Kristen O'Halloran Cardinal

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Education

2003-2007 **University of Arizona**, Ph.D. Biomedical Engineering (GPA 4.0/4.0)
Date of Completion: May 2007 *Advisor*: Dr. Stuart K. Williams
Dissertation: Development and Utilization of a Tissue Engineered Blood Vessel Mimic to Assess the Neointimal Response to Intravascular Stents

1999-2003 **Cal Poly, San Luis Obispo**, B.S. General Engineering (GPA 3.98/4.0)
Concentration: Biomedical Engineering *Graduated Summa Cum Laude*

Work Experience

- Assistant Professor- Biomedical and General Engineering, Cal Poly
  - *July 31, 2007- present*
- Preclinical Research Intern- Vascular Intervention, Guidant Corporation
  - *May 22, 2006 – August 3, 2006*
  - *Performed histologic and molecular analysis of endothelial function in ex vivo artery model; developed protocols for cryosamples; quantified gene expression*
- Student Research Assistant- St. Jude Model Heart Project, Cal Poly
  - *June 23, 2003 – August 1, 2003*
  - *Developed three-dimensional CAD solid model of human heart and worked to create physical model with rapid prototyping*
- Volleyball Coach- Cal Poly, UC Santa Barbara, All-American Camps
  - *June 2000 – July 2003 (during summers)*
  - *Coached volleyball for junior high and high school girls at 3-5 day camps; created and implemented drills and games; responsible for team development and tournament play*

Other Professional Experience

- NSF Graduate Research Fellow, University of Arizona (2004-05, 2005-06, 2006-07)
- IGERT Research Fellow, University of Arizona (2003-04)
- Rotation with Cardiologist at University Medical Center, University of Arizona (Spring 2004)
- Bioprocess-Engineering Teaching Assistant, Cal Poly (Winter 2003)

Awards & Honors

- CSUPERB Faculty Travel Grant, awarded by the CSU for travel to TERMIS (2008)
- P.E.O. National Scholar Award, awarded for 2006-2007 academic year (2006)
- Donald Sheer Travel Award, awarded by Sarver Heart Center, University of Arizona, for travel to ISACB (2006)
- Student Poster Award, Surfaces in Biomaterials (2005)
- Herbert E. Carter Travel Award, awarded by Graduate Interdisciplinary Program, University of Arizona, for travel to Surfaces in Biomaterials (2005)
- Travel and Professional Development Award, Society for Biomaterials (2005)
- NSF Graduate Research Fellowship, tenure through 2007 (2004)
- IGERT Fellowship, University of Arizona (2003-2004)
- NCAA Post-Graduate Scholarship (2002-2003)
- College of Engineering Outstanding Senior Award, Cal Poly (2003)

- General Engineering award for Contributions to the Public Image of the University, Cal Poly (2003)
- General Engineering Outstanding Woman in Engineering Award, Cal Poly (2003)
- Cal Poly Female Scholar Athlete of the Year, Cal Poly (2002 and 2003)
- Verizon First Team All-Academic (2001 and 2002)
- Verizon Second Team All-Academic (2000)
- President's List, (yearly) Cal Poly (2000-2003)
- College of Engineering Dean's List, (quarterly) Cal Poly (2000-2003)
- Athletic Department Honor Roll, (quarterly) Cal Poly (1999-2003)
- Full Athletic Scholarship, (Women's Volleyball) Cal Poly (1999-2003)

Memberships

- Surfaces in Biomaterials, Member (2005-present)
- American Society for Engineering Education, Member (2005-present)
- Society for Biomaterials, Member (2003-present)
- Biomedical Engineering Society, Member (2002-present)

Publications

Peer-Reviewed Manuscripts

- **Cardinal KO**. "A Case-Study Based Course on 'Device Evaluation and FDA Approval'"; *American Society for Engineering Education Conference Proceedings*, June 2008.
- Bonnema GT, **Cardinal KO**, Williams SK, Barton JK. "An automatic algorithm for detecting stent endothelialization from volumetric optical coherence tomography datasets"; *Physics in Medicine and Biology*, June 21 2008; 53(12): 3083-98.
- Bonnema GT, **Cardinal KO**, McNally JB, Williams SK, Barton JK. "Assessment of Blood Vessel Mimics with Optical Coherence Tomography"; *Journal of Biomedical Optics*, Mar-Apr 2007; 12(2): 024018.
- **Cardinal KO**, Bonnema GT, Hofer H, Barton JK, and Williams SK. "Tissue Engineered Vascular Grafts as In Vitro Blood Vessel Mimics for the Evaluation of Endothelialization of Intravascular Devices"; *Tissue Engineering*, Dec 2006; 12(12): 3431-3438.

Manuscripts in Submission

- **Cardinal KO**, Williams SK. "Assessment of the Intimal Response to a Protein Modified Stent in a Tissue Engineered Blood Vessel Mimic." (Submitted to *Biomaterials*)
- Bonnema GT, **Cardinal KO**, Williams SK, Barton JK. "A Concentric Three Element Radial Scanning Optical Coherence Tomography Endoscope" (Submitted to *Optics Letters*)

Abstracts

- Delagrammaticas DE, Dawson MC, **Cardinal KO**. "Implementation of Improved Physiologic Components in an In Vitro Tissue Engineered BVM for Stent Evaluation" (TERMIS; Dec 2008)
- James CM, **Cardinal KO**. "Assessment of Electrospun Scaffolds for use in High-Throughput Blood Vessel Constructs" (Surfaces in Biomaterials: BioInterface; Oct 2008)
- Dawson M, **Cardinal KO**. "A Simple Method of Implementing Physiologic Flow Conditions in a Tissue Engineered Blood Vessel Construct" (Surfaces in Biomaterials: BioInterface; Oct 2008)

- Delagrammaticas DE, Smith AN, **Cardinal KO**. "Co-culture of Endothelial and Smooth Muscle Cells for a Dual-layer In Vitro Tissue Engineered Blood Vessel Mimic" (Surfaces in Biomaterials: BioInterface; Oct 2008)
- **Cardinal KO**, Williams SK. "Protein-Modification of Stents Increases Endothelialization." (Surfaces in Biomaterials: BioInterface; December 2006)
- **Cardinal KO**, Bonnema GT, Barton JK, Williams SK. "Effect of Flow on Tissue Responses to Intravascular Stents." (Biomedical Engineering Society: Unlimited Horizons; October 2006)
- Bonnema GT, **Cardinal KO**, Williams SK, Barton JK. "Imaging Blood Vessel Mimics with Optical Coherence Tomography." (American Society for Laser Medicine and Surgery Annual Meeting; April 2006)
- **Cardinal KO**, Williams SK. "Formation of a Blood Vessel Mimic Using Fat-Derived Microvascular Cells." (International Society of Applied Cardiovascular Biology; March 2006)
- Hofer H, **Cardinal KO**, Stone AL, Williams SK. "Flow-Induced Intimal Thickening of Blood Vessel Mimics." (International Society of Applied Cardiovascular Biology; March 2006)
- **O'Halloran K**, Bonnema G, Barton J, Williams SK. "Stent Evaluation in a Blood Vessel Mimic." (Surfaces in Biomaterials: BioInterface; October 2005)
- **O'Halloran K**, Williams SK. "Tissue Engineered Vascular Grafts as an In Vitro Model System." (Society for Biomaterials Annual Meeting; April 2005)
- Bonnema G, **O'Halloran K**, Williams SK, Barton J. "Imaging Vascular Implant Development with Optical Coherence Tomography." (Lasers and Electro-Optics Society; November 2004)

Oral and Poster Presentations

- *Protein-Modification of Stents Increases Endothelialization* (oral) at BioInterface, San Mateo, CA (6-Dec-2006)
- *Effect of Flow on Tissue Responses to Intravascular Stents* (oral) at Biomedical Engineering Society, Chicago, IL (14-Oct-2006)
- *Formation of a Blood Vessel Mimic Using Fat-Derived Microvascular Cells* (poster) at International Society of Applied Cardiovascular Biology, La Jolla, CA (9-Mar-2006)
- *Blood Vessel Mimics for Stent Evaluation* (oral) at Biomedical Engineering Student Forum, University of Arizona (13-Feb-2006)
- *Stent Evaluation in a Blood Vessel Mimic* (poster) at Surfaces in Biomaterials, Minneapolis, MN (25-Oct-2005)
- *Tissue Engineered Vascular Grafts as an In Vitro Model System* (oral) at Society for Biomaterials, Memphis, TN (30-Apr-2005)
- *OCT Imaging of Tissue Engineered Vascular Grafts* (poster) at Life Sciences Recruitment Day, University of Arizona (18-Feb-2005)
- *Tissue Engineered Vascular Grafts* (oral) at Biomedical Engineering Student Forum, University of Arizona (7-Feb-2005)

Grants & Awards

- California Central Coast Research Partnership Grant — April 2008-September 2008
  - "Implementation and Evaluation of Physiologic Conditions for High-Throughput BVM Model" — $48,070

- GENE/BMED Student Fee Committee — January 2008
  - On-site Histology Laboratory — $65,850

- Center for Teaching and Learning Grant — Dec 2007-Jan 2008
  - "Development of a Case-Study Based Course…" — $4,672
- Cal Poly Extramural Funding Initiative — Sept 2007-June 2008
  - "Establishment of a Tissue Engineering Research Lab for Creating BVMs" — $12,200
- National Science Foundation Graduate Research Fellowship — August 2004 – July 2007; $30,000 annual stipend; $10,500 annual cost of education
- 2006 PEO National Scholar Award — $10,000
- NCAA Post Graduate Scholarship — $6,900

Research Experience

- Development and utilization of tissue engineered vascular grafts as blood vessel mimics for in vitro evaluation of the endothelial cell response to stents and intravascular devices
- Non-invasive Optical Coherence Tomography imaging of cellular development on the luminal surface of vascular grafts and of the cellular response to stents (collaboration with Garret Bonnema in Optical Sciences; Jennifer Barton, P.I.; University of Arizona)

Courses Taught and Teaching Experience

Cal Poly

- ENGR 111: Engineering Science II (Winter 2008)
- ENGR 112: Engineering Science III (Spring 2008)
- ENGR 450: Biomedical Engineering Horizons (Spring 2008)
- ENGR 481: Senior Project Design Lab I (Fall 2007, Fall 2008)
- BMED 481: Senior Project Design Lab I (Fall 2008)
- BMED 591: Master's Thesis Design Lab I (Spring 2008)
- BMED 450/550: Tissue Engineering (Fall 2007, Fall 2008)
- ENGR 550: Device Evaluation and FDA Approval (Winter 2008)

Arizona

- Certificate in College Teaching Program (Fall 2004-Spring 2006)
  - Coursework: College Teaching Methods (3 units, Fall 2004); Critical Issues in Higher Education (3 units, Spring 2005)
  - Practicum: Supervised College Level Teaching (4 units, Spring 2006)
  - Received Certificate in College Teaching (Summer 2006)
- Instructor (8 lectures) in NATS 104: Biology in Medicine, Engineering, and Applied Sciences (Spring 2007)
- Instructor (3 lectures) in NATS 104: Biology in Medicine, Engineering, and Applied Sciences (Spring 2006)
- Guest lecture in PHCL 554 Cardiovascular Pharmacology (25-Apr-2005)
- Innovations in College Biology Teaching Symposium, University of Arizona (Aug 2004, 2005)

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Service

Activities

- Cal Poly MEDITEC liaison to Edwards Life Sciences and Abbott Vascular (2007-present)
- Program Committee and Chair of Student Poster Session, BioInterface (28-Oct-2008)
- Cal Poly Faculty Liason to Women's Volleyball Team (2007-present)
- Cal Poly BMGE Student Fee Allocation Committee Faculty Advisor (2007-2008)
- BioInterface Conference, Student Poster Competition Judge (30-Oct-2007)
- Biomedical Engineering Program Committee, Student Representative (2005-06, 2006-07)
- Biomedical Engineering Student Forum Coordinator, University of Arizona (2005, 2006)
- BioInterface Conference, Student Poster Competition Judge (5-Dec-2006)
- Session Moderator, Cardiovascular Biomaterials: Surface Interactions, at Society for Biomaterials Conference in Memphis, TN (29-Apr-2005)
- Cardiovascular Journal Club Coordinator, University of Arizona (2004, 2005)
- Biomedical Engineering Resources Subcommittee, Student Representative (2004-05)
- Biomedical Engineering Student Preceptor, University of Arizona (2004-05, 2005-06, 2006-07)
- NSF Fellowship Workshops, Student Volunteer Assistant, University of Arizona (2004, 2006)
- Biomedical Engineering Society Treasurer, University of Arizona (2004)
- Undergraduate Biology Research Program, Student Supervisor (Summer 2004)
- General Engineering Fee Committee, Cal Poly (2002-03)
- Biomedical Engineering Society, Founding Member, Cal Poly (2002-03)
- Women's NCAA Division 1 Volleyball Team, Captain 2002, Cal Poly (1999-2002)

Outreach

- Host and Coordinator for Tunnell School 5th graders day at Cal Poly (17-Oct-2008)
- Lab Instructor, Cal Poly Engineering Days Summer Camp (15-July-2008)
- Invited guest speaker, Tunnell Elementary School 5th grade class (15-Apr-2008)
- SWE High School Shadow an Engineer Day (1-Nov-2007)
- Invited Speaker at Arizona P.E.O. State Convention (5-May-2007)
- Volunteer Server at the Tucson Parkinson's Foundation Taste of Spring (31-Mar-2007)
- Keynote Speaker at P.E.O. Founder's Day, Yuma, Arizona (20-Jan-2007)
- Tour Guide and Speaker to 6th grade GEM class (30-Nov-2006)
- Speaker to Tucson Chapter EY (8-Nov-2006)
- Habitat for Humanity Day of Caring, Volunteer (7-Oct-2006, 8-Oct-2005)
- Speaker to McNair Achievement Program (16-Sept-2005)
- Girl Scout Robotics Camp, Volunteer Advisor (20,21-July-2005)
- Tucson Math, Science, and Technology Funfest, Volunteer (16-Mar-2005)
- University of Arizona Engineering Senior Day, BME Representative (26-Feb-2005)
- Arizona MedCamp, Speaker to high school students (12-Jul-2004)
- Daughters on Campus Day, Tour Guide (23-Apr-2004)
- Big Brother Big Sister Program, Volunteer Big Sis (2003)