

University education

2012.09–2016.03 | University College London (UCL) | PhD | Evolutionary Biology

- Research topics: major evolutionary transitions, bioinformatics, bioenergetics, divergence of archaea and bacteria, evolution of cell membranes and proteins, origins of life and eukaryotes.
- Supervisors: Prof. Nick Lane & Prof. Andrew Pomiankowski.

2011.09–2012.09 | UCL | MRes | Mathematical Modelling of Biological Systems

- Result: Distinction. Research projects: whole-genome phylogenetic analysis of fission yeasts, evolution of sex and horizontal gene transfer, molecular modelling of membrane proteins.

2007.03–2011.04 | Central University of Venezuela (UCV) | MSc(Research) | Computer Science

- Specialisation: Software Engineering.
- Project: "Development of an Integrative Environment for Computational Chemistry". Relevant courses taken: Biochemistry, Statistics, Medical Image Processing, Software Engineering, Human-Computer Interaction, Linear Programming. Final grade average: 86.3%.

1997.11–2003.10 | UCV | Licentiate (Research BSc) | Chemistry

- 5-year research-based degree.
- Graduation research thesis: inhibition of membrane-bound gluconeogenesis enzyme glucose-6-phosphatase by bioactive compounds extracted from Amazonian plants.
- Relevant electives: Biochemistry, Cell Biology, Spectroscopy, Quantum Chemistry, Organic Compound Synthesis, Advanced Inorganic Chemistry, Advanced Organic Chemistry, Evolution.
- Electives audited: Population Genetics, Population Ecology, Animal Behaviour, Molecular Genetics.

Research appointments

2019.08–present | American Museum of Natural History, New York City | Fellow

- Selected as a Scholar in Bioinformatics & Computational Biology to develop independent research projects on the evolution of cell membranes and the origin of eukaryotes.

2019.01–2019.07 | Institute for Advanced Study, Berlin | Fellow

- Selected to join a cohort of fellows from a wide variety of disciplines, including historians, political scientists, physical scientists, life scientists, and artists.
- Projects: evolution of eukaryotes and providing high-quality education for excluded communities worldwide.

2016.03–2018.10 | Ludwig-Maximilian University of Munich (LMU) | Postdoctoral Fellow

- Successfully applied for funding from the European Molecular Biology Organization (EMBO) and from the Simons Foundation to work as a PostDoc at Prof. Dieter Braun's Systems Biophysics lab.
- Original independent research projects consisted of studying the origin of life's first molecules.

2016.11–2017.05 | RIKEN, Tokyo | JSPS Short-Term Postdoctoral Research Fellow

- Studied CO₂ fixation, bio-geochemical catalysis, and bio-mimetic systems, during a 6-month full fellowship obtained competitively from the Japanese Society for the Promotion of Science.

2010.05–2011.09 | Venezuelan Institute of Scientific Investigations | Research Associate

- Based at the Laboratory of Computational Chemistry. Duties included the development of a set of user interfaces to integrate several computational-chemistry packages under a single application, assisting in research, and developing educational programmes in a trans-national collaboration.

2005.01–2009.12 | Ministry of Health – Venezuela | Chemist (researcher)

- Analyzed natural products and industry documents. Consulted for the World Health Organization.

Teaching experience

2018.06–2018.12 | Science Corps | Education-Advancement Special Fellow

- Selected competitively to promote scientific training in places where science is underdeveloped.
- Developed teaching programs in Chemistry, Biology and Computer Science for a school in the Philippines, and a website (eduversum.org) to share materials with educators worldwide.

- Separately, worked with an organization in the Indian Himalayas (aavishkaar-palampur.org), training teachers in rural communities and developing demonstrations in Genetics and Evolution.
- 2015.01–2015.04 | UCL | Postgraduate Teaching Assistant - Evolutionary Genetics**
- Assisted at practicals and small-group tutorials on diverse topics on evolutionary genetics.
- 2014.01–2015.04 | UCL | Postgraduate Teaching Assistant - Sex, Genes and Evolution**
- Led small-group discussions for Prof. Andrew Pomiankowski, for 2nd-year Biology students.
- 2013.09–2015.12 | UCL | Postgraduate Teaching Assistant - Computational Biology**
- Assisted at large-group practicals on computational molecular biology, modelling and evolution.
- 2013.01–2015.04 | UCL | Postgraduate Teaching Assistant - Energy and Evolution**
- Led small-group discussions for Prof. Nick Lane's course on Energy and Evolution, versing on the major geological and biological transitions in Earth's history, and how they relate to each other.
- 2011.11–2015.02 | UCL-Information Services Division | Staff & Student Trainer and Assistant**
- Trainer and assistant in several courses on applied statistics, computer programming, and others.
- 2004.10–2011.09 | UCV | Lecturer - General Chemistry**
- Appointed to lecture both theory and laboratory courses of General Chemistry for first-year undergraduate students of Physics, Chemistry and Biology, at Venezuela's leading university.
 - Responding to the changing needs of the increasingly deteriorating Venezuelan economy, re-wrote several of the theory and laboratory guidebooks to use cheaper, less and fewer materials.
 - Created multimedia tools for learning chemistry, including online video lectures (at youtube.com/quimicaucv, in Spanish) that have received over 170,000 visits worldwide.
- 2010.02–2010.07 | UCV | Lecturer - Biochemistry**
- Lectured general Biochemistry for advanced undergraduate students of the School of Chemistry.
- 2009.09–2010.02 | UCV | Postgraduate Teaching Assistant - Evolution**
- Led journal discussions and practical tutorials with advanced undergraduate students. Topics varied from the origin of life to the evolution of ecosystems and population ecology.
- 2000.03–2004.04 | UCV | Undergraduate Teaching Assistant - General Chemistry**
- Assisted on laboratory courses, guiding students to understand the phenomena observed.

Peer-reviewed publications

-
- **V Sojo**. Why the lipid divide? Membrane proteins as drivers of the split between the lipids of the three domains of life. *BioEssays* 41(5): 1800251. ***Journal cover***
 - **V Sojo**, A Ohno, S McGlynn, Y Yamada, R Nakamura. Microfluidic study of carbon fixation at the origin of life under alkaline-hydrothermal-vent conditions. *Life* 9: 16 (2019).
 - T West, **V Sojo**, A Pomiankowski, N Lane. The origin of heredity in protocells. *Phil. Trans. R. Soc. Lond. B.* 372(1735): 20160419 (2017).
 - FM Möller, F Kriegel, M Kieß, **V Sojo**, D Braun. Steep pH gradients and directed colloid transport in a microfluidic alkaline hydrothermal pore. *Angewandte Chemie Intl. Ed.* 56(9): 2340-2344 (2017).
 - W Castillo, F Martínez, LM Álamo, **V Sojo**, et al. [in Spanish] EduQuim, a computational tool for teaching and learning Chemistry in secondary schools. *Educere* 21(68) (2017).
 - **V Sojo**, C Dessimoz, A Pomiankowski, N Lane. Membrane proteins are dramatically less conserved than water-soluble proteins across the tree of life. *Molecular Biology and Evolution.* msw164 (2016).
 - **V Sojo**, B Herschy, A Whicher, E Camprubí, N Lane. The origin of life in alkaline hydrothermal vents. *Astrobiology* 16(2): 181-197 (2016). ***Journal cover***
 - **V Sojo**. On the biogenic origins of homochirality. *Orig. Life Evol. Biosph.* 45: 219-214 (2015).
 - D Jeffares, B Tomiczek, **V Sojo**, M Dos Reis. A beginner's guide to calculating the evolutionary rates of all protein-coding genes in a genome. In *Parasite Genomics Protocols*, 2nd ed., Christopher Peacock (Ed.). Humana Press (2015).
 - **V Sojo**, A Pomiankowski, N Lane. A bioenergetic basis for membrane divergence in archaea and bacteria. *PLoS Biology* 12: e1001926 (2014). ***Cover article on New Scientist***
 - M Sánchez, A Peraza, **V Sojo**, et al. A dynamic integrative web environment for computational chemistry. *Revista Processos Químicos* 2012 (Jan/Jun): 35-38 (2012).

- **V Sojo**, A Peraza, F Ruetter, M Sánchez, E Acosta. IVIChem: An integrative web environment for computational chemistry. *J. Comput. Methods Sci. Eng.* 12 (4): 397-406 (2012).

Talks (T) and posters (P) at international peer-reviewed conferences

- 2019.03 | T | **Invited** | 30/80 Meeting on the Alkaline Vent Theory for the Emergence of Life | Granada, Spain.
- 2018.06 | T | Fellows' meeting of the European Molecular Biology Organization | Heidelberg, Germany.
- 2018.04 | P | Annual meeting of the Simons Collaboration on the Origins of Life | New York, NY, USA.
- 2018.03 | T | Prebiotic molecules in space and origins of life on Earth | Bad Honnef, Germany.
- 2018.01 | P | ELSI Symposium | Earth Life Sciences Institute (ELSI), Tokyo, Japan.
- 2017.04 | T | **Invited** | Astrobiology Science Conference (AbSciCon) | Mesa AZ, USA.
- 2017.01 | P | ELSI Symposium | Earth Life Sciences Institute (ELSI), Tokyo, Japan.
- 2016.12 | T | **Invited** | Fall Meeting of the American Geophysical Union (AGU) | San Francisco CA, USA.
- 2016.11 | T | **Invited** | Electrochemistry at the Origin of Life | Earth Life Sciences Institute | Tokyo, Japan.
- 2016.01 | P | Gordon Research Conference (GRC) on the Origin of Life | Galveston TX, USA.
- 2015.09 | T | 6th Meeting of the Astrobiology Society of Britain | London, UK.
- 2015.07 | P | Meeting of the Society for Molecular Biology and Evolution (SMBE) | Vienna, Austria.
- 2015.03 | T | Workshop on Eukaryo and Archaeoogenesis | Sussex, UK.
- 2014.09 | T | Evolutionary Biology Meeting | Marseille, France.
- 2014.07 | P | Meeting of the International Society for the Study of the Origin of Life | Nara, Japan.
- 2011.12 | P | **Poster prize** | XI Meeting of the Venezuelan Society of Chemistry | Naguayatá, Venezuela.

Research funding received

- **2019 | Gerstner Foundation - Scholar:** Competitive fellowship to pursue independent research in computational biology and biochemistry. ~US\$ 205,000.
- **2019 | Institute for Advanced Studies, Berlin - Fellow:** Awarded a competitive fellowship from the College of Life Sciences of the Wissenschaftskolleg zu Berlin, to pursue research on the origin of eukaryotes and on providing education for excluded communities. €24,300.
- **2018 | NASA - Maine Space Grant:** Awarded with collaborator Dr. Reuben Hudson, for joint research proposed to study carbon fixation at high pressure under simulated hydrothermal vent conditions. US\$ 25,000.
- **2017–2018 | Simons Foundation - Collaboration Program:** Lead writer of the grant, which was approved to Prof. Dieter Braun for funding of my research and salary. US\$ 83,000.
- **2016–2018 | European Molecular Biology Association (EMBO) - Long-Term Fellow:** Awarded this highly competitive European fellowship to pursue postdoctoral research. ~€77,000
- **2016–2017 | Japan Society for the Promotion of Science (JSPS) - Short-Term Post-Doctoral Fellow:** A competitive full fellowship covering travel, accommodation, expenses, and research costs to establish a novel collaboration in Japan (RIKEN) for six months. ~US\$ 26,000.
- **2014 | Engineering and Physical Sciences Research Council of the United Kingdom (EPSRC) - Summer Vacation Bursary:** Wrote a successful grant application to have an undergraduate student's aid in research through the summer-vacation period. £2,000 (for undergrad student).
- **2012–2015 | EPSRC - International Graduate Scholarship:** To pursue doctoral studies, covering stipend and part of fees. £64,770.
- **2012–2015 | UCL - Faculty of Mathematics and Physical Sciences - Dean's Prize:** granted to pursue doctoral studies, covering fees. £49,200.
- **2007–2010 | Fundación Gran Mariscal de Ayacucho - Postgraduate scholarship:** Scholarship from the Venezuelan government to pursue Master's degree in Computer Science. ~US\$ 23,000.

Other prizes & awards

- **2016 | Center for Nano-Science (CeNS) - University of Munich** | CeNS travel award.
- **2015 | Institute of Population Genetics** | Travel support to attend the 2015 Conference of the Society for Molecular Biology and Evolution (SMBE) in Vienna, Austria.
- **2015 | University College London** | Travel Grant to attend the meeting of the Society for Molecular and Evolutionary Biology (SMBE) in Vienna.
- **2015 | Company of Biologists** | full scholarship to attend and present at the meeting on “Eukaryo and Archaeogenesis”.
- **2014 | UK Higher Education Academy** | appointed Fellow at the second of four levels.
- **2014 | University College London - Graduate School** | Travel Grant to attend the International Society for the Origins of Life conference in Nara, Japan.
- **2011 | Venezuelan Society of Chemistry** | best-poster award at the XI Venezuelan Congress in Chemistry - Computational Chemistry section.
- **2008 | Government of India** | full scholarship to study 3-D computer animation for two months in Chandigarh, Punjab, India.
- **2007 | Venezuelan Ministry of Information and Telecommunications - *Independent production award***: to create short educational films broadcast on TV to all Latin America.
- **2006 & 2009 | Union for International Cancer Control (UICC)**: full scholarship to present at the 13th and 14th World Conferences on Tobacco or Health in Washington DC, USA, and Mumbai, India.
- **2003 | Lindau Nobel Laureate Meeting**: invited student to the 52nd edition of this prestigious meeting of students with Nobel Laureates.

Relevant workshops & courses

- 2017.06 | EMBO, Heidelberg, Germany | Laboratory management: research leadership**
- Three-day workshop on leadership skills for managing a research laboratory.
- 2015.04 | UCL | In-front-of and behind the camera**
- Short comprehensive hands-on workshop on audio-visual production to present research.
- 2013.10-12 | UCL | Teaching in higher education**
- Taught in collaboration with the UK Higher Education Academy, leading to qualification as Fellow.
- 2013.06 | UCL | An introduction to bacterial and recombinant DNA methods**
- Practical hands-on workshop on bacteriology and molecular biology methods including bacterial cultures, mutation selection, gene amplification, cloning, and production of recombinant species.
- 2013.05 | UCL | Small-group teaching - Encouraging active learning in the classroom**
- Designing effective tasks for high-level learning outcomes (problem-solving, critical thinking).
- 2012.12 | Birkbeck | University of London & UCL | Bioinformatics**
- Comprehensive workshop covering approaches and packages frequently used in bioinformatics.
- 2011.05 | Severo Ochoa Molecular Biology Centre | Intro. to molecular modelling of proteins**
- Hands-on workshop on chemoinformatics and computational chemistry of proteins.
- 2011.02 | European Bioinformatics Institute | Small-molecule bioactivity resources**
- Chemoinformatics workshop on pharmacological databases and methods.
- 2009.07 | University of The Andes | Bio-sequence analysis workshop**
- Topics included: searching remote servers; databases; sequence analysis; multiple-sequence alignment; construction of phylogenetic trees; 3D visualizers.
- 2009.06 | European Bioinformatics Institute | Basic and advanced use of Ensembl databases**
- Workshop on advanced use of the Ensembl genome relational database.
- 2008.02-04 | Centre for Development of Advanced Computing, Mohali, India | 3D animation**
- Comprehensive 2-month hands-on course covering all main aspects of 3D animation.
- 2007.10 | Venezuelan Laboratory of Proteomics | Protein chemistry, bioinformatics and synthesis**
- Topics included: principles of protein chemistry; prediction of structures; synthesis of pseudopeptides for immunology (laboratory practical); molecular modelling.

Information-Technology skills

- **Programming/scripting languages:** Python, R, Bash, Perl, C/C++, Java, Matlab, Mathematica.
- **Web development:** HTML, PHP, MySQL, JavaScript, CSS, XML, WordPress.
- **Modelling and computational physics & chemistry:** Gromacs, Modeller, PyMol, VMD, COMSOL.
- **Operating Systems:** advanced user of Windows, Linux/Unix, and Mac OS.
- **Graphics editing software:** Adobe Photoshop & Illustrator. Gimp. Inkscape.
- **2D&3D modelling and animation:** Autodesk Inventor, Maya & 3ds. Adobe Animate. Blender.
- **Video production:** iMovie. Adobe Premier & After Effects.
- **Others:** Git/GitHub. Moodle. Advanced user of MS Office.