

Research Activities

HIV neuropathogenesis and HIV reservoirs in the brain *Dr Katherine Thompson*: Research in this department has shown that the brain perivascular macrophage is the main reservoir for HIV and is pivotal in relation to spread of infection from the blood into the brain when the immune system deteriorates. Macrophages therefore represent a focus for targeted treatments to prevent cognitive decline from HIV infection in the brain. It is hypothesised that treatment should begin prior to systemic immunosuppression. This work was presented at the 10th International Symposium on Neurovirology, Milan, Italy, 2010.

Pathogenesis of HIV-associated neurocognitive impairment in the era of effective antiretroviral therapy *Dr Katherine Thompson* in collaboration with Professor Ian Everall and the HIV Neurobehavioral Research Centre, University of California, San Diego. This study is the first to quantify latent viral infection in circulating macrophages and resident brain cells in HIV-positive patients with mild neurocognitive dysfunction, including those using antiretroviral therapy, and will look at associations between latent infection, neuropathology and clinical status.

Progressive multifocal leukoencephalopathy (PML) pathogenesis *Dr Julianne Bayliss*: Establishment of latent reservoirs of JC virus in the brain, blood, and kidney of healthy and immunosuppressed patients is studied using histology and molecular biology techniques. Specific aims are to determine the cellular sites of viral latency during immunocompetence, delineate the role of immunosuppression in viral reactivation and mobilisation from latent reservoirs prior to the development of PML and to investigate the role of viral genotype in establishing latency and the development of PML.

Biomarkers of JC virus reactivation in immunosuppressed patients *Dr Julianne Bayliss*: Collaborating with Dr Catherine Cherry, this study investigates the association between specific genes of JC virus within the plasma of HIV/AIDS patients who later develop PML.

Prostate specific antigen (PSA) levels in cyclists over 50 *Dr Julianne Bayliss*: This study, in collaboration with the Victorian Institute of Sport, investigates the role that long distance road cycling plays on PSA levels in men over the age of 50 through measurement of PSA before and after cycling.

Breast cancer sub-typing and epidemiology *Professor Catriona McLean* in collaboration with the Cancer Council Victoria. This multinational study (with Cambridge University) highlights the relationship of various subtypes of breast cancers with diet, environmental factors and a new prognostic marker in breast cancer.

The role of phosphatases in breast cancer *Professor Catriona McLean* in collaboration with Professor Christina Mitchell.

Characterisation of TCPTP as a tumour suppressor in breast cancer *Professor Catriona McLean* in collaboration with Professor Tony Tiganis.

The Australian Breast Cancer Family Study *Professor Catriona McLean* in collaboration with Professor John Hopper.

Australian Brain Bank Network (ABBN) *Professor Catriona McLean* is Director of the ABBN, overseeing the coordination, neuropathological diagnosis and research activities of the ABBN

and the Victorian arm of the network. Over 1,000 fully pathologically analysed brains are available for research (www.nnf.com).

Neurotrauma brain bank *Dr Tony Frugier (NTRI), Professor Catriona McLean*

Neuroimaging (using novel binders) of neurodegenerative diseases

A study of TDP-43 in motor neurone disease

The role of LRRK2 in Parkinson's disease

A study of FHL1 in muscular dystrophy

A study of filamin C in myopathy

A study of the use of mesenchymal stem cells in an ovine model

Major Achievements

Professor Catriona McLean is CIA of a five-year (\$2M) NHMRC Enabling Grant to facilitate continued brain banking for neurodegenerative diseases. She is also CIA on a continuing (\$800,000) grant into neurotrauma through the Victorian Neurotrauma Initiative (VNI) and is a CI on four NHMRC Project Grants. Professor McLean is one of multiple national and international investigators on a (\$6M) five-year NIH grant that will investigate genetic causes of familial breast cancer. She was invited to present her work in latent virus of the brain at the International Society of Neuropathologists Congress in Salzburg, Austria.

Dr Julianne Bayliss received the Donald H Gilden Lectureship award for excellence in Neuroscience at the 10th International Symposium on Neurovirology, Milan; travel grants from the Ian Potter Foundation, Monash University and the International Society for Neurovirology, and best poster prize at the Brain Awareness Week Symposium, Monash University.

Colleen D'Arcy received a Monash University travel grant.

Colleen D'Arcy (left) and Professor Catriona McLean examine tissue sections using a dual header microscope.



Postgraduate Students
1 PhD Student

Publications
9 Journal Articles
2 Book Chapters