

ALIREZA NOROOZI

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Peptide and protein binder design; generative models for biological sequences; evaluation with molecular dynamics.

EDUCATION

Koç University, Istanbul

Oct 2025 – Jun 2027 (expected)

MSc in Computational Sciences and Engineering — Presidential Fellowship

GPA: 3.48/4.0

Sharif University of Technology, Tehran

Sep 2020 – Jun 2024

BSc in Computer Engineering — thesis on paratope prediction with protein LMs

GPA: 17.32/20

SELECTED PUBLICATIONS

- **A. Noroozi**, Ö. Keskin, A. Gürsoy, Y. Karami, H. Khakzad. **IDPepDesign: Insertion-Deletion is All Peptide Design Needs**. Preprint, 2026; ML4SM Workshop, NeurIPS 2026.
- **BinderEval**: evaluating designed protein binders with molecular dynamics data and COMPASS. With the DELTA team, Inria Nancy. Preprint, 2026.
- **A. Noroozi**, Ö. Keskin, A. Gürsoy. **AMP-DiT**: Antimicrobial Peptide Design with AMP-classifier Conditional Diffusion Transformers. GenBio Workshop at ICML 2026 (poster). paper
- M. Kalemati, **A. Noroozi**, A. Shahbakhsh et al. ParaAntiProt provides paratope prediction using antibody and protein language models. *Scientific Reports* 14, 29141 (2024).
- J. Reyes, **A. Noroozi**, Y. Xiao, M. Kersten-Oertel. Bridging the Gaps: Imputation of Parkinson's Disease Clinical Assessments With Federated Learning. *IEEE JBHI* (2025).

RESEARCH EXPERIENCE

DELTA Team, Inria Nancy | *Peptide binder design, molecular dynamics*

Jun 2026 – Present

- Supervised by Hamed Khakzad and Yasaman Karami. Built **IDPepDesign**, a target-conditioned insertion-deletion diffusion model (perplexity 17.1 → 11.3; FPD 1.84 → 0.75) with competitive interface quality across 11 benchmark targets.
- Contributed to **BinderEval** and a new release of **COMPASS**, scoring designs from dynamics rather than single-structure confidence. Invited talk at PhD Pizza Time, Inria Nancy.

Koç University | *Generative models for antimicrobial peptides*

Oct 2025 – Present

- Supervised by Prof. Attila Gürsoy and Prof. Özlem Keskin. **AMP-DiT**: classifier-conditioned discrete diffusion generating peptides directly in sequence space; conditioning on one activity predictor generalises to others. Accepted at GenBio @ ICML 2026; submitted to the AMP Challenge.
- **AMP-BindGen**: guided design of peptide inhibitors of the carbapenemases NDM-5 and KPC-3 with a composite interface/activity/toxicity ranking; designs validated experimentally in the lab. Posters at ECCB 2026 and the Koç AI Symposium.
- **TED**: end-to-end seq2seq transformer predicting domain boundaries and CATH ids from sequence, trained on ~186M sequences with LoRA over ESM-2.

310.ai | *AI Engineer in Computational Biology*

Sep 2024 – Oct 2025

- Protein design models, IgG1 binder design, and a transformer generating taxonomy lineages from sequence; addressed token collapse with curriculum learning and embedding regularisation. Built an LLM tool-calling chatbot backend.

Sharif University (OPL) and Concordia University (apLab)

Dec 2022 – Sep 2024

- **ParaAntiProt**: sequence-only paratope prediction by transfer learning from antibody and protein LMs (*Sci. Rep.*, 2024), under Dr. Koohi. Earlier work on MHC-peptide binding with attention models.
- Summer internship under Dr. Kersten-Oertel: federated learning for imputing Parkinson's clinical assessments (*IEEE JBHI*, 2025); implemented PW, FedAvg and FedOpt, with work on a PW convergence proof.

HONORS, SERVICE AND SKILLS

- **Honors**: 2025 Presidential Fellowship, Koç University. 2024 Vector Scholarship for MSc entrance, York University (17,500 CAD, deferred). Ranked 31st of 150k+ in Iran's national university entrance exam (2020). Silver (2019) and Bronze (2018) medals, Iran's National Mathematical Olympiad.
- **Reviewing**: GenBio Workshop, ICML 2026; ML4SM Workshop, NeurIPS 2026.
- **Teaching**: TA, Python Programming (Koç); Head TA, Probability and Statistics (2 semesters) and Compiler Design; projects head, Introduction to Bioinformatics (Sharif).
- **Skills**: Python, C++, PyTorch, Hugging Face, SLURM/multi-GPU training; Boltz, BoltzGen, ADFLIP, RFdiffusion, ESM-2/ESM-C, ProtT5, Biopython, molecular dynamics analysis; Git, Docker, Linux.
- **Languages**: Persian (native); English (fluent, TOEFL 97).