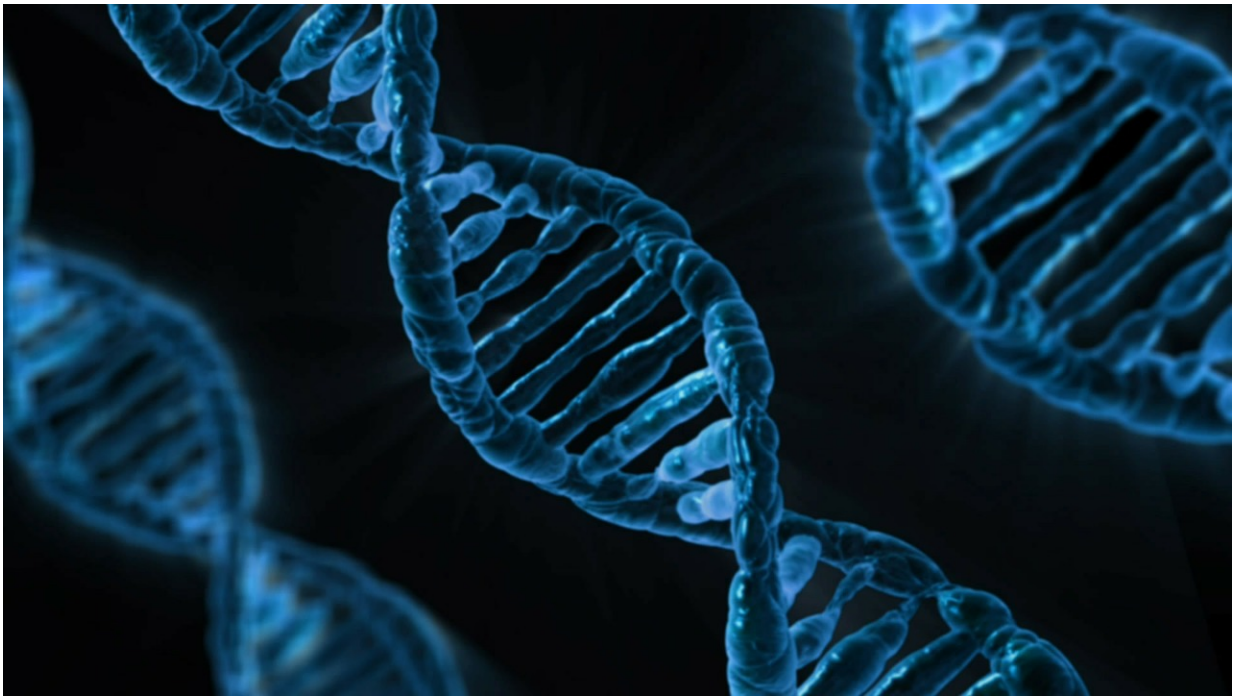
Cause of fatal childhood disorder revealed in gene study

April 14 2017



Credit: CC0 Public Domain

A gene involved in brain development that can lead to severe disability and infant death has been identified by scientists.

Mutations in the gene cause profound developmental problems and seizures in young children, researchers have found.

Scientists and doctors worked with children with a range of severe problems, including seizures and abnormal brain scans, and discovered that the infants all had mutations in a gene known as PLAA. The researchers have named the condition PLAA-associated neurodevelopment disorder, or PLAAND.

Brain function

By making a mouse with the same mutation as found in patients, the team – led by the University of Edinburgh – showed how this gene had to function properly for the healthy brain to develop.

PLAA is essential for signalling cells to clear build-up of damaged proteins, which is crucial for brain cell function, the researchers say.

Cells in children with PLAAND have lost this ability and damaged proteins build up, causing severe problems in brain development and at synapses – parts of brain cells that communicate with other cells.

Future treatments

Insights learned from the study may enable scientists to uncover new drugs to treat this rare disease. They could also shed light on conditions such as Alzheimer's disease, in which there is also an issue with damaged protein build up.

Pinpointing mutations in this gene that lead to such severe outcomes in the affected children is an important advance.

"Children affected with PLAAND die before the age of six and most heart-breaking for their families is that they fail to meet any developmental milestones. There is no treatment currently available. In

identifying this gene and the processes it controls, we have made significant steps in understanding its role in healthy brain development, which will help us target drug studies in future," says Dr Pleasantine Mill of the MRC Human Genetics Unit

Provided by University of Edinburgh