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*Jamie TULIC*

Molecules, Membranes, Biophysics, NMR??? Television's Rove McManus would have quoted a "what da!?" and so did I, prior to meeting Croatian born/Australian raised Professor Frances Separovic, a Biophysical Chemist and University of Melbourne lecturer.

Professor Separovic is a Biophysical Chemist who specializes in NMR (nuclear magnetic resonance) spectroscopy and cell membrane biophysics, and teaches undergraduate chemistry at the University of Melbourne. She has developed solid-state NMR techniques to determine the structure and dynamics of membrane components in situ, specializing in antibiotic peptides and toxins within phospholipids membranes.



Her research group, located at the Bio21 Institute, studies how molecules get into membranes, looking at how membranes form using the NMR technique. They mainly focus on the interaction of antibiotic peptides, amyloid Ab peptide from Alzheimer's disease and cytolytic toxins with model cell membranes and the 3D structure of new materials at the atomic level.

Professor Frances Separovic first immigrated to Australia as a three year old back in 1957. Her Croatian background extends back to her parents origin from one of the great tourist islands - Korcula, in Croatia, where they were born in the village of 'Blato'. This greatly accomplished lady, a role model for us all, first grew up in Broken Hill in Western New South Wales.

Having excelled throughout secondary school, completing all advanced courses with high marks, she was awarded both a Commonwealth and teacher's scholarship to further her studies at the University of Sydney. After completing 1st term studies she had a desire to explore other interests and went on to work as a junior technical assistant in a microbiology laboratory at CSIRO.

Following the birth of her son, Frances continued working full time at CSIRO Food Research, part-time study at Tafe and went on to complete a BA in mathematics and physics with Honours in physics at Macquarie University, and a PhD in physics at University of NSW.

After 23 years with CSIRO Food Research in Sydney and a year at the National Institutes of Health in the USA, Frances joined the University of Melbourne in 1996 as an Associate Professor and Reader in Chemistry.

She teaches undergraduate Chemistry at 1st, 3rd and 4th year levels and has served on many University of Melbourne Committees and has played a leading role in several Departmental and Faculty committees.

Professor Separovic was elected to the Council of International Union of Pure and Applied Biophysics (IUPAB), President of the Australian Society for Biophysics (ASB) and chair of a subgroup of the Biophysical Society (USA) as well as being appointed Director of Australian New Zealand Magnetic Resonance Society (ANZMAG) and to the editorial board of Concepts in Magnetic Resonance.

She is an adjunct Professor at San Diego State University in the US and a Senior Member of St Hugh's College, Oxford in the United Kingdom.

Frances has successfully organised 18 national and international scientific conferences, published 90+ refereed papers in international journals, and given over 150 conference presentations and 90 invited seminars, some of which were free public lectures held over the past few months at the University of Melbourne.

This savvy, highly gifted and intelligent successful scientist took time out to speak with the Croatian Herald's, JAMIE TULIC about her accomplishments and Croatian background:

***HRVATSKI VJESNIK (HV): What kind of memories do you have growing up in Blato, Croatia?***

FRANCES SEPAROVIC (FS): Well, I remember when I was back in 1979, everything felt like it was the wrong size, the tiles, the gate, my grandparents, oh and I remember the 'riba' and 'zelje'.

***HV: Can you speak Croatian?***

FS: Yes, but not very well, I communicate mainly in English but when I find myself talking about 'family things' with my family then we start speaking Croatian again.

***HV: Where does your Croatian connection come from?***

FS: Well, both my parents and I were born in Blato on the island of Korcula, so my strongest connection with Croatia is as a result of my family. Not so much the Croatian community, as I work very hard and concentrate greatly on my work, so my strongest connection is through my family and my son.

***HV: When did you last visit Croatia and which places did you go to?***

FS: I last visited in 2004. I went to Blato, of course, Split, Dubrovnik and Rijeka.

***HV: Which place was your favorite and why?***

FS: Blato! It's the most special because the family is all back there. But we also liked Dubrovnik and Split. Oh, and Rijeka, I did love the centre of their town, but Blato was the most special, mostly because it was so unpretentious.

***HV: Can you tell us a bit about your studies post 1972, when you were awarded the Commonwealth and teachers' scholarships?***

FS: I started study at Broken Hill High School, where I completed all the advanced courses through secondary school, so when I got to Sydney University I found it really boring. I was quite disappointed, as I had already done all the first year material in secondary school. So I went and got a job as a microbiology technician at CSIRO and then continued to study at Tafe.

***HV: When did you realise you wanted to get into the field of work you are doing now?***

FS: It wasn't until I changed from microbiology and went into a physics lab that I realised I wanted to do this. I never wanted to be a scientist, I never really knew what I wanted to be until I was actually doing it and realised there and then, that I enjoyed it. People knew that I was good at maths and physics and it wasn't actually until I worked with an NMR machine that I knew I really liked that kind of work.

And that's when I went back to Macquarie University to study mathematics and physics so I could continue in this line of work.

***HV: How long did it take to complete your studies?***

FS: It took me a total of six years to complete my Bachelor of Arts with honours in physics, five

years to do the BA and one year for the honours in maths and physics, which was part time and I was still working full time at CSIRO at the time and bringing up my son. But, I really enjoyed my undergraduate studies, although it took me six months to get over the "oh God, what do I want to do my PhD in?" phase.

I thought it was chemistry but after doing a bit of it, I realized that I was a physician and not a chemist, so I went ahead and completed my PhD in physics, which took 6 years in itself, part time again, as I was always working full time.

***HV: I know a lot of readers, like myself, will be asking themselves what exactly is a Biophysical Chemist. Could you briefly explain your role as one?***

FS: The main thing is that it's a multi-disciplinary field, hence biophysical chemist, but really it involves looking at biological molecules. So that's the bio lot and chemistry but also using physical techniques, so using physics to study these biological molecules, so that's the biophysical chemist. But, to be flippant, someone once asked me, what is a biophysical chemist and I answered 'oh, that's a scientist that doesn't know anything about rocks,' (laughingly).

***HV: What's the main focus of your research group at the BIO21 institute?***

FS: Our group really studies how molecules get into membranes. So we look at how membranes form, using the technique NMR (nuclear magnetic resonance) and that's developed into how do things get into membranes and how drugs get through a membrane and how do signals get in and out of membranes,.

***HV: What would you say interests you most about your work? What keeps you going?***

FS: I guess, trying out how something works, the problem solving. I mean, others will tell you how they want to find a cure for a disease or something, but for me its actually working with molecules that are related to diseases. I guess the real thing I enjoy is working out how things work, like how things get into a membrane, or how an anti-bio gets into a cell.

***HV: Having visited other countries for work, like Japan, Canada, the US and so forth, how different would you say the working atmosphere is like in comparison to Australia?***

FS: Well, it's the same type of work wherever you go, but the biggest difference is the way people approach things in different ways. Such as one of the biggest differences in Japan is the way they approach a problem, in that they tend to start with a very complex system and try to work it out, whereas we start with a simple one and try to build it up.

People also work differently. I love the creativity of American scientists, who are one of the most creative scientists in the world as they look at matters so differently. There is excitement in science over in the States. Probably more so than in any other country.

***HV: Have you ever been to work in Croatia?***

FS: I have actually, I visited the Ruder Boskovic Institute in Zagreb, which is part of the University of Zagreb. It's actually one of the most prestigious work institutes in Croatia. They have a lot of hard working, good quality, young people there and we actually have a couple of those young Croatian students coming down to Lorne in Victoria for a science conference in February. One works in Switzerland and the other in Germany and they were both originally from Ruder Boskovic.

***HV: Have you ever considered working permanently in Croatia?***

FS: I'd like to work over there for a short period of time, although, finding the time is a huge factor. Also, there is not a lot of funding for our type of research, and this is one factor we struggle with here, let alone in Croatia where funding is close to none. This is why many young Croatians are leaving their homeland and moving to other countries to work in.

One of the other problems for me, is the fact that when they were contacting Croatian people around the world to work in the science field, they would send everything in Croatian. I would write back

saying "sorry, I vaguely know what you're talking about but could you please send it to me in English", and they didn't, so that was definitely a problem for me and, I'd imagine, many other people with a Croatian background.

**HV: How does it make you feel knowing you are a role model in your field of work, especially for young Croatian/Australians interested in the sciences?**

FS: I've never really thought of myself as a role model. I'm probably a very bad role model because I don't think of it as a career but as a hobby, its just so enjoyable.

**HV: Finally, Frances, do you have any advice for young people interested in your field of work?**

FS: I just really thing that if you're lucky enough to do what you want, then you should go and put everything into it. If you do this and enjoy it you will progress. The work is hard and there is a big demand for it.

Volunteer work is good, it's a way we get to know the students. So if you want to get your foot in the doorway, I would highly suggest you do some volunteer work. That way you get to know people, your lecturers get to know you and that helps you with jobs later on, especially with regards to references.

**HV: Thank you for your time Frances and best of luck with all your future goals and projects.**

FS: That's great and thank you.

#### Quick facts about the professor

FAVORITE FOOD: 'Riba' and 'zelje'. (fish and silverbeat)

FAVORITE SHOW: I love 'West Wing' but also 'Boston Legal'.

FAVORITE SPORT: Soccer, of course.

FAVORITE MOVIE: 'Bladerunner'.

FAVORITE SONG: 'Zbogom Blato' and 'Bulls on parade' by Rage Against the Machine.

FAVORITE BOOK: Annie Prou's 'Shipping News' and Susan Quinn's 'Marie Curie, a life'.

FAVORITE PLANT: Sturt Dessert Pea from Broken Hill.


FAVORITE COUNTRY TO WORK/ LIVE IN: Australia

MOST ADMIRABLE PERSON AND WHY? Nelson Mandela, he's someone who fought for what he believed in and suffered for it. He believed in being peaceful and reconciliated.

WHAT YOU WISH MOST FOR? At this stage in my career, I'd like more than anything else, some more 'thinking time'.



#### Comments

 By wow @ Monday, January 29, 2007 8:04 PM ★★★★★

fascinating reading.Fascinating subject.Well done Jamie, well written. Isnt it amazing how many success stories we have, yet we dont hear about them for years. Perhaps prof Separovic could occasionally herself write something for Vjesnik.

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