

THE BRAIN AND MIND RESEARCH INSTITUTE



Annual Report 2008

Addendum 2009



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RESEARCH INSTITUTE

KEN PARKER BRAIN RESEARCH LABORATORIES

Brain Tumour Research Laboratories

Prof Manuel Graeber

**Brain Tumour Research Chair
Director, Brain Tumour Research Laboratories
Brain & Mind Research Institute**



BIOGRAPHY:

Professor Manuel B. Graeber MD PhD FRCPath began his career as a doctoral student and then post-doc at the Max-Planck-Institute for Psychiatry (Neurobiology) in Munich/Martinsried, Germany. For his work he was awarded a “summa cum laude” doctoral degree (Dr. med.) by the Technical University of Munich. This was followed by research fellowships in neurology and genetics at the Harvard Medical School in Boston, MA, USA (1989-1992). After his return to Munich, Manuel Graeber founded the Laboratory of Molecular Neuropathology at the Ludwig-Maximilians-University and completed his clinical training as neuropathology consultant. He was awarded a second doctorate by the Ludwig-Maximilians-University of Munich in connection with his Habilitation (extended PhD). He then served as head of the Molecular Neuropathology Laboratory at the Max-Planck-Institute of Neurobiology from 1996-1999 and underwent specialist training in surgical neuropathology of brain tumours at Mayo Clinic Rochester, MN, USA. In 2000, Manuel Graeber founded the University Department of Neuropathology at Imperial College London and Hammersmith Hospitals Trust which he led as chairman until 2007 when Professor Graeber decided to close his department for ethical reasons related to brain banking. Subsequently, he spent one year on sabbatical writing up research results and co-chaired the first European Board Examination in Neuropathology (www.euro-cns.org).

Professor Graeber is a highly cited neuroscientist whose work has been recognised by national and international awards including the Otto-Hahn-Medal of the Max-Planck-Society, the Gerhard Hess-Award of the German Research Foundation, and a Centre of Excellence Visiting Scientist Award from the National Institute of Neuroscience, National Centre of Neurology and Psychiatry, Tokyo, Japan. Professor Graeber is a Fellow of the Royal College of Pathologists of the UK and a member of London’s Athenaeum. He was invited to apply for the position of Neuropathologist-in-Chief at the Montreal Neurological Hospital and Institute, McGill University, Montreal, Canada, and was offered the Directorship of the Institute of Neuropathology and Chair of Neuropathology at the University of Hamburg, Germany, as a non-applicant. Professor Graeber has published more than 90 original research papers in international journals including PNAS and Nature Genetics, and he was or is a member of the editorial board of 9 scientific journals. Professor Graeber is a Founding Editor of Neurogenetics and advises institutions and funding bodies world-wide. He currently serves as consultant to the Neurosciences Center at King Fahad Medical City in Riyadh, Kingdom of Saudi Arabia, where he leads brain tumour diagnostics, teaches at the Medical Faculty and where he is setting up a clinical research programme in neuro-oncology. Professor Graeber has joined the BMRI in April 2009 and will move to Sydney in early 2010.

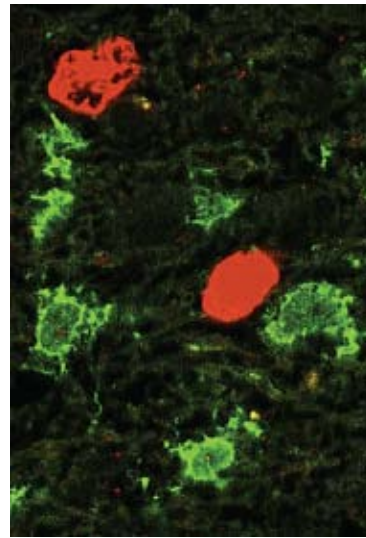
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RESEARCH HIGHLIGHTS AND SOCIETAL IMPACT:

Professor Graeber's work at the BMRI focuses on the role of microglia and brain macrophages in gliomas. He is particularly interested in investigating whether microglia which have the potential to develop into cytotoxic brain macrophages can be used to treat glioblastoma and how they relate to stem cells. Glioblastoma is the most common and malignant glial brain tumour. This deadly lesion is surprisingly rich in microglia and macrophages which contribute substantially to the tumour's mass.

Professor Graeber's Laboratory at the BMRI will use transgenic rats and bone marrow transplantation in combination with a number of advanced molecular biological techniques to establish an experimental rodent model for the treatment of malignant glioma. The establishment of this model will be guided by information obtained from the study of human gliomas.



Confocal image of a human glial tumour showing tumour cell nuclei (red, proliferation marker) and numerous neighbouring brain macrophages (green, macrophage antigen).



KEN PARKER BRAIN RESEARCH LABORATORIES

Brain Tumour Research Laboratories

Professor Bernard Balleine

Director
Behavioral Neuroscience Laboratory
Brain & Mind Research Institute



BIOGRAPHY:

Professor Balleine completed his undergraduate degree in Psychology at Sydney University in 1987 with 1st class honours and the University Medal, receiving both the Thomson prize and Australian Psychology Society Prize. He was subsequently awarded both a Commonwealth Scholarship and a College Studentship from Churchill College Cambridge to conduct research towards his PhD, which he received from the University of Cambridge in 1993. Professor Balleine was elected to a Research Fellowship at Jesus College Cambridge in that year, a post he held until 1996 when he took up a position of Assistant Professor in the Department of Psychology, University of California, Los Angeles (UCLA). He was promoted to Associate Professor with tenure in 2000 and, in 2004, to the position of full Professor in the Department of Psychology and, subsequently, in the Department of Psychiatry and Biobehavioral Sciences. In 2005 he was made Associate Director of the Brain Research Institute at UCLA. He was appointed to a Research Professorship in the Brain & Mind Research Institute at the University of Sydney in 2009.

RESEARCH HIGHLIGHTS AND SOCIETAL IMPACT:

Professor Balleine's research aims to understand the neural bases of the learning and motivational processes that control volitional, or goal-directed, action, an issue that has direct bearing on our developing understanding of the role that the integration of cognitive and emotional systems plays in executive functions and decision-making. Currently his research team is focusing on three primary issues: [1] The role of the prefrontal cortex-basal ganglia network in the changes in goal-directed learning that emerge as a consequence of neurodegeneration, focal brain damage and addiction; [2] The role of the amygdala, its brain stem afferents and its efferents on ventral striatum, insular cortex and midbrain dopamine neurons in regulating the emotional processes through which the reward value of events is encoded; and [3] The role of the thalamo-striatal projection and related cortical connections involving somatosensory cortex in the integration of cognitive and emotional processes necessary for normal decision-making. Dysfunction of this integrative capacity accompanies major psychiatric conditions, neurodegenerative disorders, drug addiction and stroke which, together, constitute the highest health, economic and social capital attrition burden to Australia of any disease group, a burden that is only predicted to increase as the population ages. Understanding the changes in neural systems that accompany these disorders and their specific psychological and behavioral effects is, therefore, of critical importance and will ultimately provide new targets for treatment and rehabilitation.