Seyed Alireza Hashemi

Under-Graduate of Biotechnology
Research and development specialist – Protein engineering and purification
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Education

MSc in Biophysics, Institute of Biochemistry and Biophysics (Tehran University), 2023 – current
BSc in Biotechnology, Kharazmi University (Visitor student: Tehran University), GPA: **3.86/4**, 2019 – 2023
Diploma in Natural Science, Allame Helli School (National Organization for Development of Exceptional Talents), GPA: 18.83/20, 2016 – 2019

Professional positions & experience

ReNAP Therapeutic, Tehran, Iran — March 2022 – Present

Internship program, Supervised by Dr. Khoddami & Dr. Moazzami — **March – Jun 2022**

- Passed safety in the laboratory course and general acquaintance with the laboratory
- Studied RNase R structure and function, extracted and organized data for purification and assay development

Project 1: Protein Engineering Department — **Jun 2022 – March 2023**

- Purified GMP grade **RNase R** Enzyme (1 million units) with 99% purity
  - Designed two-step purification by His-trap and SP (Ion exchange)
  - Developed a novel wash method for Ni-NTA based on conductivity
- Developed analytical methods for enzymatic activity determination
  - Provisioned different types of RNA (Circular RNA, Single-strand RNA, Blunt ended double-strand RNA, Double-strand RNA with overhang) substrates by IVT (In Vitro Transcription) method
  - Developed activity and specificity assays, alternative for radio-labeled nucleotide approach based on the specific behavior of enzyme in dealing with different substrates
- Experimented 3 main Quality Control assays
  - Determined nuclease impurity test (RNase Contamination), purity assay, and concentration measurement

Project 2: Informatic and Protein Engineering Departments — **November 2022 – Present**

- Implemented Alpha-fold 2, RF-Diffusion, Graphinity, and Diffab on the laboratory server
- Studied Alpha-fold and Diffusion algorithms and architecture
- Design of Lab management systems and Django based web-apps with a focus on inventory keeping, Periodic devices and tools services, and scientific data collection

Teaching experience

Lab Assistance

- Genetic engineering (Dr. Bakhshandeh) – April 2023
  - Guided 3rd-year bachelor students through "Gene cloning, primer design, and sequencing data analysis"
- Molecular Genetic lab (Dr. Minai) – May 2021
  - Introduced "Bioinformatic principle for molecular genetic study" to 2nd-year bachelor students

Teaching Assistance

- Molecular Genetics (Dr. Inanloo) – September 2022
  - Guided 2nd-year bachelor students through "Principle of gene cloning and molecular mechanisms of transcription and translation"
- Cellular and Molecular Biology (Dr. Safarian) – February 2022
  - Supplement problem solving for 3rd-year bachelor students

Instruction experiences

- B**ioinformatic course,** Allame Helli School (NODET) **–** Since September 2021
  - Bioinformatic Course with a focus on applied computational biology like genetic data Analysis and Image Processing for cancer detection or color blindness detection
- **Programming Course**, Allame Helli school (NODET), Allame Tabatabie school – Since November 2019
  - Python programming course with a focus on basic knowledge of programming

Data Analyst – February — March 2021

- Back-end data analyst for "Danio.ir" with intelligent problem and solution provision approach

Publications

Poster presentation:

- **Hashemi SA**, Modaresi MS, Sedghi M, Khoddami V; A Computational Approach to Identify the RNA Binding Site and Structural Analysis on E.coli RNase-R by Designing novel Inhibitors; **EMBO Lecture Course Structural biophysics of biomolecular complexes; 4-8 Sep 2023**

- **Hashemi SA**; Purification and method development for RNase R, applications for circular RNA development; **Iranian mRNA Health Conference Dec 2022**

In-progress publications:

- **Hashemi SA**, Modaresi MS, Khoddami V; Characterization of the nicked form of circular RNA by the use of HPLC-DAD, Planned for March 2024
- **Hashemi SA**, Bigdeli MH, Razzaznian M, Khoddami V; Comprehensive design of Ni-NTA wash step, Planned for March 2024, Protein Science

Skill highlights (Lab/Computer skills)

Lab skills

- Chromatography
  - FPLC (ÄKTAexplorer) (Ni-NTA, Ion exchange, SEC, HIC)
  - HPLC (Agilent 1100)
- Assay development
- Characterization methods: PCR (qPCR, Colony PCR and RT-PCR)
- Cloning (Gibson assembly, Digestion)
- Electrophoresis (DNA, RNA, Protein, Western blotting)
- Transformation
- Spectrophotometry
- Primer design
- In vitro transcription
- General lab assignments and group management

Programming skills

- Pandas
- Matplotlib
- Opencv
- Tensorflow
- Numpy
- Tkinter/QT
- OS
- Pygame
- Django
- SQL lite

Honors

- Fund awarded for EMBO lecture course 2023
- Stem-Cell Olympiad – rank 29th among thousands of under graduated students 2022
  - Awarded from Organization of Educational Testing and Ministry of Science
- Founder of the Kharazmi Student Biotech Association and Journal Club 2019
  - Published Trend In Biotechnology (TIB) Journal
- Selected Project at NODET Annual Seminar 2017
  - Develop Neural prosthesis, moved based on EMG
- Selected project at NODET Annual Seminar 2016
  - Robo-cup soccer simulator

References