

Interview with Marta Abellan Flos

I am from Castellón de la Plana, which is a small and sunny city on the Mediterranean coast of Spain, very close to Valencia. I studied my degree in Chemistry at the University Jaume I (UJI, also in Castellón). During the fourth year of my degree, I went to study in Ghent with an Erasmus grant and I discovered the marvelous country of Belgium. So, when I finished my Master in Applied Chemistry (at the UJI) and Pharmacology, I decided to look for a PhD abroad, and what better option than coming back to Belgium? Sometimes it is a bit cold for me, but nothing that cannot be solved with plenty of winter clothes! Besides, people are in general very kind and I love this little country because of its traditions, its architecture, its long history and, why not say, its chocolate!



Marta Abellan Flos
CBO, Belgium

How did you meet Stéphane Vincent's team?

While I was studying my Master's, I started to look for PhD fellows since I had crystal clear the idea of starting a research career and I wanted to do it abroad. It is the best way to improve my level of English, and also learn another language! Also, it is an experience that I consider vital for researchers. I found this PhD position at the website Euraxess, which is promoted by the European Commission in order to facilitate the mobility of students and researchers. I became really interested in this project when I saw the offer, since it combines organic synthesis, the field in which I had already worked at the laboratory, with breathtaking biomedical applications.

Can you describe your project? And tell us about the objectives you have to reach?

My project, entitled "Synthesis of functionalized carbohydrates as dynamic nanosystems applied in the field of cancer and infectious diseases", focuses on the synthesis of new glycoclusters carrying cancer biomarkers.

To make it simple, I will split my project into two main goals:

Development of a synthetic procedure which allows the controlled attachment of the biomarker to a central platform.

Taking into account previous results, we have selected as the platform dodecafunctionalized fullerene surrounded by azide functions to attach the twelve biomarkers to it. These balls are unique three-dimensional molecules formed by a central core of fullerene C₆₀ (molecule composed entirely of carbon that resembles a football because it is made of twenty hexagons and twelve pentagons) functionalized with a Th-symmetrical octahedral addition pattern.

The synthesis of these molecules involves the employment of click chemistry, which is a synthetic approach that uses the most practical and reliable chemical transformations, connecting two readily available reagents or building blocks to give products selectively in high yield, in particular the modern version of the well-known Huisgen cycloaddition, the 'copper-catalyzed azide/alkyne cycloaddition' (CuAAC).

Development of the grafting of these glycoclusters to biological macromolecules and fluorescent probes and purification techniques.

The obtention of these sugar balls could make possible the development of anticancer vaccines and microarrays tests for the early detection of tumours.

Moreover, as the potentiality of these syntheses is limitless, another branch of the PhD is to graft anti-virulence molecules into the fullerene hexakisadduct in order to synthesize a new generation of antibiotics whose mechanism of action avoids the development of bacterial resistances.

What is the best thing about taking a PhD? What is challenging?

I could not take only one thing to define it as the best. The scope of this research is exciting and absolutely motivating for me. I am really happy to have been given the possibility of fulfilling this project as every day I learn new things. Furthermore, I am sure that after these three years I will have greatly improved my knowledge on Carbohydrate and click chemistry, characterization of complex molecules by NMR, MS, etc. and I am going to be able to design and optimize challenging syntheses. It is also stimulating to get more involved in the field of biology and have the option of completing some biological assays of my synthesized molecules. On top of all this, having the chance of collaborating with the partners of the Network is without question inspiring and astonishing!

On the other hand, sometimes it is difficult to be in a different country where you don't know the language, but this is a minor problem as the feeling of communicating with people encourages you to learn it! Moreover, to face new challenges in the laboratory when something does not work (which happens quite frequently!) can be frightening and discouraging occasionally; however, achieving the final objective would not be so satisfactory without obstacles! In addition, it is rewarding to count with the help of my laboratory colleagues and Prof. Vincent who help me to overcome the difficulties with sugars and fullerenes!

What did you learn from your last participation to the DYNANO's Network on October 2012 in Montecatini Terme?

That was an incredible experience mainly in terms of meeting all the people who are part of the network and knowing a little bit about their projects and laboratories, which were briefly introduced by all the participants. Thanks to this, we had the opportunity of discussing about establishing possible collaborations and I am already working on some of them! So the most valuable message which I carried away from the Meeting was the great importance for scientists of being capable of explaining and diffusing our researches and results and also the significance of collaborating with other scientists.

What do you expect from this PhD?

As I commented above, I believe that after these three years I will have gained a solid background in laboratory work and research to keep on improving by studying a Post-doc. I cannot imagine a better starting point for a research career than this Marie Curie ITN in which we will end up with considerable experience and with the advantage of having met many other students and researchers with similar scientific interests and having the opportunity of collaborating with them in further research.

Thank you Marta and all the best for DYNANO.

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.

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