



**Donald Martin, PhD**  
**Professor, Université Joseph Fourier, Grenoble, France**  
**Chaire d'Excellence, Fondation RTRA Nanosciences, Grenoble, France**

Dr Martin has formal training in optometry, biomedical engineering and electrophysiology and he worked with Prof Irving Fatt at the University of California (Berkeley) during his PhD training. His postdoctoral training was at Sydney University as the inaugural Medical Foundation Post-Doctoral Fellow (1988–91) studying ion channels in non-excitabile cells (exocrine glands), and at St Vincent's Hospital (Senior Research Officer, 1991–96) studying excitable cells (cardiac muscle, smooth muscle) and macrophages which led research, published in *The Lancet*, implicating ion channels in plaque rupture in the vasculature by describing a new explanation for the action of macrolide antibiotics in heart disease. That work extended to a study of ion channels on the cell nucleus, with a publication in the *Journal of Biological Chemistry* detailing the first isolation and characterisation of a chloride channel protein from the cell nucleus. He investigated the function of induced ion channel expression in genetically-engineered cell systems, both in animal tissue ( $K_{ATP}$  ion channels) and in yeast (ALR1  $Mg^{2+}$  transporter). He is now investigating the use of purified ion transport proteins in cell-free systems for application in the field of nanobiotechnology and biosensors. Such cell-free systems, recently published in *Advanced Functional Materials*, also provide the basis for his conception of the *MekaNo* project to biomimetically produce energy. This *MekaNo* project recently commenced at the Université Joseph Fourier, Grenoble after Don was awarded an internationally competitive position in 2008 as a senior Chaire d'Excellence with funding from the Fondation RTRA Nanosciences (French government).

He also initiated the formation of the Australian network in nanobiotechnology called *OzNano<sub>2</sub>Life* during his participation in an Australian government trade mission to France in 2002. The *OzNano<sub>2</sub>Life* program, funded by the International Science Linkages program of the Australian Government, provided the portal for structured exchange of scientists and information with European nanotechnology institutes and in particular with Nano2Life, which was the first Network of Excellence in nanobiotechnology to be funded by the European Commission under the 6<sup>th</sup> Framework. *OzNano<sub>2</sub>Life* also directly funded 6 postdoctoral scientists to conduct research under the supervision of Principal Investigators at several universities and institutions across Australia, with the research outputs from the 2 year research programs of *OzNano<sub>2</sub>Life* including 1 book, 3 book chapters, 3 patents, and 105 journal articles.

Dr Martin is co-author on several patents and is instrumental in developing intellectual property. For example, he is a co-founder of a new company (Seagull Technologies Pty Ltd, [www.seagulltechnologies.com.au](http://www.seagulltechnologies.com.au)) that has been formed recently in the field of drug delivery. He is also a key member and on the scientific advisory board of a start-up French company (Synthelis, [www.synthelis.fr](http://www.synthelis.fr)) from the Université Joseph Fourier.

In 2008 the Irish government invited Don as an international evaluator for a new industry-led initiative in nanosciences and nanotechnology. From 2003-2008 he was invited to speak on nanobiotechnology at The Biotechnology Industry Organisation (BIO) annual conferences. Prior to moving to France in 2008 Don was an Executive Board Member of the Australian French Association for Science and Technology (AFAS NSW) and now is a member of the Association Française de Coopération en Recherche Industrielle avec l'Australie (AFCRIA). His contributions to science and technology are recognised formally in the Hansard records of the NSW Parliament in Australia.

#### Examples of Publications

- Ting JHY, Haas MR, Valenzuela SM, Martin DK (2010). Terminating polyelectrolyte in multilayer films influences growth and morphology of adhering cells. *IET Nanobiotechnology* (accepted 26/1/10, in revision)
- Battle AR, Valenzuela SM, Mechler A, Nichols RJ, Praporski S, di Maio IL, Islam H, Girard-Egrot AP, Cornell BA, Prashar J, Caruso F, Martin LL, Martin DK. (2009). Novel engineered ion channel provides controllable ion permeability for polyelectrolyte microcapsules coated with a lipid membrane. *Advanced Functional Materials*. 19:201-208 (including inside front cover)
- Martin DK (ed.) "*Nanobiotechnology of Biomimetic Membranes*", Springer, NY, 2007 ([www.springer.com/978-0-387-37738-4](http://www.springer.com/978-0-387-37738-4))
- Krishnamurthy V, Luk KY, Cornell B, Prashar J, di Maio IL, Islam H, Battle A, Valenzuela S, Martin DK (2007). Gramicidin ion channel based nano-biosensors: Construction, stochastic dynamical models and statistical detection algorithms. *IEEE Sensors Journal*. 7:1281-1288.
- Liu GJ, Simpson AM, Swan AM, Tuch BE, Martin DK (2003). ATP-sensitive potassium channels induced in liver cells after transfection with insulin receptor and GLUT2 transporter regulate glucose-stimulated insulin secretion. *FASEB Journal*. 17:1682-1684.
- Liu GJ, Martin DK, Gardner RC, Ryan PR (2002). Large  $Mg^{2+}$ -dependent currents are associated with the increased expression of ALR1 in *Saccharomyces cerevisiae*. *FEMS Microbiology Letters*. 213:231-237.
- Martin D, Bursill J, Qui MR, Breit SN, Campbell T (1998). Alternative hypothesis for efficacy of macrolides in acute coronary syndromes. *The Lancet*. 351:1858–1859.
- Valenzuela SM, Martin DK, Por SB, Robbins JM, Bootcov MR, Schofield PR, Campbell TJ, Breit SN (1997). Molecular cloning and expression of a chloride ion channel of cell nuclei. *Journal of Biological Chemistry*. 272:12575–12582.