

ANZMAGazine's Magnetic Resonance Group Profiles

By Anne Conibear

As a regular feature, ANZMAGazine introduces our readers to magnetic resonance groups from the region to showcase the diversity of the community and promote discussion and collaboration. In this issue, we introduce you to Frances Separovic and Nick Cox.

Name: Frances Separovic

Institution/Affiliation:

School of Chemistry,

Bio21 Institute,

University of Melbourne

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Brief description of main research focus:

Our current focus is on the structure and interactions of amyloid peptides from Alzheimer's disease, pore-forming toxins and antimicrobial peptides in model biological membranes. NMR spectroscopy, complemented by a range of biophysical techniques, is being used to determine the mechanism of action of membrane-active polypeptides. The primary goal is to do this for membrane components in situ.

What first interested you in MR?

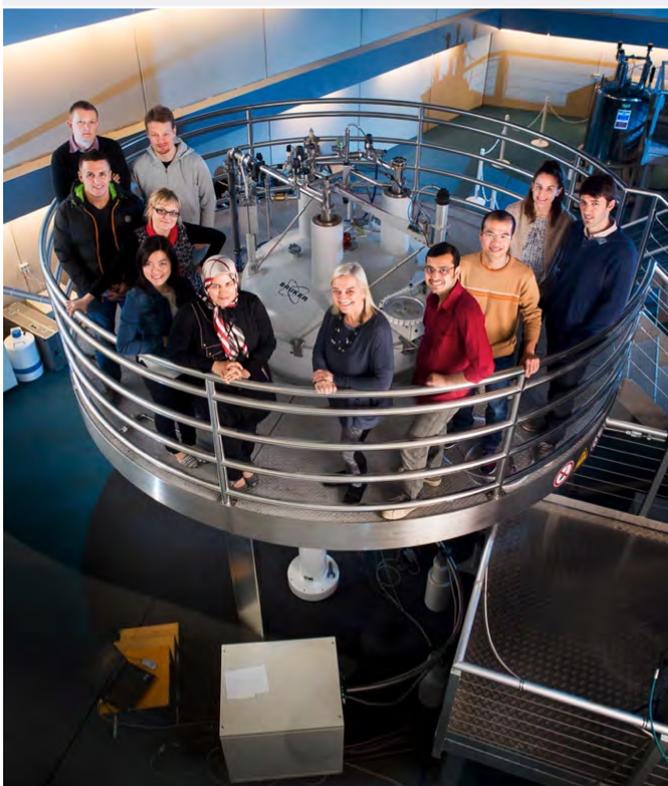
I was working full-time as a technician in an NMR lab while studying part-time. My physics lecturer, a distinguished professor, stated that we'd never need to use quantum theory when I realized that NMR was everyday quantum mechanics and I've been fascinated ever since.

What do you enjoy most about your work?

Having the opportunity to work out how things work and learn new things daily, create new knowledge and to pass it on, and the international nature of science. I enjoy the challenge and the variety although I wish there were a few more quiet days.

Are there any specific people who have inspired or mentored you?

Bio21. Left to right. Tom Meikle, John Karas, Jonathon Zerweck, Anna Mularski, Emmy Wijaya, Elaheh Jamasbi, Frances Separovic, Nitin Patil, Wenyi Li, Siobhan Carne, Marc-Antoine Sani



Bruce Cornell who encouraged me to do a degree after I completed my technician's certificate; Graham Bowden who was my PhD supervisor and was always full of enthusiasm; and Paul Callaghan, whose excitement was contagious.

What new challenges and opportunities do you see in the field?

Solids are exciting and where the challenges and the opportunities lie. As far as membrane proteins, solid-state NMR offers a bridge between structural and mechanistic data. Other than sensitivity, sample preparation remains taxing but the possibility of structural determination in near-native environments makes solid-state NMR a valuable tool.

What is your favourite pulse sequence?

Pines, Gibby & Waugh (1973) "Proton-enhanced NMR of dilute spins in solids". Cross-polarisation (CP) enhances the signal and also allows faster acquisition. I've used CP since the late 70s and it still impresses me. Combining cross polarization with magic angle spinning for solid samples was incredible.

What is/has been your most unusual project?

Condensed milk, opals or watching paint dry: phosphorus, silicon and carbon NMR, respectively. These were analyses for a food enterprise, a fraud investigation and a polymer manufacturer. Only the latter resulted in a publication.