



CURRICULUM VITAE ABREVIADO (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

CVA date	9 July, 2024
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Part A. PERSONAL INFORMATION

First name	Angel		
Family name	Barco		
Gender (*)	Male	Birth date (dd/mm/yyyy)	28/06/1969
Social Security, Passport, ID number	08826790B		
e-mail	abarco@umh.es	URL Web	https://in.umh-csic.es/grupo3893
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-0653-3751		

(*) Mandatory

A.1. Current position

Position	Profesor de Investigación CSIC & Director IN UMH-CSIC		
Initial date	March 2016 & October 2020		
Institution	Consejo Superior de Investigaciones Científicas (CSIC)		
Department/Center	Instituto de Neurociencias, UMH-CSIC (IN UMH-CSIC)		
Country	Spain	Teleph. number	965 919232
Key words	Epigenetics, regulation of gene expression, neuronal plasticity, neuronal identity, learning & memory, intellectual disability disorders		

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

Period	Position/Institution/Country/Interruption cause
Mar 2010-Mar 2016 (72 m)	Investigador Científico CSIC, IN UMH-CSIC, Spain
Jun 2007-Mar 2010 (32 m)	Científico Titular CSIC, IN UMH-CSIC, Spain
Nov 2004-Oct 2008 (48 m)	MC Excellence Grant Team Leader, IN UMH-CSIC, Spain
Sep 2004-Oct 2004 (2 m)	Investigador Ramón y Cajal, IN UMH-CSIC, Spain
Oct 2003-Aug 2004 (10 m)	Associate Research Scientist, Columbia University, USA
Oct 1998-Sep 2003 (60 m)	Postdoctoral fellow, Columbia University, USA
Jan 1997-Sep 1998 (20 m)	Postdoctoral fellow, CBMSO (UAM-CSIC), Spain
Jan 1993-Dec 1996 (48 m)	Predoctoral fellow, CBMSO (UAM-CSIC), Spain
Sep 1990-Dec 1992 (28 m)	Colaboration student (pre-grad), CBMSO (UAM-CSIC), Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD Biochemistry & Molecular Biology (with distinction – Premio extraordinario)	Universidad Autónoma de Madrid	1996
Mcs Biology (Especial mention in the National Prizes for Graduates)	Universidad Autónoma de Madrid	1992

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

Angel Barco (AB) is Professor of Research (Full Professor equivalent) at CSIC, Director of IN UMH-CSIC (2020) and Scientific director of the institutional “SOCE” grant (2023). AB initiated his scientific career investigating the molecular mechanisms of cytotoxicity by poliovirus in the lab of Dr. Carrasco (CBMSO, Madrid). In this productive period, he received training in virology, biochemistry, cellular and molecular biology, and yeast genetics, and developed an interest in bioinformatics. After defending his thesis (1996, "Juan Abelló Pascual I" Prize of the Spanish Royal Academy of Doctors to the best thesis dissertation in Biochemistry), AB conducted a brief postdoc at CBMSO before moving to Columbia University in New York (USA) where he joined the group of Nobel laureate Prof. Eric Kandel to work in the molecular mechanisms of learning and memory. Among other findings, his research there helped to explain how synaptic specificity is achieved after nuclear activation by synaptic inputs and pioneered the field of



neuroepigenetics. In 2004, AB moved to the IN, CSIC-UMH in Alicante, where he established his own research group thanks to the support of a MC Excellence Grant for new research teams (precursor of ERC grants). There he holds a tenured position since 2007. His team investigates the role of activity-driven gene expression in neuronal plasticity, learning and memory. Towards this end, the group undertakes a multidisciplinary approach based on the combination of bioinformatics and functional genomics with behavioral analyses, and molecular and cellular neurobiology. Over the last decade, AB's group made important contributions to the understanding of the relationship between epigenetic marks in the chromatin, gene expression and neuronal plasticity, both in physiological and in the context of intellectual disability and neurodegenerative disorders. The results of his research have been presented in more than 90 publications in top scientific journals (*Cell*, *Neuron*, *Nat Neurosci*, *Nat Comm*, *Cell Rep*, *J Neurosci*, *EMBO J*, *CDD*, *NAR*, etc.) that accumulate thousands of citations. To conduct this research, the group has received funding from national and international sources, including the European Commission, the Human Frontiers Scientific Program Organization (HFSP) and several Spanish and International foundations. Among other distinctions, AB has received the Alberto Sols award to the best scientific publication (2022) and the "UMH Consejo Social" Award to Research Teams (2005). Before becoming IN director, AB was twice Head of the Molecular Neurobiology and Neuropathology Department (2019-20 and 2009-11). AB has also been President of European Molecular and Cellular Cognition Society (EMCCS), member of FENS Governing Council (2013-16) and member of the Kemali Foundation Scientific Committee (2020-). Member of the evaluation committee for Fundazione Telethon (2019), Spanish Research Agency (AEI, 2016), French National Research Agency (ANR, 2011, 2012, 2014), and reviewer for numerous national and international grant programs: Plan Nacional, FIS, ICREA (Spanish); Swiss National Science Foundation; National Science Foundation (USA) ; Wellcome Trust (UK); ANR, BMRC-NMRC (Singapore), ERC (EU), etc. AB is part of the Editorial board of *Frontiers Beh Neurosci* (2008-), *Brain Res Bull* (2010-2019), *Mol Brain* (2014-present), *Neurobiol Learn&Mem* (2015-), and *Sci Reports* (2016-), and reviewer for many scientific journals (*Neuron*, *Nat Neurosci*, *Nat Comm*, *J Neurosci*, *EMBO J*, *EMBO Mol Med*, *Brain*, *PNAS*, etc). Overall, the Barco's lab has a prominent international presence and collaborates with numerous research groups in Spain and abroad, being recognized as a leading laboratory in the emerging field of neurogenomics and neuroepigenetics.

Outreach: AB is involved in numerous outreach activities, particularly during the last 3 years as director of IN in representation of the institute. He has been involved in the organization of the Science fair during the Brain Awareness Week for more than a decade.

Training: Number of directed doctoral thesis (last 10 years): 7 (2 received Special distinction). Former PhD students followed their training in top clinical (Geneva Univ. Hospital), international research institutions (IN, Alicante; DKFZ-Gottingen, Germany; EMBL-Monterotondo, Italy; UCSF, BROAD Institute and Stanford Univ, USA), and the pharma industry (My Personal Therapeutics, UK; BeiGene, Basel, Switzerland). Former postdoctoral fellows hold positions as principal investigator (ISABIAL, Luis M. Valor; IN UMH-CSIC, Jose P. López-Atalaya) or senior researchers at national and international institutions. AB currently directs 6 thesis and leads an interdisciplinary team of 13 researchers.

General indicators

- Five 6-year terms (sexenios) (last 2017-2022).
- 93 indexed articles and 8 book chapters and non-indexed reviews. H-index = 41/47 (Scopus/Google Scholar). Total citations: 6461/9193 (Scopus/Google Scholar). Average cites/year (last 5 years): > 500/year (Google Scholar).

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

1. Herrera ML, Paraiso-Luna J, Bustos Martinez I, Barco A (AC, 4/4). Targeting epigenetic dysregulation in autism spectrum disorders. ***Trends Mol Med*** (2024) S1471-4914(24)00162-X. **IF: 13.6**. Feature review.
2. del Blanco B, Niñerola S, Martín-González AM, et al., Barco A (AC, 10/10). Kdm1a safeguards the topological boundaries of PRC2-repressed genes and prevents aging-related

euchromatinization in neurons. **Nat Comm.** 15:1781(2024). **IF: 16.6.** DOI: 10.1038/s41467-024-45773-3.

3. Lipinski M, Niñerola S, Fuentes-Ramos M, et al., Barco A (AC, 7/7). CBP is required for establishing adaptive gene programs in the adult mouse brain. **J Neurosci.** 42(42):7984-8001 (2022). **IF: 6.7.** DOI: 10.1523/JNEUROSCI.0970-22.2022

4. Fernández-Nogales M, López-Cascales MT, Murcia-Belmonte V, et al., Barco A*, Herrera E* (AC, 7/8). Multiomic analysis of neurons with divergent projection patterns identifies novel regulators of axon pathfinding. **Adv Sci.** 2022 9(29):e2200615.*: **Co-AC. IF: 17.5.** DOI: 10.1002/advs.202200615

5. Fuentes-Ramos M, Alaiz-Noya M, Barco A (AC, 3/3). Transcriptome and epigenome analysis of engram cells: Next-generation sequencing technologies in memory research. **Neurobiol Biobehav Rev** 127:865-875 (2021). **IF: 8.3.** DOI: 10.1016/j.neubiorev.2021.06.010

6. Lipinski M, Muñoz-Viana R, del Blanco B, et al., Barco A (AC, 14/14). KAT3-dependent acetylation of cell type-specific genes maintains neuronal identity in the adult mouse brain. **Nat Comm.** 11(1):2588 (2020). **IF: 11.9.** DOI: 10.1038/s41467-020-16246-0

7. Fernandez-Albert J, Lipinski M, Lopez-Cascales MT, et al., Barco A (AC, 8/8). Integrative multi-omic analysis unveils the immediate and deferred epigenomic signature of neuronal activation. **Nat Neurosci.** 22, 1718-30 (2019). **IF: 21.1.** DOI: 10.1038/s41593-019-0476-2

8. Del Blanco B, Guiretti D, Tomasoni R, et al, Barco A (AC, 12/12). CBP and SRF co-regulate dendritic growth and synaptic maturation. **Cell Death & Diff.** 26(11):2208-2222 (2019). **IF: 10.7.** DOI: 10.1038/s41418-019-0285-x

9. Scandaglia M, Lopez-Atalaya JP, Medrano-Fernandez A, et al, Barco A (AC, 11/11). Loss of Kdm5c causes spurious transcription and prevents the fine-tuning of activity-regulated enhancers in neurons. **Cell Rep** 21(1): 1-14 (2017). **IF: 8.3.** DOI: 10.1016/j.celrep.2017.09.014

10. Ito S, Magalska A, Alcaraz-Iborra M, et al., Barco A (AC, 14/14) Loss of neuronal 3D chromatin organization causes transcriptional and behavioral deficits related to serotonergic dysfunction. **Nat Comm.** 5: 4450 (2014). **IF: 10.8.** DOI: 10.1038/ncomms5450

AC: Author for correspondence. For full list see: <https://in.umh-csic.es/es/author/abarcoumh-es/>

C.2. Congress, indicating the modality of their participation.

1. A. Barco. 15th International Conference on Genomics and Systems Biology of Human Disease and Aging, Chania, Greece (23-26 July, 2024). Invited conference.
2. A. Barco. EMBO Symposium on "Gene regulatory mechanisms in neural fate decisions", Alicante, Spain (7-10 Sep, 2023). Invited conference.
3. A. Barco. International Conference on Intelligence: from Cell to Network, Beijing, China (19-21 Aug, 2023). Invited conference.
4. A. Barco. 3rd Neuroepigenetics & Neuroepitranscriptomics FUSION Conference, Tulun, México (28 April-1May, 2023). Invited conference.
5. A. Barco. EMBO Symposium on "Brain Genome: regulation, evolution and function", Heidelberg, Germany (25-28 Apr, 2023). Invited conference.
6. A. Barco. Neuroepigenetics: writing, reading and erasing the epigenome. Cajal Advanced Course. Bordeaux, France (21 Nov-9 Dec, 2022). Organizer of the course and invited speaker.
7. A. Barco. Epigenetics in the nervous system: development and disease, Berlin, Germany (8-10 Jun, 2022). Invited conference.
8. A. Barco. XIX Congreso de la Sociedad Española de Neurociencias. Lleida, Spain (3-5 Nov, 2021). Symposium organizer and invited speaker.
9. A. Barco. 49th Meeting of the European Brain and Behavior Society, Lausanne, Switzerland (4-7 Sep, 2021). Invited conference.
10. A. Barco. FENS 2020 Virtual Forum. Symposium organizer & Chair, and invited speaker in Forum mini conference "Behavioural neuroscience for the next decade: Why behaviour matters to brain science" (12-15 Jul, 2020).



The list above highlights 10 conferences or workshops in the last 4 years. I have been invited speaker in many other meetings, and seminar Programs in numerous Spanish Universities and European and International Institutions (> 100).

C.3. Research projects, indicating your personal contribution.

Current projects

1. Chan Zuckerberg Initiative (CZI) Collaborative Pairs Pilot grant: *Sleep and circadian-driven nuclear multi-omics dynamics* (International project with Dr. Robles in Germany). Funding Agency: CZI. PI Spanish team: A Barco. Duration: 3/2024-9/2025. Amount: 100,000 USD.
2. AC22-00030/JPND2022-115: EPI-3E: *Defining (sex and age) cell-specific epigenetic mechanisms underlying Environmental Enrichment/Exercise as non-pharmacological intervention for Alzheimer's and Huntington's disease and related potential noninvasive biomarkers* (International project with groups in France, Germany, Poland, Hungary and Spain). Agency: ISCIII. PI Spanish team: A Barco. Duration: 01/2023-12/2025. Amount: 175,000 EUR.
3. FCAIXA HR22 HR22-00394: *Epigenetic basis of gene-environment interactions underlying variation in Cognitive capabilities and their Decline with Age (EpiCoDA)*. Agency: Fundación La Caixa. PI: A Barco. Duration: 01/2023-12/2025. Amount: 498,000 EUR.
4. CEX2021-001165-S: Call for Centers of Excellence «Severo Ochoa». Funding Agency: AEI. PI: A Barco. Duration: 1/2023-12/2026. Amount: 4,000,000 EUR. **Institutional grant.**
5. PCI2021-122087-2A/ERA-Net NEURON NDD-243: *Patient-centered targeting of epigenetic vulnerabilities in neurodevelopmental disorders: a cross-disciplinary platform for druggable disease models* (International project with groups in Germany, Italy, Belgium, Israel, Hungary and Spain). Funding Agency: AEI. PI: A Barco, IN (UMH-CSIC). Duration: 1/2022-12/2024. Amount: 175,000 EUR.
6. PID2020-118169RB-I00: *Transcriptional and Epigenetic Regulation of Neuronal Activity-driven gene expression and genomic memory: Role of CREB, FOS and competition for co-activators*. Funding: AEI. PI: A Barco. Duration: 09/2021-08/2024. Amount: 399,300 EUR.
7. Proyectos Neurociencias 2020: *Epigenetic etiology of autism spectrum disorders: Contribution abnormal chromatin acetylation*. Agency: Fund. Tatiana Pérez Guzmán del Bueno. PI: A Barco, IN (UMH-CSIC). Duration: 01/2021-12/2024. Amount: 97.200 EUR.
8. Fundació La Marató #202003: *Neuronal spurious transcription and enhanceropathy in the etiology of intellectual disability*. Funding Agency: Fundació la Marató de TV3. PI: A Barco, IN (UMH-CSIC). Duration: 04/2021-10/2024. Amount: 197.500 EUR.

Most relevant past projects (last 10 years)

9. HFSP Grant RGP0039/2017: *3D genome organization and transcription regulation in hippocampal circuits*. Funding: Human Frontiers Science Program Organization (HFSP). Duration: 07/2017-06/2022. Amount: \$330,000 USD (Barco's team). Coordinator (last two years): Angel Barco, IN (UMH-CSIC).
10. PCIN-2015-192-C02-01/ERA-Net NEURON8-2015: *Chromatin-related Intellectual disability syndromes: Molecular etiology and therapy* (International project with groups in Poland, Israel and Spain coordinated by AB). Funding: MINECO. PI: Angel Barco, IN (UMH-CSIC). Duration: 11/2015-10/2018. Amount: 162,000 EUR.

C.4. Contracts, technological or transfer merits,

Eric R. Kandel and Angel Barco, Invention report: *Use of histone deacetyltransferase (HDAC) inhibitors as therapeutic reagents for the treatment of Rubinstein-Taybi syndrome* (Columbia University, New York, NY, USA). 2003.

Secretario de la comisión de seguimiento de la Unidad Científica de Innovación Empresarial del Instituto de Neurociencias (IN.Pulse: <https://in.umh-csic.es/es/in-pulse/>) financiada por la Agencia Valenciana de Innovación (AVI). Desde 2021

A. Barco, Model of utility for a device aimed to the behavioral analysis of rodents. In progress.