Cole A. DeForest

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EDUCATION

University of Colorado, Boulder, CO — Spring 2011 (expected)
Ph.D. in Chemical and Biological Engineering under Dr. Kristi Anseth
Certificate in Molecular Biophysics
GPA: 4.0

Princeton University, Princeton, NJ — June 2006
B.S.E. in Chemical Engineering – *Magna Cum Laude* (3 / 30)
Concentration in Bioengineering and Biotechnology
Certificate in Material Science and Engineering
Certificate in Engineering Biology
GPA: 3.92 in department, 3.67 cumulative

Boulder High School, Boulder, CO — June 2002
Valedictorian (1 / 397)

AWARDS

Excellence in Graduate Polymer Research Award, AIChE	2010
Graduate Student Research Gold Award, Materials Research Society	2009
Molecular Biophysics Training Grant, National Institute of Health (NIH)	2007 – 2009
Biomolecular GAANN Fellowship, US Dept. of Education	2007 – 2010
Outstanding Achievement Award, Society for Biomaterials Annual Meeting	April 2009
First-Year Graduate Research Fellowship, University of Colorado	August 2006
Material Science Student of the Year, Princeton University	June 2006
Sigma Xi Chemical Engineering Book Award, Princeton University	June 2006
Graduate Research Fellowship Honorable Mention, Natl. Sci. Foundation	2006 & 2007
Most Approachable Resident Adviser, Princeton University	June 2005

PUBLICATIONS

Adzima, B.J., Tao, Y., Kloxin, C.J., **DeForest, C.A.**, Anseth, K.S. & Bowman, C.N. Photoinitiated Click Reactions: Spatial and Temporal Control of the Alkyne-Azide Reaction. *Nature Chemistry*, In Press (2010).

Sims, E.A., **DeForest, C.A.** & Anseth, K.S. A Mild, Large-Scale Synthesis of 1,3-Cyclooctanedione: Expanding Access to Difluorinated Cyclooctyne for Copper-Free Click Chemistry. In Review (2010).

DeForest, C.A., Sims, E.A. & Anseth, K.S. Peptide-Functionalized Click Hydrogels with Independently Tunable Mechanics and Chemical Functionality for 3D Cell Culture. *Chemistry of Materials* **22**, 4783-90 (2010).

Johnson, L.M., **DeForest, C.A.**, Pendurti, A., Anseth, K.S. & Bowman, C.N. Formation of Three-Dimensional Hydrogel Multilayers Using Enzyme-Mediated Redox Chain Initiation. *ACS Appl Mater Interfaces*. **2**, 1953-1972 (2010).

DeForest, C.A., Polizzotti, B.D. & Anseth, K.S. Sequential Click Reactions for Synthesizing and Patterning 3D Cell Microenvironments. *Nature Materials* **8**, 659-664 (2009). ** This article has been highlighted in *Nature*, *Chemistry World*, *F1000*, as well as others

Benton, J.A., **DeForest, C.A.** & Anseth, K.S. Tunable Microporous Photocrosslinking of Geletin Macromers to Synthesize Porous Hydrogels that Promote Valvular Interstitial Cell Function. *Tissue Engineering Part A* **15**, 3221-3230 (2009).

Lawson, M.C., Hoth, K.B., **DeForest, C.A.**, Bowman, C.N. & Anseth, K.S. Inhibition of *Staphylococcus epidermidis* Biofilms using Polymerizable Vancomycin Derivatives. *Clin Orthop Relat Res* **468**, 2081-2091 (2010).

CONFERENCE PRESENTATIONS

DeForest, C.A. & Anseth, K.S. Cytocompatible Click-based Hydrogels with Dually-Tunable Properties Through Orthogonal Photocoupling and Photodegradation Reactions. *Australasian Polymer Symposium* (Coffs Harbour, Australia, 2010).

DeForest, C.A., Sims, E.A. & Anseth, K.S. Phototunable Click-based Hydrogels for 3D Encapsulation and Manipulation. *Society for Biomaterials* (Seattle, WA, 2010).

DeForest, C.A., Sims, E.A. & Anseth, K.S. Spatiotemporal Patterning of Click-Based Hydrogels for User-Directed 3D Cell Function. *American Chemical Society* (San Francisco, CA, 2010).

DeForest, C.A., Sims, E.A. & Anseth, K.S. Click-based Hydrogels for Spatially Directed Cell Function. *Mountain West Biomedical Engineering Conference* (Park City, UT, 2009).

DeForest, C.A., Sims, E.A. & Anseth, K.S. Bioorthogonal Click Chemistries for Synthesizing and Patterning the 3D Cell Niche. *Materials Research Society* (Boston, MA, 2009).

DeForest, C.A., Sims, E.A. & Anseth, K.S. Photopatterned Click-Based Hydrogels for Three-Dimensional Cell Culture. *Photopolymerization Fundamentals Conference* (Breckenridge, CO, 2009).

DeForest, C.A., Fairbanks, B.D., Kloxin, A.M. & Anseth, K.S. Synthetic Matrices Based on Sequential Click Reactions for Directing Cell Function. *European Polymer Federation* (Graz, Austria, 2009).

DeForest, C.A., Sims, E.A., Polizzotti, B.D. & Anseth, K.S. Sequential Click Reactions for Synthesizing and Patterning 3D Cell Microenvironments. *Society for Biomaterials* (San Antonio, TX, 2009).

DeForest, C.A., Benton, J.A. & Anseth, K.S. Engineering Microporous Gelatin-Based Hydrogels for Three-Dimensional Cell Culture. *8th World Biomaterials Congress* (Amsterdam, The Netherlands, 2008).

DeForest, C.A., Fairbanks, B.D., Polizzotti, B.D. & Anseth, K.S. Three-Dimensional Biochemical Patterning of Click-Based PEGtide Hydrogel via Thiol-ene Photopolymerization. *Industry/University Cooperative Research Centers 3M Research Day* (St. Paul, MN, 2008).

Benton, J.A., **DeForest, C.A.** & Anseth, K.S. *In Vitro* Modeling of Stenotic Disease Progression in Valvular Interstitial Cells. *Keystone Symposia on Tissue Engineering and Developmental Biology* (Snowbird, UT, 2007).

DeForest, C.A., Benton, J.A. & Anseth, K.S. Photopolymerization and Characterization of Methacrylated Gelatin for Three-Dimensional Cell Culture. *Photopolymerization Fundamentals Conference* (Breckenridge, CO, 2007).

PATENTS

Aimetti, A.A., **DeForest, C.A.** & Anseth, K.S. Method for Synthesizing Cyclic, Multivalent Peptides using Thiol-Mediated Reactions. *PCT Patent Application Filed 6/2010.*

Polizzotti, B.D. Fairbanks, B.D., Anseth, K.S. & **DeForest, C.A.** Hydrogels and Methods for Producing the Same. *US Patent Application Filed 6/2010, PCT Patent Application Filed 9/2008.*

RESEARCH

Ph.D. Thesis Student, Prof. Kristi Anseth, Univ. of Colorado 2006 – Present

- Developed novel biomaterials with highly defined, regular structures that can be subsequently modified locally with specific user-dictated functionalities for 3D cell culture
- Strong knowledge of organic synthesis, polymer chemistry, peptide synthesis, HPLC purification, and advanced imaging techniques including SEM and confocal microscopy
- Thesis entitled "Phototunable Click-based Hydrogels for 3D Cell Culture: Dynamic Biochemical and Biomechanical Tailorability of the Stem Cell Niche"

Thesis Student, Prof. Christodoulos Floudas and Prof. Jim Broach, Princeton 2005 – 2006

- Experimental, theoretical, and computational study of DNA microarray experiments in yeast
- Critically evaluated both new and existing numerical algorithms using GAMS software for gene clustering, seeking to propose the best method to go about sorting, digesting, and beginning to better fully understand any genome
- Thesis entitled "Novel Computational Studies for the Elucidation of Complex Signal Transduction and Metabolic Pathways"

REU Student, Prof. Kristi Anseth and Prof. Chris Bowman, Univ. of Colorado Summer 2005

- Investigated multilayer, living radical polymeric, microfluidic devices as a high-throughput technology for controlled stem cell differentiation via experimentation and numerical modeling using MATLAB

Research Assistant, Prof. Stanislav Shvartsman, Princeton Univ. 2004 – 2005
- Employed *Monte Carlo* methods using MATLAB to gain further insight into the ultrasensitivity of the MAP kinase cascade, which allows for the biological conservation of switch-like behavior

Research Assistant, Prof. Robert Prud'homme, Princeton Univ. Summer 2004
- Investigated thermally expanded graphite oxide as a cheap alternative to carbon nanotubes as well as a medium for hydrogen storage
- Prepared samples and tested these using x-ray diffraction, BET surface analysis, tape casting, thermal analysis, and spin-coating

EXPERIENCE

Teaching and Laboratory Assistant, Tissue Engineering, Univ. of Colorado Spring 2009
- Led course lab "Peptide-Functionalized Affinity Hydrogels for Controlled Protein Delivery"
- Served as a consultant for graduate students final design projects

Graduate Student Representative, Univ. of Colorado 2009
- Attended faculty meetings and served as a liaison between graduate student body and faculty
- Organized departmental recruiting events for ~60 prospective students as well as social activities for current students throughout the year

Advanced Teaching Assistant, Polymer Chemistry, University of Colorado Spring 2008
- Guest lectured five full class periods in addition to preparing course demos to clarify difficult topics
- Assisted in the preparation of homework and exam problems
- Designed, created, and maintained the course website

Teaching Assistant, Chemistry for Engineers, University of Colorado Spring 2007
- Hosted weekly review lectures on course material, conducted a laboratory section, and held office hours
- Gave written feedback on students' work, and held review sessions prior to exams

AIChE Vice President, Princeton Chapter, Princeton, NJ 2005 – 2006
- Organized guest lecturers from both academia and industry to expose undergraduate chemical engineers to opportunities ahead of them, providing a resource network for colleagues
- Planned and led monthly informative meetings for the chapter

COMPUTER SKILLS

Proficient in Microsoft Word, Excel, PowerPoint, Outlook, Works, LaTeX, Adobe Photoshop
Strong knowledge of Windows 9x/NT/2000/XP/Vista, Macintosh OS X, and Linux
Programming languages include Java, MATLAB, GAMS, HTML, Perl, and some C++

ACTIVITIES & INTERESTS

Rock-climbing, backcountry skiing, trail running, hiking, backpacking, tennis, ping-pong, guitar
Can speak a fair amount of Japanese.

WEBSITES MAINTAINED

http://www.colorado.edu/che/ansethgroup/ (webmaster 2007 – present)
http://www.colorado.edu/che/ (webmaster, website design)
https://webfiles.colorado.edu/deforest/www/index.htm (personal site)