

Pinpointing the damage alcohol does to the brain

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(Medical Xpress)—New research has identified, for the first time, the structural damage at a molecular level that excessive alcohol abuse causes to the brain.

The study, led by The University of Nottingham, detected the loss and modification of several key cellular proteins in the brains of alcoholics.

Published in the academic journal *PloS ONE*, the research will help scientists make informed choices on appropriate drugs and diet to reduce brain damage and limit addictive behaviour in alcoholics.

Dr Wayne Carter, who is based in the Division of Medical Sciences and Graduate Entry Medicine in the School of Medicine, said: "Excessive [alcohol consumption](#) is a global social and financial healthcare problem of epidemic proportions. We have provided an insight into some of the

[tissue](#) and cellular [brain damage](#) that arises in alcoholic patients. The hope is that we can improve the lives of alcoholics and reduce the number of deaths associated with alcoholism."

Chronic excessive alcohol intoxications have a cumulative effect on damage to brain tissue and other organs. However, the long-term effects of alcohol consumption on the structure and function of the brain are not well understood.

The study: 'Alcohol-Related Brain Damage in Humans' was carried out in collaboration with the School of Life Sciences at The University of Nottingham, the Basque Institute of Legal Medicine and the University of the Basque Country.

Post-mortem [brain tissue](#) was examined from control donors and 20 matched alcoholics, and tissue and protein damage assessed.

Studying the prefrontal cortex, researchers detected alterations in the neuronal cytoskeleton in the brains of alcoholic patients. These changes in the neuronal structure, induced by ethanol ingestion, can affect the organisation, the capacity for making connections and the functioning of the neuronal network, and could largely explain alterations in cognitive behaviour and in learning, attributed to persons suffering from alcoholism.

More information: Erdozain AM, et al.. "Alcohol-related brain damage in humans." *PLoS One*. 2014 Apr 3;9(4):e93586. [DOI: 10.1371/journal.pone.0093586](#). eCollection 2014.

Provided by University of Nottingham

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