MINISTERIO DE ECONOMÍA, INDUSTRIA Y COMPETITIVIDAD

CURRICULUM VITAE (maximum 4 pages)

AGENCIA ESTATAL DE INVESTIGACIÓN

Part A. PERSONAL INFORMATION			**CV date**	**13/02/2021**
First and Family name	**Kepa Ruiz Mirazo**			
Social Security, Passport, ID number	**30.638.582-Y**		Age	**50**
Researcher numbers		Researcher ID	**L-3363-2014**	
		Author ID		
		ORCID code	**0000-0002-0157-4394**	

A.1. Current position

Name of University/Institution	**Universidad del País Vasco (UPV/EHU)**			
Department	**Department of Logic and Philosophy of Science**			
Address and Country	**Avda. Tolosa 70, 20018 Donostia-San Sebastián, Gipuzkoa**			
Phone number	**943 015628**	E-mail	**kepa.ruiz-mirazo@ehu.eus**	
Current position	**Full-time Researcher (IDP) at the UPV/EHU**	From	**01/10/2012**	
UNESCO code	**7205.01-7201.02**			
Key words	**Philosophy of Biology, Origins of Life, Theoretical Biology**			

A.2. Education

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

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

- Number of '**sexenios**' (positively evaluated 6-year research periods): **3** (last period: **2012-2017**).
- PhD supervision: **3 completed doctoral theses**. Gabriel Piedrafita, July 2013, European PhD, Universidad Complutense de Madrid; Ben Shirt-Ediss, February 2016, International PhD, Univ. of the Basque Country; Sara Murillo-Sánchez, Sept. 2017, Univ. of the Basque Country (mark obtained, by all of them: cum laude-distinction, unanimously – the second, B.S-E., obtained *Premio Extraordinario de Doctorado* de la UPV/EHU in 2018). **1 current PhD student** (Nino Lauber).
- Total number of citations: **1280** (**1146** non self-citations) -- (WoS – Thomson Reuters).
- Average of citations per year over the period 2016-2020 (last 5 years): **165 citations/year** (WoS – Thomson Reuters).
- Number of publications in the top quartile (Q1): **23** (according to the ranking of JCR).
- h-index: **18** (WoS – Thomson Reuters) / **23** (Google Scholar).

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

KR-M 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 Universitá Roma Tre, 2003-2005). He then returned to the Basque Country and soon obtained a *Ramon y Cajal* Research Fellowship (2007-2012) at the Department of Logic and Philosophy of Science (UPV/EHU). He was visiting scholar at the Gulbenkian Institute (Portugal) for three months (2011). Affiliated also to the Biofisika Institute (CSIC, UPV/EHU), he currently lectures 'systems biology' at the Faculty of Science and Technology, 'philosophy of biology' (Masters in Philosophy, Science and Values) and an introduction to 'philosophy of science' (Masters in Chemistry and Polymers), all at the UPV/EHU.

Member of the Editorial Board of OLEB, he was recently part of the Management Committee of two EU COST Actions: CM1304 (Emergence and Evolution of Complex Chemical Systems) and TD 1308 (Origins and Evolution of Life on Earth and in the Universe). He was also 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. In accordance with this main objective and profiting from his multidisciplinary background (Bachelors in Physics (1994), Masters in Society, Science and Technology in Europe (1995), PhD in Sciences, Complex Systems (2001)), complemented with a long post-doctoral experience in the fields of Astrobiology (2002) and Supramolecular Chemistry (2003-2004)) his research builds on a combination of diverse methodologies and tools of analysis (philosophical reflection, development of theoretical models and *in silico* computational simulations, as well as design and performance of *in vitro* experiments). So far, this trans-disciplinary approach has been mainly applied to the emergence and development of proto-cellular systems, to provide an explanation of how a set of molecules and chemical transformation processes can get functionally integrated within a compartment of their own creation. However, it may expand to other areas of research in the future, like the origins of metabolic pathways. In fact, KRM belongs to 'ProtoMet' (https://protomet-etn.eu/team/), an on-going Marie Curie ITN network focusing on the chemical roots of minimal forms of metabolism.

Part C. RELEVANT MERITS

C.1. Publications (10 most relevant, recent publications)

1. **Ruiz-Mirazo, K.** (2020): Boundary versus enabling conditions for the origins of life. *Physics of Life Reviews* 34-35: 96-98. (doi: 10.1016/j.plrev.2020.06.001). ISI WoK -- JCR 2019_IF: **14,789**. ISSN: 1571-0645. – **Q1**

2. Amilburu, A., Moreno, A. & **Ruiz-Mirazo, K.** (2020): Definitions of life as epistemic tools that reflect and foster the advance of biological knowledge. *Synthese.* Published online (doi: 10.1007/s11229-020-02736-7) – **Q1** -- ISI WoK -- JCR 5yearIF: **0,815**. ISSN: 0039-7857.

3. **Ruiz-Mirazo, K.** (2019): A plea for hypothesis-driven research in prebiotic systems chemistry. *Chem* 5: 1920-1922. **Q1** -- ISI WoK -- JCR 2019_IF: **18,2**. ISSN: 2451-9294.

4. Serrano-Luginbühl, S., **Ruiz-Mirazo, K.**, Ostaszewski, R., Gallou, F. & Walde, P. (2018): Soft and dispersed interface-rich aqueous systems that promote and guide chemical reactions. *Nature Reviews Chemistry* 2: 306-327. ISI WoK -- JCR 2018_IF: **30,6**. ISSN: 2397-3358. **Q1**

5. Piedrafita, G., Monnard, P.-A., Mavelli, F. & **Ruiz-Mirazo, K.** (2017): Permeability-driven selection in a semi-empirical protocell model: the roots of prebiotic systems evolution. *Scientific Reports* 7: 3141. **Q1** -- ISI WoK -- JCR 5yearIF: **5,078**. ISSN (online): 2045-2322.

6. **Ruiz-Mirazo, K.**, Briones, C. & de la Escosura, A. (2017): Chemical roots of biological evolution: the origins of life as a process of development of autonomous functional systems. *Open Biology* 7: 170050. **Q1** -- ISI WoK -- JCR 5yearIF: **5,3**. ISSN: 2046-2441.

7. Murillo-Sánchez, S., Beaufils, D., González Mañas, J. M., Pascal, R. & **Ruiz-Mirazo, K.** (2016): Fatty acids' double role in the prebiotic formation of a hydrophobic dipeptide. *Chemical Science* 7: 3406-3414. **Q1** -- ISI WoK -- JCR 5yearIF: **9,2**. ISSN: 2041-6520.

8. **Ruiz-Mirazo, K.**, Briones, C. & de la Escosura, A. (2014): Prebiotic Systems Chemistry: New Perspectives for the Origins of Life. *Chemical Reviews* 114: 285-366. **Q1** -- ISI WoK --JCR 5yearIF: **48,832**. ISSN: 0009-2665.

9. Mavelli, F. & **Ruiz-Mirazo, K**. (2013): Theoretical conditions for the stationary reproduction of model protocells. *Integrative Biology* 5, 324-341. **Q1** -- ISI WoK -- JCR 5yearIF: **4,455**. ISSN: 1757-9694.

10. **Ruiz-Mirazo, K.** & Moreno, A. (2012): Autonomy in evolution: from minimal to complex life. *Synthese* 185 (1): 21-52. **Q1** -- ISI WoK -- JCR 5yearIF: **0,815**. ISSN: 0039-7857.

C.2. Research projects and grants

[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 Center 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 Comission. Role in the project: 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 €)

[03/12/2013 - 31/12/2017] Title and acronym: 'Emergence and Evolution of Complex Chemical Systems' (COST-Action CM 1304). Coordinator: S. Otto. Place: UPV/EHU (Spain). Funding source: European Comission. Role in the project: Researcher and member of the Management Committee & STSMs Coordinator.

[01/01/2012 - 31/12/2014] Title and acronym: 'Autonomía y niveles de organización' (FFI2011-25665). Principal Investigators: A. Moreno & J. Umerez. Place: UPV/EHU (Spain). Funding source: MEC (Spain) (85.849 €). Number of researchers: 12. Role in the project: Researcher.

[01/01/2010 - 01/01/2013] Title and acronym: 'Basque Government Financing for Research Groups: Philosophy of Biology' (IT 505-10). Principal Investigator: A. Etxeberria. Place: UPV/EHU (Spain). Funding source: Basque Government (Spain) (61.000 €). Number of researchers: 12. Role in the project: Researcher.

[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 €).

[03/04/2008 - 02/04/2012] Title and acronym: 'Systems Chemistry' (COST-Action CM0703). Coordinator: G. von Kiedrowski (Ruhr Universitat Bochum, DE) & S. Otto (University of Groningen, NL). Participating Countries: 15. Funding source: European Comission. Role in the project: Researcher.

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/), I attended and contributed to a large number of scientific events (more than 120), for the most part international (European), often as an invited speaker.

C.6. Organization of scientific events

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*.

Main organiser, together with Xabier Barandiaran, of the international workshop **'Modelling biological and cognitive autonomy'**, held in San Sebastian – Donostia in 2007, March 22-23. This workshop was organised with the collaboration and financial support of Kutxa and the European project Eucognition (estimated total budget: 6.000 €), related to which a "special issue" was published in the specialized journal *BioSystems*.

C.7. Research stays in foreign centres

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).

Post-doctoral research training fellowship in Astrobiology at the Instituto Nacional de Técnica Aeroespacial (**INTA**) during 5 months (2002, April – Sept.) to work at the Centre of Astrobiology (INTA/CSIS) under the supervision of its Director, Juan Pérez Mercader.

C.8. Awards and recognitions

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

Member of the **Editorial Board** of the journal *Origins of Life and Evolution of Biospheres*.

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

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

Reviewer of research projects for *NASA* (*Exobiology Program*). **Regular reviewer** of papers for journals such as *Biology and Philosophy* (Kluwer/Springer, ISSN 0169-3867), *Artificial Life* (MIT Press, ISSN 1064-5462), *Origins of Life and Evolution of the Biosphere* (Kluwer/Springer, ISSN 0169-6149), *BioSystems* (Elsevier, ISSN 0039-7857), *Biological Theory* (MIT Press, ISSN 1555-5542), *Journal of Theoretical Biology* (Academic Press, ISSN 0022-5193), as well as several others in the field of science, like *Nature Communications*, *Scientific Reports*, *Angewandte Chemie*, *Open Biology* or *Plos ONE.*