

# Decreased activity of basal ganglia is the main cause of abnormal muscle constrictions in dystonia

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Dystonia is a neurological disorder characterized by involuntary abnormal muscle constrictions. More than 300,000 people in North America are affected, but the mechanism of abnormal muscle constrictions has not been well understood.

Here, Japanese research team led by Prof Atsushi Nambu and Dr Satomi Chiken of National Institute for Physiological Sciences (NIPS) in Japan, with Dr. Pullanipally Shashidharan of Mt Sinai School of Medicine in USA, has found that the decreased activity of the basal ganglia, a part of the brain structure, is the main cause of abnormal muscle constrictions of dystonia using a mouse model. They report their findings in *Journal of Neuroscience*, on Dec 17, 2008.

They investigated neuronal activity in the basal ganglia of a dystonia mouse model, which was generated by transferring human dystonia genes, in awake state. Basal ganglia send inhibitory signals to the motor cortex and tune optimal movement in normal state. However, in the dystonia mouse model, the neuronal activity is decreased so that basal ganglia cannot inhibit motor cortical activity related to unnecessary movements. The research team has concluded that this is the main cause of involuntary abnormal muscle constrictions in dystonia patients.

"Now we understand the mechanism of abnormal muscle constrictions in dystonia. If we can artificially increase basal ganglia activity, abnormal

muscle constrictions in dystonia patients could be well controlled", said Prof Nambu and Dr Chiken.

Source: National Institute for Physiological Sciences

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