

# Brian M. Howell

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## Education

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### ***BS Chemical Engineering***

April 2017

Brigham Young University - GPA: 3.7/4.0

- Recipient of full and half academic scholarships from BYU
- Emphasis in Controls and Dynamic Optimization

## Research

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### ***Lawrence Livermore National Laboratory*** – Livermore, CA

Researcher – Post-College Appointee

Spring 2017 – Current

- Developing urethane resin formulations for various applications in additive manufacturing
- Tuning rheological parameters for optimal printing speeds and curing times
- Successfully implemented a dual-cure system comprising of urethane and acrylate chemistry
- Developed a composite ink with appropriately selected solid fillers, with the end goal of working towards polymers which can be used in energetic material formulations
- Working towards a first-author publication

### ***Zucrow Propulsion Laboratory*** – West Lafayette, IN

Visiting Researcher (Purdue University)

Spring 2016 – Fall 2016

- Oversaw project commissioned by Army Research Laboratory to increase sensitivity in propellants and explosives by utilizing the piezoelectric effect under the direction of Professors Steven Son and Sally Bane
- Successfully developed piezoelectric propellant and explosive from fluoropolymers and nano-aluminum
- Developed experimental methods of testing voltage levels in piezoelectric explosives during impact testing
- Designed and built a device that allows impact testing of explosives within an electric field, and that allows for the measurement of voltage produced by the material when impact occurs
- Successfully discovered methods to decrease sensitivity of piezoelectric explosives for transportation and storage, and immediately increase its sensitivity by placing it in a device with an electric field
- Resulted in an extensive report to the Army Research Laboratory and a second author publication (currently in manuscript)

### ***Placental and Lung Cell Signaling Laboratories*** – Provo, UT

Researcher (Brigham Young University)

Fall 2013 – Fall 2015

- Led projects in identifying specific proteins associated with complicated pregnancies and lung disease under the direction of Professors Juan Arroyo and Paul Reynolds
- Led animal testing experiments that created the foundation of data for all tests in the lab
- Developed specialized immunofluorescence protocol for the lab, later used by the physiology department
- Responsible for specific projects that included, drug delivery in rats and necropsies, preparing tissue samples, immunoprecipitation, western blotting, RNA isolation, cDNA production, and polymerase chain reaction

### ***Publications (Peer Reviewed)***

- Jimenez FR1, Belgique ST, Lewis JB, Albright SA, Jones CM, **Howell BM**, Mika AP, Jergensen TR, Gassman JR, Morris RJ, Arroyo JA, Reynolds PR. Conditional pulmonary overexpression of Claudin 6(Cldn6) during embryogenesis delays lung morphogenesis. *Int J Dev Biol*. 2015 Jul 22.
- Alexander K, Nelson M, **Howell B**, Mejia C, Jones C, Reynolds P, and Juan A. Arroyo. Differential Receptor for Advanced Glycation End-Products (RAGE) Expression in Preeclamptic, Intrauterine Growth Restricted, and Gestational Diabetic Placentas. *Am J Reprod Immunol. Am J Reprod Immunol*. 2015 Dec 19.

### ***Contributions to Professional Meetings (Abstracts Published)***

- Aleksander P. Mika, **Brian Howell**, Paul R. Reynolds and Juan A. Arroyo. Elevated apoptosis in ovine Intrauterine Growth Restriction (IUGR) is associated with increased caspase 3 and 9 and decreased telomerase activity. Poster at the 2015 Experimental Biology Annual meeting, Boston, MA, March 28<sup>th</sup> - April 1<sup>st</sup>, 2015.
- Kristen Alexander, Joshua B. Lewis, Camilo Mejia, **Brian Howell**, Paul R. Reynolds and Juan A. Arroyo. Differential placental expression of the Receptor for Advanced Glycation End-Products (RAGE) in normal and complicated pregnancies. Poster at the 2015 Experimental Biology Annual meeting, Boston, MA, March 28th-April 1st, 2015.

### ***Academic Reports***

- Omar Yehia, **Brian M. Howell**, Ibrahim E. Gunduz, Steven F. Son, Sally P. Bane. Investigation of Piezoelectric Reactives as Tunable Energetics for Advanced Munitions. Report to Army Research Laboratory 2016 Aug 12

## **Work Experience**

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### ***Alta View Hospital Operating Room*** – Sandy, Utah

Surgical Orderly

Winter 2013 – Winter 2016

- Assisted surgeons in holding retractors and equipment in sterile field
- Managed anesthetic drugs for each operating room
- Laser Safety Officer and operator of a holmium YAG laser for kidney stone removal procedures
- Helped optimize operating room efficiency by learning other's tasks and executing them during off hours

### ***Tissue Staining Machine*** – Salt Lake City, UT

Independent Project

Spring 2015 – Fall 2015

- Designed a machine that automates procedures for preparing tissues samples for histological staining
- Collaborated with a student from the University of Utah

### ***ChemE Car*** – Provo, UT

Team Leader for Stopping Crew

- Led a team of four in building the stopping mechanism for a car powered by hydrogen fuel cells

## **Outreach**

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### ***The Church of Jesus Christ of Latter-day Saints*** – Singapore & Malaysia

Volunteer Missionary

Winter 2010 – Winter 2012

- Volunteered full time for two years in multiple areas in Singapore and Malaysia

- Instructed and trained groups of missionaries on how to be more effective teachers and listeners
- Taught families moral values in native language
- Trained and led groups of 20-40 missionaries over 13-months

### **Pertinent Classes & Tools**

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- ChEn 436 Process Dynamics & Controls
- ChEn 493 Semiconductor Fabrication
- ChEn 693 Dynamic Optimization
- Python, Autodesk Inventor, Mathcad  
APMonitor Optimization, LaTeX
- Control & Optimization
  - PID control
  - Moving Horizon Estimation
  - Model Predictive Control
- Working Proficiency in Malay and Indonesian