

CURRICULUM VITAE ABREVIADO (CVA)**IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.****Part A. PERSONAL INFORMATION**

First name	Patrick		
Family name	Aloy Calaf		
Gender (*)	Male	Birth date (dd/mm/yyyy)	09/09/1972
Social Security, Passport, ID number	77609655L		
e-mail	patrick.aloy@irbbarcelona.org	URL Web	https://sbnb.irbbarcelona.org
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-3557-0236		

(*) *Mandatory***A.1. Current position**

Position	ICREA Research Professor		
Initial date	01/04/2006		
Institution	Institute for Research in Biomedicine (IRB Barcelona)		
Department/Center	Mechanisms of Disease		
Country	Spain	Teleph. number	934039690
Key words	Systems pharmacology; systems medicine; computational biology		

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
2003-2006	Staff Scientist/EMBL-HD/Germany
2001-2003	Research Assistant/EMBL-HD/Germany

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Biochemistry	Autonomous University of Barcelona	2000
MSc in Biotechnology	Autonomous University of Barcelona	1998
BSc in Biochemistry	Autonomous University of Barcelona	1996

Part B. CV SUMMARY (*max. 5000 characters, including spaces*)

Dr Patrick Aloy is an ICREA Research Professor and Principal Investigator of the Structural Bioinformatics and Network Biology lab at the IRB. He has a BSc in Biochemistry and a MSc in Biotechnology from the Universitat Autònoma de Barcelona, Spain, and spent six years as postdoctoral researcher and staff scientist at the European Molecular Biology Laboratory, Heidelberg, Germany. For twenty-five years Dr Aloy has been developing and implementing new technologies and algorithms, applying state-of-the-art methods to specific problems and bridging the gap between theoretical models and experiments in different disciplines. The main goal of his lab is to combine molecular, cell and computational biology to unveil the basic wiring architecture and dynamics of physiological pathways to increase our understanding of how biological systems change from the healthy state to disease. In the last years, he has been developing resources to process, harmonize and integrate bioactivity data on small molecules, providing compound bioactivity descriptors that push the similarity principle beyond chemical properties. Currently, the main research line in the lab is to collect heterogeneous datasets and develop novel methodologies to integrate different layers of regulation to unveil disease signatures. Moreover, they are convinced that artificial intelligence (AI) will transform drug discovery, as it is reshaping other areas of science and technology, and biological signatures are the key to guide the (semi) automated design of chemical compounds to globally revert disease states, beyond individual targets.



Scientific contributions

The results of Dr Aloy's contributions to science are reflected in the over **157 articles (38 in the last 5 years)** published in top journals (e.g. Nature (x2), Science (x3), Cell (x2), Nat Biotechnol (x5), Nat Methods (x2), etc), **24 of which as 1st author and 75 as senior**. The scientific and social relevance of his work can be measured with the **over 17,600 collected citations (h-index = 57)**, a remarkable press coverage of his results, **over 140 talks** given in top international meetings and the recurrent invitation to co-organize some of the most prestigious international conferences in the field (e.g. EMBO and CSHL meetings).

Scientific supervision and mentoring

Dr Aloy has supervised **15 PhD students**. 12 of them already completed and defended their theses, **all of which obtained the qualification of Excellent Cum Laude**, including **two UPF Extraordinary Awards** in 2021 (Lidia Mateo) and 2017 (Miquel Duran-Frigola). Two of the students supervised by Dr Aloy are now group leaders in academic institutions (Universities of Copenhagen and Aix-Marseille), one founded Erisilia (<https://www.ersilia.io/>) a tech non-profit organization to apply AI technologies to neglected and tropical diseases in developing countries. The rest occupy responsibility positions in top pharma (e.g. Novo-Nordisk, Rovi) and biotech companies (e.g. Made of Genes). Additionally, Dr Aloy also supervised 12 MSc students and 3 BSc Final Degree Projects. Finally, Dr Aloy has **mentored 20 postdoctoral fellows**, including Ramón y Cajal, EMBO, Marie Curie and Juan de la Cierva grantees.

Technology transfer and entrepreneurship

In 2007 Dr Aloy **co-founded Anaxomics Biotech SL** (<https://www.anaxomics.com/>), a life sciences company focused on drug discovery, and he is author of **three patents, a copyrighted product under exploitation** by EMBLEM Technology Transfer. He is currently Scientific Advisor to Nuage Therapeutics and consultant for several biotech and pharmaceutical companies (e.g. GSK, Eli-Lilly, Janssen, Biersdorf, etc).

Commissions of trust

Dr Aloy currently holds several positions as advisor and participates in different commissions: he is **Scientific Co-lead of the Cellular and Molecular Research priority area of ELIXIR-Europe** (2024-), Member of the Scientific Advisory Board of Nuage Therapeutics (2023-), Member of the Scientific Board of the BioHealth Excellence campus of the University of Graz (2019-), Coordinator of the Computational Biology Node at the IRB Barcelona (2018-), Member of the Advisory Committee of the Protein Families resources at the EMBL-EBI (2015-) and has been the Coordinator of the Life and Biomedical Sciences of the Spanish Supercomputing Network (2011-2014). Additionally, Dr Aloy recurrently participates as **Member of many Evaluation Committees** for the European Commission (EU), SNSF (CH), Wellcome Trust (UK), MRC (UK), NCI (US), MICINN (ES), etc.

He is also **Member of the Editorial Board** of several journals (e.g. Genome Medicine, Molecular Cell Proteomics, Scientific Data, etc) and ad hoc Reviewer for many top-tier scientific journals, including Nature, Science, Cell, Nat Biotechnol, Nat Methods, etc.

Scientific societies

Dr Aloy is the Co-Coordinator of the Proteomics section of the Societat Catalana de Biologia (2020-), and he is an Ordinary Member of the Instituto Nacional de Bioinformática (2018-), the Societat Catalana de Biologia (2001-) and the Sociedad Española de Bioquímica y Biología Molecular (1996-).

Outreach activities

Dr Aloy constantly participates in outreach activities expanding the natural niche of his research discipline, including international dissemination (e.g. European Science Night), national and local initiatives (e.g. Barcelona Science Week, IRB Open Day), where he delivers talks and lectures addressed to the general public Secondary School students.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

Dr Aloy has published **157 articles (38 in the last 5 years)** in top journals (e.g. Nature (x2), Science (x3), Cell (x2), Nat Biotechnol (x5), Nat Methods (x2), etc), **24 of which as 1st author and 75 as senior**. Please, find below a selection of recently published works.

- Lobentanzer S, **Aloy P** (2/32), ... Saez-Rodriguez J. Democratizing knowledge representation with BioCypher. Nat Biotechnol (2023) 41, 1056-1059. IF: 68,164; Q1
- Kim DK, ..., **Aloy P** (46/52), ... Falter-Braun, P. A proteome-scale map of the SARS-CoV-2-human contactome. Nat Biotechnol (2023) 41, 140-149. IF: 68,164; Q1
- Fernández-Torras, A, Duran-Frigola, M, Bertoni, M, Locatelli M & **Aloy, P***. Integrating and formatting biomedical data as pre-calculated knowledge graph embeddings in the Bioteque. Nat Commun (2022) 13, 5304. IF: 17,694; Q1
- Pauls E, Bayod S, Mateo L, ... **Aloy P*** (14/14). Identification and drug-induced reversion of molecular signatures of Alzheimer's disease onset and progression in App^{NL-G-F}, App^{NL-F} and 3xTg-AD mouse models. Genome Med (2021) 13: 1-23. IF: 10,675; Q1
- Bertoni M, Duran-Frigola M, Badia-i-Mompel P, ... **Aloy P*** (13/13). Bioactivity descriptors for uncharacterized chemical compounds. Nat Commun (2021) 12: 1-13. IF: 14,919; Q1
- Costanzo M, ... **Aloy P** (14/17), ... Andrews B. Environmental robustness of the global yeast genetic interaction network. Science (2021) 372: eabf8424. IF: 47,728; Q1
- Duran-Frigola M, Pauls E, Guitart-Pla O, Bertoni M, Alcalde V, Amat D, Juan-Blanco T, **Aloy P***. Extending the small molecule similarity principle to all levels of biology. Nat Biotechnol (2020) 38:1087-1096. IF: 35.725; Q1
- Luck K, Kim DK, ..., **Aloy P** (78/87), ... Calderwood MA. A reference map of the human binary protein interactome. Nature (2020) 580: 402-408. IF: 49,962; Q1
- Mateo L, Duran-Frigola M, Gris-Oliver A, ... **Aloy P*** (11/11). Personalized cancer therapy prioritization based on driver co-occurrence patterns. Genome Med (2020) 12:78. IF: 10,886; Q1
- Fernández-Torras A, Duran-Frigola M, **Aloy P***. Encircling the regions of the pharmacogenomics landscape that determine drug response. Genome Med (2019) 11: 17. IF: 10,886; Q1

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

Dr Aloy has given over **140 talks at international conferences**, 30 of which in the last 5 years. Find below a selection of some recent ones.

- BioMed Conference on Proximity-Inducing Pharmacology (Invited Speaker). Barcelona, ES. May 2023.
- Conference on Precision Toxicology (Invited Speaker). Birmingham, UK. April 2023.
- Systems Biology: Networks (Invited Speaker). Cold Spring Harbor Laboratory, US. March 2023.
- International Conference on Systems Biology – ICSB (Invited Speaker). Berlin, DE. October 2022.
- European Conference on Computational Biology – ECCB (Invited Speaker). Sitges, ES. September 2022.
- From algorithms to discovery in biology and medicine (Invited Speaker). San Francisco, US. July 2022.

Additionally, Dr Aloy has (co-) **organized 17 International Conferences**, including:

- CRG-SCB Annual Proteomics Symposium. Barcelona, ES. November 2022, 2023.
- European Conference on Computational Biology (ECCB) meeting. Sitges, ES. September 2022.
- EMBO conference on Expanding the druggable proteome with chemical biology. Heidelberg, DE. February 2020.

C.3. Research projects, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

Since his incorporation to IRB Barcelona, Dr Aloy has attracted **over 9M€** of extramural competitive grants and salaries, including an **ERC Consolidator Grant**. Please, find below a selection of the obtained grants as Principal Investigator in the last 10 years. The indicated funding corresponds to the amount received by the SB&NB group.

- Causative link between respiratory syncytial virus and chronic respiratory diseases: identifying targets for therapy. European Commission (101137201) 2024-2029. **1,000,368€**.
- Utilización de Big Data biológica para avanzar hacia una medicina sistémica personalizada. Ministerio de Ciencia e Innovación (PID2020-119535RB-I00) 2021-2024. **305.000€**.
- Programa de ciencia de datos de la infraestructura de medicina de precisión asociada a la ciencia y la tecnología (IMPACT-Data). Ministerio de Ciencia e Innovación e Instituto de Salud Carlos III (IMP/00019) 2021-2024. **139,914€**.
- Rapid interaction profiling of 2019-nCoV for network-based deep drug repurpose learning. European Commission (101003633) 2020-2023. **197.500€**.
- Medicina personalitzada: Valorització d'EGA per a la Industria i la Societat. Generalitat de Catalunya (001-P-001647) 2020-2023. **90,000€**.
- Human Brain Project: Cluster Emergent del Cervell Humà. Generalitat de Catalunya (001-P-001682CECH) 2020-2023. **90,000€**.
- Plataforma Tecnológica de Investigación en Salud – Bioinformática. Instituto de Salud Carlos III (PT17/0009/000). 2018-2020. **102,025€**.
- Aproximación de farmacología sistémica para posibilitar el abordaje de enfermedades complejas. Ministerio de Educación y Ciencia (BIO2016-77038-R) 2017-2019. **290,000€**.
- Desarrollo de nuevas estrategias terapéuticas, basadas en farmacología computacional sistémica, contra la enfermedad de Alzheimer. Ministerio de Educación y Ciencia (BIO2013-48222-R) 2014-2016. **287,980€**.
- A systems pharmacology approach to Alzheimer's disease. European Research Council - ERC (694144) 2014-2019. **1,300,000€**.

C.4. Contracts, technological or transfer merits, Include patents and other industrial or intellectual property activities (contracts, licenses, agreements, etc.) in which you have collaborated. Indicate: a) the order of signature of authors; b) reference; c) title; d) priority countries; e) date; f) Entity and companies that exploit the patent or similar information, if any

In 2007 Dr Aloy **co-founded Anaxomics Biotech SL** (www.anaxomics.com), he is author of three patents (**US Patent Application Nos: 61/754,186; 13/660,205; 12/912, 535**) and a copyrighted product (**InterPreTS; EU - 19.4.2002**) under exploitation. He is currently Scientific Advisor to Nuage Therapeutics and consultant for several biotech and pharmaceutical companies (e.g GSK, Eli-Lilly, Janssen, Biersdorf, etc). In the last 10 years, he has established research contracts with Biersdorf (2023-2024; **74,000€**), Almirall (2020; **37,500€**), Eli-Lilly (2019; **10,000€**), Nostrum BioDiscovery (2021; **4,000€**) and Nuage Therapeutics (2022; **6,000€**).