Monah **Abou Alezz**

Postdoc Researcher | Senior Computational Biologist | Workshop Trainer

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Professional Experience

Freelance Bioinformatician

California - USA

Sepal AI — *August 2025 – Present*

- Designing and implementing custom AI tools and AI-driven analytical workflows to accelerate biomedical research, streamline bioinformatics pipelines, and generate high-quality, publication-ready visualizations.

Postdoc Researcher - Senior Computational Biologist

Milan - Italy

San Raffaele Telethon Institute for Gene Therapy (TIGET) - Bioinformatics Core — *October 2020 – Present*

- Developed and maintained bioinformatic and statistical workflows. Performed data analysis, integration, and visualization. Designed and implemented novel bioinformatics methods. Provided training and support to team members. Contributed to the publication of research findings. Assisted in administering on-premises high-performance computing infrastructure. Supported the research in the following research groups: (i) Retrovirus-host interactions and innate immunity to gene transfer of Prof. Anna Kajaste-Rudnitski, and (ii) Human hematopoietic development and disease modeling of Prof. Andrea Ditadi.

Data Carpentry Lessons Maintainer

California - USA

The Carpentries organization — *September 2021 – September 2023*

- Maintained core lessons for the Data Carpentry program. Reviewed submissions, discussions of change and set standards for the organization as a whole.

PhD Internship

Pavia - Italy

Institute of Molecular Genetics Luigi Luca Cavalli-Sforza, National Research Council — *October 2017 – September 2020*

- Led a bioinformatics research project titled 'Characterization of Genomic and Splicing Features of Long Non-Coding RNAs' within the Computational Biology Unit supervised by Prof. Silvia Bione.

ERASMUS+ Traineeship

Poznan - Poland

Polish Academy of Sciences — *July 2017 – October 2017*

- Contributed to an integrated wet-lab/bioinformatics project to characterize miRNA features and functions. Gained hands-on experience with computational methods and tools for small-RNA analysis under the supervision of Prof. Jorge A. Pinto Paiva.

Teaching Experience

Freelance Trainer

Milan - Italy

BlackBird Training — *October 2025 – Present*

- Freelance trainer for programming and Microsoft Office courses

Associated Partner

Jena - Germany

MiCCrobioTackle - Leibniz Institute for Natural Product Research and Infection Biology — *May 2025 – Present*

- Delivered hands-on training workshops covering introductory and advanced courses in R, Python, Bash and Git to PhD students within the 'MiCCrobioTackle' consortium.

Freelance Trainer

Milan - Italy

Global Horizon Training Center — *April 2025 – Present*

- Trainer of courses of scientific communication, project organisation, public speaking, scientific writing and projects management.

Bionformatics Trainer

Milan - Italy

San Raffaele Telethon Institute of Gene Therapy — *January 2025 – Present*

- Organized and delivered the 'Bioiformatics Pills' program for delivering bioinformatics lessons for PhD students and Postdocs

Summer School Trainer

Berlin - Germany

EMERALD International PhD Program for Medical Doctors — *September 24 2024 – September 25 2024*

- Delivered a 2-day workshop in 'Advanced Techniques for Data Visualisation using R Programming Language'

Bionformatics Trainer

Heidelberg - Germany

German Cancer Research Center (DKFZ)

March 2024 – Present

- Organized and delivered PhD courses in the usage of R programming language for Bioinformatics analyses

Freelance Trainer

Europe

Agile Leaders Training

February 2024 – Present

- Trainer of advanced courses in Bioinformatics, cloud computing, data visualisation, grant writing and scientific communication.

Bionformatics Trainer

Berlin - Germany

Max Delbrück Center for Molecular Medicine (MDC)

January 2023 – Present

- Organized and delivered introductory and advanced workshops for graduate and undergraduate researchers in Genomics data analyses, RNA-seq analysis, AI and Machine Learning, R, RMarkdown, Python, Bash and version control with Git

Software and Data Carpentry Instructor

California - USA

The Carpentries organization

September 2019 – Present

- Delivered 30+ workshops in Europe (University of Milan, Universität Stuttgart,...), USA (Harvard Stem Cell Institute, Genentech, Centers for Disease Control) and Saudi Arabia (Saudi Food and Drug Authority), teaching various foundational coding and data science skills to researchers.

Bioinformatics Tutor

Pavia - Italy

University of Pavia

October 2018 – September 2020

- Delivered practical training in the Bioinformatics course for students of the Masters program in Molecular Biology and Genetics of Prof. Silvia Bione.

Projects

NatChat - Chatting with Nature Journals

Milan - Italy

San Raffaele Hospital

March 2025 – July 2025

- Developing a software for summarising scientific articles from the current issue of Nature Journals.

EARLY - dEsigning an ARtificial inteLligence-based sYstem

Macerata - Italy

Univesity of Macerata

March 2024 – February 2025

- A multidisciplinary project among medical doctors, engineers, lawyers and researchers for designing an AI tool for improving diagnosis, treatment, and monitoring of patients with rare diseases preserving fundamental rights by law.

Education

University of Pavia

Pavia - Italy

PhD in Genetics, Molecular and Cellular Biology

2017 – 2020

- 110/110 cum laude

University of Pavia

Pavia - Italy

Masters Degree in Molecular Biology and Genetics

2015 – 2017

- 110/110 cum laude

Lebanese University

Beirut - Lebanon

Bachelor Degree in Earth and Life Sciences

2012 – 2015

- GPA: 3.6

Almustapha High School

Kasarnaba - Lebanon

High School Diploma in Life Sciences

2010 – 2012

- 13th rank in Lebanon and 5th rank in Bekaa region on all Lebanese students with a score of 17.5/20

Skills

Bioinformatics Workflows

Pipeline development using Snakemake and Nextflow

Omics Data Analysis

Genomics (WGS, WES, ChIP-seq, ATAC-seq, Variant Calling), Transcriptomics (RNA-seq, scRNA-seq, Spatial Transcriptomics), Multi-omics, Proteomics, Metabolomics, Lipidomics tools and workflows.

Machine Learning

Scikit-learn, PyTorch, Pandas, NumPy, Deep Learning (CNNs, ResNet)

Programming Languages

Bash, Python, R, SQL, HTML, Perl, Julia, Java

Markup Languages

LaTeX, Markdown, RMarkdown

Version Control

Git, Github, Gitlab, Bitbucket

Data Visualisation

R, python, Cytoscape, MERSCOPE Visualizer, Adobe Illustrator, Inkscape

Cloud Computing

AWS EC2, AWS S3, AWS Glacier, AliBaba Cloud, Galaxy

Operating Systems

Windows 7/8/10, MacOS, Linux Ubuntu, Linux CentOS

Text Editors

RStudio, VIM, Nano, Sublime Text, Notepad++

Microsoft Office

Excel, Outlook, OneNote, PowerPoint, Word

Awards

Galaxy Community Conference (GCC2021) — *Online*

James Taylor Fellowship — *2021*

- Grant to attend the virtual edition of Galaxy platform annual community gathering

EMBL-EMBO Symposium: The Non-Coding Genome — *Heidelberg - Germany*

Best Poster Prize — *2019*

AIRC Foundation — *Pavia - Italy*

Fellowship Grant — *2018*

INTEROMICS — *Pavia - Italy*

Travel Grant — *2018*

- Grant for attending the EMBO worskhop: From epigenome towards epitranscriptome in cell fate choice

Besta Neurological Institute — *Pavia - Italy*

Fellowship Grant — *2017*

University of Pavia — *Pavia - Italy*

ERASMUS+ internship — *2017*

- A 3-months grant for internship at the Polish Academy of Science, Poznan - Poland

EDiSU Pavia — *Pavia - Italy*

Full Master's Scholarship — *2015*

- Recipient of EDiSU Scholarship for Master's program at the University of Pavia - Italy, covering tuition and living expenses in recognition of academic excellence

Lebanese Ministry of Education — *Beirut - Lebanon*

Scholars Honorary Excellence Award — *2012*

- Granted to the top 20 students in Lebanese senior year official exams

Languages

Arabic

Mother-tongue language

English

C1 level

Italian

B2 level

French

A2 level

Publications

Articles

- Paillet J, Gaudeaux P, Abou Alezz M, Moirangthem RD, Cascione S, Corredera MM, Dolens AC, De Mulder K, Velghe I, Lavaert M, Vandekerckhove B, Noémie R, Corneau A, Sadek H, Rault P, Joshi A, De La Grange P, Staal F, Taghon T, Olivier N, Ditadi A, André I, Soheili TS. Ex vivo-generated lymphoid progenitors encompass both T cell and innate lymphoid cell fates. Front Immunol. 2025. doi: 10.3389/fimmu.2025.1617707
- Costa-Verdera H, Meneghini V, Fitzpatrick Z, Abou Alezz M, Fabyanic E, Hunag X, Dzhashiashvili Y, Ahiya A, Mangiameli E, Valeri E, Crivicich G, Piccolo S, Cuccovillo I, Caccia R, Kai Chan Y, Bertin B, Ronzitti G, Engel EA, Merelli I, Mingozzi F, Gritti A, Kuranda K, Kajaste-Rudnitski A. AAV vectors trigger DNA damage response-dependent pro-in ammatory signalling in human iPSC-derived CNS models and mouse brain. Nat Commun. 2025. doi: 10.1038/s41467-025-58778-3
- El Boustani M, Mouawad N, Abou Alezz M. AP3M2: A key regulator from the nervous system modulates autophagy in colorectal cancer. Tissue and Cell. 2024. doi: 10.1016/j.tice.2024.102593
- Valeri E, Breggion S, Barzaghi F, Abou Alezz M, Crivicich G, Pagani I, Forneris F, Sartirana C, Costantini M, Costi S, Marino A, Chiarotto E, Colavito D, Cimaz R, Merelli I, Vicenzi E, Aiuti A, Kajaste-Rudnitski A. A novel STING variant triggers endothelial toxicity and SAVI disease. J Exp Med. 2024. doi: 10.1084/jem.20232167
- Scarfò R, Randolph LN, Abou Alezz M, El Khoury M, Gersch A, Li Z, Luff S, Tavosanis A, Ramondo GF, Valsoni S, Cascione S, Didelon E, Passerini L, Amodio G, Brandas C, Villa A, Gregori S, Merelli I, Freund JN, Sturgeon C, Tavian M, Ditadi A. CD32 captures committed haemogenic endothelial cells during human embryonic development. Nat Cell Biol. 2024. doi: 10.1038/s41556-024-01403-0
- Valeri E, Unali G, Piras F, Abou Alezz M, Pais G, Benedicenti F, Lidonnici MR, Cuccovillo I, Castiglioni I, Arévalo S, Spinozzi G, Merelli I, Behrendt R, Oo A, Kim B, Landau NR, Ferrari G, Montini E, Kajaste-Rudnitski A. Removal of innate immune barriers allows efficient transduction of quiescent human hematopoietic stem cells. Mol Ther. 2023. doi: 10.1016/j.ymthe.2023.11.020
- Unali G, Crivicich G, Pagani I, Abou Alezz M, Folchini F, Valeri E, Matafora V, Reisz JA, Giordano AMS, Cuccovillo I, Butta GM, Donnici L, D'Alessandro A, De Francesco R, Manganaro L, Cittaro D, Merelli I, Petrillo C, Bachi A, Vicenzi E, Kajaste-Rudnitski A. Interferon-inducible phospholipids govern IFITM3-dependent endosomal antiviral immunity. EMBO J. 2023. doi.org/10.15252/embj.2022112234
- Giordano AMS, Abou Alezz M, Merelli I, Kajaste-Rudnitski A. Protocol to differentiate monolayer human induced pluripotent stem cells into inflammatory responsive astrocytes. STAR Protoc. 2023. doi.org/10.1016/j.xpro.2023.102142
- Giordano AMS, Luciani M*, Gatto F*, Abou Alezz M*, Begh C, Della Volpe L, Migliara A, Valsoni S, Genua M, Dzieciatkowska M, Frati G, Tahraoui-Bories J, Giliani SC, Orcesi S, Fazzi E, Ostuni R, D'Alessandro A, Di Micco R, Merelli I, Lombardo A, Reijns MAM, Gromak N, Gritti A, Kajaste-Rudnitski A. DNA damage contributes to neurotoxic inflammation in Aicardi-Gouti res syndrome astrocytes. J Exp Med. 2022. doi.org/10.1084/jem.20211121
- Abou Alezz M, Celli L, Belotti G, Lisa A and Bione S. 2020. GC-AG Introns Features in Long Non-coding and Protein-Coding Genes Suggest Their Role in Gene Expression Regulation. Front. Genet. 11:488. doi:10.3389/fgene.2020.00488

Software

- Abou Alezz M. 2025. NatChat: Chatting with Nature Journals Current Issue using a local Language Model. R-package version 1.1.0. https://monahton.github.io/NatChat. doi:10.5281/zenodo.15482472
- Abou Alezz M. 2025. GencoDymo2: Comprehensive Analysis of GENCODE Annotations and Splice Site Motifs. R-package version 1.0.1. https://github.com/monahton/GencoDymo2. doi:10.5281/zenodo.15302316
- Abou Alezz M, Salviati L, Alfieri R, Bione S. 2020. GencoDymo: Data Extraction and Manipulation from the GENCODE Database. R-package version 0.2.1. https://github.com/monahton/GencoDymo. doi:10.5281/zenodo.3605995

Book Chapters

- Abou Alezz M. 2024. Artificial Intelligence Bioinformatics Systems for the Diagnosis and Treatment of Rare Diseases: Integration and Implementation. In: Vulpiani G (ed.) Diritto, Intelligenza Artificiale e Medicina. Un dialogo interdisciplinare. Napoli: Edizioni Scientifiche Italiane. ISBN: 978-88-495-5722-0.