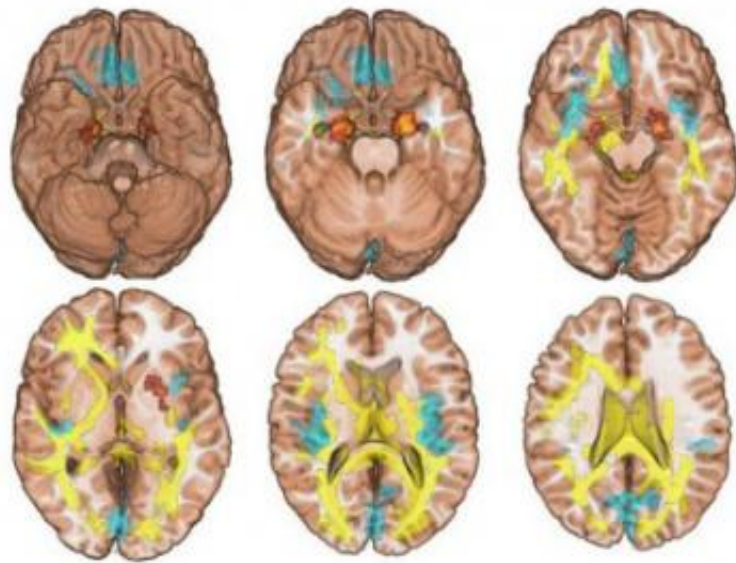


# Brains of addicts are inherently abnormal: study (Update)

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Brain scans from study. Credit: Science

(Medical Xpress) -- Researchers funded by the Medical Research Council (MRC) at the University of Cambridge have identified a brain abnormality which is found in drug-dependent individuals as well as their siblings who have had no history of drug addiction. The brain abnormality identified by the researchers makes it more difficult for individuals to exercise self-control.

This research will help understanding about why some people with a

family history of drug abuse are at a higher risk of addiction than others. The findings are published today in the journal *Science*.

Led by Dr. Karen Ersche, the researchers scanned the brains of 50 pairs of brothers and sisters, of whom one was dependent on cocaine while the other did not abuse drugs or alcohol. Their brains were compared with those of 50 unrelated healthy volunteers who had no personal or family history of drug addiction.

The researchers found that both the drug-dependent and their non-dependent siblings shared the same abnormality in the [parts of the brain](#) associated with how we control our behavior, known as the fronto-striatal systems. This kind of abnormality is typically seen in people who struggle with drug addiction.

Dr. Karen Ersche, of the Behavioral and Clinical Neuroscience Institute (BCNI) at the University of Cambridge, said: “It has long been known that not everyone who takes drugs becomes addicted, and that people at risk of [drug dependence](#) typically have deficits in self-control. Our findings now shed light on why the risk of becoming addicted to drugs is increased in people with a family history of drug or alcohol dependence: parts of their brains underlying self-control abilities work less efficiently. The use of addictive drugs such as cocaine further exacerbates this problem, paving the way for addiction to develop from occasional use.”

Dr. Ersche added: “Given that some forms of drug addiction are thought to develop out of bad habits that get out of control, it’s intriguing that siblings who don’t abuse drugs show similar [brain abnormalities](#) as the ones who have been abusing drugs for many years. While we still have more work to do to fully address the reasons why some family members show a greater resilience against addiction, our results will provide the scientific basis for the development of more effective preventative and

therapeutic strategies for people at risk of addiction.”

Professor Chris Kennard, chair of the Neuroscience and Mental Health Board at the Medical Research Council which funded the research, said: “Drug addiction devastates thousands of families in the UK and the MRC is leading a strategy for addiction and substance misuse research, by funding cross-discipline research that addresses the biological, medical, social and economic aspects of addiction and substance misuse. This research represents an important step towards understanding some of the factors which cause some members of a family to abuse drugs, while leaving others unaffected.”

The next step will be to explore how the siblings who don’t take drugs manage to overcome their brain abnormality in their daily life. The scientists want to understand what makes the non-drug using siblings resilient to addiction. A better understanding of what may protect them from drug abuse may provide vital clues for developing more effective therapies for those trying to beat their addiction.

The study was funded by the Medical Research Council and conducted within the Behavioural and Clinical Neuroscience Institute at the University of Cambridge, which is co-funded by the MRC and the Wellcome Trust.

**More information:**

[www.sciencemag.org/content/335/6068/601.abstract](http://www.sciencemag.org/content/335/6068/601.abstract)

Provided by University of Cambridge

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