

**BAPTESTE Eric** // ORCID ID: 0000-0003-1966-1215

18/05/1978; French (3 children, born in 2015, 2017 and 2019)

URL for web site: <http://www.evol-net.fr/>

- **APPOINTMENTS AND QUALIFICATIONS**

- 2003           **PhD in Evolutionary Biology**: "Reconstructing the eukaryotic tree with massive ESTs datasets"/ Dept. 'Systematics, Adaptation & Evolution'/ Université Pierre et Marie Curie/ France.
- 2007 – 2015   **CNRS Researcher**/ UMR 7138 'Systematics, Adaptation & Evolution'/ Sorbonne Université/ France. Since 2009, **group leader of the AIRE team**, with P. Lopez.
- 2003 – 2007   **Post-doctoral fellow** in phylogenomics/ Department of Biochemistry and Molecular Biology/ Doolittle lab/ Dalhousie University/ Canada
- 2007           **PhD in Philosophy of Biology**: "Beyond the Tree of Life"/ IHPST/ Paris I- Panthéon Sorbonne Université/ France.
- 2010           **Habilitation à Diriger des Recherches** (Highest academic degree in France)
- 2015 – now     **CNRS Research Director (DR2)** / UMR 7138 'Systematics, Adaptation & Evolution'/ Sorbonne Université/ France. **Group leader of the AIRE team**, with P. Lopez.

- **BRIEF SYNOPSIS OF CAREER PATH**

My scientific career demonstrates **my independent creative thinking**, and my **ability to go beyond the state of the art**. My work is **largely interdisciplinary**: at the interface of evolutionary biology, microbiology, network sciences, bioinformatics, ecology, and philosophy of biology, as assessed by my publication record and my strong network of international collaborations. I started with a **PhD in phylogenetics and phylogenomics** of eukaryotes, during which **I produced reference methods papers**[1], partly resolving and dating the **tree of eukaryotes**[2], and demonstrating that complete nuclear pores, highly similar to the extant ones, were present in the last common ancestor of eukaryotes[3]. I rapidly **expanded the scope of my research in terms of investigated taxa and processes** to tackle the incongruence between the phylogenetic histories of genes and of species, which conflicted with the traditional phylogenetic framework. My **postdoctoral research on the molecular evolution in archaea and bacteria** and my **2<sup>nd</sup> PhD in Philosophy of Biology** focused on the **scientific and philosophical limits of traditional phylogenomics**[4, 5]. By developing **original phylogenetic network methods for the detection and the representation of lateral gene transfer (LGT)**[6-8], I further unravelled the importance of **LGT in these taxa**. Based on my very broad expertise on the evolution of life, as a **CNRS researcher** then as an **ERC PI**, I developed **sequence similarity networks (SSN)**[9], a **powerful inclusive scalable network-based approach to structure and analyse the evolution of genetic diversity, at multiple levels of biological organisation**[10]. Simultaneously using SSN on genes from **viruses, plasmids and cells**, I discovered a **new structure of life, the genetic worlds**[11]; **2 novel classes of genes, the symbiogenetic genes**[12, 13] and the **chimeric composite genes**[14]; and I devised an **original network-based mining strategy to detect divergent sequences and novel major lineages in large environmental datasets**[15]. All these original methodological developments provided me with **unique tools and conceptual skills to propose and implement a ground-breaking theoretical shift**, the coupling of phylogenetic trees, interaction networks and SSN to develop a **new type of evolutionary analyses based on coloured interaction networks**[16]. These networks, **modelling the evolution of organisations, of processes and of ecosystems, ultimately via inclusive, multilayer graph-based analyses of dynamical systems, retracing interactions between phylogenetically related or unrelated components**, should better explain the evolution of biological complexity and diversity. In the past three years, I have used **original network approaches** that effectively represent and analyze interconnected biological processes by jointly exploiting evolutionary information with topological information from interaction networks **to investigate the evolution of ageing and regulated death, and thus I contributed to enhance the understanding of the ultimate evolutionary and systemic causes of both organismal ageing and regulated death**.

- **SOME ESTEEM INDICATORS**

- 2021-2024     **Grant** 'New tools, methods, and resources for aquatic symbioses', **Gordon and Betty Moore Foundation** (\$749,000), Grant Agreement for Macquarie University (#9319) to B. Llorente (PI) (Bapteste co-PI : \$118 000)

- 2021-2023 **Grant** Émergence from ‘Alliance Sorbonne Université’, project ‘Evolutionary, systemic, and philosophical dimensions of ageing’ (55 000€, Baptiste PI)
- 2020-2023 **CNRS funding** for the Réseau Thématique Pluridisciplinaire CNRS **on the epistemic impacts of microbiome studies** REVMICNAT (15 000 €)
- January 2019 Invited **Plenary Speaker (main stage, live on TV)**: ‘Evolution in the Web of Life’, at the upcoming ‘**VIII Futures Congress**’, (**Santiago, Chile**), most important open-access scientific event in Latin America (millions of viewers, and >30 000 attendees)
- 2014 – now **ERC Consolidator Investigator Grant** (PI, 1,2284,240 euros)
- 2013 **Invited Speaker at Scientific Council** of the IHU Méditerranée-Infection, Gordès, France
- 2009 – now Constantly renewed **CNRS Prime for Scientific Excellency (PES, competitive)**
- 2009 **Paoletti Price**, prestigious award by the **CNRS** to 1 (or 2) young outstanding researcher(s) in Biology/year, (<http://www.cnrs.fr/insb/recherche/prix-2009.htm>)
- 2002 **Jacques Lebbe Price**, awarded by **French Society of Systematics** to 1 young innovative PhD student in Systematics/year.

Moreover, in the past ten years:

- I delivered **77 scientific talks in national and international conferences** (e.g., **15<sup>th</sup> National Congress of the French Society of Microbiology 2019**; **SMBE 2019**, UK; **ISHPSSB 2019**, Norway; **VIII Futures Congress (Congreso futuro)**, Chile; **15th International Congress of Protistology 2017**, Czech Republic; **International BioPerspectives CNRS School 2016**, France; **International workshop The Origin of metazoans**, 2015, French 2015; **The Phylogenetic Network Workshop**, 2015, Singapore; **10th International Phycological Congress**, 2013, Florida....);
- **I hosted 104 talks in a series of workshops, summer schools and colloquia that I contributed to organize**

My work is regularly featured in **internationally distributed, renowned media** (**Press**: *Le Monde* (20/04/2013, 04/04/2018), *Libération* (5/11/2015), *Science et Vie* (12/2020), *Science et Vie Junior* (03/2021), *Pour la Science* (04/2016, 11/2016, 27/03/2018 ; 11/2020), *Mediapart* (2018), *Philosophie Magazine* (04/2016), *New Scientist* (/21/01/2009,18/03/2011,11/11/2015, 23/06/2021); *CurrentScienceDaily* (21/07/2021), *La Recherche* (03/2022) **Radio interviews**: *France Inter* (2013/2018), *RFI* (2013/2018), *France culture* (2014). Thanks to my **well-selling science books** on evolution, I am guest plenary speaker in **nationally renowned conferences**: with *Jean-Claude Ameisen* (2018), at the *Cité des Sciences* (2013), at the *Festival d'Astronomie de Fleurance*, opened by the French Minister of Research (2017).

#### • PROFESSIONAL SERVICE & REVIEWING ACTIVITIES

- 2021 **Reviewer** for the **Canada Foundation for Innovation (CFI)/ John R. Evans Leaders Fund**
- 2021- **Associate Editor at *Microbiology Research* and at the *German Journal of Microbiology***
- 2021 **Member of PhD committee** (3rd) of B. Churcheward (Université Nantes)
- 2020 **Member of PhD committee** (1st) of Mélanie Hénnart (Pasteur)
- 2019 **PhD jury member** for Mr. Romain Lannès (19/11/2019, Paris, France)
- 2019- **Associate Editor at *Biology* and at *Microorganisms***
- 2019 **Member of PhD committee** (1st) of B. Churcheward (Université Nantes)
- 2019 **Member of PhD committee** (1st) of F. Van Beveren (Université Paris-Saclay)
- 2019 **Reviewer** for **The Netherlands Organisation for Scientific Research (NWO)**, NWA-ORC research programme.
- 2018 **Jury member** for Dr. S. Harzallah Debbabi **PhD** (Université Jean-Moulin Lyon 3)
- 2017 **Jury member for the regional final round of Three Minute Thesis** (Paris, France)
- 2017 **Team presentation** to the High Council for Evaluation of Research and Higher Education
- 2017 **Member of PhD committee** of R. Tignat-Perrier (Ecole Centrale Lyon)
- 2016- 1 contribution/year: **preparation to ERC interviews at CNRS & Sorbonne Université**
- 2016 **External PhD Referee** for Mr. V. Keshri, PhD then rejected (U. Aix-Marseille)
- 2015-2016 **Member of PhD committee** of L. Urbini (Université de Lyon 1)
- 2014- **Associate editor at *Genome Biology & Evolution***

2014 **Evaluator for the US - Israel Binational Science Foundation**  
 2014 **External PhD Referee for Dr. O. Poirion** (Ecole Centrale Lyon)  
 2014 **Evaluator for the Programma Nazionale di Ricerche in Antartide** (Italy)  
 2013 **Evaluator for the Center for Advanced Study, Univ. of Illinois, USA**  
 2012 **External PhD Referee for Dr. E. Skippington** (The University of Queensland, 2012)  
 2010 & 2012 **Jury member for the CNRS Paoletti Prize** (Paris, France)  
 2010 **Evaluator for the US - Israel Binational Science Foundation**  
 2008 **External PhD Referee for Dr. C.A Michael** (Macquarie University, 2012)  
 2008-2018 **Associate editor at *BMC Research Notes***  
 2006-2018 **Associate editor at *Biology Direct***

Since 2007, I have **taught 9 hours/year of classes I created** (master level) on microbial evolution (at the Ecole Normale Supérieure, Paris, at U. Paris VII, and in one different european university each year: Barcelona, Berlin, Duesseldorf, etc.). Moreover, I am a **regular reviewer for *Genome, Trends in Genetics, PloS ONE, BioEssays, Genome Research, Proceedings of the National Academy of Sciences, Molecular Biology and Evolution, Journal of Molecular Evolution, Environmental Microbiology, The International Journal of Systematic and Evolutionary Microbiology, Nucleic Acid Research, Genome Biology and Evolution, BMC Bioinformatics, etc.***

- **SELECTED SCIENTIFIC PUBLICATIONS**

I have published **95** papers (91 without my PhD supervisor, 81 without my postdoctoral supervisor, 25 as first author and 47 as last author). **8** of my articles appeared in **PNAS**, **36** were cited **> 50** times. Faculty of 1000 has highlighted **7** of my papers. My google scholar h-index is **42**, and my papers have attracted **> 6780** citations. I have also published **4** single author **books** (2013, 2015, 2018, 2022) and **15** book chapters.

- **MAIN SOFTWARES (since 2008)**

CONCLUSTADOR[17], MOSAIC FINDER / FUSED TRIPLETS[18], EGN[19], SCAN[20], BRIDES[21], MULTITWIN[22], COMPOSITESEARCH[23]

- **MAJOR COLLABORATIONS**

*Protistology*: **C. Lane** (University of Rhode Island, USA), **I. Ruiz-Trillo** (Barcelona, Spain)

*Network and statistics*: **M. Habib** & **L. Viennot** (University Paris Diderot, Fr.), **FJ. Lapointe** (U. Montréal, Canada), **P. Gambette** (U. Marne-la-Vallée, Fr.), **S. Chaffron** & **D. Eveillard** (U. Nantes, Fr.)

*Evolution*: **D. Bhattacharya** (Rutgers, USA), **J. Mcinerney** (Nottingham, UK)

*Microbial ecology*: **D. Walsh** (U. Concordia, Canada), **T. Stoeck** (U. Kaiserslautern, Germany), **M. Dunthorn** (U. Essen, Germany), **L. Hug** (U. Waterloo, Canada), **K. Olsonn-Francis** (Open University, UK), **C. Larose** (Ecole Centrale Lyon, France), **F. Not** (Roscoff, Fr.)

*Philosophy of biology & linguistics*: **P. Huneman** (CNRS, France), **J. Dupré** (Exeter, UK), **F. Bouchard** (U. Montréal, Canada), **M. List** (Jena, Germany)

- **SUPERVISION SINCE 2009**

- 1 **L1 student** from *ENS Paris*,

- 6 **L1 students** from *l'Ecole Polytechnique*,

- 11 **master students in bioinformatics** from *UPMC, U. Paris 7, Harvard, U. Nantes, Paris-Saclay*,

- 1 **DES student** from *UPMC*,

- 8 **PhD students in evolutionary biology** (2 other **PhD students** will start in September 2021),

- 1 **PhD student in philosophy of biology** from *U. Montréal*,

- 8 **postdoctoral fellows**.

**Overall, I contributed to the career promotion of 19 academic trainees.**

- **FUNDING ID**

Over the past 10 years, I benefited from **1,825,902 euros** of funding as **PI**, including an ERC Consolidator grant on network-based evolutionary studies; and **1,162, 547 euros** as **co-PI**, including a Moore Foundation grant on symbiosis model systems and methods.