Serge Nader, PhD

Academic & Research Expertise · Project Management · Infrastructure Development

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Professional Experience

Founder, Chem3D
Edmonton, Canada

University of Alberta, Faculty of Science
Jun. 2023 - Oct. 2025

- Secured **$48,000** in funding and established a 3D-printing service focused on research and education. Meet the team.
- Recruited, supervised, and coordinated engineering staff, overseeing daily operations, task allocation, and service delivery.
- Prepared financial reports, progress documentation, and funding-related materials for senior leadership and granting bodies.
- Supported 35+ research groups across seven university departments and worked with laboratories abroad.
- Prioritized cross-faculty engagement through presentations, outreach, and structured communication channels.
- Connected technical and financial activities into an operational strategy that supported long-term sustainability of the service.
- Delivered measurable institutional impact, achieving **$25,000** in financial savings in the first year.

Postdoctoral fellowship
Edmonton, Canada

University of Alberta, Gunning-Lemieux Chemistry Centre, Mansy Group
Oct. 2019 - Oct. 2023

Research Activities:

- Led experimental research on aerosols, protocells and protometabolism to explore mechanisms central to the origins of life.
- Designed and built experimental setups for aerosol generation, handling, and analysis.
- Generated the first experimental evidence that aqueous aerosols can transform into vesicles.
- Synthesized peptides and carried out experiments under anaerobic conditions.
- Developed user friendly computational tools to support rapid and efficient data analysis.
- Presented research findings to interdisciplinary audiences through group meetings, seminars, and scientific conferences.
- Supervised and mentored postdoctoral fellows, undergraduate students, graduate students and visiting students.
- Published and co-authored peer-reviewed articles based on experimental and collaborative research.

Laboratory Management:

- Led the setup of a new research laboratory following Prof. Mansy's arrival at the University of Alberta, supporting the implementation of a $2.5M start-up budget.
- Coordinated laboratory logistics, competitive bid procedures, procurement planning, equipment acquisition, and supply management for a newly established research group.
- Managed instrument purchase, installation, and user training for specialized laboratory equipment.
- Formalized laboratory safety and compliance documentation, including SOPs, hazard assessments, and waste management.
- Installed and maintained critical infrastructure, coordinated equipment access, and organized research environments.
- Assembled AtmosBags, optimized Schlenk lines and installed an inert atmosphere glove box system.
- Designed and 3D-printed laboratory accessories to streamline workflow.

Doctoral thesis
Grenoble, France

French Atomic Energy Commission, Department of Fundamental Research
Oct. 2015 - Nov. 2018

- Purified Fur proteins and performed structural characterization using MALLS, XAFS, SAXS, and crystallization approaches.
- Developed in-house scripts and applied molecular dynamics simulations to identify critical amino acid residues.
- Proposed structural and functional models based on a coupled theoretical and experimental approach.

Education

Ph.D. in Structural Biology
Grenoble, France

University of Grenoble Alpes, Chemistry and Biology of Metals Laboratory
2015 - 2018

M.Sc. in Structures of Macromolecules and Functional Genomics
Mar Roukoz, Lebanon

Saint Joseph University of Beirut, Faculty of Sciences
2013 - 2015

B.Sc. in Life and Earth Sciences - Biochemistry
Mar Roukoz, Lebanon

Saint Joseph University of Beirut, Faculty of Sciences
2010 - 2013

Teaching Experience

Doctoral Teaching Fellow, M.Sc. Drug Sciences and Biotechnology — *Grenoble, France*
Faculty of Medicine and Pharmacy of Grenoble — *2016 - 2018*

- Completed a specialized training program focused on university level pedagogy.
- Obtained a Higher Education Teaching Certification.
- Taught a Protein Engineering laboratory course for groups of 20 M.Sc. students in Biotechnology.
- Designed examination materials and assessed student performance through written exams and oral presentations.
- Delivered practical training in mutant and wild-type DNA sequence production, bacterial transformation, protein expression, protein purification, and activity assays.

Grants and Awards

Campus Sustainability Major Grant — *University of Alberta*
Awarded **$48,000** by the Energy & Climate Action office to lead the Faculty of Science project "Sustainable procurement of laboratory accessories through 3D-printing". — *Jun. 2023*

Campus Sustainability Leaders Award — *University of Alberta*
Recognized by the University of Alberta Sustainability Council, read the article. — *Apr. 2023*

Service to the community

Fossil preparation — *Edmonton, Canada*
University of Alberta, Dino Lab — *Oct. 2022 - Apr. 2023*
Prepared fossil specimens uncovered from Dinosaur Provincial Park (Alberta, Canada) and joined a local excavation field party. Featured in Volunteer Spotlights.

Bilingual judges - Team leader — *Edmonton, Canada*
Canada-Wide Science Fair | Expo-Sciences PanCanadienne — *May. 2023*
Assessed and interviewed student science projects in English and French, and coordinated the adjudication of special awards.

Laboratory council member — *Grenoble, France*
Chemistry and Biology of Metals Laboratory — *Oct. 2015 - Sep. 2018*
Represented non permanent staff, PhD students, and postdoctoral fellows in laboratory council meetings, communicated community concerns to laboratory leadership, and created websites and social media pages for the laboratory.

University board member — *Beirut, Lebanon*
Saint Joseph University of Beirut — *Oct. 2013 - Jul. 2015*
Represented the Science and Technology Campus at the general assemblies of the Saint Joseph University Board, communicated student concerns to university leadership, and proposed solutions to issues affecting students across campus.

Skills

Aerosols	Aerosol generation and handling. Experience with optical particle counters, custom and commercial nebulizers, microfluidics pressure regulators, and gas mass flow controllers. Design of scientific glassware and custom experimental apparatus.
Lipids & Peptides	Liposome and vesicle preparation; fluorescence-based assays; peptide synthesis; anaerobic experiments. Epifluorescence, confocal and transmission electron microscopy; LC-MS; and UV-Vis spectrophotometry.
Structural Biology	Protein expression, purification, and crystallization; molecular dynamics simulations and molecular docking. Synchrotron-based techniques, including XAFS and SAXS.
Programming	Python, AWK, Bash/Shell scripting, LaTeX, Visual Basic for Applications (VBA).
3D Design/Printing	Autodesk Fusion 360, Cura, Microsoft 3D Builder; UltiMaker and Prusa 3D-printing ecosystems.
Languages	English (fluent), French (fluent), Arabic (fluent), and Italian (novice).

Presentations

Jun. 2024	University of Alberta Campus Sustainability Mixer (Invited Seminar)	*Edmonton, Canada*
Nov. 2023	Laboratoire de Chimie et Biologie de Métaux (Invited Seminar)	*Grenoble, France*
Nov. 2023	Conférence Nationale d'Exobiologie (Oral Communication)	*Grenoble, France*
Oct. 2023	Origins of Life Donostia Meeting (Poster)	*Donostia, Spain*
Nov. 2022	Space Exploration Symposium (Oral Communication)	*Edmonton, Canada*
Jun. 2022	Molecular Origins of Life & Emergence of Life Forum (Poster)	*Munich, Germany*

Publications

11 - D. Rossetto, S. Nader, C. Kufner, G. Lozano, L. Cerofolini, M. Fragai, V. Martin-Diaconescu, B. Zambelli, S. Ciurli, G. Guella, R. Szabla, D. Sasselov, S. S. Mansy, **Chemical Science**, "Preferential survival of prebiotic metallopeptides in the presence of ultraviolet light". DOI: 10.1039/D5SC02170G **2025**

10 - S. Nader, A. Baccouche, F. Connolly, M. Abou-Ghanem, S.A. Styler, J. Lewis, D. Pink, S.S. Mansy, **ACS Earth & Space Chemistry**, "Model atmospheric aerosols convert to cell-sized vesicles upon entry into lipid coated aqueous solution". DOI: 10.1021/acsearthspacechem.2c00328 **2023**

9 - S. Nader, L. Sebastianelli, S.S. Mansy, **Philosophical Transactions of the Royal Society A**, "Protometabolism as out-of-equilibrium chemistry". DOI: 10.1098/rsta.2020.0423 **2022**

8 - L. Valer, D. Rossetto, S. Scintilla, Y.J. Hu, A. Tomar, S. Nader, I. Betinol, S.S. Mansy, **Canadian Journal of Chemistry**, "Methods to identify and characterize iron-sulfur oligopeptides in water". DOI: 10.1139/cjc-2021-0237 **2022**

7 - M. Ha, S. Nader, S. Pawsey, J. Struppe, M. Monette, S.S. Mansy, J. Boekhoven, V.K. Michaelis, **The Journal of Physical Chemistry B**, "Racing Towards Fast and Effective 17O Isotopic Labeling and NMR Spectroscopy of N-formyl-MLF-OH and Associated Building Blocks". DOI: 10.1021/acs.jpcb.1c07397 **2021**

6 - I. Betinol, S. Nader, S.S. Mansy, **Analytical Biochemistry**, "Spectral decomposition of iron-sulfur clusters". DOI: 10.1016/j.ab.2021.114269; **Fit-FeS software**: DOI: 10.5281/zenodo.4765989 **2021**

5 - S. Basak, S. Nader, S.S. Mansy, **JACS Au**, "Protometabolic Reduction of NAD+ with α-Keto Acids". DOI: 10.1021/jacsau.0c00124 **2021**

4 - S. Nader, J. Pérard, P. Carpentier, L. Arnaud, S. Crouzy, I. Michaud-Soret, **Biometals**, "New insights into the tetrameric family of the Fur metalloregulators". DOI: 10.1007/s10534-019-00201-8 **2019**

3 - S. Nader, **Université Grenoble Alpes**, "Structural studies on inhibition mechanisms, oligomerization and DNA binding of the transcription regulator Fur : from *in silico* simulations to *in vitro* biological assays". `https://tel.archives-ouvertes.fr/tel-02050234` **2018**

2 - J. Pérard, S. Nader, M. Levert, L. Arnaud, P. Carpentier, C. Siebert, F. Blanquet, C. Cavazza, P. Renesto, D. Schneider, M. Maurin, J. Coves, S. Crouzy, I. Michaud-Soret, **Communications Biology**, "Structural and functional studies of the metalloregulator Fur identify a promoter-binding mechanism and role in Francisella tularensis virulence". DOI: 10.1038/s42003-018-0095-6 **2018**

1 - K. Kwapien, M. Damergi, S. Nader, L. El Khoury, Z. Hobaika, R. Maroun, J.P. Piquemal, L. Gavara, D. Berthomieu, J.F. Hernandez, N. Gresh, **The journal of physical chemistry B**, "Calibration of 1,2,4-Triazole-3-Thione, an Original Zn-Binding Group of Metallo-β-Lactamase Inhibitors. Validation of a Polarizable MM/MD Potential by Quantum Chemistry". DOI: 10.1021/acs.jpcb.7b01053 **2017**

Additional Training and Certificates

2022	**Naloxone training,** University of Alberta.	*Edmonton, Canada*
2019	**Transportation of Dangerous Goods,** University of Alberta.	*Edmonton, Canada*
2018	**Label Recherche et Enseignement Supérieur,** University of Grenoble Alpes.	*Grenoble, France*
2017	**Doctoriales ®,** Training in financial forecasting for science and innovation projects.	*Autrans, France*
2016	**FAME+,** Control and management of synchrotron beam-lines experiments.	*Grenoble, France*

Professional affiliations and memberships

- European Astrobiology Network Association
- Origin of Life Early-career Network
- Société Française d'Exobiologie