Alcoholism research that won’t break the bank

A pioneering project at the University of Sydney is storing donated brain tissue from alcoholics and healthy control populations to provide researchers with a wealth of samples. Professor Jillian Kril and colleagues at the New South Wales Brain Tissue Resource Centre (NSW BTRC) are using this resource to make significant advances in the understanding of alcohol-related brain damage.

Alcohol-related disorders are areas of major public health and socio-economic concern. Research aimed at understanding addiction and organ damage, especially alcohol-related brain damage (ARBD), must be underpinned by a sound knowledge of the biology behind alcohol abuse at a cellular level.

Understanding the biological basis of addiction, and the factors affecting an organ’s susceptibility to damage, is required to further our knowledge of alcoholism and alcohol toxicity – and for the development of treatment and prevention strategies. Such research is dependent on access to high quality, extensively characterised tissue from alcoholic subjects and matched controls.

OPENING THE BANK ACCOUNT

The New South Wales Brain Tissue Resource Centre (NSW BTRC) at the University of Sydney is an established brain bank that focuses on facilitating research into alcoholism, alcohol-related brain damage and associated conditions. The aim of this innovative facility is to provide fresh-frozen and formalin-fixed tissue to research groups worldwide who study alcohol use disorders. Tissue is collected, with appropriate consent, from forensic autopsies and through a prospective brain donor programme called ‘Using our Brains’. The donors have lifestyle, medical and psychiatric histories fully documented to provide the maximum benefit to future researchers.

OPEN ACCESS BANKING

Access is open to any researcher with institutional ethics approval. Since its inception, the NSW BTRC has provided tissue for over 150 research projects, predominantly from the USA, Europe and Australia. More than 180 publications have arisen from these projects, and Professor Kril has been involved in many of these with colleagues at the University of Sydney.

Using tissue samples from the bank, she and her fellow researchers have uncovered where in the brain chronic alcohol use causes the most damage – consequently revising the previous understanding of ARBD, based on animal models of alcohol use.

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What most interests you about neuropathology?
The extraordinary complexity of the human brain is endlessly fascinating. Studying brain diseases gives us insights into this complexity. It also teaches us about how the brain works in healthy individuals.

What are the particular strengths of the NSW BTRC?
The breadth of clinical and lifestyle information collected on donors, and made available to researchers, increases the scope of the research that can be undertaken. This, together with the careful pathological screening and attention paid to tissue quality, means the full potential of the donation can be realised.

How can researchers access the samples?
Any researcher, with institutional ethics approval, can apply to access tissue from the resource. Applications are reviewed for scientific merit by independent experts and then tissue prepared to suit the type of research to be undertaken.

What is the most interesting finding to come out of these studies so far?
Demonstrating that neuronal loss can occur in one brain region while other regions, even those immediately adjacent, are spared. The mechanisms that underlie this selective vulnerability are yet to be determined.

What direction do you see alcohol related neuropathology research heading into in the future?
The explosion in ‘omics research has only just begun and future studies which can tell us, at a cellular level, what gene or protein is changed in response to alcohol exposure will advance our knowledge greatly.

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