Joshua Abraham
Curriculum Vitae

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EDUCATION

Ph.D., Chemical and Biological Engineering *Tentative 2024*
University of Wisconsin, Madison

B.S., Chemical and Biomolecular Engineering *June 2019*
University of California, Los Angeles
GPA: 3.84

RESEARCH / PROJECTS

UCLA-DOE and Molecular Biology Institute *March 2016 – May 2019*
Undergraduate Researcher
Principal Investigator: Dr. James U. Bowie

Characterizing thermophilic enzymes for cell-free synthesis of terpenes
- Developing means of easily establishing cell-free systems by thermal enzyme purification
- Quantifying thermal tolerances for enzymes in terpene production pathways

In vitro biosynthetic production of terpene products with *Bacillus megaterium* cytochrome P450 mutant
- Examined effects of site-directed mutagenesis on specificity and activity of P450BM3 enzyme
- Optimized cell-free processing to generate terpenoid end-products such as santalol and perillyl alcohol

Structure and stability of dihydroxy-acid dehydratase from *Streptococcus mutans* for the aerobic catalysis of the isobutanol pathway
- Studied enzyme by crystallography to examine stability under aerobic conditions
- Improved robustness of an *in vitro* pathway for the cell-free production of high titers of isobutanol

UC Davis, Department of Chemistry *June 2018 – September 2018*
Visiting Undergraduate Researcher
Principal Investigator: Dr. Shota Atsumi

A synthetic biology approach to improve CO_2 fixation in cyanobacteria
- Stabilized long-term productivity of carbon fixation by ribulose-1,5-bisphosphate carboxylase (RuBisCO)
- Analyzed effect of expression and culture conditions on production of target chemical 2,3-butanediol

Facilities Management and Renewable Energy Association at UCLA
Project Manager

Food waste to biofuels initiative *April 2016 – May 2017*
- Improved purification methods to prepare waste oil for conversion into usable biofuel
- Drafted experimental plan and standard operating procedures for student-led tests

South Kinross building lighting audit *October 2015 – May 2016*
- Audited lighting options for South Kinross library building by collecting and analyzing data with Excel
- Submitted a 15-page report that proposes cost-saving measures with a payback time of two years

Rutgers University Waksman Student Scholars Program
Student Scholar

Sequence bioinformatics of *Landoltia punctata* genome for expression analysis *August 2013 – June 2015*

- Executed DNA wetlab series of purification and amplification of *Landoltia punctata* duckweed genes
- Mentored underclassmen on complex lab techniques and methods of analysis
- Investigated bioinformatics and submitted sequences on NCBI GenBank [67JA1.14, 67JA2.14]

PRESENTATIONS

Abraham, J.P., Carroll, A.L., Hernandez, J., Atsumi, S., A Synthetic Biology Approach to Improve CO_2 Fixation in Cyanobacteria. Annual Biomedical Research Conference for Minority Students Abstracts. Poster presentation delivered at the Annual Biomedical Research Conference for Minority Students meeting, Indianapolis, IN, November 2018.

Abraham, J.P., Korman, T.P., and Bowie, J.U., In vitro biosynthetic production of terpene products with Bacillus megaterium cytochrome P450 mutant. University of California Office of the President Abstracts. Poster presentation delivered at the Koret UC Leadership Excellence through Advanced Degrees meeting, Santa Barbara, CA, March 2018.

Abraham, J.P., Korman, T.P., Chan, S., and Bowie, J.U., Structure and stability of dihydroxy-acid dehydratase from Streptococcus mutans for the aerobic catalysis of the isobutanol pathway. Annual Biomedical Research Conference for Minority Students Abstracts. D-001. Poster presentation delivered at the Annual Biomedical Research Conference for Minority Students meeting, Phoenix, AZ, November 2017.

FELLOWSHIPS / AWARDS

UC Leadership Excellence through Advanced Degrees Scholar *May 2017 – June 2019*
University of California, Office of the President

Phillips 66 Scholarship in Chemical Engineering *February 2018*
University of California, Los Angeles and Phillips 66
Henry Samueli School of Applied Science and Engineering

Poster Presentation Award, Biochemistry and Molecular Biology *November 2017*
Annual Biomedical Research Conference for Minority Students, Phoenix, AZ

Poster Presentation Top Honors, Chemistry and Biochemistry *March 2017*
Koret UC LEADS Symposium, Santa Barbara, CA

Gaspar Family Scholarship for Filipinos in Engineering *February 2017*
University of California, Los Angeles
Henry Samueli School of Applied Science and Engineering

TEACHING EXPERIENCE

UCLA Center for Education Innovation and Learning in the Sciences

Learning Assistant, Organic Chemistry I *Spring 2018, Winter 2019*

- Facilitated peer learning for a lecture of 300 students and developed practice sets based on curriculum
- Applied formal pedagogy from weekly seminars and implemented regular feedback

UCLA Extension: Technical Management Program *September 2017*

Teaching Assistant, Program Attendee

- Organized and facilitated logistics for 200 technical managers in a one-week program
- Completed three courses on project management, development, and leadership

AFFILIATIONS

American Institute for Chemical Engineers

Alumni and Outreach Chair (UCLA Chapter) *February 2018 – February 2019*
Publicity Chair (UCLA Chapter) *February 2017 – January 2018*
External Affairs Committee (UCLA Chapter) *October 2016 – February 2017*
National Organization Member *September 2015 – Present*

Renewable Energy Association at UCLA

President *April 2017 – March 2018*
Internal Vice President *April 2016 – March 2017*

Bruin Engineering Network

Founding Director *January 2017 – June 2018*

References are available upon request