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Shayan Jalali

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ABOUT ME

I'm a Medical Biotechnology master's student in Italy, graduating with a GPA of 110/110 with honors as a top student. My program was fully taught in English, and I'm proficient in academic and scientific English. I completed my thesis and Erasmus+ research at RCSI in Dublin, where I contributed to a mechanistic model of erythropoiesis in AML using Julia, R, and Python. I have over six years of experience across four countries, including working in a sugarcane biotechnology lab, a COVID-19 PCR diagnostics lab, and a regenerative medicine lab at UPO-CAAD using both wet lab and bioinformatics methods. I've also served as a teaching assistant at undergraduate and graduate levels. I've co-authored several scientific papers (some as first author) on transcriptomics, WGCNA, miRNA analysis, and biomarker discovery using microarray, RNA-seq, and single-cell data. My technical skills include Python, R, Julia, Bash, Git, LaTeX (Overleaf), EndNote, Cytoscape, Galaxy, GEO2R, RapidMiner, and machine learning tools for omics and systems biology.

WORK EXPERIENCE

RCSI – Royal College of Surgeons in Ireland, Dublin – Dublin, Ireland

City: Dublin | **Country:** Ireland

Research Intern – Erasmus+ Programme (Computational Hematology and Systems Biology)

[01/03/2025 – 31/08/2025]

Website: https://www.rcsi.com
At RCSI Dublin, under the mentorship of **Dr. Marc Sturrock**, I worked on my Master's thesis through an interdisciplinary project studying how AML disrupts red blood cell production by affecting EBIs and nurse macrophages. My work focused on three key areas: building an ODE-based model in Julia (DifferentialEquations.jl), conducting an in-depth literature review on AML and hematopoiesis, and contributing to scientific writing and team collaboration. I also created toy models for Global Sensitivity Analysis (Sobol, Morris), ran simulations, explored M-CSF treatment strategies, and used LaTeX (Overleaf) and EndNote for manuscript preparation.
Skills & Tools: Julia · R · Python · ODE Modeling · GSA (Sobol, Morris) · Data Visualization · Scientific Writing · Overleaf · EndNote · Bioinformatics · Interdisciplinary Collaboration

Università degli Studi del Piemonte Orientale (UPO) – CAAD Center – theinnovationlab – Novara, Italy

City: Novara | **Country:** Italy

Graduate Teaching Assistant & Research Trainee – Regenerative Medicine and Bioinformatics

[2023 – Current]

Websites:
https://www.uniupo.it
https://caad.uniupo.it

https://www.theinnovationlab.it
At the Università degli Studi del Piemonte Orientale (UPO), within the CAAD Center for translational research and the Innovation Lab, I was involved in three main areas of responsibility: wet lab research, dry lab bioinformatics, and graduate-level tutoring. In the wet lab, I contributed to regenerative medicine projects under **Professors Lia Rimondini** and **Andrea Cochis**, working on tissue engineering, stem cell therapy, and scaffold analysis using techniques such as DNA extraction, PCR, flow cytometry, and immunohistochemistry. In the dry lab, I analyzed biological data using R, Python, and bioinformatics pipelines, applying deep learning and systems biology methods to interpret cellular responses and molecular interactions. As part of the academic team, I supported Master's and PhD students in statistics, mathematics, and coding classes, developed course materials, and led tutorials—some of which are available on my YouTube channel to extend learning beyond the classroom.

Iranian Sugarcane and By-Products Research and Training Institute (ISCRTI) – Ahvaz, Iran

City: Ahvaz | **Country:** Iran

Intern – Plant Biotechnology Laboratory (Sugarcane Biotechnology Research)

[22/09/2020 – 20/03/2021]

Website: https://iscrti.ir
During my undergraduate studies, I completed a research internship at the Iranian Sugarcane and By-Products Research and Training Institute (ISCRTI), focusing on cellular and molecular biology in sugarcane biotechnology. I performed tissue culture and plant propagation techniques, conducted DNA/RNA extraction, PCR, and electrophoresis, and worked on molecular marker and genetic modification projects. I maintained sterile environments using agar-based culture jars, operated lab instruments such as centrifuges, microscopes, and autoclaves, and followed protocols while analyzing experimental data and keeping accurate records. I also participated in lab meetings and developed strong skills in scientific observation and experimental design.

Department of Biotechnology Islamic Azad University (IAU) – Ahvaz, Iran

City: Ahvaz | **Country:** Iran

Undergraduate Teaching Assistant

[2019 – 2020]

Website: https://iau.ir/en
As a Teaching Assistant for **Professors Mojgan Khodadadi** and **MohammadKazem Mohammadi**, I supported undergraduate biotechnology courses by helping plan lessons, organize materials, and guide class activities in a collaborative academic setting. Responsibilities included assisting with curriculum design and teaching plans, supporting classroom instruction and student engagement, organizing group work and academic content, contributing to improved course delivery, and gaining hands-on experience in educational planning and collaborative teaching.

Golestan Hospital – Tehran, Iran

City: Tehran | **Country:** Iran

Laboratory Assistant – PCR Diagnostics (COVID-19 Response)

[2022 – 2023]

Website: https://golestan.ajaums.ac.ir/
During the COVID-19 pandemic, I volunteered at the PCR Laboratory of Golestan Hospital in Tehran, where I contributed to essential diagnostic services during a public health crisis. I assisted with PCR-based testing for COVID-19 samples, supported sample preparation and workflow organization, and helped maintain sterile conditions while adhering to strict biosafety protocols. This role strengthened my understanding of molecular diagnostics and clinical lab operations, enhanced my ability to work under pressure, and gave me valuable experience in teamwork and crisis response within a medical environment.

EDUCATION AND TRAINING

Master's degree

Università del Piemonte Orientale [01/10/2023 – Current]

Address: 28100 Novara (Italy) | **Website:** http://www.uniupo.it/ | **Field(s) of study:** Medical Biotechnologies - Bioinformatics | **Final grade:** Ongoing [score by now: (110 + "with honor") out of 110] | **Level in EQF:** EQF level 7

| **Number of credits:** 120 | **Thesis:** Mathematical Modeling and Sensitivity Analysis of Nurse Macrophage-Driven Erythropoiesis Disruption in Acute Myeloid Leukemia

I contributed to the development of a mechanistic ODE-based model in Julia to study how Acute Myeloid Leukemia (AML) disrupts erythroblastic islands (EBIs) and nurse macrophages. My work included literature review, global sensitivity analysis, parameter optimization, and simulation of M-CSF treatment effects. The project is part of a submitted publication and forms the basis of my Master's thesis.

Bachelor's degree

Azad University [01/10/2016 – 02/03/2021]

City: AHVAZ | **Country:** Iran | **Website:** https://iau.ir/en | **Field(s) of study:** Cellular and Molecular Biology – Biotechnology | **Final grade:** 15.58 out of 20 | **Level in EQF:** EQF level 6 | **Number of credits:** 155

LANGUAGE SKILLS

Mother tongue(s): Persian

Other language(s):

English

LISTENING B2 **READING** B2 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Languages & Tools

python / Julia / R (tidyverse, caret, ggplot2, WGCNA, clusterProfiler, plotly, dplyr, limma) / Platforms: GEO, TCGA , ArrayExpress, UniProt / Modeling Tools: DifferentialEquations.jl (Julia) & Cytoscape / Collaboration & Version Control: Git, GitBash, GitHub

Computer Skills

machine learning / computational biology / biostatistics / Systems Biology

Scientific Writing & Research Skills

Visualization (ggplot2, plotly, Cytoscape) / LaTeX-BibTeX / Reference management software (Zotero, EndNote) / Overl eaf / Mind map with XMind / literature review / write scientific publications

Bioinformatics & Data Analysis

Data Integration / Data Cleaning / Data Normalization / Feature Selection (e.g., Gini Index, Chi-squared, Relief, Information Gain) / Statistical Testing (t-tests, Chi-squared, Correlation Analysis) / Differential Expression Analysis (limma) / Global Sensitivity Analysis (Sobol, Morris, etc) / Parameter Optimization / External Dataset Validation (GEO) / Simulation / Microsoft Excel

Omics Technologies

Pathway Enrichment (Enrichr, Reactome, GSEA) / miRNA Target Analysis (miRTarBase) / Transcriptomics Analysis / Mi croarray / Single-cell RNA-seq / Multi-omics Integration / RNA-seq

Machine Learning & Modeling

Systems Biology & Modeling / ODE Modeling (Ordinary Differential Equations) / Model Tuning & Cross-validation / Predictive Modeling / K-Nearest Neighbors (KNN) / Decision Trees / Logistic Regression / Random Forest / Support Vector Machines (SVM) / Naive Bayes

Lab & Clinical Skills

DNA Extraction / Clinical Data Interpretation / Immunohistochemistry / PCR / Tissue Culture (Plant & Human Cells) / Flow Cytometry

PUBLICATIONS

[2025]
Peritoneal Metastasis Prediction in Gastric Cancer: A Machine Learning Approach
Status: Manuscript in preparation
Authorship: *First author* – Shayan Jalali

Authors: Shayan Jalali

[2025]
Remodeling of nurse macrophages and erythroblastic islands contributes to the loss of bone marrow erythropoiesis in acute myeloid leukemia
Status: *Submitted*
Role: Contributing researcher – Erasmus+ project & Master's thesis

[2025]
Identification of Circulating MicroRNA Biomarker Panels for Early Gastric Cancer Detection Using Integrated Transcriptomic and Machine Learning Approaches
Status: Manuscript in preparation
Role: Contributing researcher

[2023]
Investigating the Use of Nanobodies and the Use of Biotechnology Methods in Cancer Treatment
Status: *Published and presented*
Event: *1st International Congress of Cancer Genomics*, Tehran, Iran
Date: May 3–5, 2023
Role: First author – undergraduate research and presenter

Authors: Shayan Jalali | **Journal Name**: 1st international congress of cancer genomics, Tehran, IRAN | **Publisher**: civilica.com

REFERENCES

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