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# Examining adolescent brain development

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For the next few years hundreds of young people will have their brains scanned at the Mind Research Network on the University of New Mexico's north campus as researchers try to understand precisely how normal young brains rapidly develop the complex neural networks humans need to understand and function in the world.

UNM Distinguished Professor of Electrical and Computer Engineering and Executive Science Officer at the Mind Research Institute Vince Calhoun is principal investigator for a new $5.9 million research grant from the National Science Foundation's Experimental Program to Stimulate Competitive Research (EPSCoR). The work will be done at the Mind Research Network in New Mexico, at the University of Nebraska and at Tulane University in Louisiana.

The cutting edge work will combine magnetic resonance imaging (MRI) scans with images from a magneto encephalography (MEG) scan which measures change over time in the magnetic field produced by neurons firing in the brain. They will also use genetic information and observe changes in a specific type of epigenetic marker that can alter over time.

Calhoun says there are four key goals of the project including collecting MEG, MRI and epigenetic data over time in children, developing data-driven algorithms to extract useful information and study changes in time at multiple scales, and developing novel tools to integrate or fuse these data together using advanced approaches including dynamic independent component analysis and deep learning.

He adds a major goal of the EPSCoR program is workforce development, which will happen through engaging and training students and junior faculty members in the context of this project in order to prepare them for interdisciplinary scientific careers.

The four-year study should give the research group a good baseline view of the developing adolescent brain. Calhoun says the results may then be used as they continue research, to try to determine what occurs inside a brain that might make it vulnerable to mental illness.

Provided by University of New Mexico

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