

Dr Christi Essex



**AUT BRAIN HEALTH
RESEARCH INSTITUTE**



Positions

Research Fellow – UoA

Contact info

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Research focus

Christi is a neuroscientist with expertise in advanced MRI and histology. She combines these macro and micro-scale approaches to study chronic traumatic encephalopathy (CTE), a progressive neurodegenerative condition, validating the biophysical basis of the MR signal and advanced brain modelling techniques against their biological substrates. Her aim is to bridge the translational gap between what we can diagnose after death and what we can measure in life.

Current projects

1. Magnetic Resonance Imaging Signatures of Chronic Traumatic Encephalopathy: An Ex-Vivo Histological Validation
2. Building a Probabilistic CTE Lesion Atlas: An Empirical Guide for Neuropathological and Neuroimaging Research
3. The Cellular Iron Landscape and Iron-Tau Axis in Chronic Traumatic Encephalopathy
4. Human Microglial Responses to Repetitive Head Injury in a Chimeric Mouse Model

Examples of recent work

Essex, C. A., Merenstein, J. L., Overson, D. K., et al. (2025). Characterizing positive and negative quantitative susceptibility values in the cortex following mild traumatic brain injury: A depth-and curvature-based study. *Cerebral Cortex*, 35(3), bhaf059. <https://doi.org/10.1093/cercor/bhaf059>

Essex, C. A., Overson, D. K., Merenstein, J. L., Truong, T. K., et al. (2025). Mild traumatic brain injury increases cortical iron: Evidence from individual susceptibility mapping. *Brain Communications*, 7(2), fcaf110. <https://doi.org/10.1093/braincomms/fcaf110>