

Tobin Elliott Brown, Ph.D.

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EDUCATION

Ph.D. - Chemical Engineering (2013 – 2018)

University of Colorado – Boulder

Thesis: *Dynamic Hydrogels to Investigate Cell-Matrix Interactions*

Advisor: Kristi Anseth, Ph.D.

Thesis committee: Christopher Bowman, Ph.D., Stephanie Bryant, Ph.D., Andrew Goodwin, Ph.D., Rui Yi, Ph.D.

Cumulative GPA: 3.93

B.Eng. - Chemical Engineering (2009-2013)

McGill University, Montreal, Quebec

Cumulative GPA: 3.90 – Dean's Honour List

PUBLICATIONS (*denotes equal contribution)

Brown, T.E., Silver, J.S., Worrell, B.T., Marozas, I.A., Yavitt, M.A., Bowman, C.N., Anseth, K.S., “Secondary photocrosslinking of click hydrogels to probe myoblast mechanotransduction,” *submitted*.

Grim, J.C., **Brown, T.E.**, Aguado, B.A. Chapnick, D., Viert, A., Liu, X., Anseth, K.S., “Dynamic patterning of signaling proteins in hydrogels through a reversible and repeatable thiol-ene bioconjugation,” *ACS Central Science*, **2018**, *in press*.

Brown, T.E., Carberry, B.J., Worrell, B.T., Dudaryeva, O.D., McBride, M.K., Bowman, C.N., Anseth, K.S., “Photopolymerized dynamic hydrogels with tunable viscoelastic properties through thioester exchange,” *Biomaterials*, **2018**, *in press*.

Shin, D.S., Tokuda, E.Y., Leight, J.L., Miksch, C.E., **Brown, T.E.**, Anseth K.S., “Synthesis of microgel sensors for spatial and temporal monitoring of protease activity,” *ACS Biomaterials Science and Engineering*, **2018**, 4(2), 378-387.

Brown, T.E., Anseth, K.S., “Spatiotemporal hydrogel biomaterials for regenerative medicine.” *Chemical Society Reviews*, **2017**, 46, 6532-6552. *Inside front cover, HOT Chem Soc Rev Article for August 2017*

Brown, T.E.*, Marozas, I.A.*, Anseth, K. S., “Amplified photodegradation of cell-laden hydrogels via an addition-fragmentation chain transfer reaction.” *Advanced Materials*, **2017**, 29(11), 1605001.

Erythropel, H.C., **Brown, T.E.**, Maric, M., Nicell, J.A., Cooper, D.G., Leask, R. “Designing greener plasticizers: Effects of alkyl chain length and branching of maleate diester based plasticizers.” *Chemosphere*, **2015**, 134: 106-112.

McKinnon, D., Domaille, D., **Brown, T.E.**, Kyburz, K., Kiyotake, E., Cha, J., Anseth, K. S., “Measuring Cellular Forces Using Bis-Aliphatic Hydrazone Crosslinked Stress-Relaxing Hydrogels.” *Soft Matter*, **2014**, 10(46): 9230-6.

McKinnon, D.*, **Brown, T.E.***, Kyburz, K., Kiyotake, E., Anseth, K. S., “Design and Characterization of a Synthetically Accessible, Photodegradable Hydrogel for User-Directed Formation of Neural Networks.” *Biomacromolecules*, **2014**, 15 (7): 2808–2816.

Storms, Z. J., **Brown, T.E.**, Cooper, D. G., Sauvageau, D. and Leask, R., “Impact of the cell life-cycle on bacteriophage T4 infection”. *FEMS Microbiology Letters*, **2014**, 353: 63–68.

Storms, Z. J., **Brown, T.E.**, Sauvageau, D. and Cooper, D. G. (2012), “Self-cycling operation increases productivity of recombinant protein in *Escherichia coli*”. *Biotechnology and Bioengineering*, **2012**, 109: 2262–2270.

PRESENTATIONS

Oral presentation – “Spatiotemporal control over intestinal organoid formation in photodegradable hydrogels,” Society for Biomaterials National Meeting, Atlanta, GA (2018)

Poster – “Secondary photocrosslinking of click hydrogels to probe myoblast mechanotransduction,” Frontiers in Photoactive Soft Matter, Boulder, CO (2017)

Oral presentation – “Photodegradable, photoadaptable hydrogels crosslinked by allyl sulfides for cell culture applications,” American Chemical Society National Meeting, Washington DC (2017)

Oral presentation – “Amplified photodegradation of cell-laden hydrogels through an addition-fragmentation reaction,” Society for Biomaterials National Meeting, Minneapolis, MN (2017)

Oral presentation – “Amplified photodegradation of cell-laden hydrogels through an addition-fragmentation reaction,” American Chemical Society National Meeting, San Francisco (2017)

Poster – “Surface patterned dermal-epidermal co-culture hydrogels to mimic the hair follicle niche,” World Biomaterials Congress, Montreal (2016)

Oral Presentation – “Photodegradable hydrogels for studying axon guidance and the user-directed formation of neural circuits,” American Chemical Society National Meeting, Denver (2015)

Poster – “Light Wavelengths to Control the Release of Multiple Growth Factors,” Society for Biomaterials Annual Meeting, Denver (2014)

PATENTS

Brown, T.E., Marozas, I.A., & Anseth, K.S., “Amplified photodegradation of hydrogels and methods of producing the same” *Submitted*.

AWARDS

2018 – Travel Grant, United Government of Graduate Students, University of Colorado

2017 – American Institute of Chemists Graduate Award, CU Boulder Dept. of Chemical Engineering

2017 – *Finalist*, Eastman Chemical Student Award in Applied Polymer Science, American Chemical Society

2015 – National Science Foundation Graduate Research Fellow

2015 – Excellence in Graduate Polymer Research Symposium, American Chemical Society

2014 – NIH/CU Molecular Biophysics Training Scholarship (NIH T32 GM-065103)

2013 – NSERC Postgraduate Studies M Scholarship

2013 – Dean’s Outstanding Merit Fellowship - CU Boulder PhD program

2009-2013 – Dean’s Honour List – McGill University (top 10% in faculty)

2012 – McGill EUL Undergraduate Research Scholarship

2009-2013 – JW McConnell Scholarship – McGill University

2009 – National Merit Scholar (*declined to study in Canada*)

2009 – U.S. Presidential Scholar Semifinalist

WORK EXPERIENCE

Visiting Scientist (Oct.-Dec. 2016 & Apr.-Jun. 2017)

Professor Matthias Lutolf, Bioengineering Institute, EPFL, Lausanne, Switzerland

- Photodegradable hydrogels for the culture of intestinal stem cell organoids and defined crypt formation

Research Assistant (2013-current)

Professor Kristi Anseth, Chemical and Biological Engineering, CU Boulder

- Dynamically tunable hydrogels for the culture and directed growth of mammalian cells, including embryonic stem cell-derived motor neurons, human mesenchymal stem cells (hMSCs), and intestinal organoids

Research Assistant (summer 2012 – Eugene Ulmer Lamothe Scholarship)

Professor Richard Leask, Chemical Engineering, McGill University

- The effect of host cell synchronization on bacteriophage replication and recombinant protein production

Research Assistant (summer 2011)

Professor David Cooper, Chemical Engineering, McGill University

- Synthesis and biodegradation of potential “green” plasticizers and analysis of metabolites

TEACHING/MENTORING EXPERIENCE

Advanced Teaching Assistant: Chemical Engineering Heat Transfer (CHEN 3210) – (Fall 2016) Faculty course questionnaire (overall) = 5.0/6.0

Two guest lectures given in Physical Chemistry with Biological Applications 2 (CHEM 4431) – (Spring 2015)

Teaching Assistant: General Chemistry for Engineers (CHEN 1211) & Chemical Engineering Kinetics (CHEN 4330) - (Spring 2014)

Mentor to two high school students, three undergraduate students, and four graduate students in the Anseth lab

SCIENCE OUTREACH

Boulder Valley School District Science Fair: Student Mentor – 2015, **Judge** – 2014, 2015

Google/NIH LabTV project: Biographical video sketch to encourage top high school students to enter the medical research field

Manager of Anseth group website (www.colorado.edu/ansethgroup) and Twitter account, @AnsethGroup

Affiliations

Society for Biomaterials, American Chemical Society

VOLUNTEER EXPERIENCE

Undergraduate Tutor – Material and Energy Balances

Engineers Without Borders Canada (School outreach program)

Jackson Youth Hockey Assistant Coach

Habitat for Humanity