

Molecular pathology of suicide: A postmortem study

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What changes in the brains of people who commit or think about committing suicide? Ph.D. candidate Lin Zhang investigated at a

molecular level the processes that take place in the human brain during suicide. The hope is that her findings could be the first step towards a drug or therapy intervention which could help people with suicidal thoughts. Zhang will defend her theses at the University of Amsterdam on Wednesday 25 October.

More than 700,000 people die by suicide every year. Among the most common causes in Western countries are psychiatric conditions such as [bipolar disorder](#), depression and schizophrenia. Zhang used brains donated to science to help her examine various aspects of the molecular changes that occur in the brain during suicide.

"I looked for certain markers—substances—produced by the brain," Zhang says. "One of my conclusions is that the neurobiological processes that take place in our brain during suicide and during depression are different. And my research also shows that [suicidal thoughts](#) and depression take place in different parts of the brain. Genes related to suicide can therefore be linked to a specific part of the brain."

Receptor gene P2RX7

In a world-first, Zhang—whose project was a collaboration between the UvA and the Netherlands Institute for Neuroscience—studied the molecular changes in brains from the Netherlands Brain Bank, from donors who had died after legal euthanasia. "When we are able to study brains shortly after death, the suicide-specific molecular changes are closer to the changes during life," she says.

Zhang was also able to conduct research into people who had suicidal thoughts but died of [natural causes](#). In the hippocampus of people with suicidal thoughts and those who actually committed suicide, there appears to be a strong increase in the receptor gene P2RX7.

First steps toward treatment

Zhang's research marks the first, very cautious steps toward a medicine or better therapy for people with suicidal thoughts. "That people are willing to donate their brains is amazing, because this is the only way we can move forward. But it may take decades before a cure is available. In the meantime, I will continue to work on this topic because I hope and believe that I can make a difference. And I know we are on the right track," says Zhang.

Provided by University of Amsterdam

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