saameh.sanaaee@neuromatchacademy.org
https://saamehsanaaee.github.io
0000-0002-8858-9117
saameh-sanaaee
saamehsanaaee

Saameh Sanaaee

Education

Sept 2019 – Feb 2024 **B.Sc. in Cellular and Molecular Biology**, ***Islamic Azad University of Medical Sciences***, Tehran, Iran
GPA: 16.46/20.00

Research Experience

May 2025 – Present **Independent Researcher**, ***Supported by Neuromatch Academy***, US & Canada – Remote

- Developing deep learning models training on Working Memory task-fMRI BOLD signals.
- Developing parallel "demand detection" neural networks that aim to calculate and predict the processing load on Working Memory from non-WM tasks.

Oct 2024 – May 2025 **Scholar in the Impact Scholars Program**, ***Neuromatch Academy***, Neuromatch Inc., US – Remote, Project Advisor: Raul Rodriguez Cruces

- Developed statistical and deep learning models, trained on and tested with task-fMRI data.
- Designed and created models that elucidate architecture of working memory and act as sensors for task demand during non-working-memory task engagement.
- Member of a team of Impact Scholars selected by Neuromatch Academy to continue preliminary projects after the Computational Neuroscience 2024 Summer Course.

Apr 2023 – July 2024 **Researcher**, ***NeuroTRACT***, Tehran, Iran

- Collaborated as a researcher in a neurobiological research published in the Archives of Gerontology and Geriatrics.
- Was responsible for literature review, writing, editing, and proofreading.

Sept 2019 – Dec 2019 **Laboratory Assistant**, ***Gen Pajuhan Ebne Sina Laboratory***, Tehran, Iran

- Conducted plasmid isolation, PCR, and gel electrophoresis in the molecular lab.

Publications

2025 **Sanaaee, S.**, Mu, B., Tang, C. K.-M., Caslick-Waller, Z. R. G., Li, W., Gao, T., & Rodriguez Cruces, R. (2025). *Parallel GNN-LSTM model predicting working memory involvement during language and emotion processing.* https://doi.org/10.5281/ZENODO.15126505

2024 Farhadieh, M.-E., Mozafar, M., **Sanaaee, S.**, Sodeifi, P., Kousha, K., Zare, Y., Zare, S., Maleki Rad, N., Jamshidi-Goharrizi, F., Allahverdloo, M., Rahimmi, A., Sadeghi, M., Shafie, M., & Mayeli, M. (2024). Polygenic hazard score predicts synaptic and axonal degeneration and cognitive decline in Alzheimer's disease continuum. *Archives of Gerontology and Geriatrics, 127*, 105576. https://doi.org/10.1016/j.archger.2024.105576

2023 Mousavinasab, F., karimi, R., Taheri, S., Ahmadvand, F., **Sanaaee, S.**, Najafi, S., Halvaii, M. S., Haghgoo, A., Zamany, M., Majidpoor, J., Khosravifar, M., Baniasadi, M., Talebi, M., Movafagh, A., Aghaei-Zarch, S. M., Khorram, N., Farnia, P., & Kalhor, K. (2023). Microbiome modulation in inflammatory diseases: Progress to microbiome genetic engineering. *Cancer Cell International, 23*(1), 271. https://doi.org/10.1186/s12935-023-03095-2

2023 Fardi, F., Khasraghi, L. B., Shahbakhti, N., Salami Naseriyan, A., Najafi, S., **Sanaaee, S.**, Alipourfard, I., Zamany, M., Karamipour, S., Jahani, M., Majidpoor, J., Kalhor, K., Talebi, M., & Aghaei-Zarch, S. M. (2023). An interplay between non-coding RNAs and gut microbiota in human health. *Diabetes Research and Clinical Practice, 201*, 110739. https://doi.org/10.1016/j.diabres.2023.110739

Projects

Ongoing **Working Memory Architecture and Demand (WoMAD) Modeling**, *Independent Research Project*, Supported by Impact Scholars Program, Neuromatch Academy
Developing deep neural networks training on task-based fMRI BOLD time series to analyze the architecture of Human Working Memory and its involvement in non-Working Memory tasks.

Presentations

2025 **Working Memory Involvement in Higher Cognition: Insights from fMRI Modeling**, *Impact Scholars Program Seminar Presentations*, Neuromatch Academy, Oral Presentation
https://youtu.be/F5_z5fJTgNs

Skills

Wet Lab **Molecular Laboratory Techniques**

- DNA Extraction, RNA and Plasmid Isolation, cDNA synthesis, Gel Electrophoresis, Western Blotting
- Polymerase Chain Reaction (PCR), Real-Time Polymerase Chain Reaction (qPCR)
- Enzyme-Linked Immunosorbent Assay (ELISA), BCA Protein Assay, Affinity Chromatography
- MTT assay, Direct and indirect MTT assay for scaffolds

Cell and Animal Laboratory Techniques

- Mammalian Cell Culture, Cancer and Stem Cell Culture, 3D Cell Culture, Bacterial Cell Culture
- *in vivo* Tissue Graphting, Bone Marrow and Adipose Tissue Primary Stem Cell Isolation from Laboratory Rodents, Clean, Aseptic, and Sterile Procedures

Histology and Microscopy

- Multi-channel Immunofluorescence (IF) Microscopy, H&E and Special Tissue/Cell Staining, Immunohistochemistry (IHC)
- Karyotyping, Tissue processing, Histopathological Techniques

Dry Lab **Computational Techniques and Tools**

- Primer Design for PCR and qPCR, Next-Generation Sequencing (NGS) Analysis (DNA-seq, RNA-seq, ChIP-seq)
- Machine Learning, Deep Learning, and Computational Modeling for Medical Image/Signal Analysis (task-fMRI, BOLD and other Biosignals), Exploratory Data Analysis (EDA)
- **Software:** GeneRunner, Gene5™, StepOne™, ImageJ, Connectome Workbench, CAD (basics)

Programming

- **Python** (NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn, PyTorch)
- **Bash, Git, R**, HTML, CSS
- Basics of: JavaScript, SQL, MATLAB, Rust

Research **Technical and SciComms**

- Experimental Design, Biostatistical Modeling and Statistical Analysis
- Technical Report Writing, Grant Writing, Scientific Presentation
- Technical and Scientific Editing and Translation

Selected Courses and Certifications

2025 **Time Series Analysis**, *Hasso Plattner Institute (HPI)*, openHPI MOOC, *Taught by Mario Tormo Romero*
`https://open.hpi.de/verify/xibad-pamag-tovel-medak-vafab`

2024 **SciComms Workshop**, *Neuromatch Acadmey*, Virtual Workshop, *Taught by Xaq Pitkow*

2024 **Computational Neuroscience**, *Neuromatch Academy*, Interactive Course and Project
`https://portal.neuromatchacademy.org/certificate/62c18dc2-0fb4-4dce-a403-31eab01b0a0d`

2023 **Tissue Engineering & Regenerative Medicine**, *GenIran Research & Education Laboratory*, In-person Laboratory Training, *Taught by M. Soltani Halvaii*
Grade: 100%

2022 **Cytogenetics & Karyotyping techniques**, *GenIran Research & Education Laboratory*, In-person Laboratory Training, *Taught by GenIran Cell Lab*

2022 **Histopathology Techniques**, *GenIran Research & Education Laboratory*, In-person Laboratory Training, *Taught by GenIran Pathology Team*

References

References are available upon request.