Daniel S. Reynolds

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EDUCATION

BOSTON UNIVERSITY — BOSTON, MA
Ph.D. in Biomedical Engineering — Anticipated 2017
GPA 3.91/4.0

UNIVERSITY OF ROCHESTER — ROCHESTER, NY
B.S. in Biomedical Engineering — May 2012
Minor: Mechanical Engineering
GPA 3.93/4.0, *Magna Cum Laude* with Highest Distinction

HONORS AND AWARDS

2013 National Science Foundation Graduate Research Fellowship (NSF GRFP)
2012 National Institute of Health Graduate Student Training Grant in Biomaterials (NIH TRB)
2012 Elected to the Phi Beta Kappa Society
2012 Biomedical Engineering Faculty Award for Outstanding Undergraduate Research, University of Rochester
2011 Tau Beta Pi Engineering Honors Society National Scholarship
2008 University of Rochester Portable Research Grant Award

RESEARCH EXPERIENCE

LABORATORY FOR MOLECULAR & CELLULAR DYNAMICS, BOSTON UNIVERSITY — BOSTON, MA

Graduate Student — July 2012 – Present
Advisor: Prof. Muhammad Zaman, Ph.D.

"Elucidating the breast cancer stem cell niche using an in vitro three-dimensional tumor model"

Currently developing an *in vitro* three-dimensional tumor model to investigate how extrinsic factors - such as extracellular matrix properties, soluble signals, and cell-cell interactions - affect stem-like behavior in cancer cells during tumorigenesis. The model recapitulates the *in vivo* microenvironment by encapsulating multicellular spheroids within three-dimensional collagen scaffolds.

THERAPEUTIC BIOMATERIALS LABORATORY, UNIVERSITY OF ROCHESTER — ROCHESTER, NY

Undergraduate Student — September 2010 – May 2012
Advisor: Prof. Danielle Benoit, Ph.D.

"Crosstalk between the canonical Wnt/β-catenin and Notch signaling pathways"

Worked on characterizing the effect of GSK3-beta inhibitor 6-bromoindirubin-3'oxime on the canonical Wnt/beta-catenin and Notch signaling pathways for applications in mesenchymal stem cell-based cartilage tissue regeneration.

"Patterning of siRNA cues within hydrogels to control cell fate"

Spatially patterned small interfering RNA (siRNA) cues within photocrosslinkable poly(ethylene glycol) (PEG) hydrogels to control mesenchymal stem cell (MSC) behavior. Utilized cell culture and RT-PCR techniques to analyze gene expression of MSCs in response to patterned siRNA cues.

"Polyanhydride polymeric delivery system for bone fracture repair"

Collaborated with an outside company, *Anchor Therapeutics*, for the development of a polyanhydride polymeric delivery system for the localized delivery of the drug pepducin to bone fracture sites. Optimized the polymer composition by recording polymer degradation rates and subsequent drug release. Complemented experimental results with a computational MATLAB model capable of determining the optimal loading concentration needed to obtain therapeutic levels.

"Novel polymeric delivery system for the drug parthenolide to treat leukemia stem cells"

Assisted in the synthesis of amphiphilic polymers for the development of a novel polymeric delivery system to be used for the drug parthenolide against acute myeloid leukemia stem cell.

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST) GAITHERSBURG, MD

Summer Undergraduate Research Fellow (SURF) June 2010 – August 2010
Advisor: Frederick Phelan, Ph.D.

"Computational Modeling of Multiphase Flow with Interfacial Agents"

Developed a finite element model using COMSOL Multiphysics software to analyze multiphase flow with interfacial agents. Gave a formal presentation to faculty and peers at the conclusion of the program.

PUBLICATIONS

1. A. Chen, M. Hoffman, C. Chen, **D.S. Reynolds**, D.S.W. Benoit, "Disruption of Cell-Cell Contact-mediated Notching Signaling via Hydrogel Encapsulation Reduces Mesenchymal Stem Cell Chondrogenic Potential," *J. Biomed. Mater. Res., Part A*, In Review.

TALKS AND POSTER PRESENTATIONS

4. **D.S. Reynolds**, B. Fallica, M.H. Zaman, "Embedded spheroid model as a tissue-specific tumor analogue" Poster Presentation, Translational Research in Biomaterials Training Grant Symposium, Boston University, Boston, MA, April 2013.
3. **D.S. Reynolds**, M. Boutin, D.S.W. Benoit, "Patterning of siRNA cues within hydrogels to spatially control mesenchymal stem cell differentiation" Oral Presentation, National Conference for Undergraduate Research, Ogden, UT, March 2012.
2. **D.S. Reynolds**, M. Boutin, D.S.W. Benoit, "Patterning of siRNA cues within hydrogels to spatially control mesenchymal stem cell differentiation" Independent Poster, BMES Annual Meeting, Hartford, CT, October 2011.
1. **D.S. Reynolds**, F. Phelan, "Modeling of multiphase flow with interfacial agents" Oral Presentation, Summer Undergraduate Research Fellowship Colloquium, Gaithersburg, MD, August 2010.

TECHNICAL AND LABORATORY SKILLS

- Experienced in cell culture techniques including cell viability assays, qRT-PCR, ELISA, Flow Cytometry, and three-dimensional cell culture.
- Proficient in MATLAB, FlowJo, IMARIS, and CAD for modeling and analysis.
- Adept in COMSOL, ABAQUS, and NASTRAN/PATRAN for finite element analysis.

TEACHING EXPERIENCE

DEPARTMENT OF BIOMEDICAL ENGINEERING, BOSTON UNIVERSITY BOSTON, MA

Graduate Teaching Fellow for Fundamentals of Fluid Mechanics Spring 2015
Graduate Teaching Fellow for Introduction to Solid Biomechanics (Instructor Rating: 4.5/5.0) Fall 2013

DEPARTMENT OF BIOMEDICAL ENGINEERING, UNIVERSITY OF ROCHESTER ROCHESTER, NY
Teaching Assistant for Introduction to Biomaterials Course Spring 2011, 2012
Be a Mentor Freshman Mentoring Program Fall 2011 – 2012

COLLEGE CENTER FOR ACADEMIC SUPPORT, UNIVERSITY OF ROCHESTER ROCHESTER, NY
Tutor for Biomechanics, Physics I & II, Social Statistics Fall 2010 – 2012

LEADERSHIP ACTIVITIES AND ATHLETICS

BOSTON UNIVERSITY BOSTON, MA

Biomedical Engineering Graduate Student Committee (GSC) Spring 2013 – Present

- Head of the Professional Development Subcommittee. Extensive involvement in organizing several Q&A discussions in which professionals from either academia or industry share their career paths with graduate students. The events have been well attended with over 50 graduate students at each event.
- Have been a strong proponent for using the GSC as a vehicle for promoting graduate student involvement in community outreach activities. Solicited and organized graduate students to volunteer at a number of local STEM-related educational events; including the Massachusetts State Middle School Science Fair, the Boston Regional FIRST Lego League competition, and the Boston Museum of Science's annual EurekaFest.

NIH Training Grant in Translational Research in Biomaterials (TRB) Fall 2012 – Present

- Participated in organizing the TRB Distinguished Biomaterials Lecture series.

UNIVERSITY OF ROCHESTER ROCHESTER, NY

University of Rochester Solar Splash Team Fall 2009 – Spring 2012

- Managed funds for the design and construction of a solar powered boat to be entered into the annual Solar Splash international competition.

Division III Football Team Member August 2008 – May 2010

- Devoted 35+ hours per week to training, practices, meetings, travel, and game competition.