

Laser dissection of depression

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Chinese investigators from Hefei and Dutch researchers in Amsterdam have collaborated using for the first time a combination of new elegant methodology in Depression research. They used postmortem human brain tissue that was donated to the Netherlands Brain Bank for research purposes and investigated a region in the basal part of the brain, the hypothalamus, that is known to be of crucial importance for the development of symptoms of depression.

This region is 6 mm³ large and is called the Paraventricular Nucleus (PVN) since it is situated along the third ventricle of the brain. This brain area is central in the regulations of our normal stress response, while a too high activity of the PVN is a pivotal characteristic of depression.

The hypothalamus consists of a large number of very small specialized cell groups that all have different functions and should thus be studied separately, hence the necessity of the application of the methodology used.

Corticotrophin-releasing factor (CRF) cells in the PVN of human hypothalamus are the central driving force of the stress response and are hyperactive in depression. The investigators sampled the PVN using new technology in psychiatry to study its molecular changes related to CRF.

Frozen hypothalami of 7 depressed patients and 7 controls of the same age, the same sex and obtained the same time after death. The frozen brain structures were serially sectioned and the PVN was dissected using

a microscope with a laser beam. The micro-laser-dissected material was subsequently studied with a very sensitive and specific quantitative molecular technique for the analysis of gene expression (qPCR).

From the 16 gene products that were studied, because they were presumed to be involved in CRF activation in depression, 5 were found to show significant changes. The molecular changes found may not only explain the hyperactivity of the CRF cells but may also be potential targets for new therapeutic strategies.

Source: Molecular Psychiatry

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