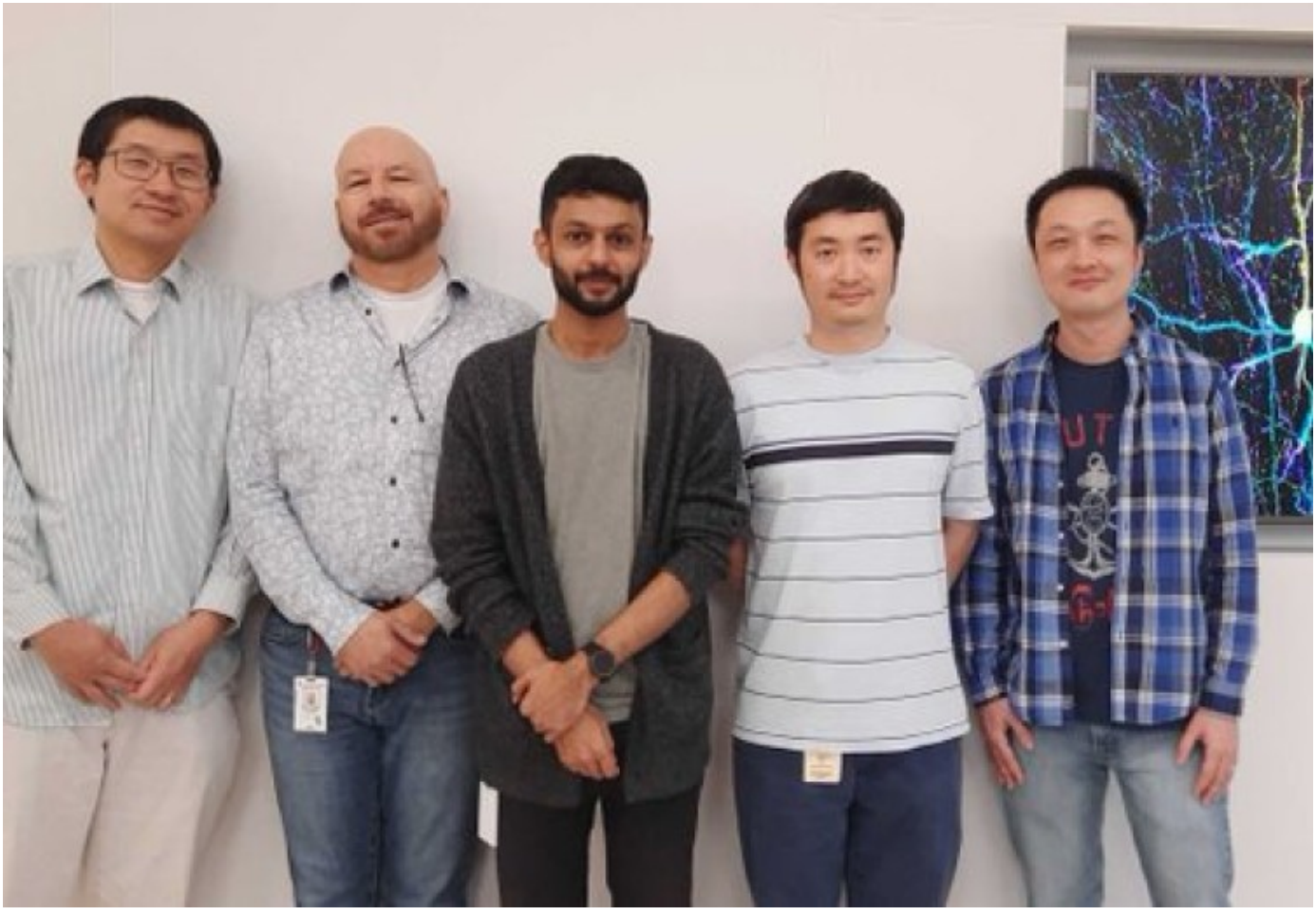
# Cain Labs and Duncan Neurological Research Institute researchers find a novel first-in-class gene therapy alleviates symptoms in animal models of STXBP1 disorder



A preclinical study led by Dr. Mingshan Xue, associate

professor at Baylor College of Medicine, and Caroline DeLuca Endowed Scholar at the Gordon and Mary Cain Pediatric Neurology Research Foundation Laboratories and the Jan and Dan Duncan Neurological Research Institute at Texas Children's Hospital, has found that intravenous administration of a normal copy of a gene encoding STXBP1 in adult mice lacking a functional copy of the STXBP1 gene rescues key symptoms in a dose-dependent manner and does so with long-lasting effects.

These data were reported at the 27th annual meeting of the American Society of Gene & Cell Therapy in Baltimore, MD, by Dr. Wu Chen, an instructor in the Xue lab.

**STXBP1 mutations cause severe epilepsy, developmental delays, and intellectual disability in children**

Genetic epilepsy caused by mutations in the syntaxin-binding protein 1 (STXBP1) gene is a devastating developmental and epileptic encephalopathy estimated to affect one in 30,000 children born each year globally. It is associated with severe developmental delay and intellectual disability, treatment-resistant seizures, and sudden unexpected death in epilepsy (SUDEP). The STXBP1 protein is present in every neuron in the brain and is essential for normal neurotransmission. There are no disease-modifying

therapies for this disorder.

Gene therapy for genetic epilepsy due to STXBP1 mutations has not been previously possible because the earlier generation adeno-associated viruses (AAVs) or wild-type AAVs could not achieve the level of widespread neuronal transduction required to modify the disease.

**CAP-002 rescues epileptic seizures as well as motor and cognitive deficits in adult mice with STXBP1 mutations**

In this study, the Xue lab researchers used a new gene therapy candidate called CAP-002 developed by Capsida Biotherapeutics. This is a first-in-class, next-generation intravenous (IV)-administered gene therapy that achieves brain-wide neuronal expression of the wild-type copy of the STXBP1 gene and does not affect the liver.

They showed a dose-dependent rescue of neurological phenotypes, including epileptic seizures, motor deficits, and cognitive impairments, with long-lasting effects in adult mice.

"This study built upon our previous proof-of-concept study and represents a significant advancement in our understanding of the therapeutic potential of engineered AAV gene supplementation therapy in the treatment of

genetic epilepsy and developmental disorders due to STXBP1 mutations," Dr. Xue commented. "These data are encouraging and emphasize the potential for CAP-002 to meaningfully improve outcomes in patients with this disease."

For more information, read Capsida's news release