

ADAM WALTER FEINBERG

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POSITIONS

2010 – Present **ASSISTANT PROFESSOR, CARNEGIE MELLON UNIVERSITY, PITTSBURGH, PA**
Department of Biomedical Engineering, Department of Materials Science and Engineering

EDUCATION & TRAINING

2005 – 2010 **HARVARD UNIVERSITY** Cambridge, MA
Postdoctoral Fellow, School of Engineering and Applied Sciences
Advisor: Assoc. Prof. Kevin Kit Parker

2004 – 2005 **UNIVERSITY OF FLORIDA** Gainesville, FL
Postdoctoral Research Assoc, Department of Chemical Engineering
Advisors: Prof. Rich Dickinson and Prof. Dan Purich

May 2004 **UNIVERSITY OF FLORIDA** Gainesville, FL
Doctor of Philosophy in Biomedical Engineering,
Advisors: Prof. Anthony Brennan and Dr. Winfred Phillips

May 1999 **CORNELL UNIVERSITY** Ithaca, NY
Bachelor of Science in Materials Science and Engineering, Option in Bioengineering

ACADEMIC HONORS & AWARDS

Nov. 2009 **BEST POSTER AWARD – MATERIALS RESEARCH SOCIETY**
“De Novo Regeneration of the Hierarchical Extracellular Matrix with Protein nanoFabrics”
MRS Fall Meeting, Boston, MA, November 30 to December 3, 2009

Nov. 2007 **BEST POSTER AWARD – MATERIALS RESEARCH SOCIETY**
“Engineering Contractility of Myocardial Sheets”
MRS Fall Meeting, Boston, MA, November 27-30, 2007

Nov. 2006 **MATERIALS RESEARCH SOCIETY AWARD – 2ND PRIZE IN SCIENTIFIC FILM FESTIVAL**
“Muscular Thin Films: Biohybrid Materials for Soft Robotics”
MRS Fall Meeting, Boston, MA, November 27-30, 2006

March 2004 **POSTER AWARD - GRAND PRIZE IN CHARACTERIZATION**
7th Annual Joint Meeting of the Florida Chapter of the AVS and the Florida Microscopy Society,
March 7-9, 2004

Sept. 2002 **COSTELLO AWARD FOR ACHIEVEMENT IN BIOMEDICAL ENGINEERING**
Department of Biomedical Engineering, University of Florida

March 2002 **POSTER AWARD – 2ND PRIZE IN MICROSCOPY FOR BIOLOGICAL SCIENCES**
5th Annual Joint Meeting of the Florida Chapter of the AVS and the Florida Microscopy Society,
March 11-14, 2002

February 2002 **BEST POSTER AWARD – BEST POSTER AT CONFERENCE**
2nd World Congress of Adhesion and Related Phenomenon (WCARP-II) and 25th Adhesion
Society meeting, February 10-14, 2002

PROFESSIONAL SERVICE & ACTIVITIES

MEMBERSHIPS

Materials Research Society, American Chemical Society, Society for Biomaterials, Biophysical Society

REVIEWER

Biophysical Journal, Journal of Biomechanical Engineering, Journal of Neural Engineering

PATENTS

1. "Surface Topography for Non-toxic Bioadhesion Control," Anthony B. Brennan, Ronald H. Baney, Michelle L. Carman, Thomas G. Estes, Adam W. Feinberg, Leslie H. Wilson and James F. Schumacher, US Patent No. 7,143,709, December 5, 2006.
2. "Surface Topographies for Non-toxic Bioadhesion Control," Anthony B. Brennan, Ronald H. Baney, Michelle L. Carman, Thomas G. Estes, Adam W. Feinberg, Leslie H. Wilson and James F. Schumacher, US Patent No. 7,650,848, January 26, 2010.

FILED PATENT APPLICATIONS

1. "Engineered Cell Growth On Polymeric Films And Biotechnological Applications Thereof," Kevin Kit Parker, Adam W. Feinberg, Sergey Shevkopyas, Alex Feigel and George M. Whitesides, US Patent Office, PCT Patent Application filed February 5, 2007.
2. "Biopolymer Structures," Kevin Kit Parker and Adam W. Feinberg, US Patent Office, PCT Patent Application filed October 10, 2007.
3. "Boundary Conditions For the Alignment of Cells and Tissues," Kevin Kit Parker, Adam W. Feinberg, Po-Ling Kuo and Chinlin Guo, US Patent Office, PCT Patent Application filed September 26, 2008.
4. "High Throughput Assays for Determining Muscle Function and Devices for Use Therein," Kevin Kit Parker, Adam W. Feinberg, Anna Grossberg, Patrick Alford, and Crystal Riplinger, US Provisional Application filed May 1, 2009.
5. "Method for Generating Functionalized Soft Substrates and Micropatterning Cells Thereon," Po-Ling Kuo, Adam W. Feinberg, and Kevin Kit Parker, US Patent Office, PCT Patent Application filed May 22, 2009.
6. "Construction of Functional Anisotropic Muscle Tissue from Muscle Progenitor Cells," Kevin Kit Parker, Adam W. Feinberg, Kenneth R. Chien, Peter van der Meer, Ibrahim Domian, PCT Patent Application filed October, 2009.
7. "Anisotropic Biological Pacemakers and AV Bypasses," Kevin Kit Parker, Crystal M. Ripplinger and Adam W. Feinberg, US Provisional Application filed October 8, 2009.

PUBLICATIONS

1. M. E. Callow, A. R. Jennings, A. B. Brennan, C. A. Seegert, A. Gibson, L. H. Wilson, A. W. Feinberg, R. H. Baney and J. A. Callow, "Microtopographic Cues for Settlement of Zoospores of the Green Fouling Alga *Enteromorpha*," *Biofouling*, 2002 Vol. 18(3), pp 237-45.
2. A. W. Feinberg, A. L. Gibson, W. R. Wilkerson, C. A. Seegert, L. H. Wilson, L. C. Zhao, R. H. Baney, J. A. Callow, M. E. Callow and A. B. Brennan, "Investigating the Energetics of Bioadhesion on Microengineered Siloxane Elastomers: Characterizing the Topography, Mechanical Properties, and Surface Energy and Their Effect on Cell Contact Guidance," in **Synthesis and Properties of Silicones and Silicone-Modified Materials**. Eds. Clarson, Fitzgerald, Owen, Smith and V. Dyke, ACS. 2003, 838: pp 196-211.
3. L. H. Wilson, J. F. Schumacher, M. L. Carman, A. L. Gibson, A. W. Feinberg, M. E. Callow, J. A. Finlay, J. A. Callow and A. B. Brennan, "Antifouling Potential of Lubricious, Micro-engineered, PDMS Elastomers against Zoospores of the Green Fouling Alga *Ulva* (*Enteromorpha*)," *Biofouling*, 2004 Vol. 20 (1): pp 53 – 63.
4. M. L. Carman, T. G. Estes, A. W. Feinberg, J. F. Schumacher, W. Wilkerson, L. H. Wilson, M. E. Callow, J. A. Callow and A. B. Brennan, "Engineered antifouling microtopographies – correlating wettability with cell attachment," *Biofouling*, Vol. 22 (1) 2006: pp 11 – 21.

5. J. F. Schumacher, M. L. Carman, T. G. Estes, A. W. Feinberg, L. H. Wilson, M. E. Callow, J. A. Callow, J. A. Finlay and A. B. Brennan, "Engineered antifouling microtopographies – effect of feature size, geometry, and roughness on settlement of zoospores of the green alga *Ulva*," **Biofouling**, 2007 Vol. 23 (1): pp 1 – 8.
6. A. W. Feinberg, A. Feigel, S. S. Shevkopylas, S. P. Sheehy, G. M. Whitesides and K. K. Parker, "Muscular Thin Films for Building Actuators and Powering Devices," **Science** 7 September 2007: Vol. 317, no. 5843, pp 1366 – 1370.
7. A. W. Feinberg, W. Wilkerson, C. A. Seegert, A. L. Gibson, L. H. Wilson and A. B. Brennan, "Systematic Variation of Microtopography, Surface Chemistry and Elastic Modulus and the State Dependent Effect on Endothelial Cell Alignment," **Journal of Biomedical Materials Research: Part A**, 86A (2), 2008, pp 522-534.
8. N. A. Geisse, A. W. Feinberg, P. Kuo, S. P. Sheehy, M. Bray and K. K. Parker, "Micropatterning Approaches for Cardiac Biology," in **Micro and Nanoengineering of the Cell Microenvironment: Applications and Technologies**. Eds. Khademhosseini, Borenstein, Takayama and Tomer, Artech House Publishers. 2008, pp 341 – 360.
9. A. W. Feinberg, J. F. Schumacher and A. B. Brennan, "Engineering High-Density Endothelial Cell Monolayers on Soft Substrates," **Acta Biomaterialia**, Vol. 5 (6), 2009, pp 2013 – 2024.
10. I. J. Domian, M. Chiravuri, P. van der Meer, A. W. Feinberg, X. Shi, Y. Shao, S. M. Wu, K. K. Parker, K. R. Chien, "Generation of Functional Ventricular Heart Muscle from Mouse Ventricular Progenitor Cells," **Science** 16 October 2009: Vol. 326, no. 5951, 2009, pp 426 - 429.
11. P. W. Alford*, A. W. Feinberg*, S. P. Sheehy and K. K. Parker, "Biohybrid Thin Films for Measuring Contractility in Engineered Cardiovascular Muscle," **Biomaterials**, Vol. 31 (13), 2010, pp 3613 – 3621. (*co-first authors)
12. M. P. Bray, W. J. Adams, N. A. Geisse, A. W. Feinberg, S. P. Sheehy and K. K. Parker, "Nuclear morphology and deformation in engineered cardiac myocytes and tissues," **Biomaterials**, Vol. 31 (19), 2010, pp 5143 – 5150.
13. A. W. Feinberg and K. K. Parker, "Surface-Initiated Assembly of Protein Nanofabrics," **Nano Letters**, Vol. 10 (6), 2010, pp 2184 – 2191.

PRESENTATIONS (ORAL AND POSTER)

1. "Role of Silicone Elastomer Surface Properties on Enteromorpha Fouling." C.A. Seegert, L.C. Zhao, W.R. Wilkerson, A.W. Feinberg, A.B. Brennan, Office of Naval Research Fouling Release Coatings Program Review, Alexandria, VA, 5, August 2000.
2. "Forces Between Selectins and Their Sialyl Lewis X Counter-Receptor," LC Zhao, BD Hauser, AW Feinberg, WR Wilkerson, CK Ozaki, AB Brennan, American Heart Association 221 Scientific Sessions, New Orleans, LA, November 2000.
3. "Designed structures for directed biofilm formation," C. A. Seegert, L. C. Zhao, W. R. Wilkerson, A. W. Feinberg, A. B. Brennan, First International Symposium on Polymers in the Marine Environment, Poly Millennium 2000, Waikoloa, HI, December 2000.
4. "Bioadhesion Studies on Microtextured Siloxane Elastomers," WR Wilkerson, CA Seegert, AW Feinberg, LC Zhao, JA Callow, ME Callow, AB Brennan, American Chemical Society 221st Meeting, San Diego, CA, April 1-5, 2001
5. "Characterization of Chemically and Topographically Modified Siloxane Elastomer," AW Feinberg, C Seegert, WR Wilkerson, A Gibson, L Wilson, R Baney, AB Brennan, American Chemical Society 221st Meeting, San Diego, CA April 1-5, 2001
6. "Engineered Surfaces for Directed Cell Function: Physical, Chemical and Topographical Modification and Endothelial Cell Response," AB Brennan, AW Feinberg, A Gibson, C Seegert, CK Ozaki, W Wilkerson, L Wilson and LC Zhao, NIH BECON, Bethesda, MD, July 2001
7. "Engineering Micrometer and Nanometer Scale Features in Polydimethylsiloxane Elastomers for Controlled Cell Function," AW Feinberg, CA Seegert, AL Gibson and AB Brennan, MRS 2001 Fall Meeting, Boston, MA, November 26-30, 2001.
8. "Characterization of Chemically and Topographically Modified Siloxane Elastomer for Controlled Cell Growth" AL Gibson, LH Wilson, AW Feinberg, WR Wilkerson, CA Seegert, RH Baney and AB Brennan, MRS 2001 Fall Meeting, Boston, MA, November 26-30, 2001.

9. "Quantifying Inter-Cellular Forces in Bioadhesion: Examination of Sialyl Lewis X and Selectin Interactions with Atomic Force Microscopy," AW Feinberg, LC Zhao and AB Brennan, 25th Annual Meeting of the Adhesion Society, Orlando, FL, February 10-14, 2002.
10. "Toward Hierarchical Tissue Engineering: Chemistry and Topography as Competing Factors in an Endothelial System," CA Seegert, AW Feinberg, AL Gibson, LH Wilson, WR Wilkerson, RH Baney and AB Brennan, 25th Annual Meeting of the Adhesion Society, Orlando, FL, February 10-14, 2002.
11. "Nanoforce Measurements of Chemotactic Specificity on Biopolymers," Adam W. Feinberg, Amy L. Gibson, Leslie H. Wilson, Lee C. Zhao, and Anthony B. Brennan, Society for Biomaterials, April 2002.
12. "AFM Nanolithography of Nanometer and Micron Scale Hierarchical Topographies in Polymers for Tissue Engineering Applications," AW Feinberg, CA Seegert, AL Gibson, AB Brennan, Fifth Annual Joint Meeting of the Florida Chapter of the AVS and the Florida Society for Microscopy, March 11-14, 2002.
13. "Effect of Argon Plasma Treatment on PDMS Elastomer Investigated by AFM," A.W. Feinberg, T.G. Estes and A.B. Brennan, The 225th ACS National Meeting, New Orleans, LA, March 23-27, 2003
14. "Direct measurement of receptor-ligand binding on the surface of living cells," Adam W. Feinberg and Anthony B. Brennan, The 225th ACS National Meeting, New Orleans, LA, March 23-27, 2003
15. "Mapping and Quantifying Proteins on the Surface of Living Cells," A.W. Feinberg and A.B. Brennan, Graduate Student Forum, University of Florida, April 1, 2003.
16. "AFM Quantification of Receptor–Ligand Interactions on the Surface of Living Cells," A.W. Feinberg and A.B. Brennan, Society for Biomaterials, Reno, NV, April 30 – May 4, 2003
17. "Application of AFM to Engineering the Structure and Quantifying the Properties of the Biointerface," A.W. Feinberg and A. B. Brennan, Physical Chemistry on the Nanometer Scale Summer School, Washington State University, Pullman, WA, August 1, 2003.
18. "Simultaneous AFM Quantification of Topographical, Mechanical and Biochemical Properties on Live Cells," A.W. Feinberg and A.B. Brennan, Biomedical Engineering Society Meeting, Nashville, TN, October 2003.
19. "Morphology, Cytoskeletal Structure and Mechanical Properties of Vascular Endothelial Cells Cultured On Microengineered Surfaces," A.W. Feinberg, J. F. Schumacher and A. B. Brennan, 7th Annual Joint Meeting of the Florida Chapter of the AVS and the Florida Microscopy Society, March 7-9, 2004. (INVITED)
20. "Fluorescent Imaging of Endothelial Cells On Microengineered Surfaces," A.W. Feinberg, J. F. Schumacher and A. B. Brennan, 7th Annual Joint Meeting of the Florida Chapter of the AVS and the Florida Microscopy Society, March 7-9, 2004.
21. "Focal Contact Adhesions To Engineered Surfaces And The Affect On Cell Morphology, Mechanical Properties And Membrane Receptors," A.W. Feinberg, J.F. Schumacher and A.B. Brennan, The 227th ACS National Meeting, Anaheim, CA, March 28 – April 1, 2004.
22. "Bioadhesion To Microengineered Siloxane Elastomers," A.B. Brennan, M.L. Carman, T.G. Estes, A.W. Feinberg, J.F. Schumacher and L.H. Wilson, The 227th ACS National Meeting, Anaheim, CA, March 28 – April 1, 2004.
23. "Control Of *Ulva* Zoospore Settlement On Silicone Substrates Via Microtopographic Cues," L.H. Wilson, M.L. Carman, A.W. Feinberg, J.F. Schumacher, M.E. Callow and A.B. Brennan, The 227th ACS National Meeting, Anaheim, CA, March 28 – April 1, 2004.
24. "Modeling Wetting Of Engineered Topographies On Silicone Elastomers For Predicting Bioadhesion," M.L. Carman, J.F. Schumacher, A.W. Feinberg and A.B. Brennan, The 227th ACS National Meeting, Anaheim, CA, March 28 – April 1, 2004.
25. "Settlement And Release Of *Balanus* And *Ulva* As A Function Of PDMS Elastomer Surface Energy," T.G. Estes, A.W. Feinberg, M.E. Callow, G. Swain and A.B. Brennan, The 227th ACS National Meeting, Anaheim, CA, March 28 – April 1, 2004.
26. "Comparison of the Morphology and Mechanical Properties of Vascular Endothelial Cells Cultured on Microengineered Surfaces and from Fresh Artery," A.W. Feinberg, J.F. Schumacher and A.B. Brennan, 7th World Biomaterials Congress, Sydney, Australia, May 17 – 21, 2004.
27. "Development of a Microfluidic Device for Separating Circulating Endothelial Cells from Blood," A.W. Feinberg, J.F. Schumacher, M.S. Segal and A.B. Brennan, 7th World Biomaterials Congress, Sydney, Australia, May 17 – 21, 2004.
28. "Micro-Engineered Coatings for Antifouling and Biofouling Release of Marine Micro-Organisms," A.W. Feinberg, M.L. Carman, T.G. Estes, J.F. Schumacher, L.H. Wilson, J.A. Finlay, J.A. Callow, M.E. Callow, and A.B. Brennan, 7th World Biomaterials Congress, Sydney, Australia, May 17 – 21, 2004.
29. "Endothelial Cell Taxis Directed by Microengineered Topographies: The Effect of Curved Steps and Cliffs," A.W. Feinberg, J.F. Schumacher and A.B. Brennan, Society for Biomaterials, Memphis, TN, April 27 – 30, 2005.

30. "Directionally Guided Actin-Based Particle Motility *In Vitro*," K. A. Interliggi, A. W. Feinberg, W. Zeile, S. Hens, G. McGuire, D. L. Purich and R. B. Dickinson, American Institute of Chemical Engineers Annual Meeting, Cincinnati, OH, October 30 – November 4, 2005.
31. "Muscular Thin Films: Cardiomyocyte/PDMS Bio-Composites With Emergent Functionality," A.W. Feinberg, A. Feigel, S. Shevkopyas, S. Sheehy, G.M. Whitesides And K. Parker, Biomedical Engineering Society 2006 Annual Meeting, October 11-14, 2006, Chicago, IL.
32. "Engineered Self-Assembly of Cardiomyocytes into 3-Dimensional Muscular Thin Film Bio-composites," A.W. Feinberg, A. Feigel, S. Shevkopyas, S. Sheehy, G.M. Whitesides And K. Parker, Materials Research Society 2006 Fall Meeting, November 27-30, 2006, Boston, MA.
33. "An In Vitro Model of Cellular Injury in Traumatic Brain Injury," B.E. Dabiri, E.H. Weiss, A.W. Feinberg and K.K. Parker, Neurotrauma Society National Meeting 2007, July 30 to August 1, Kansas City, MO.
34. "Microstructured Multi-Component Protein Scaffolds for Cardiac Tissue Engineering," A.W. Feinberg, S.P. Sheehy and K.K. Parker, Biomedical Engineering Society National Meeting 2007, September 26-29, Hollywood, CA.
35. "In Vitro Contractility Assay Correlates Sarcomere Alignment With Systolic Stress In 2D Myocardium," A.W. Feinberg, S.P. Sheehy and K.K. Parker, Biomedical Engineering Society National Meeting 2007, September 26-29, Hollywood, CA.
36. "An In Vitro Model of Integrin Mediated Neural Injury," B. E. Dabiri, E. H. Weiss, A. W. Feinberg and K. K. Parker, Biomedical Engineering Society National Meeting 2007, September 26-29, Hollywood, CA.
37. "Muscular Thin Films for Building Actuators and Powering Devices," A.W. Feinberg, NSEC Research Exchange Seminars, Harvard University, October 31, 2007, Cambridge, MA. (Invited Talk)
38. "Muscular Thin Films: Towards Myocardial Regeneration and Drug Screening Platforms," A.W. Feinberg, A. Forsyth, E. Weiss, S. P. Sheehy and K. K. Parker, CIMIT Innovation Congress 2007, November 13-14, 2007, Boston, MA.
39. "Building Tissue Engineering Scaffolds Directly from Extracellular Matrix Proteins with Microscale Spatial Control," A.W. Feinberg, S.P. Sheehy and K.K. Parker, Materials Research Society 2007 Fall Meeting, November 26-30, 2007, Boston, MA.
40. "Engineering Contractility of Myocardial Sheets," A.W. Feinberg, W.J. Adams, M.A. Bray, S.P. Sheehy and K.K. Parker, Materials Research Society 2007 Fall Meeting, November 26-30, 2007, Boston, MA.
41. "Finite Deformation of a Biotic-Abiotic Thin Film in a Fluid," W. Adams, A.W. Feinberg and K.K. Parker, Materials Research Society 2007 Fall Meeting, November 26-30, 2007, Boston, MA.
42. "Protein μ Fabrics and μ Threads for Tissue Engineering Applications," A.W. Feinberg, February 4, 2008, Eidgenössische Technische Hochschule (ETH) Zürich, Zurich, Switzerland. (Invited Talk)
43. "Engineered Boundary Conditions Direct Cardiac Myogenesis and Contractility," A. W. Feinberg, S.P. Sheehy and K.K. Parker, Union of the Swiss Societies for Experimental Biology- Biology Meets Engineering 2008, February 6, 2008, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland. (Invited Talk)
44. "Engineering Myocardium in 3D: Towards Regeneration and In Vitro Disease Models," A.W. Feinberg, February 8, 2008, University of Bern, Bern, Switzerland. (Invited Talk)
45. "Engineering Cardiac Myogenesis and Contractility," A.W. Feinberg, April 28, 2008, Columbia University, New York, NY. (Invited Talk)
46. "Sarcomere Alignment Dictates Contractile Force in Engineered Myocardium," A.W. Feinberg, S.P. Sheehy and K.K. Parker, Biomedical Engineering Society National Meeting 2008, October 2-4, St Louis, MO.
47. "Microscale Heterogeneities Enhance Sarcomere Alignment and Contractile Force in Engineered Myocardium," A.W. Feinberg, C.M. Ripplinger, S.P. Sheehy and K.K. Parker, Materials Research Society Fall Meeting, December 1-5, 2008, Boston, MA.
48. "Engineering Cardiac Contractility from the Sarcomere to Tissue-Scale," A.W. Feinberg, P.W. Alford, C.M. Ripplinger, W.J. Adams, S.P. Sheehy and K.K. Parker, Biophysical Society Annual Meeting, March 1-4, 2009, Boston, MA.
49. "Engineering the Contractility of Cardiac Muscle from the Sub-Cellular to Tissue Scale," A.W. Feinberg, *Generation and Repair of Myocardial Tissue*, 6th International Ascona Workshop on Cardiomyocyte Biology, April 16-30, 2009, Monte Verita, Ascona, Switzerland. (Invited Talk)
50. "De Novo Regeneration of the Hierarchical Extracellular Matrix with Protein nanoFabrics," A.W. Feinberg and K.K. Parker, Materials Research Society Fall Meeting, November 30 to December 3, 2009, Boston, MA.
51. "A Device for in vitro, High Throughput Cell Tissue Contractility Assay," A. Grossberg, A.W. Feinberg, J. Goss and K.K. Parker, Materials Research Society Fall Meeting, November 30 to December 3, 2009, Boston, MA.