRU, Mar. 13, 2008 (Cleveland, OH).
53. "Making new body parts: It's not science fiction anymore." Eino Nelson Conference, Mar. 3, 2007 (Bonita Springs, FL).
54. "Novel bio-inspired materials to control cell function and orthopaedic tissue regeneration." Department of Orthopaedics, CWRU, Jun. 8, 2006 (Cleveland, OH).
55. "Novel bio-inspired materials to control cell function and tissue regeneration." Midwest Biomedical Engineering Conference, University of Michigan, Mar. 24, 2006 (Ann Arbor, MI).
56. "Novel bio-inspired materials to control cell function and tissue regeneration." International Workshop on Mechanics of Complex Biological Systems in Tissues and Cells, Kyoto University, Jan. 17, 2006 (Kyoto, Japan).
57. "Development of novel hydrogels for bone tissue engineering." Department of Biomedical Engineering, Johns Hopkins University, Feb. 28, 2005 (Baltimore, MD).
58. "Development of novel hydrogels for bone tissue engineering." Department of Mechanical Engineering, Stanford University, Feb. 14, 2005 (Stanford, CA).
59. "Development of novel hydrogels for bone tissue engineering." Department of Chemical Engineering, Texas A&M University, Feb. 9, 2005 (College Station, TX).
60. "Development of novel hydrogels for bone tissue engineering." Department of Biomedical Engineering, Northwestern University, Jan. 27, 2005 (Evanston, IL).
61. "Development of novel hydrogels for bone tissue engineering." Department of Biomedical Engineering, Case Western Reserve University, Nov. 4, 2004 (Cleveland, OH).
62. "Development of novel hydrogels for bone tissue engineering." Department of Mechanical Engineering, University of Illinois, Apr. 28, 2004 (Champaign-Urbana, IL).
63. "Development of novel hydrogels for bone tissue engineering." Department of Biomedical Engineering, Cornell University, Apr. 22, 2004 (Ithaca, NY).
64. "Development of novel hydrogels for bone tissue engineering." Hospital for Special Surgery, Nov. 14, 2003 (New York, NY).
65. "Development of novel hydrogels for bone tissue engineering." Department of Bioengineering, University of California, June 30, 2003 (San Francisco, CA).
66. "Development of novel hydrogels for bone tissue engineering." Department of Biomedical Engineering, University of Wisconsin, Nov. 11, 2002 (Madison, WI).
67. "Development of novel hydrogels for bone tissue engineering." Harvard Medical School, 2002 (Boston, MA).
68. "Development of novel hydrogels for bone tissue engineering." Skeletal Research Center, Case Western Reserve University, 2002 (Cleveland, OH).
69. "Development of novel hydrogels for bone tissue engineering." University of Virginia, Sept. 27, 2002 (Charlottesville, VA).
70. "Development of novel hydrogels for bone tissue engineering." University of Massachusetts, 2002 (Worchester, MA).

ADVISORY BOARD ACTIVITIES

Antria Advisory Board (2012-present)
International Advisory Board - Research proposal for National Center of Excellence - Polysaccharide based activity at the Norwegian University of Science and Technology, Trondheim, Norway (not funded; 2011-2012)

CONSULTING ACTIVITIES

FMC Biopolymer, Philadelphia, PA (2005-present)
Luna Innovations, Inc., Charlottesville, VA (2010-present)
Antria (2011-present)

L.E.K. Consulting, San Francisco, CA (2011-2012)
Merck (2011-2012)
Bush Consulting (2012-present)