MedicalXpress

Study could aid degenerative disease therapies

October 30 2019

Fresh insights into how nerves connect with muscles in the body could aid the development of therapies to treat neurodegenerative diseases.

Scientists have found that a pair of molecules—one in nerves and one in muscles—need to bind in order for the contact points, known as synapses, to form properly.

Without this connection, growing nerves cannot advance during development of the embryo and communication between nerve and muscle is disrupted.

Developing treatments

The findings offer clues for developing treatments that could help patients with spinal muscular atrophy (SMA).

Children with SMA experience progressive muscle wastage and loss of mobility and control of their movements. The disorder is often referred to as 'floppy baby syndrome' because of the weakness it creates.

It affects one in 6000 babies and, despite recent exciting advances in therapy for infants, it remains one of the major causes of neurological disability in childhood.

Nerve disruption

Researchers at the University of Edinburgh and the University of Oxford used zebrafish and mice to show that synapses do not form properly when the function of nerves is disrupted.

They say they will now undertake further research into the changes inside the nerves, which could lead to treatments that will slow down the impact of diseases like SMA.

The study was funded by Spinal Muscular Atrophy UK as part of their UK SMA Research Consortium and by a Ph.D. studentship from the Motor Neurone Disease Association. It has been published in the journal *Cell Reports*.

"Our findings contribute to the fundamental understanding of the components that hold synapses together. This knowledge reveals potential new therapeutic targets for stabilisation of synapses in diseases, such as SMA. In the future, we plan to use the zebrafish model in automated screening experiments to find drugs that stabilise synapses," says Dr. Thomas Becker, University of Edinburgh's Centre for Discovery Brain Sciences.

More information: *Cell Reports* (2019). doi.org/10.1016/j.celrep.2019.09.033

Provided by University of Edinburgh