



<b>Part A. PERSONAL INFORMATION</b>		<b>CV date</b>		<b>24/01/2025</b>
First and Family name	<b>Kepa Ruiz Mirazo</b>			
Social Security, Passport, ID number	<b>30.638.582-Y</b>	Age	<b>54</b>	
Researcher numbers	Researcher ID	<b>L-3363-2014</b>		
	ORCID code	<b>0000-0002-0157-4394</b>		

**A.1. Current position**

Name of University/Institution	<b>Universidad del País Vasco (UPV/EHU)</b>		
Department	<b>Philosophy // Biofisika Institute (BERC -- CSIC, UPV/EHU)</b>		
Address and Country	<b>Barrio Sarriena s/n, 48940 Leioa, Bizkaia</b>		
Phone number	<b>94 601 8005</b>	E-mail	<b>kepa.ruiz-mirazo@ehu.eus</b>
Current position	<b>Full-time Researcher (IDP)</b>	From	<b>01/10/2012</b>
UNESCO code	<b>7205.01-7201.02</b>		
Key words	<b>Origins of Life, Procell Modelling, Theoretical Biophysics, Systems Chemistry, Philosophy of Biology</b>		

**A.2. Education**

Degree/PhD	University	Year
<b>PhD in Sciences (Complex Systems)</b>	<b>Universidad del País Vasco (UPV/EHU)</b>	<b>2001</b>
<b>Masters in Society, Science and Technology in Europe (ESST)</b>	<b>UPV/EHU – FUNDP (Namur, Bélgica)</b>	<b>1995</b>
<b>Five-year-degree in Physics (Solid State Physics)</b>	<b>Universidad del País Vasco (UPV/EHU)</b>	<b>1994</b>

**A.3. Research quality indicators: JCR articles, h-index, supervised theses**

- Number of ‘sexenios’ (positively evaluated 6-year research periods): **4** (last period: **2018-2023**).
- PhD supervision: **4 (completed) doctoral theses**. Gabriel Piedrafita, July 2013, European PhD, Universidad Complutense de Madrid; Ben Shirt-Ediss, February 2016, International PhD, UPV/EHU; Sara Murillo-Sánchez, Sept. 2017, UPV/EHU; Nino Lauber, Sept. 2023, International PhD, UPV/EHU (all of them: cum laude-distinction, unanimously – the second, B.S-E., *Premio Extraordinario de Doctorado* de la UPV/EHU in 2018). **2 PhDs in progress**, under current supervision (Arián Ferrero & Krishnadev Narayanankutty), within the Molecular Biology & Bio-Medicine PhD program.
- Total number of citations: **1935** (WoS – Thomson Reuters), **3925** (Google Scholar)
- Average of citations per year over the period 2020-2024 (last 5 years): **165 citations/year** (WoS).
- Number of publications in the top quartile (Q1): **26** (according to the ranking of JCR).
- h-index: **20** (WoS – Thomson Reuters) / **27** (Google Scholar).

**Part B. CV SUMMARY** (max. 3500 characters, including spaces)

Kepa Ruiz-Mirazo (KRM) is full-time researcher of the University of the Basque Country (UPV/EHU) since October 2012. After a doctorate in the trans-disciplinary field of Complex Systems (PhD advisor: Alvaro Moreno) at the UPV/EHU (1996-2001), he carried out an experimental post-doc, under the supervision of Prof. P. L. Luisi (ETH-Zürich and Università Roma Tre, 2003-2005). He then returned to the Basque Country and soon obtained a Ramon y Cajal Research Fellowship (2007-2012) at the D. Philosophy (UPV/EHU), where he became PI at the IAS-Research Group ([https://www.ias-research.net/people/kepa\\_ruiz-mirazo/](https://www.ias-research.net/people/kepa_ruiz-mirazo/)). At the same time, he became affiliated to the Biofisika Institute (BERC centre -- CSIC, UPV/EHU), where he started his own scientific line of research and has consolidated a lab (<https://www.biofisika.org/en/about/people/kepa-ruiz-mirazo>). He currently lectures ‘Systems Biology’ (undergrad course at the Faculty of Science and Technology), ‘Filosofía de la Complejidad’ (Masters in Philosophy: Science, Society, Technology) and also contributes to other Masters (Biomedicine and Molecular Biology, at the UPV/EHU;



Integrative Synthetic Biology, CSIC & UIMP). He was Deputy Director of the Master and Doctoral School (MDe) of the UPV/EHU for a year (2017-2018). His research interests are fundamentally related to the problems of the origin and definition of life, as a way of exploring the epistemological foundations of biology. His research builds upon a combination of diverse methodologies and tools of analysis (philosophical reflection, development of theoretical models and in silico computational simulations, as well as the design and performance of in vitro experiments). This deeply transdisciplinary approach is manifest in his publication record, with a long list of articles in top-ranked journals that cover areas as diverse as philosophy of science, biology, chemistry or physics. KRM was senior investigator of 'ProtoMet' (<https://protomet-etn.eu/team/>), a European Marie Curie ITN network focusing on the chemical roots of minimal forms of metabolism, which just finished at the end of 2023. Previously, he was also PI in a number of research grants, both from the Ministry of Spain and Basque Government ('grupos consolidados'). And he was part, as well, of two EU COST Actions (as a member of their Management Committee): CM1304 (Emergence and Evolution of Complex Chemical Systems) and TD 1308 (Origins and Evolution of Life on Earth and in the Universe). KRM is habilitated as Full Research Professor since 2018.

## Part C. RELEVANT MERITS

### C.1. Publications (10 most relevant publications in the last 5 years: 2020-2024)

1. Shirt-Ediss, B., Ferrero-Fernández, A., De Martino, D., Bich, L. Moreno, A. & Ruiz-Mirazo, K. (2024): Modelling the prebiotic origins of regulation and agency in evolving protocell ecologies. *BioRxiv* Preprint. <https://www.biorxiv.org/content/10.1101/2024.11.20.624505v1>
2. Ruiz-Mirazo, K. & Moreno, A. (2024): On the evolutionary development of biological organisation from complex prebiotic chemistry. In: M. Mossio (Ed.) *Organization in Biology*. History, Philosophy and Theory on the Life Sciences Series -- Springer (pp. 187-218). ISBN: 978-3-031-38967-2 ([https://link.springer.com/chapter/10.1007/978-3-031-38968-9\\_9](https://link.springer.com/chapter/10.1007/978-3-031-38968-9_9)).
3. Ashkenasy, G., Kauffman, S., Lancet, D., Otto, S., Ruiz-Mirazo, K., Semenov, S. & Xavier, J. (2023): Collectively autocatalytic sets. *Cell Reports Physical Science* 4(10): 101594. *JCR 2022\_IF: 8,9*. ISSN: 2666-3864 – **Q1** <https://doi.org/10.1016/j.xcrp.2023.101594>
4. Lauber, N., Tichacek, O., Narayanankutty, K. De Martino, D. & Ruiz-Mirazo, K. (2023): Collective catalysis under spatial constraints: phase separation and size-scaling effects on mass action kinetics. *Physical Review E* 108: 044410. (<https://doi.org/10.1103/PhysRevE.108.044410>) – *JCR 2022\_IF: 2,4*. ISSN: 2470-0045 – **Q1**
5. Nogal, N., Sanz-Sánchez, M., Vela-Gallego, S., Ruiz-Mirazo, K. & de la Escosura, A. (2023): The protometabolic nature of prebiotic chemistry. *Chem Soc Rev* 52: 7359–7388. <https://doi.org/10.1039/D3CS00594A> *JCR 2022\_IF: 46,2*. ISSN: 0306-0012 – **Q1**
6. Lauber, N., Tichacek, O., Bose, R., Flamm, C., Leuzzi, L., Tang, T-Y D., Ruiz-Mirazo, K. & De Martino, D. (2023): Statistical mechanics of biomolecular condensates via cavity methods. *iScience* 26: 106300 (<https://doi.org/10.1016/j.isci.2023.106300>) -- *JCR 2022 IF: 5,8* eISSN: 2589-0042 – **Q1**
7. Amilburu, A., Moreno, Á. & Ruiz-Mirazo, K. (2021): Definitions of life as epistemic tools that reflect and foster the advance of biological knowledge. *Synthese* 198, 10565–10585. <https://doi.org/10.1007/s11229-020-02736-7> – *JCR 2021\_IF: 1,6*. ISSN: 0039-7857 -- **Q1**
8. Lauber, N., Flamm, C. & Ruiz-Mirazo, K. (2021): 'Minimal metabolism': a key concept to investigate the origins and nature of biological systems. *BioEssays* 43: 2100103. (<https://doi.org/10.1002/bies.202100103>) *JCR 2021\_IF: 4,345*. ISSN: 0265-9247 – **Q1**
9. Ruiz-Mirazo, K., Shirt-Ediss B., Escribano-Cabeza M. & Moreno, A. (2020): The construction of biological 'inter-identity' as the outcome of a complex process of protocell development in prebiotic evolution. *Frontiers in Physiology – Systems Biology* 11: 530. (<https://doi.org/10.3389/fphys.2020.00530>). *JCR 2020\_IF: 4,56* ISSN: 1664-042X – **Q1**
10. Ruiz-Mirazo, K. (2020): Boundary versus enabling conditions for the origins of life. *Physics of Life Reviews* 34-35: 96-98. (<https://doi.org/10.1016/j.plrev.2020.06.001>). *JCR 2020\_IF: 11,025*. ISSN: 1571-0645. – **Q1**



## C.2. Research projects and grants

[01/09/2024 - 31/08/2028] Title and acronym: "OUTAGENCIAS: Varieties of autonomous agency across living, humanimal and technical systems" (PID2023-147251NB-I00). **Principal Investigator:** X. Barandiaran, UPV/EHU (Spain). Funding source: Ministerio de Ciencia e Innovación (Spanish Government). Number of researchers: 6 + 21 (66.200€ +117.554€ FPI Grant).

[01/09/2024 - 31/08/2027] Title and acronym: "Cellular Phase Transitions" (PID2023-146408NB-I00). **Principal Investigator:** Daniele De Martino, IkerBasque Associate, Biofisika Institute (Spain). Funding source: Ministerio de Ciencia e Innovación (Spanish Government). Number of researchers: 2 + 2 (42.500€ +117.554€ FPI Grant). Role in the project: Senior researcher

[01/01/2022 - 31/12/2025] Title and acronym: Basque Government 'Consolidated Research Groups': IAS-Research Centre for Life, Mind and Society (IT1668-22). **Principal Investigator:** J. Umeriz. Place: UPV/EHU (Spain). Funding source: Basque Government (Spain). Number of researchers: 17+2 (107.000 €). Role in the project: Senior researcher

[01/11/2021 - 31/07/2024] Title and acronym: "Integration and individuation as key properties in the origin of agency and cognition". **Principal Investigators:** A. Moreno & K. Ruiz-Mirazo. Place: Donostia International Physics Centre (DIPC, Spain). Funding source: John Templeton Foundation. Number of researchers : 6 (USA \$ 250.000).

[01/06/2020 - 31/12/2023] Title and acronym: "OUTONOMY: fleshing out autonomy beyond the individual" (PID2019-104576GB-I00). **Principal Investigators:** X. Barandiaran & L. Bich. Place: UPV/EHU (Spain). Funding source: Ministerio de Ciencia e Innovación (Spanish Government). Number of researchers: 5 + 20 (33.094 €). Role in the project: Senior researcher

[01/11/2018 - 31/10/2022] Title and acronym: Protometabolic pathways: exploring the chemical roots of systems biology ('ProtoMet' Marie Curie ITN -- Grant Agreement No: 813873)). **Coordinator:** Sheref Mansy (Trento, Italy) **Principal Investigator (UPV/EHU):** K. Ruiz-Mirazo. Funding source: EU. Number of nodes (labs/companies): 8 (2.174.00 € total; 250.000 € UPV/EHU).

[01/01/2019 - 31/12/2021] Title and acronym: Basque Government 'Consolidated Research Groups': IAS-Research Centre for Life, Mind and Society (IT1228-19). **Principal Investigator:** K. Ruiz-Mirazo. Place: UPV/EHU (Spain). Funding source: Basque Government (Spain). Number of researchers: 17 (170.548 €)

[01/01/2015 - 31/12/2018] Title and acronym: 'Identidad en interacción: aspectos ontológicos y normativos de la individualidad biológica, cognitiva y social' (FFI2014-52173-P). **Principal Investigators:** A. Etxeberria & K. Ruiz-Mirazo. Place: UPV/EHU (Spain). Number of researchers: 15. Funding source: MINECO (Spain). (50.000€)

[15/05/2014 - 30/06/2018] Title and acronym: 'Origins and evolution of life on Earth and in the Universe' (COST-Action TD 130). **Coordinator:** M. Gargaud (Laboratoire d'Astrophysique de Bordeaux, FR). Participating Countries: 30. Founding source: European Commission. Role in the project: Senior researcher and member of the Management Committee.

[01/01/2013 - 31/12/2018] Title and acronym: Basque Government Financing for Research Groups: IAS-Research Center for Life, Mind and Society (IT590-13). **Principal Investigator:** K. Ruiz-Mirazo (after A. Moreno). Place: UPV/EHU (Spain). Number of researchers: 15. Funding source: Basque Government (Spain) (226.598 €)

[01/01/2009 - 01/01/2012] Title and acronym: 'La organización biológica: entre el mecanicismo y la autonomía' (FFI2008-06348-C02-01). **Principal Investigator:** K. Ruiz-Mirazo. Place: UPV/EHU (Spain). Number of researchers: 10. Funding source: MICINN (Spain) (48.400 €).



### C.3. Contracts

### C.4. Patents

### C.5. Participation in conferences and international scientific events

As shown in my full CV (which can be easily downloaded following the next link: [http://www.ias-research.net/people/kepa\\_ruiz-mirazo/](http://www.ias-research.net/people/kepa_ruiz-mirazo/)), I attended and contributed to a large number of scientific events (more than 120), for the most part international (European), very often as an invited speaker.

### C.6. Organization of scientific events

Main organiser of the international workshop on Origins of Life '**OLDM 2023**', held at the Palacio Miramar, San Sebastián – Donostia in 2023, Oct 2-4, with the collaboration and financial support of the European Union ('ProtoMet' Marie Curie ITN), DIPC, FBB, UPV/EHU, the Basque Government and the JTF (estimated total budget: 60.000 €), and the attendance of ca. 100 scientists from Europe and the United States of America. More info at: <https://www.oldm2023.org/>

Main organiser of the international workshop '**SYSCHEM2014**', held at the Palacio Miramar, San Sebastián – Donostia in 2014, June 9-12. COST-Action Meeting of the network CM1304 (Emergence and Evolution of Complex Chemical Systems) with the collaboration and financial support of the European Union (COST Program), UPV/EHU (Vice-Rectorate of Research) and the Basque Government (estimated total budget: 80.000 €), and the final attendance of 90 scientists from Europe and the United States of America.

Main organiser, together with Pier Luigi Luisi, of the international workshop "**Open Questions on the Origins of Life 2009**", held at the Palacio Miramar, San Sebastián – Donostia, 2009, May 20-23, with the collaboration and financial support of the UPV/EHU (Vice-Rectorate of Research, Campus de Ibaeta, Euskera y Plurilingüismo, MICINN, Gobierno Vasco, CSIC y Kutxa (estimated total budget: 40.000 €), and related to which a "special issue" was published in the specialized journal *Origins of Life and Evolution of Biospheres*.

### C.7. Research stays in foreign centres

**Invited professor** at the **D. Philosophy of the University of Calgary**, Canada for a Research Sabbatical, hosted by Marc Ereshefsky (9 months, Sept 2022 – June 2023).

**Invited professor and research fellow** at the **Instituto Gulbenkian de Ciencia**, Oieras, Portugal. Collaboration with Luis Rocha from the group FLAD (Computational Biology) on topics related to Computational Science, Biology of Systems and Prebiotic Chemistry (10 weeks in 2011, June 20 – Sept. 2).

**Invited research fellow** at the University of Bari (Italy) within the research framework **HPC-Europa** (High-Performance-Computing in Europe) to collaborate with Fabio Maveli, researcher at Department of Chemistry, in developing a simulation model of minimal cellular systems (8 weeks in 2005, Sept. - Nov.).

**Post-doctoral fellow of MECD** in the group led by Pier Luigi Luisi at the Institute for Polymers at ETH-Zürich (Suiza) (2003, Feb. - Sept.). The research stay was continued at the Department of Biology at the University of Roma Tre, in Rome, Italy (January 2004 – March 2005).

### C.8. Awards and recognitions

**Official habilitation as a Full Research Professor (in Humanities)** - awarded by Unibasq (2018).

**I3 Certificate** - awarded for an outstanding research track, in accordance with the I3 Program of the Ministerio de Ciencia e Innovación (evaluation – ANEP 10/01/2011).

**Extraordinary Doctorate Award** of the Universidad del País Vasco UPV/EHU (2004).

**Reviewer of research projects** for NASA (*Exobiology Program*). **Regular reviewer** for journals like *Nature Chemistry*, *Ecology and Evolution*, *Nature Communications*, *Scientific Reports*, *Angewandte Chemie*, *Phil Trans Royal Society*, *Open Biology*, *Plos ONE*, *Biology and Philosophy*, *Artificial Life*, *BioSystems*, *Biological Theory*, *Journal of Theoretical Biology*, etc.