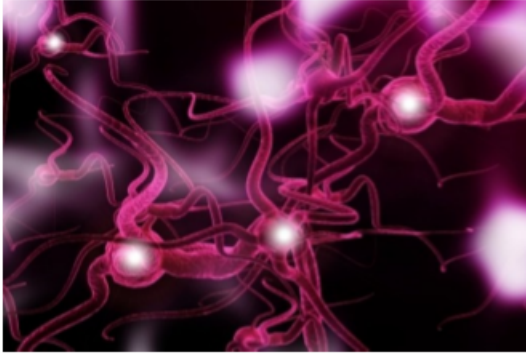


Alcohol alters brain structure at the molecular level

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Specific proteins within the brain's building blocks, the neurons, are damaged by alcohol.
Ranjith Krishnan/Free Digital Photos, used with permission

Joint Spanish/English research has identified, for the first time, the structural damage caused in brain cells by excessive alcohol use. The research was published in the April 2014 biomedical sciences journal, [PLOS One](#). This breakthrough by the University of the Basque Country and the University of Nottingham opens up pathways for generating new medications or therapies to enhance the life of recovering alcoholics.

Binge drinkers and those with the disease of [alcoholism](#) commonly experience learning and memory deficits, impairment of decision making and poor motor skills. They sometimes show behavioral changes, as well, plus anxiety and depression from cumulative effects of intoxication and alcohol withdrawal. Excessive alcohol consumption can result in a reduction of brain weight as well. The new discovery identifies, for the first time, the damage to the brain from alcohol goes down to the cellular level.

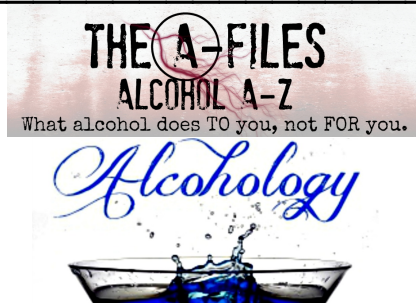
The research team determined alcohol causes alterations in the proteins in neurons of the prefrontal zone of the brain. Neurons are the basic building block of the nervous system... the prefrontal zone is the most advanced brain region in terms of evolution and controls functions such as planning, designing strategies, working memory, selective attention or control of [behavior](#).

In the research, doctors studied the postmortem brains of 20 men and women diagnosed with alcohol abuse/dependence, alongside another 20 non-alcoholic brains. Studying the prefrontal cortex, researchers detected alterations in the molecular "cytoskeleton" in the brains of alcoholic patients. These alcohol-related changes in the brain structure can affect the capacity for making connections and the functioning of the brain – and could largely explain alterations in thinking and learning – attributed to persons suffering from alcoholism.

The researchers aim to further identify these molecular changes in order to be able to, on the one hand, link them with the processes of alcohol abuse and dependence and, on the other, generate new pharmaceutical drugs and therapeutic options that reverse the alterations produced by alcohol, enhancing the quality of life of alcoholic persons and reducing the mortality rate due to alcoholism.

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