

KELLY R. STEVENS

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EDUCATION

- University of Washington** September 2003—Present
Ph.D. student, Bioengineering
Thesis: Control of human embryonic stem cell-derived cardiomyocyte intracardiac graft size for cardiac repair
Supervisor: Charles Murry, M.D., Ph.D.
- University of Wisconsin-Madison** September 1997—May 2002
B.S., Biomedical Engineering

HONORS AND AWARDS

- Keystone Symposia Scholarship, 2007
Biomedical Engineering Society Poster Award, 2006
Biomedical Engineering Society Travel Award, 2006
Bioengineering Cardiovascular Training Grant (NIH T32), 2006-2008
Heart Failure Society of America Poster Highlight Session Award, 2006
National Science Foundation Graduate Research Fellowship, 2003-2006
Wisconsin Hilldale Undergraduate Research Fellowship, 2001-2002
Outstanding Student Leader Award, University of Wisconsin-Madison, 2001
UW-Madison Biomedical Engineering Dept. Scholarship for Outstanding Academic Achievement, 2001
Schoof's Prize for Creativity: 2002, Judges' Prize for Special Merit; 2000, 3rd prize
Tau Beta Pi Engineering Honors Society

RESEARCH EXPERIENCE

- Graduate Research Assistant** September 2003—present
University of Washington, Supervisor: Charles Murry, M.D., Ph.D.
- Developing a synthetic molecular system to control human embryonic stem cell-derived cardiomyocyte graft cell proliferation for post-infarction myocardial regeneration
 - Creating three dimensional human cardiac tissue constructs by manipulating embryonic stem cell-derived cardiomyocytes with fluid flow
- Applied Research Engineer** July 2002—August 2003
Boston Scientific, Maple Grove, MN
- Identified and led brainstorming to address key pathophysiological chemical, electrical, and hemodynamic mechanisms of heart failure with novel device therapies
 - Assessed cutting edge emerging technologies for utilization in cardiac applications
- Stent R&D Engineering Intern** January 2001—August 2001
Boston Scientific, Maple Grove, MN
- Developed process utilized on Express and Taxus Express² production lines that chemically removed laser dross and oxides from stainless steel cardiac stents
 - Planned detailed methodology for similar process development of self-expanding nitinol stents
- Undergraduate Research Assistant** April 2000—May 2002
University of Wisconsin, Supervisor: Weiyuan John Kao, Ph.D.
- Synthesized gelatin based-biodegradable hydrogels and interpenetrating networks loaded with dexamethasone for wound healing applications
 - Analyzed rodent inflammatory response to materials via subcutaneous cage implant system

RESEARCH EXPERIENCE (cont.)

Design Projects, student and extra-curricular activity

University of Wisconsin

August 1998—May 2001

- Designed, built, and tested devices to:
 - Cauterize the tract left by a liver biopsy needle upon its withdrawal from the patient
 - Provide variable cushioning for lower limb prosthetics
 - Deliver odors to a patient in an MRI machine

TEACHING EXPERIENCE

Invited Student Leadership Workshop Chair

October 2006

- Invited to organize and conduct student leadership and chapter development workshops at the 2006 Biomedical Engineering Society Annual Meeting
- Taught, discussed, and practiced leadership techniques such as development of community, enthusiasm, vision, and plan of action

Invited Guest Lecturer

Bioengineering Principles of Physiology (BIOEN 588).

November 2005

- Taught students to methodically dissect disease pathophysiology in order to identify novel arenas for engineered device therapies

Teaching Assistant

September 2004—December 2004

Bioengineering Principles of Physiology (BIOEN 588), a required course for all first-year bioengineering graduate students at UW)

- Developed and delivered several lectures to teach:
 - Protein interactions during muscle contraction
 - Journal article critique strategies
 - Electronic resources (e.g., databases, reference programs, E-journals) and search methods
 - Pathophysiology of atherosclerosis, myocardial infarction, and heart failure
 - Device therapies for treatment of heart disease
- Developed and graded term paper assignment to teach principles of cell therapy and grant writing
- Wrote and graded journal article critique assignments
- Received training from TA conference on subjects such as “presenting information effectively” and “teaching one-on-one”
- Learned to efficiently develop dynamic lectures, write/grade assignments, and answer student questions

LEADERSHIP

National Student Representative to the Board, Biomedical Engineering Society. 2006-present

- Represent all BMES students nationally at BMES Board Meetings
- Oversaw development of a national student board and subsequently four student regional conferences, student article submissions to the national BMES Bulletin, student activities at the 2007 national annual meeting, and development of national electronic student resources

President, Biomedical Engineering Society at the University of Washington. 2005-2006

- Taught committee chairs leadership skills for developing committees to promote student professional and personal development (committees in academia, industry, medicine, minority/underrepresented students, outreach, undergraduate/graduate social activities)
- One of ten founders
- One of two BMES student chapters recognized nationally with Meritorious Achievement Award from national organization

President, Bioengineering Student Association at the University of Washington. 2004-2005

- Coordinated organization of graduate student mentoring, social, and professional activities
- Organized 2004 bioengineering department graduate student retreat

LEADERSHIP (cont.)

President, Biomedical Engineering Society at the University of Wisconsin-Madison. 2000-2001

- Enthusiasm, vision, and direction helped organization grow from 8 to 87 members
- One of six founders
- Only BMES student chapter recognized nationally by BMES with Meritorious Achievement Award and awarded outstanding Student Organization Awards from both the Wisconsin Alumni Association and Wisconsin Student Organization Office

LeaderShape. 2001

- Participated in intensive weeklong leadership camp and seminar

DEPARTMENT SERVICE

Bioengineering faculty meeting student representative, University of Washington. 2004-2006

Student advisory board to the department chair member, University of Washington. 2004-present

Faculty search committee student representative, University of Washington. 2004-2005

College of engineering dean's leadership council, University of Wisconsin. 2000-2001

MENTORING

Kira Bendixen, Seattle University undergraduate (May 2005 – present)

RESEARCH INTERESTS

I am interested in advancing stem cell biology and regenerative medicine by utilizing tools in cellular and molecular biology, nano/microscale engineering, and biomaterials science. Specifically, I am interested in:

- Probing basic developmental biology with engineering and molecular biology tools to advance knowledge of the differentiation, proliferation, and organization of stem cells that is required for tissue formation.
- Developing methods to synthetically stimulate cell signaling cascades for the control of cell behavior
- Creating novel culture systems that encourage cells to create tissues
- Developing *in situ* tissue engineering models to study tissue development after cell implantation in rodents
- Developing novel engineering approaches to manipulate the three-dimensional positioning of cells

PUBLICATIONS

Stevens KR*, Rolle MW*, Minami E, Ueno S, Nourse MB, Virag JI, Reinecke H, Murry CE. Chemical Dimerization of FGFR-1 Induces Myoblast Proliferation, Increases Intracardiac Graft Size, and Reduces Ventricular Dilation in Infarcted Hearts. Human Gene Therapy. 2007. 18(5); 401-412.

Kao WJ, Burmania J, Li J, Einerson N, Witte R, **Stevens K**, Nelson D, Martinez-Diaz G. Multifunctional protein based matrix for drug delivery and wound management. Materials Science Forum. 2003; 426-432, 3145-3150.

Burmania JA, **Stevens KR**, Kao WJ. Cell interaction with protein-loaded interpenetrating networks containing modified gelatin and poly(ethylene glycol) diacrylate. Biomaterials. 2003. 24(22); 3921-30.

Einerson NJ, **Stevens KR**, Kao WJ. Synthesis and physiochemical analysis of gelatin-based hydrogels for drug carrier matrices. Biomaterials. 2003. 24(3), 509-23.

Laeseke PF, Winter III TC, Davis CL, **Stevens KR**, Fronczak FJ, Webster JG, Lee Jr. FT. Postbiopsy bleeding in a porcine model: reduction with radio-frequency ablation—preliminary results. Radiology. 2003. 227(2); 493-9.

Stevens KR, Einerson NJ, Burmania JA, Kao WJ. In vivo biocompatibility of gelatin-based hydrogels and interpenetrating networks for drug delivery. Journal of Biomaterials Science, Polymers Edition. 2002. 13(12); 1353-66.

Kao WJ, Liu Y, Gundloori R, Li J, Lee D, Einerson N, Burmania J, **Stevens K**. Engineering endogenous inflammatory cells as delivery vehicles. Journal of Controlled Release. 2002; 78, 219-233.

PATENTS

Laeseke PF, **Stevens KR**, Winter III TC, Lee Jr. FT, Fronczak FJ, Webster JG, Davis CL. Cauterizing Biopsy System. Patent application #US2003/0109802 A1.

GRANT WRITING EXPERIENCE

Bioengineering Cardiovascular Engineering Training Grant, NIH T32. Title: A synthetic molecular system to control the proliferation of embryonic stem cell-derived cardiomyocytes for cardiac repair. September, 2006.

REFEREED CONFERENCE PRESENTATIONS

Stevens KR, Pabon LM, Murry CE. Engineering a three-dimensional and expandable human cardiac tissue patch from human embryonic stem cells. Keystone Symposia: Tissue Engineering and Development Biology. Snowbird, Utah. April 12 – 17, 2007. (Poster presentation)

Stevens KR*, Rolle MW*, Minami E, Ueno S, Nourse MB, Virag JI, Reinecke H, Murry CE. Synthetic proliferation control switch enhances graft size and cardiac repair in infarcted hearts. Biomedical Engineering Society Annual Meeting. Chicago, IL. October 11 – 14, 2006. (Poster presentation)

Stevens KR*, Rolle MW*, Minami E, Ueno S, Nourse MB, Virag JI, Reinecke H, Murry CE. Ventricular remodeling in infarcted mouse hearts can be controlled by molecular induction of intracardiac graft cell proliferation. Heart Failure Society of America: 10th Annual Scientific Meeting. Seattle, WA. September 10 – 13, 2006. (Poster and **invited podium** presentation)

Stevens KR*, Rolle MW*, Minami E, Ueno S, Nourse MB, Virag JI, Reinecke H, Murry CE. Selective induction of myoblast proliferation enhances intracardiac graft size and controls remodeling in infarcted mouse hearts. Keystone Symposia: Molecular Mechanisms of Cardiac Disease and Regeneration. Santa Fe, NM. February 19 – 23, 2006. (Poster presentation)

Burmania JA, **Stevens KR**, Martinez-Diaz GJ, Kao WJ. Protein-based interpenetrating networks (IPN) for tissue scaffolds/drug release. 2nd Annual International IEEE-EMBS Special Topic Conference on Microtechnologies in Medicine and Biology. Madison, WI. May 2 – 4, 2002.

Einerson NJ, **Stevens KR**, Kao WJ. Synthesis and physiochemical analysis of gelatin-based hydrogels for cell/drug carrier matrices. 2nd Annual International IEEE-EMBS Special Topic Conference on Microtechnologies in Medicine and Biology. Madison, WI. May 2 – 4, 2002.

Winter TC, Laeseke PL, Johnson C, Davis CL, **Stevens KR**, Lee Jr. FT. Development of a thermocouple monitored, RF thermal-ablation introducer needle for safe percutaneous core biopsy of coagulopathic patients. 87th Scientific Assembly and Annual Meeting of the Radiologic Society of North America. Chicago, IL. November 25 - 30, 2001.

NON-REFEREED PRESENTATIONS

Stevens KR*, Rolle MW*, Minami E, Ueno S, Nourse MB, Virag JI, Reinecke H, Murry CE. Chemical Dimerization of FGFR-1 Induces Myoblast Proliferation, Increases Intracardiac Graft Size, and Attenuates Ventricular Remodeling in Infarcted Hearts. South Lake Union Poster Symposium. 2006.

Stevens KR*, Rolle MW*, Minami E, Ueno S, Nourse MB, Virag JI, Reinecke H, Murry CE. Ventricular dilation in infarcted hearts can be controlled by induction of intracardiac graft cell proliferation. Department of Pathology Retreat. Leavenworth, WA. September 15-16, 2006.