

Interview with Prof. Jesús Jiménez-Barbero CSIC-CIB. Madrid, Spain

Can you give us some background information about your education and current research?

I studied Chemistry at Madrid (1977-82). At that time (last century), it was possible to choose a particular specialization and I chose Organic Chemistry. Then, I started with research during my Master Thesis (1983), focusing on the synthesis and conformational studies of sugars, a subject that I continued for my PhD (1987). During my Thesis, I visited CERMAV at Grenoble, working on the application of molecular mechanics calculations to oligosaccharides. I realized that synthesis was not my subject and I decided to focus on NMR methods and applications. Then I performed different postdoctoral stages: at Zürich, working on NMR of organometallics, at Mill Hill (UK), working on NMR of proteins, and at Pittsburgh, working on NMR methodology. I came back to Madrid in 1992, at the Institute of Organic Chemistry (CSIC), and started my career on the study of the molecular recognition of saccharides with proteins. This has been the major focus of my career, which was further developed when I moved to CIB-CSIC in 2002/2003. The methods developed in the previous years could be adopted to other biomolecular systems. I think that our major contributions are in the field of glycosciences, trying to understand the molecular basis of the recognition of saccharides by receptors, using a multidisciplinary approach, which employs carbohydrate synthesis, protein biochemistry and molecular biology, molecular modeling, and NMR. Worldwide collaborations are essential for this project



Jesús Jiménez-Barbero
Head of the nuclear magnetic resonance group



The new Center of Biological Research (CIB) was inaugurated in 2004. Its new facilities allow the scientists to continue advancing knowledge in five scientific areas: environmental biology; cellular biology and development; chemical and physical biology; cellular and molecular medicine; molecular microbiology and biology of infection.

Group participating in DYNANO: Prof. Jesús Jiménez-Barbero's group

The Chemical and Physical Biology group (CPB) develops a quantitative understanding of specific biological problems at different levels of complexity, from the single molecule level to sub-cellular macromolecular assemblies. This knowledge will enable to predict, control and engineer **essential biological functions** towards biomedical and/or biotechnological applications. In order to meet these challenges, CPB's approach makes use of structural biology, mechanistic biochemistry, molecular biophysics, and computational biology.

You are the head of the nuclear magnetic resonance (NMR) group which is interested in the development of general methodological aspects of the NMR techniques and, particularly, in their applications to the study of the conformation and dynamics of the molecular recognition processes. Could you give us more details about your group, activities, outcomes and outlook?

We work at a research center (CIB-CSIC). Therefore, we are not obliged to teach to undergrads. We participate in a couple of master courses in Valencia and Madrid and try to give some basic lectures on NMR and molecular recognition at different Academic and Scientific Institutions. We are focused on basic research, trying to be oriented towards drug design, including different collaborations and contracts with Pharma industries. We usually disseminate our science through publications (more than 250 in the last 10 years) and lectures. Some patent applications have also been filled (about 5).

We are usually between 12 and 14 people in the group. I share the group leader responsibilities with my friend and colleague Javier Cañada, who is also CSIC Research Professor. The group is composed by several brilliant senior and junior postdoctoral associates, Ana Ardá, Ángeles Canales, Dolores Díaz, Carmen Fernández-Alonso and Ana Manzano, and several PhD researchers, Luca Unione (within DYNANO), Alvaro Berbís, Javier Sastre, and Silvia Galante (also MC). Pilar Blasco just presented her PhD and is going to postdoc to Stockholm. We do not have any technician and we deal ourselves with all scientific, bureaucratic and technical tasks.



And how would you define your job?

I love my work. It is highly creative and provides many satisfactions. But there is one point, I believe that it is essential that you always try to bring your expertise (in this case, NMR) to the highest level of complexity, to solve cutting edge problems, which you are not sure that can be solved when you start. I think that our success has been due to our capacity for collaboration with many different groups, with completely different expertises, and that to that we are one of the few groups that not only apply NMR methods but also develop advanced NMR techniques and protocols for studying the conformational properties of small and medium size molecules and their interactions with other biomolecules, such as proteins and nucleic acids, as well as with other carbohydrates. We have been firmly ensconced in the carbohydrate community and have brought our general NMR expertise to many collaborative works worldwide.

Of course, at my current place, we have an immense burocratic task (with no secretary), trying to raise funding and to be able to continue working, but is is worthy. I also believe that helping young scientists at the early stage of their careers is extremely important. I think that the working atmosphere is essential and the people in the group share responsibilities (and good moments). They always help each other in their scientific problems, sharing instrument time and facilities, a factor which is indispensable for being well recognized and trying to be competitive in the scientific arena.

DYNANO brings together Research labs and industry. How do you view research-industry collaboration within the framework of the project?

I think it is extremely useful. The topic of the project is perfect for bringing together expertises and views from the different “worlds”. The design of new tools and systems, following the suggestions and needs of the industry view can be accommodated by us, the research groups, still continuing making high-quality research, and just orienting our efforts towards a particular focus. Also for the young scientists, I believe that it is essential that they contact and feel the ideas, views, perspectives, logistics and investments that are instrumental for both “academy” and “industry”. The similitude and the difference.

You have organized the DYNANO's Network and workshop on 30 September – 4 October 2013 in Madrid. Could you tell us your feeling, feedback.. ?

Well, that was a joint effort, with Lola Solís and Javier Cañada especially, with our research groups, and with all ERs and ESRs from Madrid area. Therefore, it was not difficult. We have already expertise in organizing meetings and symposia of different sizes and CIB is a good place to organize this special type of events. We also enjoyed a spectacular support from the speakers and attendees. Very professional people. And, so many young people! This is always a pleasure. The presentation of the posters, the discussions. Yes, it was a wonderful period. I will always remember that week as something very close to my heart.

What do you think is the most satisfying part of this project?

I do not think that I can particularly make one special point. The science, the very good science, the people, PIs, associated scientists, ERs, ESRs, those who I knew before and the new ones, the interactions, the dissemination, these interviews, the news, the web page, the courses, the scientific sessions. Everything is special and excellent. Really well organized. Everything. I am really satisfied and proud to be part of this consortium.

And the most frustrating part?

Till now... nothing! And I do not foresee any reason for this to change.

Is there anything else you would like to add to the report of your interview?

To all my colleagues, that I am really happy to collaborate with them.

To the young scientists, that scientific life is not easy, but is highly satisfying. That the effort is worthy. That the best we have is that we can think. And to keep the mind thinking is very special.

To all the participants that make possible our DYNANO to run, THANK YOU.

and Thank you for the interview!

Thank you Jesus and all the best for DYNANO.

Interviewed by Sadika Guedidi

J.J. Barbero's group :

>200 pubs (2005-). >100 Invited & Plenary lectures (2005-)

1 Science Trans. Med.; 1 TIBS;
6 Angew. Chem. Int. Ed.; 1 Nat Prod Rep,
1 PNAS; >15 J. Am. Chem. Soc.;
2 Org. Lett.; >25 Chem. Eur. J.;
4 ACS Chem. Biol., 4 J. Med. Chem.,
2 Biochem. J.; 5 JBC, 12 ChemBiochem,
3 Biochemistry, 3 ChemMedChem, 1 Febs J

2500 citations for these publications;

Starting Collaborations in Dynano:

D Solís, S Vincent, M Barboiu, O Ramström

DYNANO in brief

Starting date: 1st November 2011

Project duration: 48 months

Number of partners: 15

Project Coordinator: Dr. Mihai BARBOIU,
European Membrane Institute -IEM, Montpellier, France.

FP7-PEOPLE-2011-ITN

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www.dynano.eu

