

**PERSONAL INFORMATION**

**Arnau Sebé-Pedrós**  
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 Orcid: 0000-0002-9896-9746  
 Google Scholar: <https://scholar.google.com/citations?user=vHtvMcAAAAAJ&hl>  
 Date of birth: 10/06/1986 | Nationality: Spanish

**EDUCATION**

2009-2013 PhD in *Genetics*. **University of Barcelona**, Barcelona, Spain.  
*Cum laude* and Award to most outstanding thesis, University of Barcelona (2014)

2008-2009 M.Sc. in *Developmental Biology and Genetics*. **University of Barcelona**, Barcelona, Spain.

2004-2008 B.Sc. in *Biological sciences*. **University of Barcelona**, Barcelona, Spain.  
 Award to most outstanding graduates. Spanish Ministry of Education (2008)

**RESEARCH POSITIONS**

2023-present **ICREA Research Professor**.

2019-present **Centre for Genomic Regulation (CRG)**. Barcelona, Spain.  
 Group Leader.

2015-2018 **Weizmann Institute of Science**. Rehovot, Israel.  
 EMBO/WIS Postdoctoral fellow. Advisor: Prof. Amos Tanay.

2013-2014 **Institute of Evolutionary Biology (CSIC-UPF)**, Barcelona, Spain.  
 Research associate.

2009-2013 **University of Barcelona/Department of Genetics**, Barcelona, Spain.  
 PhD Student. Supervisor: Prof. Iñaki Ruiz-Trillo.

**PUBLICATIONS****RESEARCH ARTICLES**

§ Corresponding author, \* Co-first authors

- 2023 Najle, S., Grau-Bové, X., Elek, A., Navarrete, C., Cianferoni, D., Chiva, C., Cañas-Armenteros, D., Mallabiarrena, A., Kamm, K., Sabidó, E., Gruber-Vodicka, H., Schierwater, B., Serrano, L., Sebé-Pedrós, A. § Stepwise emergence of the neuronal gene expression program in early animal evolution. *Cell* 186(21), 4676-4693.e29. Cover article.
- 2023 Grau-Bové, X.\*, Subirana, L.\*, Meister, L., Soubigou, A., Neto, A., Elek, A., Fornas, O., Gomez-Skarmeta, J.L., Tena, J.J., Irimia, M., Bertrand, S. §, Sebé-Pedrós, A. §, Escrava, H. § (2023). An amphioxus neurula stage cell atlas supports a complex scenario for the emergence of vertebrate head mesoderm. bioRxiv, doi: 10.1101/2023.09.26.559513
- 2023 Zolotarov, G., Grau-Bové, X., Sebé-Pedrós, A. § (2023). GeneExt: a gene annotation extension tool for enhanced single-cell transcriptomic analysis. bioRxiv. doi: 10.1101/2023.12.05.570120

- 2023 Li Y., Slavik, K.M., Toyoda, H.C., Benjamin R. Morehouse, de Oliveira Mann, C.C., Elek, A.; Levy, S., ..., Sebé-Pedrós, A., Schwede F., Kranzusch, P. cGLRs are a diverse family of pattern recognition receptors in animal innate immunity. *Cell* 186(15), 3261-3276.e20.
- 2022 Robertson, H.E. \*, Sebé-Pedrós, A. \*, Saudemont, B., Loe Mie, Y., Zakrzewski, A., Grau-Bové, X., Mailhe, M.-P., Schiffer, P., Telford, M.J., and Marlow, H. Single cell atlas of *Xenoturbella bocki* highlights the limited cell-type complexity of a non-vertebrate deuterostome lineage. *bioRxiv* 08.18.504214.
- 2022 Miguel-Escalada, I., Maestro, M. Á., Balboa, D., Elek, A., Bernal, A., Bernardo, E., Grau, V., García-Hurtado, J., Sebé-Pedrós, A., & Ferrer, J. Pancreas agenesis mutations disrupt a lead enhancer controlling a developmental enhancer cluster. *Developmental Cell* 57(16), 1922-1936.e9
- 2022 Grau-Bové, X., Navarrete, C., Chiva, C., ..., Schleper, C., Sabidó, E., & Sebé-Pedrós, A. § A phylogenetic and proteomic reconstruction of eukaryotic chromatin evolution. *Nature Ecology & Evolution*, 6(7), 1007–1023.
- 2021 Grau-Bové, X. §, and Sebé-Pedrós, A. §. Orthology clusters from gene trees with *Poasvm*. *Molecular Biology and Evolution* 38, 5204–5208.
- 2021 Levy, S., Elek, A., Grau-Bové, X., ..., Mass, T. §, A. Sebé-Pedrós A. §. A stony coral cell atlas illuminates the molecular and cellular basis of coral symbiosis, calcification, and immunity. *Cell* 184(11), 2973-2987.e18  
Cover article
- 2021 García-Castro, H., Kenny, N., Iglesias, M., ..., Sebé-Pedrós, A., Solana, J. ACME dissociation: a versatile cell fixation-dissociation method for single-cell transcriptomics. *Genome Biology*, 22, 89.
- 2021 Rosa, N., Shabardina, V., Ivanova, H., Sebé-Pedrós, A., Yule, D.I., Bultynck, G., 2021. Tracing the evolutionary history of Ca<sup>2+</sup>-signaling modulation by human Bcl-2: Insights from the *Capsaspora owczarzaki* IP<sub>3</sub> receptor ortholog. *Biochim. Biophys. Acta - Mol. Cell Res.* 1868, 119121.
- 2020 Ku, C., Sheyin, U., Sebé-Pedrós, A., ..., Vardi, A. A single-cell view on alga-virus interactions reveals sequential transcriptional programs and infection states. *Science Advances* 6, eaba4137
- 2020 Levy, S., Brekhman, V., Bakhman, A., Malik, A., Sebé-Pedrós, A., Kosloff, M., and Lotan, T. Ectopic activation of GABAB receptors inhibits neurogenesis and metamorphosis in the cnidarian *Nematostella vectensis*. *Nature Ecology & Evolution* 5, 111–121.
- 2020 Peligero-Cruz, C., Givony, T., Sebé-Pedrós, A., ..., Abramson, J. IL18 signaling promotes homing of mature Tregs into the thymus. *Elife* 9, 1–23.
- 2019 Baran, Y., Bercovich, A., Sebé-Pedrós, A., Lubling, Y., .., Tanay, A. MetaCell: analysis of single-cell RNA-seq data using K-nn graph partitions. *Genome Biology* 20, 206.
- 2018 Sebé-Pedrós, A. §, Chomsky, E., ..., Hejnal, A., Degnan, B.M., and Tanay, A. §. Early metazoan cell type diversity and the evolution of multicellular gene regulation. *Nature Ecology & Evolution* 2, 1176–1188. F1000 score 5.
- 2018 Sebé-Pedrós, A., Saudememont, B., ..., Spitz, F., Tanay, A., Marlow, H. Cnidarian Cell Type Diversity and Regulation Revealed by Whole-Organism Single-Cell RNA-Seq. *Cell*, 173, 1520-1534. F1000 score 3.

- 2018 Torruella, G., Grau-Bové, X., Moreira, D., Karpov, S., Burns, JA., Sebé-Pedrós, A., Völcker, E., López-García, P. Global transcriptome analysis of the aphelid *Paraphelidium tribonemae* supports the phagotrophic origin of fungi. ***Communications biology***. 231.
- 2016 Sebé-Pedrós, A., Peña, Ml.,..., Gabaldón, T., Ruiz-Trillo, I., Sabidó, E. High-throughput Proteomics Reveals the Unicellular Roots of Animal Phosphosignaling and Cell Differentiation ***Developmental Cell***, 39:186-197.
- 2016 Sebé-Pedrós, A. §, Ballaré, C., Parra-Acero, H.,..., Gomez-Skarmeta, JL., Di Croce, L., Ruiz-Trillo, I§. The Dynamic Regulatory Genome of *Capsaspora* and the Origin of Animal Multicellularity. ***Cell***, 165:1224–1237.
- 2015 Alzayady KJ, Sebé-Pedrós A §, ..., Yule, DI§. Tracing the Evolutionary History of Inositol 1,4,5-trisphosphate receptor: Insights from Analyses of *Capsaspora owczarzaki* Ca<sup>2+</sup> Release Channel Orthologs. ***Molecular Biology and Evolution*** 32:2236-53.
- 2015 Grau-Bové X\*, Sebé-Pedrós A\*, Ruiz-Trillo I. The eukaryotic ancestor had a complex ubiquitin signalling system of archaeal origin. ***Molecular Biology and Evolution*** 32:726-739
- 2014 De Mendoza A, Sebé-Pedrós A, Ruiz-Trillo I. The evolution of the GPCR signalling system in eukaryotes: modularity, conservation and the transition to metazoan multicellularity. ***Genome Biology and Evolution*** 6:606-619
- 2014 Sebé-Pedrós A\*, Grau-Bové X\*, Richards TA, Ruiz-Trillo I. Evolution and classification of myosins, a paneukaryotic whole genome approach. ***Genome Biology and Evolution***, 6:290-305
- 2013 De Mendoza A\*, Sebé-Pedrós A\*, ..., Domazet-Lôso T, Ruiz-Trillo I. Transcription factor evolution in eukaryotes and the assembly of the regulatory toolkit in multicellular lineages. ***PNAS*** 110: E4858-66
- 2013 Sebé-Pedrós A, Irimia M, del Campo J, Parra-Acero H, Russ C, Nusbaum C, Blencowe BJ, Ruiz-Trillo I. Regulated aggregative multicellularity in a close unicellular relative of Metazoa. ***eLife*** 2:e01287
- 2013 Sebé-Pedrós A\*, Ariza-Cosano A\*, Weirauch MT, ..., Hughes TR, Gómez-Skarmeta JL, Ruiz-Trillo I. Early evolution of the T-box transcription factor family. ***PNAS*** 110:16050-16055.
- 2013 Sebé-Pedrós A\*, Burkhardt P\*, Sánchez-Pons N, Fairclough SR, Lang BF, King N, Ruiz-Trillo I. Insights into the origin of metazoan filopodia and microvilli. ***Molecular Biology and Evolution*** 30:2013-2023.
- 2013 Suga H, Chen Z, de Mendoza A, Sebé-Pedrós A, ..., Roger AJ, Nusbaum C, Ruiz-Trillo I. The *Capsaspora* genome reveals a complex unicellular prehistory of animals. ***Nature Communications*** 4:1–9.
- 2013 Martín-Durán JM\*, de Mendoza A\*, Sebé-Pedrós A\*, Ruiz-Trillo I, Hejnal A. A broad genomic survey reveals multiple origins and frequent losses in the evolution of respiratory hemerythrins and hemocyanins. ***Genome Biology and Evolution*** 5:1435–1442.
- 2013 Grau-Bové X, Sebé-Pedrós A §, Ruiz-Trillo I. A genomic survey of HECT ubiquitin ligases in eukaryotes reveals independent expansions of the HECT system in several lineages. ***Genome Biology and Evolution*** 5:833–847.

- 2012 Sebé-Pedrós A\*, Zheng Y\*, Ruiz-Trillo I, Pan DJ. Premetazoan Origin of the Hippo Signaling Pathway. *Cell Reports* 1:13-20.
- 2011 Sebé-Pedrós A\*, de Mendoza A\*, ..., Ruiz-Trillo I. Unexpected Repertoire of Metazoan Transcription Factors in the Unicellular Holozoan *Capsaspora owczarzaki*. *Molecular biology and evolution* 28:1241-1254.
- 2010 Sebé-Pedrós A, Roger AJ, Lang BF, King N, Ruiz-Trillo I. Ancient origin of the integrin-mediated adhesion and signalling machinery *PNAS* 107:10142-10147.

### REVIEWS & BOOK CHAPTERS

- 2021 Tanay, A. §, and Sebé-Pedrós, A. § Evolutionary Cell Type Mapping with Single-Cell Genomics. *Trends in Genetics*. 37, 919-932.
- 2019 De Mendoza A., Sebé-Pedrós A. §. Origin and evolution of eukaryotic transcription factors. *Current Opinion in Genetics & Development* 59, 25-32.
- 2019 Ku, C., Sebé-Pedrós A. §. Using single-cell transcriptomics to understand functional states and interactions in microbial eukaryotes. *Philosophical Transactions of the Royal Society B: Biological Sciences* 374, 20190098.
- 2019 De Mendoza A., Sebé-Pedrós A. §. The protistan cellular and genomics roots of animal multicellularity. In "Old Questions and Young Approaches to Animal Evolution" Martín-Duran, J.M. and Vellutini, B. (Eds.) Springer.
- 2017 Sebé-Pedrós, A. §, Degnan, B, Ruiz-Trillo, I. The origin of Metazoa: a unicellular perspective. *Nature Reviews Genetics* 18, 498-512.
- 2017 Sebé-Pedrós, A. §, Ruiz-Trillo, I. Evolution and Classification of the T-Box Transcription Factor Family. *Current Topics in Dev. Biology* 122, 1-26
- 2014 Sebé-Pedrós A, De Mendoza A. Transcription factors and the origin of animal multicellularity. In "Evolutionary transitions to multicellular life: Principles and mechanisms" Nedelcu, A. and Ruiz-Trillo, I. (Eds.) Springer.
- 2010 Sebé-Pedrós A, Ruiz-Trillo I. Integrin-mediated adhesion complex: Cooption of signaling systems at the dawn of Metazoa. *Communicative & Integrative Biology* 3:475-477.

### INVITED SEMINARS

- 2024 University of Galway, Ireland. Host: Heinz Peter Nasheuer
- 2023 EMBO Evolution of Animal Genomes, Sevilla, Spain.
- 2023 University of Vienna, Austria. Host: Darrin Schultz/Oleg Simakov
- 2023 Cornell University, US. Online. Host: Sarah Saddoris/Leanne Donahue/Praveen Sethupathy
- 2022 Institute Jacques Monod, Paris, France. Host: Eve Gazave/Michel Vervoort.
- 2022 EuroEvoDevo Meeting, Naples, Italy.
- 2022 EMBO Workshop: Evo-chromo: Evolutionary approaches to research in chromatin, Aarhus, Denmark.
- 2021 EMBO Workshop: The evolution of animal genomes. Online.

- 2021 EMBO/EMBL Symposium: The Identity and Evolution of Cell Types. Online.
- 2021 Biological Research Centre of the Hungarian Academy of Sciences. Host: László Nagy
- 2021 Oxford Brookes University. Host: PhD students.
- 2021 Max Planck Institute for Biophysical Chemistry. Host: Jochen Rink
- 2020 Universitat de Barcelona PhD Day, Barcelona, Spain.
- 2020 Centro Nacional de Investigaciones Oncológicas (CSIC-CNIO), Madrid, Spain. Host: Francisco Real.
- 2020 Institute for Research on Cancer and Aging (IRCAN), Nice, France. Host: Eric Rottinger
- 2019 Catalan Society For Biology - 2019/2020 Academic Year Inaugural Keynote Lecture
- 2019 Fribourg University, Fribourg, Switzerland. Host: Student committee.
- 2019 Centro Andaluz de Biología del Desarrollo (CABD), Seville, Spain. Host: JL. Gomez-Skarmeta.
- 2019 QMUL New Horizons in Genomics, London, UK. Organizers: D. Villar/V. Rakyán/ P. Madapura
- 2019 Natural History Museum, London, UK. Host: A. Riesgo.
- 2019 CRG Proteomics symposium 2019. Organizer: E. Sabidó.
- 2019 Observatoire Océanologique de Villefranche sur Mer. Host: A. Ferraioli/ E. Houliston
- 2019 9th Annual Meeting EFOR. Paris, France. Organizer: S. Bertrand.
- 2019 Sars International Centre for Marine Molecular Biology, Bergen, Norway. Host: A. Hejnl
- 2019 Operationalizing the Cell Type Concept. Santa Fe Institute, US. Organizers: A. Wagner, D. Arendt, M. Laubichler
- 2019 Exploring Genomic Landscapes Conference. San Pedro de Atacama, Chile. Organizers: JL. Gomez-Skarmeta/M. Allende.
- 2018 University of Western Australia. Perth, Australia. Host: A. de Mendoza
- 2018 Royal Society Meeting "Developing new approaches for the single cell manipulations and experimentation". Chicheley Hall, UK. Organizer: T. Richards.
- 2018 University of Vienna. Host: U. Technau
- 2018 Max Delbrück Center for Molecular Medicine (MDC). Berlin, Germany. Host: J-P. Junker.
- 2018 EuroEvoDevo (EED) Conference 2018. Galway, Ireland. Organizer: C. Laumer
- 2018 Royal Society Meeting "Using Genomic Comparisons to Understand Cellular Complexity in our Ancient Ancestors". Chicheley Hall, UK. Organizer: T Richards.
- 2018 Haifa University, Haifa, Israel. Hosts: T.Mass/ T.Lotan
- 2018 Queen Mary University of London, London, UK. Host: JM Martin-Duran
- 2017 Hebrew University, Jerusalem, Israel. Host: Yehu Moran.
- 2016 Barcelona Biomedical Research Park (PRBB), Barcelona, Spain. Host: M. Irimia
- 2016 Spanish Society for Developmental Biology Meeting, Girona, Spain. Organizers: I. Maeso/M. Irimia
- 2015 CRG Proteomics Symposium 2015, Barcelona, Spain. Organizer: E. Sabidó.

2014 University of Lausanne D-Day, Lausanne, Switzerland. Organizer: O. Dundin.

### CONTRIBUTED SEMINARS

2019 2019 International Choanoflagellates Meeting. Organizers: N.Ros/O.Dundin

2016 Single Cell Genomics 2016. Wellcome Trust Campus, Hinxton, UK

2016 EMBL conference: Transcription and Chromatin. Heidelberg, Germany

2015 EMBO Exploring the genomic complexity and diversity of eukaryotes Sant Feliu de Guixols, Spain

2015 "The origin of metazoans" International Workshop. Hyeres, France.

2013 4th meeting of the Spanish Society for Evolutionary Biology (SESBE) Barcelona, Spain.

2013 International Congress of Protozoology ICOP XIV. Vancouver, Canada.

2011 XIII Evolutionary Biology Meeting. Institute for Catalan Studies. Barcelona, Spain.

### ORGANIZED MEETINGS

2024 EMBO Evo-chromo: Evolutionary approaches to research in chromatin (co-organizer: Tobias Warnecke). Oxford, UK.

2023 Biodiversity Cell Atlas kick-off Meeting. Barcelona, Spain.

2022 CNRS Monod Conference – Origin of metazoans (co-organizer: Evelyn Houlston). Roscoff. France.

2019 18<sup>th</sup> CRG symposium. Barcelona, Spain  
Single cell and single molecule biology (co-organizers: Ben Lehner, Manuel Irimia)

2015 Society for Molecular Biology and Evolution Meeting. SMBE 2015. Viena. Austria.  
The origins of multicellularity under the light of functional genomics (co-organizer: Alex de Mendoza)

### FUNDED PROJECTS

2023 Moore Foundation - Biodiversity Cell Atlas. Project ID: #12189

2022 BBVA Foundation - Ecology and Biology of Conservation Research Grants

2022 Spanish Ministry of Science. Project ID: PID2021-124757NB-I00

2020 Moore Foundation (Consortium member). Project ID: GBMF9322

2019 ERC Starting Grant. Project ID: 851647

2019 BBVA Foundation - Leonardo Grant to Young Investigators.

2019 Spanish Ministry of Science. Project ID: PGC2018-098210-A-I00

### AWARDS AND FELLOWSHIPS

2023-2026 EMBO Young Investigator Program elected member.

2022 Eppendorf Award for Young European Investigators. Finalist.

2022 "Pius Font i Quer" prize, Catalan Society of Biology (SCB).

- 2017 Senior Postdoctoral fellowship. Weizmann Institute of Science. Israel.
- 2016 Weizmann Institute Systems Biology "Innovative Student Awards"
- 2016 XIX Premi Claustre Doctors Universitat Barcelona. 2nd prize.
- 2015 Koshland Prize to outstanding Postdoctoral Fellows. Israel.
- 2014 EMBO Long-term fellowship (reference ALTF 841-2014).
- 2013 PhD Extraordinary Award, Universitat Barcelona. Spain.
- 2012 Travel grant, Spanish Society for Genetics (SEG). Spain.
- 2011 Travel grant, Spanish Ministry of Education and Science. Spain.
- 2011 Prevosti Prize for the best talk, XI Evolutionary Biology Meeting, Institute for Catalan Studies. Spain.
- 2009 PhD fellowship. FPU program from the the Spanish Ministry of Education and Science. Spain.
- 2009 PhD fellowship. FI program from the Catalan Autonomic Government. Spain.
- 2008 National Academic Performance Awards, for degree students finishing in 2007/2008. Spanish Government (reference BOE-A-2010-7120).

## MEMBERSHIPS

Society for Molecular Biology and Evolution (SMBE)  
 European Evolutionary Developmental Biology (EuroEvoDevo)  
 Sociedad Española de Biología Evolutiva (SESBE)  
 Societat Catalana de Biologia (SCB)

## PEER- REVIEWING

### JOURNALS

<https://www.webofscience.com/wos/author/record/1727953>

Cell  
 Science  
 Nature  
 Nature Methods  
 Nature Ecology & Evolution  
 Current Biology  
 Development  
 BMC Biology  
 EMBO Journal  
 Cell Systems  
 Science Advances  
 eLife  
 Genome Research  
 Molecular Biology and Evolution  
 Genome Biology and Evolution  
 Nucleic Acid Research  
 BMC Evolutionary Biology  
 Scientific Reports  
 Philosophical Transactions of the Royal Society B: Biological Sciences  
 Proceedings of the Royal Society B: Biological Sciences  
 Seminars in Cell and Developmental Biology

### ASSOCIATE EDITOR

Science Advances  
 EvoDevo

### FUNDING AGENCIES

European Research Council (ERC)  
 Human Frontiers Science Program (HFSP)  
 Natural Environment Research Council (NERC, UK)  
 Austrian Science Fund (FWF, Austria)  
 Israel Science Foundation (ISF, Israel)  
 Swiss National Science Foundation (SNF, Switzerland)  
 German Research Foundation (DFG, Germany)  
 Medical Research Council (MRC, UK)  
 Ministry of Science, Innovation and Universities (Spain)  
 IdexLyon – Université de Lyon (France)  
 Research Foundation – Flanders (FWO) (Belgium)

### CONSULTING

Bioliquid (PCB - BioCat)

### MENTORING EXPERIENCE

2022-present PhD supervisor. Paulina Spurk. LaCaixa INPhINIT fellow.  
 2022-present PhD supervisor. Laia Montes. FPI fellow.  
 2021-present PhD supervisor. Grygoriy Zolotarov. LaCaixa INPhINIT fellow.  
 2022 Master thesis supervisor. Laia Montes (Universitat Autònoma de Barcelona)  
 2021 Master thesis supervisor. Monica Varona (Universitat Autònoma de Barcelona)  
 2020-2021 Master thesis supervisor. Sergi Muyo (Universitat de Barcelona)  
 2020-present PhD supervisor. Cristina Navarrete. FPI fellow.  
 2019-present PhD supervisor. Anamaria Elek. FPI fellow.  
 2014-2015 Research mentor for PhD student Nuria Ros Rocher.  
 2013-2014 Research mentor for MSc student Lourdes Riquelme Domínguez.  
 2011-2012 Research mentor for MSc student Xavier Grau-Bové.

### ACADEMIC ACTIVITIES

2021-present Chair of the CRG Graduate Committee  
 2020-present CRG annual PhD course – Systems Biology Module Organizer  
 2020 Chair of CRG PhD recruitment panel  
 2020 Member of the CRG Graduate Committee  
 2019-present CRG annual PhD course – Theoretical/practical lessons: Single-cell biology  
 2019 Theoretical lessons. MSc in Developmental Biology and Genetics. University of Barcelona, Barcelona, Spain.  
 2012-2015 Theoretical lessons. MSc in Developmental Biology and Genetics. University of Barcelona, Barcelona, Spain.  
 2010-2011 Practical lessons: *Molecular Genetics*. Biology degree. 48 hours. University of Barcelona, Barcelona, Spain.  
 2009-2010 Practical lessons: *Molecular Genetics*. Biology degree. 48 hours. University of Barcelona, Barcelona, Spain.