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Obituary: Professor Peter William Gage FAA, DSc, PhD, MB ChB (1937-2005)

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It was with a great sadness that we learnt that Peter Gage had died suddenly, but peacefully, on Saturday 13th August after a prolonged battle with illness, in the presence of his partner, Angela Dulhunty, and his immediate family who all meant so much to him. He dearly loved his family and was most proud of his two sons, Peter and David, and his two daughters, Shelley and Jenny, and his 10 grandchildren. He had been suffering from acute myeloid leukaemia, and after four rounds of chemotherapy earlier in 2004 had had a bone marrow transplant in November 2004. The transplant had taken well and Peter had even been able to start getting back into the lab with his research group periodically in 2005, and though there had been ups and downs in the recovery process with the graft-host interaction and the required immunosuppressant drugs, there was a lot of optimism, particularly given his fighting spirit. However, a sudden deterioration in his condition on August 11th signalled the beginning of the end of what had been a very productive life. Peter was a very warm, encouraging and human person, who was passionate about music, movies, tennis, their dogs and the outdoors. He will be sorely missed by a large number of current and former PhD students, post-doctoral fellows, colleagues and friends both in Australia and around the world, and his loss will continue to be felt for a long time to come.

Peter Gage did his undergraduate and graduate training in medicine at the Universities of Otago and Auckland, receiving his MB ChB degree from the University of New Zealand in 1960, worked in hospitals for two years, then moved to Sir John Eccles' department in the John Curtin School of Medical Research (JCSMR) at the Australian National University (ANU) in 1963 to do a PhD, which he received working with Professor John Hubbard in 1966. He joined Professor Paul Horowicz at Duke University, North Carolina USA as a post-doctoral fellow and then Assistant Professor to gain an excellent training in biophysics, working on muscle electrophysiology and synaptic transmission. He returned to Australia in 1968 to take up a Senior Lectureship in the School of Physiology and Pharmacology at the University of NSW, receiving a Professorial position (Personal Chair) in that School in 1976 until he left in 1984. During this time he was also made a Fellow of the Australian Academy of Science (FAA) in 1977 and appointed as Director of a Centre of Excellence (Nerve Muscle Research Centre) at UNSW from 1982-1984. He then took up a position as a tenured Professor in the Department of Physiology and subsequently Division of Molecular Bioscience at the JCSMR at the ANU in 1984 till his death this year. From 1999-2004 he was also the President of the Australian Physiological and Pharmacological Society. In 2004, he was awarded the Bob Robertson Medal by the Australian Society for Biophysics, to recognise his outstanding contributions to the field of biophysics in Australia.

During his research career Peter Gage made an enormous contribution to biomedical research both directly and indirectly. He was acknowledged both from a national and international viewpoint as the leading membrane biophysicist in Australia, particularly in the area of ion channels. As Bertil Hille commented: "For almost 40 years Peter was a leading practitioner and advocate for membrane biophysics in Australia. He had many students. He was imaginative and brave in his range of work." Peter has made outstanding original and highly significant contributions to the study of the biophysical properties of both ion channels and synaptic transmission. He has published more than 180 research papers, major reviews and book chapters, the majority being in leading international journals including Nature, Science, the Journal of Physiology, the British Journal of Pharmacology, the Journal of General Physiology, the Biophysical Journal and the Journal of Biological Chemistry, Proceedings of the National Academy of Science (USA), Proceedings of the Royal Society (London), Progress in Biophysics and Molecular Biology, FEBS Letters and the Journal of Virology. The impact of his research is flected in the fact that his publications had received greater than 4,000 citations, with many receiving more than 100 citations each.

Peter was an inspiring research group leader and his contributions to Australian and international scientific research have also included the training of more than 30 PhD students, many of whom have gone on to establish strong international reputations, and a large number of former postdoctoral colleagues and close collaborators, whom he mentored, challenged and warmly encouraged with his enthusiasm and commitment to scientific research. In addition, he was always very ready to pursue leading-edge science and was the first, with the aid of his research

colleagues, to introduce new techniques into Australia, such as the use of the voltage-clamp to record synaptic currents at the muscle end-plate, the use of the three-electrode voltage clamp on muscle fibres, the first patch-clamp set-up in Australia and the hippocampal slice technique, and then to share these techniques with other laboratories. He was also keen to understand basic underlying mechanisms and to explore them in a rigorous way, which over recent years encouraged him to combine electrophysiology with molecular biology, and provided an example for other groups to follow.

He also greatly contributed to the Australian research community by organizing patch-clamp workshops, numerous Curtin Conferences and a GABA 2000 international Symposium in Cairns. Peter was an excellent communicator, whether to the media or to colleagues, and further recognition of his research contribution was reflected in the numerous invitations for him to speak at international and national conferences, symposia and various academic institutions. He was an outstanding lecturer and popular with undergraduate students, and although they were challenged by the rigorousness of his biophysical approach, his lectures achieved the highest ratings from students.

In recent years, his research has continued to be at the forefront of research with his structure-function studies on GABAA receptors and the mechanism underlying the action of diazepam; his work on a series of virus proteins which form ion channels and the observation that drugs which block such channels can block virus budding; the characterization of the persistent Na^+ channel in cardiac and hippocampal cells, its role in cell death during hypoxia and possible strategies to prevent this; and work on the modulation of the ryanodine Ca^{2+} channel in the sarcoplasmic reticulum of muscle and its importance for muscle contraction. He was the co-inventor of two patents and the founder of the biotechnology company, Biotron.

Given continuing health, the direct contribution of Peter Gage to significant research output had been expected to continue for many years to come. Unfortunately, that was not to be the case. Though his death will be acutely felt, both personally and scientifically, by the research community for a long time, the legacy of his contributions to Australian science and to the scientific community will continue on well into the future.

We are very appreciative of Peter's contribution to our lives and to scientific research, and our thoughts and prayers are especially with his family and close colleagues and friends at this time.

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