Hadi Nayebi Gavgani

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Molecular Biologist

Versatile | Decision Making | Interdisciplinary

Driven researcher with over seven years of experience in molecular biology. Entrepreneurial mind with ideas in the Biotech sector. Quick learner with skillsets from laboratory to computational methods.

SKILLS SUMMARY

Protein (enzyme) Engineering, Protein crystallography, Enzyme Kinetics, Genetic Engineering, Python, Bioinformatics, Machine Learning.

PROFESSIONAL EXPERIENCE

Research Associate, Michigan State University……………………..………… **Feb. 2020 - Present**
- Developing strains of methylotrophs (*Methylorubrum extorquens*) for synthetic biology
  - Genetic engineering, biosensors, directed evolution
- Protein engineering on Cg10062 tautomerase for synthetic biology applications
  - Molecular dynamic simulations, mutagenesis, protein crystallography

Computational Biochemistry, Michigan State University …………………. **Feb. 2018 - Dec. 2019**
- Molecular dynamics simulation of the proposed folding intermediate for CRBP.

Physical and Biological lab, Michigan State University…………………… **Feb. 2014 - Dec. 2019**
- Kinetic studies of rice GBSSI using coupled enzyme assay.
- Crystallization of rice GBSSI and solving the ligand-bound structure.
- Developing an assay for rice branching enzyme to study the kinetics and the product profile.
- Cloning, mutagenesis of rice branching enzyme and rice GBSSI for kinetic studies.
- Cloning and expression of rice PTST protein.
- Expressing and purification of Cutinase.
- Crystallization of Cg10062 protein and solving the ligand-bound structures.

Organic chemistry lab, Sharif University of Technology………………… **Aug. 2010 - Aug. 2012**
- Synthesis of SBA-15 particles for the deposition of organometallic complexes.
- Ring closing using double Mannich reaction.
- Measuring zinc loading on SBA-15.

Computational Chemistry, Sharif University of Technology…………… **Aug. 2010 - Aug. 2012**
- Calculating the pKa change for adenine-amino acid adducts.

Organic lab, Shahid Beheshti University…………………………………… **Jul. 2009 - Nov. 2010**
- Synthesis of caged porphyrins.
- Studying the effect of aromatic ring distortion on porphyrin absorbance wavelength.

EDUCATION

- **Michigan State University,** East Lansing, MI…………………………. **Aug. 2012 - Dec. 2019**
  PhD student in Organic Chemistry
- **Sharif University of Technology,** Tehran, Iran………………….…… **Aug. 2010 - Jul. 2012**
  Master's degree in Organic Chemistry
- **University of Tabriz,** Tabriz, Iran…………………………………….. **Aug. 2006 - Jul. 2010**
  Bachelor of Science in Chemistry

PUBLICATIONS

- **H. Nayebi;** [*et al*, including J. H. Geiger]; "X-ray crystal structure of Rice Branching Enzyme I with maltododecaose (M12)", 2021, **Submitted to JBC**.
- **H. Nayebi**; A. Siriminal; [*et al*, including J. H. Geiger and K. Draths] "Cg10062 Catalysis Forges a Link Between Acetylenecarboxylic Acid and Bacterial Metabolism ", 2021, **Submitted to JACS**.
- **H. Nayebi;** "Structural Enzymology Investigating the Mechanism of Rice Branching Enzyme I, Rice Granule Bound Starch Synthase, and CG10062, a Member of the Tautomerase Superfamily*"*, Michigan State University, East Lansing, 2020.

CONFERENCE PRESENTATION

- K. Draths; A. Sirinimal; **H. Nayebi;** [et al, including J. H. Geiger]; "3-Hydroxypropionic Acid Synthesis from Methane and Carbon Dioxide via Acetylene Carboxylic Acid", 2021, SIMB-SBFC conference
- A. Sirinimal; **H. Nayebi;** [et al, including J. H. Geiger and K. Draths]; "An original biocatalytic synthesis of 3-hydroxypropionic acid", 2021, ACS Great Lakes Regional Meeting.
- N. Ehyaei; Z. Nossoni; **H. Nayebi;** [et al, including J. H. Geiger]; "Role of Water Molecules in the Wavelength Regulation of Photo Switchable Rhodopsin Mimic (hCRBPII) ", 2020, Biophysical Journal, 118, 3.
- R. Fulgos; **H. Nayebi**; [et al, including J. H. Geiger]; "Characterization of Rice Granule-Bound Starch Synthase", 2019, Poster presentation, Undergraduate Research at MSU.
- **H. Nayebi;** [et al, including J. H. Geiger]; "Origin of Chain Length Specificities of Starch Branching Enzyme", 2017, Biophysical Journal, 112, 3.

PATENTS

- K. Draths; **H. Nayebi;** [et al, including J. H. Geiger]; "Synthesis of 3-hydroxypropionic acid", Filed April 2021, Patent Pending.

AWARDS

- 1st place, startup pitch competition (EarthOne, crowdfunding the discovery of new bacterial species), MSU startup weekend, February 2021
- James L. Dye Endowment Fellowship in the Chemical Sciences, summer of 2018.
- TA Award Fellowship by Gerald T. Babcock Endowed Fund in Chemistry, spring of 2017.
- Education Merit Award for Excellence in Teaching for Fall Semester of 2016.
- Rogowski Chemistry Graduate Fellowship, summer of 2016.
- Education Merit Award for Excellence in Teaching for Spring Semester of 2016.

- Bronze Medal in the 3rd International Scientific Olympiad (Chemistry), July 2010.
- Ranked First in class of 2006, Tabriz University, Iran.

LEADERSHIP

- Training seed and undergraduate students, Michigan State University……**Jan. 2014 – Feb 2020**
- Safety officer of the laboratory, Michigan State University……………… **Jan. 2013 - Jan. 2014**

MEMBERSHIP

- MSU Entrepreneurship Association…………………………………………**Jan. 2019 – present**

TEACHING EXPERIENCE

- Teaching assistant for Biochemistry Lab……………………………………………… **Fall 2019**
- Instructor for Organic Chemistry Lab……………………………………… **Summer 2019**
- Teaching assistant for General Chemistry………………………………… **Fall 2017, Fall 2018**
- Teaching assistant for Organic Chemistry Lab………………………… **Fall 2013 – Spring 2019**
- Teaching assistant for Organic Chemistry………………………….… **Fall 2012 – Spring 2013**

ADDITIONAL SKILLS

- **Biochemical techniques:** Cloning, Polymerase Chain Reaction (PCR), In vitro protein expression, Protein purification techniques, Developing biochemical assays, Mass spectroscopy, Protein X-ray crystallography, Protein crystallization screening.

- **Identification of chemical and biochemical substances:** IR, NMR, MASS spectroscopy, Size exclusion chromatography, Fluorescent and UV Spectroscopy, Dynamic Light Scattering (DLS).

- **Computational techniques:**
  Programming: Python, C++, R, Bash.
  Bioinformatic: Neural network, Genetic algorithm, Data mining, Protein sequence analysis, Hidden Markov models, Molecular evolution, Exploratory data analysis, Molecular dynamic simulations.
  Structural Biology: PyMOL**,** Phenix, Coot, Swiss-Pdb Viewer, Visual Molecular Dynamics (VMD), AMBER.
  Organic Chemistry: Gaussian, ChemDraw, LabView.