

**Professor Frances Separovic FAA**  
**School of Chemistry**  
**University of Melbourne**



Professor Frances Separovic is a Biophysical Chemist based at the Bio21 Institute, University of Melbourne, Australia. Frances grew up in Broken Hill and, after the birth of her son, did a BA at Macquarie and a PhD at UNSW while working full-time at CSIRO, Sydney. Following a post-doctoral fellowship at National Institutes of Health (USA), Frances joined the University of Melbourne in 1996, where she became the first woman professor of chemistry (2005) and Head of School (2010). Frances has developed solid-state NMR techniques to determine the structure and dynamics of molecules in biological membranes with a focus on peptide antibiotics and toxins within phospholipid membranes.

Whilst teaching chemistry, Frances has served as Assistant Dean (EO) (2001-02) and Associate Dean (2009-10) of the Science Faculty. She is currently Secretary of the Biophysical Society (USA) and is an editorial board member of *Accounts of Chemical Research* and *Chemical Reviews* and editor of *Biochimica Biophysica Acta* and *European Biophysics Journal*. Frances was elected President of Australian New Zealand Society for Magnetic Resonance, ANZMAG (2011-13); General Treasurer of the Royal Australian Chemical Institute, RACI (2008-10); Council of the Biophysical Society (2007-10); Treasurer of Lorne Protein Conference (2006-09), Council of International Union of Pure & Applied Biophysics, IUPAB (2002-05); and President of Australian Society for Biophysics, ASB (1999-2001, 2012-14). Frances has organized 40 major scientific conferences and published over 220 papers in international journals. She was awarded the ASB Robertson Medal (2009) and ANZMAG Medal (2011) and elected Fellow of the Biophysical Society (USA) and ISMAR Fellow (2012). Frances was the first female chemist elected to the Australian Academy of Science (2012) and is a recipient of an IUPAC Distinguished Women of Chemistry/Chemical Engineering and UNSW Alumni Award: Science & Technology (2017).  
<http://separovic.chemistry.unimelb.edu.au>

Professional Experience:

2017-	Deputy Director, Bio21 Molecular Science & Biotechnology Institute, Melbourne
2016	Visiting Professor, CNRS - Universite Bordeaux; Electron. Comp. Sci., Southampton University; Biol. Chem. Molec. Pharmacol., Harvard University
2010-2015	Head, School of Chemistry, University of Melbourne
2009-2010	Associate Dean (International), Faculty of Science, University of Melbourne
2008-2009	Honorary Research Fellow, Birkbeck College, University of London, UK
2007	Acting Head, School of Chemistry, University of Melbourne (6 months)
2006-2008	Deputy Head, School of Chemistry, University of Melbourne
2005-	Professor, School of Chemistry, University of Melbourne
2001-2011	Adjunct Professor of Chem & Biochem, San Diego State University, USA
2001-2002	Assistant Dean (Equal Opportunity) Science Faculty, University of Melbourne
2000-2007	Senior Associate Member, St Hugh's College, University of Oxford, UK
1996-2005	Associate Professor & Reader, School of Chemistry, University of Melbourne
1994-1995	Fogarty Visiting Fellow, NIH, Bethesda, USA
1993-1996	Senior Research Scientist, CSIRO Food Science & Technology

### Professional Societies/Activities:

Australian Academy of Science: 2012 Fellow

Australian New Zealand Magnetic Resonance Soc:2011-13 President; 2011 ANZMAG Medal

Australian Society for Biophysics: 2013-14 President; 2009 Robertson Award

Biophysical Society (USA): 2015 Secretary; 2012 Fellow; 2009-11 Program; 2007-09 Council

Editorial Board: *Acc Chem Res*, *Chem Rev*; Editor: *Biochim Biophys Acta*, *Eur Biophys J*

International Society for Magnetic Resonance: 2012 Fellow; 2009- Nominating Comm, chair

International Union Pure and Applied Biophysics (IUPAB): 2002-05 Council; IUPAB 2014

Royal Australian Chemical Institute (RACI): 2008-10 Hon. Gen Treasurer

### Professional Qualifications:

1986-1992 PhD (part-time) School of Physics, University of NSW

1984-1985 BA, Honours in Physics (part-time), Macquarie University

1979-1983 Bachelor of Arts (part-time), Mathematics & Physics, Macquarie University

### Selected Publications: (Total 249 papers and 234 conference abstracts)

1. "Amyloid- $\beta$  peptide disruption of lipid membranes and the effect of metal ions." Lau, T.-L., Ambroggio, E.E., Tew, D.J., Cappai, R., Masters, C.L., Fidelio, G.D., Barnham, K.J. and Separovic, F. (2006) *J. Mol. Biol.* **356**, 759.
2. "Effect of antimicrobial peptides from Australian tree frogs on anionic phospholipid membranes." Gehman, J.D., Luc, F., Hall, K., Lee, T.-H., Boland, M.P., Pukala, T.L., Bowie, J.H., Aguilar, M.I. and Separovic, F. (2008) *Biochemistry* **47**, 8557.
3. "Non-Newtonian viscous shear-thinning in ionic liquids." Burrell, G.F., Dunlop, N.F. and Separovic, F. (2010) *Soft Matter* **6**, 2080.
4. "Lipid matrix plays a role in Abeta fibril kinetics and morphology." Sani, M.-A., Gehman, J.D. and Separovic, F. (2011) *FEBS Lett.* **585**, 749-754.
5. "The antimicrobial peptide aurein 1.2 disrupts model membranes via the carpet mechanism." Fernandez, D.I., Le Brun, A.P., Whitwell, T.C., Sani, M.-A., James, M. and Separovic, F. (2012) *Phys. Chem. Chem. Phys.* **14**, 15739.
6. "Proline facilitates the membrane insertion of the antimicrobial peptide maculatin 1.1 via surface indentation and subsequent lipid disordering." Fernandez, D.I., Lee, T.-H., Sani, M.-A., Aguilar, M.-I. and Separovic, F. (2013) *Biophys. J.* **104**, 1495-1507.
7. "Advances in Biological Solid-State NMR: Proteins and Membrane-Active Peptides," eds. Separovic, F. and Naito, A. (2014) RSC Books, London, U.K. pp 608.
8. "Bacteria may cope differently from similar membrane damage caused by the Australian tree frog antimicrobial peptide maculatin 1.1." Sani, M.-A., Henriques, S.T., Weber D. and Separovic, F. (2015) *J. Biol. Chem.* **290**, 19853-19862.
9. "How membrane-active peptides get into lipid membranes." Sani, M.-A. and Separovic, F. (2016) *Acc. Chem. Res.* **49**, 1130-1138
10. "A one-pot chemically cleavable *bis*-linker tether strategy for the synthesis of heterodimeric peptides." Patil, N.A., Tailhades, J., Karas, J., Separovic, F., Wade, J.D. and Hossain, M.A. (2016) *Angew. Chem. Int. Ed.* **55**, 14552-14556.
11. "Membrane insertion of a dinuclear polypyridylruthenium(II) complex revealed by solid-state NMR and molecular dynamics simulation – implications for selective antibacterial activity." Weber, D., Sani, M.-A., Downton, M.T., Separovic, F., Keene, F.R. and Collins, J.G. (2016) *J. Am. Chem. Soc.* **138**, 15267-15277.
12. "C-terminal modification and multimerization increase the efficacy of a proline-rich antimicrobial peptide." Li, W., O'Brien-Simpson, N., Yao, S., Tailhades, J., Reynolds, E., Dawson, R.M., Otvos, L., Hossain, M.A., Separovic, F. and Wade, J.D. (2017) *Chem. Eur. J.* **23**, 390-396.