

CURRICULUM VITAE ABREVIADO (CVA)

CVA date	May, 2026
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Part A. PERSONAL INFORMATION

First name	Beatriz		
Family name	Ibarra-Molero		
Gender (*)		Birth date	
Social Security, Passport, ID number			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID) (*)			

A.1. Current position

Position	Full Professor		
Initial date	November 2018		
Institution	University of Granada		
Department/Center	Química Física	Facultad de Ciencias	
Country	Spain	Teleph. number	958 240438
Key words	Protein Biophysics, Protein engineering, Protein Evolution, Conformational Diseases		

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

Period	Position/Institution/Country/Interruption cause
2003-2018	Professor ("Profesora Titular")
2001-2003	Assistant Professor ("Ayudante L.R.U. de Facultad")

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licensed in Chemistry	University of Granada	1994
PhD in Chemistry	University of Granada	1998
Postdoctoral fellow (MEC)	The Pennsylvania State University (USA)	1999-2001

Part B. CV SUMMARY

I received a degree in Chemistry from the University of Granada in 1994. I was then awarded a predoctoral fellowship from the MEC to carry out my Ph. D. Thesis, in the University of Granada on the methodological problem of determining experimental values of free energy change for protein denaturation from cosolvent-induced denaturation profiles and their molecular interpretation. I received my Ph. D. Degree in 1998 with the maximum grade. I was awarded a fellowship from the MEC to carry out post-doctoral research (1999-2000) in Dr. Robert C. Matthews, at the Pennsylvania State University. During this period I characterized the folding and in particular, the transition state energetics of the coiled-coil GCN4-p1, a model system for complex multimeric proteins. The role of salt bridges on the transition state stability was also studied. Beginning 2001 I returned to the Physical Chemistry Department of the University of Granada, as "Ayudante L.R.U. de Facultad" and from 2003 as Associate Professor ("Profesora Titular"). In 2018 I became Full Professor ("Catedrática").

Since 2001 I have been an active member of the research group "Biomolecules, BIO-223" leaded by Dr. JM Sanchez Ruiz. I am also pursuing my own research investigation that has been funded with two "Proyectos de Excelencia" from the Junta de Andalucía (P09-CVI-5073 and P06-CVI-1668) being the IP of both.

My research interests have been focused on protein biophysics and, in particular, in the study of protein stability. I was actually involved in the pioneered works from our group on the rational design of surface charge-charge interactions as an approach to achieve enhanced protein thermal stability, a relevant biotechnological objective. In fact, we have been collaborating with

Novozymes (possibly the most important company in the world in the field of technological applications of proteins) for 15 years. Of particular interest during the last years are, on one hand, my studies on protein kinetic stability which has revealed crucial for understanding many biotechnological applications of proteins and the molecular basis of different diseases related to misfolding. And, on the other hand, the studies on the relationship between protein biophysics and molecular evolution, and particularly, the characterization of resurrected ancestral proteins. It has been shown by our group and others that ancestral proteins may be a very powerful tool in protein engineering due to their extreme features in terms of stability, flexibility and promiscuity.

Currently, I am establishing a new research line based on the characterization of an interesting family of homologous proteins, the transglutaminases, and their role in a number of rare diseases. This line of research has been partially driven by the support of a Research Seed Money Grant awarded by the National Ataxia Foundation (www.ataxia.org), which enabled us to initiate studies on transglutaminase 6 and its link to neurological disorders.

I have been invited as a speaker in 8 conferences and one seminar at the Ecole Polytechnique in Paris. I act as a reviewer for different international journals as PLoS One, Journal of Molecular Biology, Biophysical Journal, ABB, BBA membranes, Journal of Molecular Structure, The Protein Journal etc. I have been councillor of the Spanish Biophysical Society (SBE) Executive Council and current Guest Editor of the Special Issue "Protein Dynamics, binding and allostery" of International Journal of Molecular Sciences.

Number of "sexenios de investigación": 5 (last one 2019-2024).

Number of supervised Ph. D. Theses in the last ten years: 7 and 2 currently in progress.

46 published articles and 5 book chapters according to Google Scholar:
https://scholar.google.es/citations?user=7Jt_SQgAAAAJ&hl=es&oi=ao

2903 total citations with an average number of 116 citations per year for the last 5 years.

h index: 26; i-10 index (number of publications with at least 10 citations): 39

Part C. RELEVANT MERITS

C.1. Relevant publications in the last ten years

Moya-Garrido P, Cano-Gómez LP, Ibarra-Molero B, Godoy-Ruiz R, Medina-Carmona, E (2026). Human transglutaminases: Updated insights into activation mechanisms, allosteric regulation and disease. *Int J Mol Sci* (IF: 4.9) 27(7):2976. doi: 10.3390/ijms27072976

Luzón-Hidalgo R, d'Agostino G, Risso VA, Delgado A, Ibarra-Molero B, Campos LA, Requejo-Isidro J, Sanchez-Ruiz JM (2025). Virus propagation linked to exceedingly rare gene-expression errors: a single-molecule microscopy demonstration. *ACS Chem Biol* (IF: 3.8) 20(11):2720-2732. doi: 10.1021/acscchembio.5c00638

Medina-Carmona E, Gutierrez-Rus LI, Manssour-Triedo F, Newton MS, Gamiz-Arco G, Mota AJ, Reiné P, Cuerva JM, Ortega-Muñoz M, Andrés-León E, Ortega-Roldán JL, Seelig B, Ibarra-Molero B, Sanchez-Ruiz JM (2023). Cell survival enabled by leakage of a labile metabolic intermediate. *Molecular Biology and Evolution* (IF: 11.0) 43:msad032. <https://doi.org/10.1093/molbev/msad032> [Scopus citations:2]

Sanchez-Ruiz JM, Ibarra-Molero B (2022). Folding free energy surfaces from Differential Scanning Calorimetry. *Methods Mol Biol* 2376:105-116. DOI: 10.1007/978-1-0716-1716-8_5 [Scopus citations: 1]

Romero ML, Garcia Seisdedos H, Ibarra-Molero B (2022). Active site center redesign increases protein stability preserving catalysis in thioredoxin. *Protein Science* (IF: 6.993) 31:e4417. <https://doi.org/10.1002/pro.4417> [Scopus citations: 2]

Luzon-Hidalgo R, Risso VA, Delgado A, Andrés-León E, Ibarra-Molero B, Sanchez-Ruiz JM (2021). Evidence for a role of phenotypic mutations in virus adaptation. *iScience* (IF: 6.107) 24:102257. DOI: 10.1016/j.isci.2021.102257 [Scopus citations: 1]

Gamiz-Arco G, Gutierrez-Rus LI, Risso VA, Ibarra-Molero B, Hoshino Y, Petrovic D, Justicia J, Cuerva JM, Romero-Rivera A, Seelig B, Gavira JA, Kamerlin SCL, Gaucher EA, Sanchez-

Ruiz JM (2021). Heme-binding enables allosteric modulation in an ancient TIM-barrel glycosidase. **Nat Commun** (IF: 17.694) 12:380. DOI: 10.1038/s41467-020-20630-1 [Scopus citations: 14]

Gamiz-Arco G, Risso VA, Candel AM, Inglés-Prieto A, Romero-Romero ML, Gaucher EA, Gavira JA, Ibarra-Molero B*, Sanchez-Ruiz JM (2019). Non-conservation of folding rates in thioredoxin family reveals degradation of ancestral unassisted-folding. **Biochem J** (IF:4.331) 476:3631-3647. DOI: 10.1042/BCJ20190739 [Scopus citations: 11]

Campos LA, Sharma R, Alvira S, Ruiz FM, Ibarra-Molero B, Sadqi M, Alfonso C, Rivas G, Sanchez-Ruiz JM, Romero Garrido A, Valpuesta JM, Muñoz V (2019). Engineering protein assemblies with allosteric control via monomer fold-switching. **Nat Commun** (IF:11.880) 10:5703. DOI: 10.1038/s41467-019-13686-1 [Scopus citations: 16]

Candel AM, Romero-Romero ML, Gamiz-Arco G, Ibarra-Molero B, Sanchez-Ruiz JM (2017). Fast folding and slow unfolding of a resurrected Precambrian protein. **Proc Natl Acad Sci USA** (IF:9.661) 114:E4122-E4123. DOI: 10.1073/pnas.1703227114 [Scopus citations: 7]

Delgado A, Arco R, Ibarra-Molero B, Sanchez-Ruiz JM (2017). Using resurrected ancestral proviral proteins to engineer virus resistance. **Cell Rep** (IF:8.282) 19:1247-1256. DOI: 10.1016/j.celrep.2017.04.037 . This work was highlighted in Nature: <https://www.nature.com/articles/d41586-017-00571-4> [Scopus citations: 10]

Romero-Romero ML, Risso VA, Martinez-Rodriguez S, Ibarra-Molero B, Sanchez-Ruiz JM. (2016). Engineering ancestral protein hyperstability. **Biochem J**. (IF:3.797) 473:3611-3620. DOI: 10.1042/BCJ20160532 [Scopus citations: 22]

Risso VA, Manssour-Triedo F, Delgado-Delgado A, Arco R, Barroso-delJesus A, Inglés-Prieto A, Godoy-Ruiz R, Gavira JA, Gaucher EA, Ibarra-Molero B, Sanchez-Ruiz JM (2015). Mutational studies on resurrected ancestral proteins reveal conservation of site-specific amino acid preferences throughout evolutionary history. **Molecular Biology and Evolution** (IF: 14.31) 32:440-455. DOI: 10.1093/molbev/msu312 [Scopus citations: 61]

Rincón V, Rodríguez-Huete A, López-Argüello S, Ibarra-Molero B, Sanchez-Ruiz JM, Harmsen MM, Mateu MG (2014). Identification of the structural basis of thermal lability of a virus provides a rationale for improved vaccines. **Structure** (IF: 6.79) 22: 1560-1570. DOI: 10.1016/j.str.2014.08.019 [Scopus citations: 39]

C.2. Research projects,

TITLE: Towards the development of precision treatments for different types of ataxia linked to transglutaminase 6

FUNDING AGENCY: National Ataxia Foundation, NAF (www.ataxia.org).

PERIOD: 03-2024 to 02-2026

FUNDING: 50.000\$

PRINCIPAL INVESTIGATOR: Beatriz Ibarra Molero

REFERENCE: PID2023-150671OA-I00.

TITLE: Caracterización integral de la transglutaminasa 6, una enzima clave en el desarrollo de disfunciones neurológicas.

FUNDING AGENCY: Ministerio de Ciencia, Innovación y Universidades

PERIOD: 09-2024 to 09-2027

FUNDING: 150.000 euros

PRINCIPAL INVESTIGATOR: Encarnación Medina Carmona

TITLE: Structure-function analysis of transglutaminase-1 biologically relevant complexes in ichthyosis (C-EXP-144-UGR23)

FUNDING AGENCY: Programa Operativo FEDER, Andalucía

PERIOD: 01-2024 to 12-2026

FUNDING: 15.000 euros

PRINCIPAL INVESTIGATOR: Encarnación Medina Carmona

CO-IP: Beatriz Ibarra Molero

TITLE: Unveiling the molecular bases of ichthyosis caused by mutations in transglutaminase 1: towards new opportunities to the development of precision treatments (PP2023.EI.03)

FUNDING AGENCY: Plan Propio, Universidad de Granada ("Estimulación a la Investigación")

PERIOD: 01-2024 to 12-2025

FUNDING: 10.000 euros

PRINCIPAL INVESTIGATOR: Beatriz Ibarra Molero

TITLE: Expression and purification of transglutaminase 6 protein in eukaryotic systems: optimizing protocols for future studies (PP2020.PP.57)

FUNDING AGENCY: Plan Propio, Universidad de Granada

PERIOD: 01-2024 to 12-2024

FUNDING: 2.500 euros

PRINCIPAL INVESTIGATOR: Encarnación Medina Carmona

REFERENCE: PID2021-124534OB-I00.

TITLE: Exploración e ingeniería de nuevas funcionalidades en proteínas

FUNDING AGENCY: Ministerio de Ciencia, Innovación y Universidades

PERIOD: 09-2022 to 09-2026

PRINCIPAL INVESTIGATOR: José Manuel Sánchez Ruiz

REFERENCE: EQC2019-006403-P

TITLE: Adquisition of robotic infrastructure for directed enzyme evolution

FUNDING AGENCY: Ministerio de Ciencia, Innovación y Universidades

PERIOD: 2020

AMOUNT GRANTED: 229,500.00 €

PRINCIPAL INVESTIGATOR: José Manuel Sánchez Ruiz

REFERENCE: RTI2018-097142-B-100.

TITLE: Ancestral proteins in modern organisms

FUNDING AGENCY: Ministerio de Ciencia, Innovación y Universidades

PERIOD: January-1 2019 to December-31 2021

AMOUNT GRANTED: 302,500.00 € plus one FPI fellowship

PRINCIPAL INVESTIGATOR: José Manuel Sánchez Ruiz

REFERENCE: P09-CVI-5073.

TITLE: Nuevas estrategias de optimización de proteínas para aplicaciones biotecnológicas y biomédicas.

FUNDING AGENCY: Consejería de Economía, Innovación y Ciencias. Junta de Andalucía.

PERIOD: March-10, 2011 to March-9, 2016

AMOUNT GRANTED: 65,000.00 €

PRINCIPAL INVESTIGATOR: Beatriz Ibarra Molero

C.4. Contracts, technological or transfer merits,

Sanchez-Ruiz JM, Martinez-Rodriguez S, Risso VA, Ibarra-Molero B. Procedimiento para diseñar polipéptidos pseudoancestrales con características mejoradas. España: ES2585054 B1 (2017) [<http://hdl.handle.net/10481/47563>]. Patent licensed by the University of Granada to the spin-off company Crystalgel S.L. (<https://spinoff.ugr.es/showcase/company/crystalgel-sl/>)