Maroun BOU SLEIMAN's Curriculum Vitae

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PROFESSIONAL EXPERIENCE

Research Associate

Faculty of Medicine, University of Geneva

December 2025 - present

- **Translational Human Genetics:** Working on the genetics of obesity-related disorders, leveraging large-scale human biological data to map genotype-phenotype interactions.
- **Data Strategy & Infrastructure:** Developing interoperable, cloud-native analysis workflows for genome-wide association studies (GWAS) and rare variant analysis, ensuring robust quality control and adherence to FAIR data principles.
- **Team Science**: Contributing to a collaborative research environment by integrating clinical patient data into computational pipelines and facilitating code/data sharing across the unit.

Visiting Researcher, Reasoning & Explainable AI Group

Idiap Research Institute | Martigny, Switzerland

November 2024 – April 2025

- Conducted collaborative research to enhance drug discovery pipelines using cutting-edge AI (LLMs, novel transformer architectures, agentic AI) and systems genetics.
- Focused on applications in cancer biomarker discovery (Nexus-Omics project using multi-modal transformers) and medical/clinical genetics (agentic AI for variant interpretation).
- Initiated and fostered collaborations with industrial partners in the medical genetics sector.

Voluntary Sabbatical

Lausanne, Switzerland

January 2024 – October 2024

- Provided personal family support.
- Undertook professional development in intellectual property, project management (PMP methodologies), and advanced communication strategies.
- Deepened technical expertise in AI/ML (LLMs, pLLMs, single-cell foundation models, Langchain, n8n, RAG) and conceptualized systems genetics-inspired solutions to bridge the 'translational valley of death' in drug development.

Senior Scientific Program Manager

Institute of Bioengineering, École Polytechnique Fédérale de Lausanne (EPFL) | Lausanne, Switzerland

May 2018 – December 2023

- Led and managed systems genetics and multi-omics research projects in model organisms (flies, worms, mice) and humans, focusing on fundamental and translational studies in metabolism and aging.

- Leadership: Contributed to strategic planning, resource allocation, and crisis management for a unit of 30+ scientists; directed bioinformatics efforts for a 5-10 member team.
- Mentoring & Teaching: Mentored over 20 students (BSc, MSc, PhD) and postdoctoral fellows, leading to successful project completions. Organized workshops on systems genetics and data science.
- Project Management: Co-conceived and managed large-scale projects such as the Healthspan Diversity Project and a multi-year collaboration with Janssen's Cardiovascular and Metabolism team for disease target identification. Coordinated multi-stakeholder initiatives like SysGen (Swiss Data Science Center), GraphNEx (explainable AI), and SenoTarg (senolytics).
- Fundraising: Actively contributed to securing over CHF 10 million in research funds from public (SNF, ERC, CHIST-ERA) and private (industrial) entities through grant writing and strategic planning.
- Publications: Co-authored approximately 30 publications, including landmark first-author studies on aging and longevity (*Science* 2022, *Cell Reports* 2020).
- Entrepreneurship: Co-conceptualized a spin-off company, defining its scientific and business strategy, and participated in fundraising efforts.
- Data Science & IT: Established data strategies and IT infrastructure (HPC, cloud, data access for UK Biobank, GTEx via dbGaP) for a 30+ member lab. Founding member of the EPFL Data Champions Community, promoting FAIR principles and open science.
- Scientific Representation: Represented research at international conferences and in media interviews.

Postdoctoral Researcher

Institute of Bioengineering, EPFL | Lausanne, Switzerland

October 2016 – April 2018

- Conducted research in the Auwerx Lab on the systems genetics of metabolism and aging in mice and humans.
- Promoted to Researcher (permanent contract) in 2018 based on performance and contributions.

Doctoral Assistant

Global Health Institute & Institute of Bioengineering, EPFL | Lausanne, Switzerland

May 2012 – September 2016

- PhD research co-directed by Prof. Bruno Lemaitre (Immunology) and Prof. Bart Deplancke (Systems Genetics).
- Focused on systems genetics of host-pathogen interactions, generating and analyzing multi-omics data (RNA-seq, GWAS, in vivo experiments in *Drosophila*).
- Authored three first-author manuscripts (*Nature Communications*, *Genome Biology*).
- Contributed to securing an ANR-SNF collaborative grant (ANR-15-CE14-0028-01).
- Assisted in teaching the Genomics and Bioinformatics graduate course and mentored the EPFL iGEM team (Gold Medal, 2014 Boston competition).

Research Intern (Master's Thesis)

Global Health Institute, EPFL | Lausanne, Switzerland

June 2011 – November 2011

- Piloted a collaborative systems genetics project between the Lemaitre and Deplancke labs, investigating *Drosophila* immunity.
- The project and its initial findings formed the basis for a successful SNF ProDoc grant (141762) funding subsequent PhD research.

EDUCATION

Doctor of Philosophy (PhD) in Molecular Life Sciences

École Polytechnique Fédérale de Lausanne (EPFL) | Lausanne, Switzerland

May 2012 – September 2016

- Thesis: 'The *Drosophila* gut response to infection: a systems approach'.
- Successfully completed 12 ECTS of doctoral courses including 'Landmark Papers in Cancer and Infection', 'Lectures in Life Sciences', and practical lab rotations.

Master of Science (MSc) in Biology

American University of Beirut | Beirut, Lebanon

September 2009 – February 2012

- Thesis: 'Identifying Polymorphisms Underlying the Ability to Survive Infection: a Quantitative Genetics and Evolutionary Approach in *Drosophila melanogaster*'.
- GPA: 89.42/100 (Equivalent GPA: 3.96/4.0).

Bachelor of Science (BSc) in Biology

American University of Beirut | Beirut, Lebanon

September 2006 – June 2009

- GPA: 82.17/100 (Equivalent GPA: 3.38/4.0).
- Good Standing.

SKILLS

- **Scientific Domains:** Genomics, Systems Genetics (Systems Biology & Quantitative Genetics), Genetic Epidemiology, Population Genetics, Translational Research, Target Identification and Validation (TIDVal).
- **Therapeutic Areas:** Aging, Metabolic Diseases, Cardiovascular Disease, Immunology, Oncology.
- **Data Science & AI:** Data Management (FAIR principles, open science, SOPs), SQL, Vector Stores (ChromaDB, Milvus), Property Graphs (Neo4j), Ontologies & Controlled Vocabularies (OWL, GO), R (Advanced), Python (Working Knowledge), Perl (Basic), JavaScript (Basic), Bash Scripting, Statistical Analysis, Machine Learning, Data Visualization & Dissemination, Interactive Dashboards (Shiny), Reproducible Pipelines (Version Control, Docker, Workflows), AI Frameworks (PyTorch, TensorFlow), LLM Orchestration (LangChain, LlamaIndex, n8n), Prompt Design, Retrieval Augmented Generation (RAG), AI Agents, Model-View-Controller (MVC) pattern.
- **Bioinformatics:** Sequence Analysis Tools & Databases (BLAST, motif analysis), High-Throughput Sequencing (HTS) data analysis, Variant Analysis, Multi-Omics (Transcriptomics, DNA & Histone Epigenetics, Proteomics, Metabolomics, Lipidomics), Quality Control, Statistical Genetics (QTL mapping, GWAS, Mendelian Randomization), Cross-Species Integration, Authorized Access to Human Data (UK Biobank, GTEx, TCGA).
- **Laboratory Techniques:** Experimental Design, *Drosophila* Genetics, Animal Experimentation (mice, flies, worms), Molecular Biology, Microbiology, Sample Preparation for Multi-Omics Experiments, Laboratory Information Management Systems (LIMS).
- **General IT:** Windows, Linux (CentOS, Ubuntu), MS Office Suite, LaTeX, Markdown, Adobe Illustrator & Photoshop, Storage (NAS) & Compute Server Management, Cloud Computing (Google Cloud Platform), High-Performance Computing (LSF, SLURM), Docker Container Development & Deployment.

- **Soft Skills:** Strategic Thinking, Program Management, Project Management (PMP fundamentals), Leadership, Mentoring & Supervision, Teamwork & Collaboration (cross-functional, international), Problem Solving, Conflict Resolution, Creativity & Innovation, Public Speaking, Media Outreach, Grant Writing, Scientific Writing & Editing.

LANGUAGES

- **English:** Proficient (C2)
- **French:** Intermediate (B2)
- **Lebanese Arabic:** Mother Tongue

PUBLICATIONS

A comprehensive list of over 30 peer-reviewed publications is available on Google Scholar. Key first-author and significant contributions include:

- **Bou Sleiman, M.**, Roy, S., Gao, A.W., Sadler, M.C., von Alvensleben, G.V.G., Li, H., Sen, S., Harrison, D.E., Nelson, J.F., Strong, R., Miller, R.A., Kutalik, Z., Williams, R.W., & Auwerx, J. (2022). Sex- and age-dependent genetics of longevity in a heterogeneous mouse population. *Science*, 377, eabo3191.
- **Bou Sleiman, M.**, Jha, P., Houtkooper, R., Williams, R.W., Wang, X., & Auwerx, J. (2020). The Gene-Regulatory Footprint of Aging Highlights Conserved Central Regulators. *Cell Reports*, 32.
- **Bou Sleiman, M.**, Frochaux, M.V., Andreani, T., Osman, D., Guigo, R., & Deplancke, B. (2020). Enteric infection induces Lark-mediated intron retention at the 5' end of Drosophila genes. *Genome Biology*, 21, 4.
- **Bou Sleiman, M.**, Osman, D., Massouras, A., Hoffmann, A.A., Lemaitre, B., & Deplancke, B. (2015). Genetic, molecular and physiological basis of variation in Drosophila gut immunocompetence. *Nature Communications*, 6.
- Li, X., Morel, J.-D., Sulc, J., Masi, A.D., Laloux, A., Benegiamo, G., Poisson, J., Liu, Y., Alvensleben, G.V.G.V., Gao, A.W., **Bou Sleiman, M.**, & Auwerx, J. (2024). Systems genetics of metabolic health in the BXD mouse genetic reference population. *Cell Systems*, 15, 497-509.e3. (Co-corresponding author role implicitly via work certificate reference 'Li et al., eLife 2023' - actual citation is Cell Systems 2024)
- Gao, A.W., Alam, G.E., Zhu, Y., Li, W., Sulc, J., Li, X., Katsyuba, E., Li, T.Y., Overmyer, K.A., Laloux, A., Mouchiroud, L., **Bou Sleiman, M.**, Cornaglia, M., Morel, J.-D., Houtkooper, R.H., Coon, J.J., & Auwerx, J. (2024). High-content phenotypic analysis of a C. elegans recombinant inbred population identifies genetic and molecular regulators of lifespan. *Cell Reports*, 43, 114836.
- Choi, S., Kang, J.-G., Tran, Y.T.H., Jeong, S.-H., Park, K.-Y., Shin, H., Kim, Y.H., Park, M., Nahmgoong, H., Seol, T., Jeon, H., Kim, Y., Park, S., Kim, H., Kim, M.-S., Li, X., **Bou Sleiman, M.**, Lee, E., Choi, J., Eisenbarth, D., Lee, S.H., Cho, S., Moore, D.D., Auwerx, J., Kim, I.-Y., Kim, J.B., Park, J.-E., Lim, D.-S., & Suh, J.M. (2024). Hippo-YAP/TAZ signalling coordinates adipose plasticity and energy balance by uncoupling leptin expression from fat mass. *Nature Metabolism*, 6, 847–860.
- Park, A., Kim, K., Park, I., Lee, S.H., Park, K.-Y., Jung, M., Li, X., **Bou Sleiman, M.**, Lee, S.J., Kim, D.-S., Kim, J., Lim, D.-S., Woo, E.-J., Lee, E.W., Han, B.S., Oh, K.-J., Lee, S.C., Auwerx, J., Mun, J.Y., Rhee, H.-W., Kim, W.K., Bae, K.-H., & Suh, J.M. (2023). Mitochondrial matrix protein LETM1D maintains thermogenic capacity of brown adipose tissue in male mice. *Nature Communications*, 14, 3746.
- Li, X., Morel, J.-D., Benegiamo, G., Poisson, J., Bachmann, B., Rapin, A., Willams, E., Perino, A., Schoonjans, K., **Bou Sleiman, M.**, & Auwerx, J. (2023). Genetic and dietary modulators of the inflammatory response in the gastro-intestinal tract of the BXD mouse genetic reference population. *eLife*, 12, e87569.

(Full list of publications available via Google Scholar link above)

RESEARCH FUNDING & GRANTS

- Significantly contributed to the conceptualization, drafting, and post-funding implementation of research grants from diverse sources including the Swiss National Science Foundation (SNF ProDoc, Sinergia, Project grants), ANR-SNF, ERC Advanced Grant, CHIST-ERA, Sino-Swiss Science and Technology Cooperation (SSSTC), Swiss Data Science Center (SDSC), and Janssen Pharmaceuticals.
- Examples include: SNF ProDoc (141762), ANR-SNF DGRPMutualism (ANR-15-CE14-0028-01), ERC-AdG UPRmt (787702), SDSC SysGen, Janssen collaboration, CHIST-ERA GraphNEx, SNF Sinergia SenoTarg (202302), ANR-SNF STATmiNADage (205514), SSSTC MitoSignalEpi (IZLCZ0_206069), SNF Project (214826).

AWARDS AND RECOGNITION

- Nominated for EPFL's Outstanding Commitment Award (2022).
- Mentored EPFL iGEM team to Gold Medal at the 2014 international competition in Boston.