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Researchers develop new animal model for one of the least understood medical issues: ADHD

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To better understand the cause of ADHD and to identify methods to prevent and treat it, researchers at Oregon Health & Science University and OHSU's Oregon National Primate Research Center have developed a new form of specially bred mouse that mimics the condition.

The number of attention deficit hyperactivity disorder (ADHD) cases in the United States are exploding. According to a 2011 statement by the Centers for Disease Control and Prevention, nearly one in 10 American children is diagnosed with the disorder. To better understand the cause of ADHD and to identify methods to prevent and treat it, researchers at Oregon Health & Science University (OHSU) and OHSU's Oregon National Primate Research Center have developed a new form of specially bred mouse that mimics the condition. The research is published in the current edition of the *PLoS ONE*, a journal of the Public Library of Science.

The research, led by OHSU and ONPRC scientists Jacob Raber, Ph.D., and Sergio Ojeda, D.V.M., found that mice carrying a certain mutated form of gene displayed the human-like symptoms of ADHD. The scientists believe that mice bred with this unique genome can greatly assist in research to combat ADHD.

The specific gene that was studied in this research is called SynCAM1, which is found in glial cells — a type of cell in the central nervous

system involved in cellular communication. The researchers found that mice carrying a dominant/negative form of the gene were hyperactive. The mice displayed enhanced and more frequent activity during rest periods. In addition, the mice exhibited reduced anxiety, similar to children diagnosed with ADHD. The mutated gene caused these conditions because it blocks the actions of the normal gene.

"While some animal models for ADHD exist, they are far from perfect," explained Raber, a professor of behavioral neuroscience and neurology in the OHSU School of Medicine and an affiliate scientist at ONPRC "For instance, a rat model of this condition displays high blood pressure also known as spontaneous hypertensive rats or SHR, which is not observed in humans with ADHD. When hypertension is eliminated by crossing SHR rats to another commonly studied rat breed, the resulting rat has normal blood pressure but no longer responds to the methylphenidate in a way that humans with ADHD do."

"We believe that this animal model may more closely mimic ADHD and shed new light on this condition," added Ojeda, a senior scientist at ONPRC.

Provided by Oregon Health & Science University