Payton J Thomas

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Education

University of Utah — Salt Lake City, UT
Honors BS Biomedical Engineering with Chemistry Minor, GPA: 3.98 — 2019–Present

University of Utah — Salt Lake City, UT
Honors BS Applied Mathematics, GPA: 3.98 — 2019–Present

Riverton High School — Riverton, UT
High School Diploma, GPA: 3.99 — 2015–2019

Experience

Undergraduate Researcher, CU Boulder — Boulder, CO
Genetic Logic Lab Research Aide — May 2020-Present

- Developed simulation tools for the computer-aided design of genetic circuits
- Adapted variance-reduction techniques for stochastic simulation of genetic circuit dynamics
- Developed novel stochastic simulation algorithms for the analysis of rare genetic events

College of Engineering Ambassador, University of Utah — Salt Lake City, UT
Ambassador — August 2019-Present

- Conducted STEM outreach and education events at local high schools
- Mentored undergraduate engineering students in the Engineering Scholars program
- Organized Engineering Day at the University of Utah for over 1000 students annually

Tutor, High Performance Tutoring — Salt Lake City, UT
Private Tutor — August 2018-Present

- Tutored Mathematics, Physics, Chemistry, Biology, and English at the high school and undergraduate levels

Project Lead, Utah BioDesign Lab — Salt Lake City, UT
Magnetic Optic Nerve Stimulator Team — January 2022-December 2022

- Developed a device which can magnetically stimulate the optic nerve for use during brain surgery
- Led a team of engineers and guided project directions
- Presented design reviews and updates to a panel of supervisors

Visiting Researcher, MIT — Cambridge, MA
Weiss Lab Research Aide — January 2022-August 2022

- Constructed biophysical models of neuromorphic genetic circuits
- Cleaned and generated statistical models of scRNA-Seq Data
- Constructed neuromorphic genetic circuits *in vivo*

Undergraduate Researcher, University of Utah — Salt Lake City, UT
Bidone Lab Research Aid — August 2021-June 2022

- Analyzed simulations of E-Cadherin dynamics

Undergraduate Researcher, University of Utah Salt Lake City, UT
Yellepeddi Research Group Research Aide April 2020-December 2020

- Developed a Python library for rapid physiologically-based pharmacokinetics modelling of nanoparticle biodistribution

Project Lead, InnovaBio West Jordan, UT
SKIP Project August 2017-August 2019

- Utilized genetic engineering techniques to produce bioactive, recombinant human skeletal muscle and kidney-enriched inositol phosphatase in *E. coli*
- Trained interns in the essential techniques of biotechnology and genetic engineering
- Presented results to supervisors

Tutoring Assistant, Kumon West Jordan, UT
Private Tutor August 2017-May 2018

- Tutored children ages 3 to 14 in mathematics and reading
- Graded student homework assignments

Awards and Honors

- **SLCC SME Symposium First Place: Team Technical Poster, 2018** First place prize at the annual Salt Lake Community College Science, Math, and Engineering Symposium in the Team Technical Poster Category. Awarded for my team's research on the expression and solubility of SKIP in E. Coli.

- **National AP Scholar, 2018 and 2019** The highest level of distinction given by AP, granted to students in the United States who receive an average score of at least 4 on all AP Exams taken, and scores of 4 or higher on eight or more of these exams. Won twice.

- **National Merit Scholar, 2019** The highest level of distinction given by NMSC, given to students who have been judged to have the strongest combination of academic skills and achievements, extracurricular accomplishments, and potential for success in rigorous university studies.

- **Sterling Scholar Finalist: Science, 2019** A Sterling Scholar is a high school senior who is publicly recognized and awarded for the pursuit of excellence in scholarship, leadership, and citizenship in the State of Utah. The title of finalist is given to 14 students in each subject annually.

- **University of Utah Presidential Scholar, 2019** The Presidential Scholarship is the most valuable merit scholarship offered by the University of Utah. Presidential Scholars receive a full tuition waver and housing stipend for eight semesters of undergraduate study.

- **Goldwater Scholar Nominee, 2021** The Goldwater Scholarship is the most prestigious undergraduate scholarship in the natural sciences, mathematics, and engineering in America. Four students are nominated for the award by participating institutions each year.

- **UROP Recipient, 2021** UROP provides funding for students who assist with a faculty member's research. I was granted a UROP award for my work simulating E-Cadherin dynamics with Tamara Bidone.

- **Utah's Next Top Model Winner, 2021** The University of Utah holds this mathematical modeling contest annually. I led a team of three students to win first place in the competition.

- **Kennecott Engineering Scholar, 2022** Kennecott Scholars are excellent engineering students at the University of Utah who have the opportunity to live in an engineering themed living-learning community.

- **SB^{3}C Student Paper Contest Second Place, 2022** Each year, the Summer Bioengineering, Biomechanics, Biotransport Conference (SB^{3}C) selects 2 undergraduate papers from its international applicant pool as winners for an undergraduate paper competition.

- **MIT Visiting Scholar, 2021** Visiting Scholars conduct academic research at MIT for a period of one week to one year. I was a visiting scholar in the Weiss Lab at the MIT Synthetic Biology Center.

Publications

1. Z Sents, TE Stoughton, L Buecherl, **PJ Thomas**, P Fontanarrosa, and CJ Myers, "SynBioSuite: A Tool for Improving the Workflow for Genetic Design and Modeling", *ACS Synthetic Biology, Submitted*

2. **PJ Thomas**, M Ahmadi, L Buecherl, C Winstead, CJ Myers, and H Zheng, "A Comparison of Weighted Stochastic Simulation Methods for the Analysis of Genetic Circuits", *ACS Synthetic Biology, December 2022*

3. B Shaikh, LP Smith, D Vasilescu, G Marupilla, M Wilson, E Agmon, H Agnew, SS Andrews, A Anwar, ME Beber, FT Bergmann, D Brooks, L Brusch, L Calzone, K Choi, J Cooper, J Detloff, B Drawert, M Dumontier, GB Ermentrout, JR Faeder, AP Freiburger, F Fröhlich, A Funahashi, A Garny, JH Gennari, P Gleeson, A Goelzer, Z Haiman, J Hasenauer, JL Hellerstein, H Hermjakob, S Hoops, JC Ison, D Jahn, HV Jakubowski, R Jordan, M Kalaš, M König, W Liebermeister, RSM Sheriff, S Mandal, R McDougal, JK Medley, P Mendes, R Müller, CJ Myers, A Naldi, TVN Nguyen, DP Nickerson, BG Olivier, D Patoliya, L Paulevé, LR Petzold, A Priya, AK Rampadarath, JM Rohwer, AS Saglam, D Singh, A Sinha, J Snoep, H Sorby, R Spangler, J Starruß, **PJ Thomas**, D Van Niekerk, Daniel Weindl, Fengkai Zhang, Anna Zhukova, AP Goldberg, JC Schaff, ML Blinov, HM Sauro, II Moraru, and JR Karr, "BioSimulators: A Central Registry of Simulation Engines and Services for Recommending Specific Tools", *Nucleic Acids Research, May 2022*

4. L Buecherl, R Roberts, P Fontanarrosa, **PJ Thomas**, J Mante, Z Zhang, and CJ Myers, "Stochastic Hazard Analysis of Genetic Circuits in iBioSim and STAMINA", *ACS Synthetic Biology, October 2021*

Conference Talks

1. **PJ Thomas** and TC Bidone, "The Role of Actin Coralling in the Formation of Cell-Cell Adhesions", *SB3C, June 2022*

2. **PJ Thomas**, M Ahmadi, H Zheng, and CJ Myers, "A Comparison of Weighted Stochastic Simulation Methods", *IWBDA, September 2021*

3. T Stoughton, L Buecherl, **PJ Thomas**, P Fontanarrosa, and CJ Myers, "iBioSim Server: A Tool for Improving the Workflow for Genetic Design and Modeling", *IWBDA, September 2021*

4. **PJ Thomas**, "Production of Biologically Active Recombinant Human SKIP", *SLCC SME, March 2019*

5. E Green, V Scott, and **PJ Thomas**, "Purification and Expression of SKIP", *SLCC SME, March 2018*