Reza Zardoshti

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About : As a biochemist, I focus on the **rational design and engineering of therapeutic peptides** and **chimeric proteins**. My research centers on **GPCR signaling**, **structural biology**, and **peptide-based drug discovery**, with a particular emphasis on **GLP-1 receptor agonists** and **ApoMimetic designs**. I am also interested in **biased GPCR agonism**, ligand–receptor interactions, and **structure-based drug design (SBDD)**. Additional interests include **Cryo-EM** and integrative structural biology of GPCR complexes, **protein quality control (PQC)**, and translational research on **GPCR mechanisms in cancer biology.**

Research Experience

September 2024 - Present

Graduate Researcher (M.Sc. Thesis) — GLP-1R Agonist Design & GPCR Pharmacology

1. project : **Rational Peptide Engineering: GLP-1R Agonist Design and GPCR Pharmacology- using site-directed mutagenesis to improve potency and PK/PD properties**

- Introduced targeted mutations into the GLP-1 sequence via site-directed mutagenesis; performed mutagenic PCR and verification (agarose gel; optional: Sanger sequencing).
- Purified GLP-1–derived peptides using chromatography (e.g., RP-HPLC/ion-exchange/size-exclusion) and isoelectric precipitation (pI); assessed purity (optional: by HPLC/LC–MS/SDS-PAGE).
- Structural/biophysical profiling: CD, AFM, DLS, DSC, SAXS, FT-IR, Raman, fluorescence to assess folding, aggregation, and conformational stability; quantified thermal stability (melting transitions via DSC) and chemical stability (urea denaturation curves)
- Cell-based assays: MTT viability and flow cytometry.
- Immunoassays & Protein Analysis: Western blot, ELISA
- Combined structure-based modeling and MD Simulation to prioritize variants and map agonist–receptor interactions.
- In vivo pharmacological and efficacy studies for peptide and GPCR-targeted therapeutics in animal models.

2. Project : **Rational Design and Functional Engineering of a Chimeric Protein Exhibiting GLP-1 Mimetic and ApoMimetic Activities**

- Purification and structural characterization methods were similar to those used for GLP-1 receptor agonists.
- Additionally, in vivo studies and lipid profile assessments were performed to evaluate the ApoMimetic (L4F-like) functionality of the chimeric protein.

Education

Sep 2024–Present · Tehran, Iran

- **M.Sc. Student in Biochemistry**_Institute of Biochemistry and Biophysics (IBB)_University of Tehran

GPA: 3.714/4
(18.39/20)

Sep 2022-Jun 2025. Hamedan, Iran

- **B.Sc. in Biotechnology** - Malayer University

GPA: 3.687/4
(18.27/20)

Skills

- **Protein & Peptide Engineering:**

Chimeric protein design (including GLP-1 receptor agonist analogs), site-directed mutagenesis, therapeutic peptide synthesis (recombinant expression, chemical SPPS), protein purification (RP-HPLC, Ion-Exchange, Affinity, SCE, IEP), and structural characterization (CD, AFM, DLS, SAXS, FT-IR, Raman, DSC, ITC, UV–Vis).

- **Molecular & Cellular Biology:**

Recombinant DNA technology (PCR, qPCR, bacterial/mammalian transformation, plasmid construction), mammalian and bacterial cell culture, immunoassays (MTT viability, flow cytometry, Western blot, ELISA).

- **Bioinformatics & Data Analysis:**

GPCRdb, GPCRmd, IUPHAR Guide to Pharmacology; peptide informatics (PEP-FOLD, GalaxyPepDock, ProtParam, NetNGlyc/NetOGlyc); primer design (SnapGene, Primer3, IDT OligoAnalyzer).Data analysis and visualization using GraphPad Prism, OriginLab, ImageJ/Fiji, SPSS, Adobe Illustrator.

- **Teaching & Academic Communication Skills:**

Experienced in teaching Biology Olympiad topics, including *Biochemistry*, *Biophysics, Cell & Molecular Biology, Genetics, Physiology*, and *Plant Sciences* to high school students preparing for national competitions.

Academic Achievements & Awards

(May 2024)

- **National Entrance Exam (M.Sc.), Iran** — *Biophysics: Rank 12, Biochemistry: Rank 29*

(July 2024)

- **National University Olympiad, Stem Cells & Regenerative Medicine** — *Rank 15*
- **Official Member,** *Iranian Peptide Society (IPS)*

(2013–2019)

- **NODET (SAMPAD)** — National Organization for Development of Exceptional Talents, Grades 7–12
- **Top-ranked student** at the National Organization for Development of Exceptional Talents (NODET, SAMPAD)

(2018-2019)

- **Two-time Phase I qualifier**, Iranian National Student Olympiad in *Biology and Stem Cells & Regenerative Medicine*
- **Olympiad Biology Instructor** — taught advanced biology topics *(cell biology, genetics, physiology, and biochemistry)* to high school students preparing for the National Biology Olympiad.

(2015-2016)

- **Professional Football Player** – National Team of Iran- Football Federation Islamic Republic of Iran (FFIRI)
- **Classical Violinist** – trained and performed in classical violin; experienced in ensemble and solo performance.

Languages

Native: Persian (Farsi)
English: B2+ (Upper Intermediate) – strong academic reading and writing skills.
Currently interested in learning **French** and **German**.

March 2023 - Present

Seminar & Conferences

- Protein Structure and Function
- Iran's 1st Conference on Biochemistry and Biophysics of Vision
- Application of Artificial Intelligence in Drug Discovery
- The 5th Iranian Conference on Peptide and Protein Sciences
- The 6th Conference on Protein and Peptide Science and Technology
- De Novo Design of Therapeutic Orally Bioavailable Small Cyclic Peptides
- G Protein–Coupled Receptors (GPCRs): Structure and Function
- Fundamentals and Advances in Peptide Synthesis Methods

References

May 2024 - present

Reza Yousefi (Supervisor)
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Ali Akbar Moosavi-Movahedi (Co-Supervisor)
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