

Pablo Chacón

Résumé

Institute of Physical Chemistry (IQFR-CSIC) C/Serrano 119. Madrid. E-28006 Spain.

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Personal Information

Name: Pablo Chacón
Birth date: 9-9-1969.
Nationality: Spanish.
Marital status: Married, Two children.

I came back to Spain with the Ramón and Cajal tenure track program to establish my own research group to broadly work on the development and application of computational methodologies for structural biology. During this period, I secured several grants as principal investigator.

2007-2010 Research Staff Scientist at CIB-CSIC. Group Leader.

2010-present. Research Staff Scientist at Institute of Physical Chemistry (IQFR-CSIC). Group Leader.

Education

BSc in Chemistry (1992), University Complutense of Madrid (UCM). Spain.

MSc in Biophysics (1992), UCM.

PhD in Chemistry (1999), UCM.

I currently have a group of four people including myself. Our multidisciplinary team is trying to ask and answer relevant questions in structure modeling, structure flexibility, protein interactions and drug discovery.

Interests

I am particularly attracted to the analysis and modeling of macromolecular machines whose actions and interactions are essential for cellular function. My research interests include new hybrid methods to combine multiresolution structural information of complementary biophysical techniques (X-ray, EM, SAXS etc.) and, new methods to analysis and predict the dynamical behavior of these complex systems using coarse-grained simulations (e.g Normal Mode Analysis). More recently, I also interested in computer-based methodologies to aid the structure rational design of new active compounds. These research lines are well supported by wide number of collaborations.

Research Positions held

1992-1993 Ph.D. Student in the Biophysics Group at UCM.

As a graduate student, I received rigorous training in theoretical biophysics and structural biology. Starting from a solid training in mathematics, informatics and biophysics, I worked on prebiotic evolution models and neural networks research fields. The latter founded my BSc work.

1994-1998 Ph.D. Student at the Centro de Investigaciones Biológicas (CIB) of the Spanish Research Council (CSIC).

My PhD work focused on shape and size determination of proteins in solution from its Small Angle X-ray Scattering profile (SAXS) using genetic algorithms. This pioneer development makes it possible to retrieve significantly more structural information from the scattering patterns than previously believed. My thesis advisors were professors J.M. Andreu CIB (CSIC) and F. Moran (UCM). During this period of time I also learned to effectively interact with experimentalists.

Publications

I am author or co-author of more than 50 scientific papers published in peer-reviewed journals. My H-index is 24 according to Google Scholar (Sep. 2013) with more than 2800 citations (the complete profile is available at [Google Scholar](https://scholar.google.com/citations?user=...)). The most relevant articles are:

2000-2003 Associate Researcher at The Scripps Research Institute. CA, USA.

My postdoctoral tenure at TSRI at W. Wriggers' lab provided me the opportunity to broaden my technical experience in multi-resolution structure analysis towards the modeling of the large-scale macromolecular assemblies on the basis of low-resolution density data from electron microscopy.

López-Blanco J.R. and P. Chacón (2013) iMODFIT: efficient and robust flexible fitting based on vibrational analysis in internal coordinates. *Journal Structural Biology*, DOI:10.1016/j.jsb.2013.08.010.

Estrin E., J.R. López-Blanco, P. Chacón, A. Martin (2013) Formation of an intricate helical bundle dictates the assembly of the 26S proteasome lid. *Structure*, 21: 1624–35.

2004-2007 Tenure track researcher position at CIB-CSIC.

Ruiz-Avila L., Huecas S., Artola M., Vergoñós A., Ramírez-Aportela E., Cercenado E., Barasoain I., Vazquez-Villa H., Martin-Fontecha M., Chacon P., Lopez-Rodriguez M.L., Andreu

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- J.M. (2013) Synthetic inhibitors of bacterial cell division targeting the GTP binding site of FtsZ ACS Chem. Biol. 8, 2072:2083.
- López-Blanco J.R., J.I. Garzón and P. Chacón. (2011) iMod: multipurpose normal mode analysis in internal coordinates. Bioinformatics, 27: 2843-50.
- Garzon J.I., J.R. López-Blanco, C. Pons, J. Kovacs, R. Abagyan, J. Fernandez-Recio, P. Chacón (2009) FRODOCK: a new approach for fast rotational protein-protein docking Bioinformatics, 25:2544-51.
- Boer D.R., J. A. Ruiz-Masó, J.R. López-Blanco, A. Gómez-Blanco, M. Vives-Llàcer, P. Chacón, I. Usón, X. Gomis-Rüth, M. Espinosa, O. Llorca, G. del Solar, and M. Coll (2009) Plasmid replication initiator RepB forms a hexamer reminiscent of ring helicases and has mobile nuclease domains. EMBO, 28:1666-78.
- Garzón J.I., J. Kovacs, R. Abagyan, and P. Chacón. (2007) ADP_EM: Fast exhaustive multi-resolution docking for high-throughput coverage. Bioinformatics, 23:427-33.
- Rueda M., P. Chacón, and M. Orozco (2007). Thorough Validation of Protein Normal Mode Analysis: A Comparative Study with Essential Dynamics. Structure, 15:565-75.
- Opalka N., M. Chlenov, P. Chacón, W. J. Rice, W. Wriggers, and S.A. Darst (2003). Structure and Function of the Transcription Elongation Factor GreB Bound to Bacterial RNA Polymerase. Cell, 114: 335-45.
- Chacón P., F. Tama and W. Wriggers (2003) Mega-Dalton Biomolecular Motion Captured from Electron Microscopy Reconstructions. J. Mol. Biol., 326:485-92.
- Chacón P. and W. Wriggers (2003). Multi-Resolution Contour-Based Fitting of Macromolecular Structures. J. Mol. Biol., 317:375-84.
- Chacón P., Morán F, Díaz JF, and Andreu JM. (2000) Shape and size determination from protein x-ray solution scattering with a genetic algorithm. J.Mol.Biol., 299:1289-02.
- Chacón P., F. Morán, J. F. Díaz, E. Pantos, and J. M. Andreu (1998). Low-Resolution Structures of Proteins in Solution Retrieved from X-Ray Scattering with a Genetic Algorithm, Biophys. J., 74:2760-75.
- Andrade, M.A., P. Chacón, J.J. Merelo and F. Morán. (1993). Evaluation of secondary structure of proteins from UV circular dichroism using an unsupervised learning neural network. Prot. Eng., 6:383-90.

For a complete list of publications see <http://chaconlab.org/publications.html>.

Academia

I regularly collaborate in different PhD programs giving seminars and courses. I was advisor of two PhD theses:

J.I. Garzón (2010) in Computer Engineering Facultad de Informática. UCM.

José Ramón López-Blanco (2012) in Chemistry Facultad de Ciencias Químicas. UCM.

Grants

- 2004-2005 Fundación BBVA (PI)
2004-2006 MEC BFU2004-01282/BMC (PI)
2007-2009 MEC-BFU2007-65977/BMC (PI)
2007-2010 CAM-SBIO-0214-2006 (co-PI)
2008-2012 Human Frontier Science Program - RGP0039/2008 (co-PI)
2009-2012 MEC-BFU2009-09552/BMC (PI)
2012-2016 CAM-S2010/BMD-2353 (co-PI)

Awards

1995-1999 Spanish predoctoral fellowship Ref: FP94-35310411 (B.O.E. 23.11.94)

2000-2001-2003 Postdoctoral training award from the La Jolla Interfaces in Science Interdisciplinary Training Program/Burroughs Wellcome Fund.


2001-2003 Spanish Post-doctoral fellowship Ref: EX2001-35310411 (B.O.E. 2.11.2000).

2004-2007 Tenure Track Scientist Ramón y Cajal.

Organizations

Biophysical Society, Spanish Biophysical Society, Sociedad Española de Bioquímica y Biología Molecular (SEBBM).

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 <http://goo.gl/hHv1b6>