

Stem cell aid for dystrophy

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Experiment using fruit flies may help understand muscle disorders in humans

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Using advances in stem cell science, Indian researchers are trying to understand the mystery of muscle-related problems such as muscular dystrophy, a progressive muscle disorder.

At the National Centre for Biological Sciences (a part of the Tata Institute of Fundamental Research), Bengaluru, researchers studied the muscles of *Drosophila* or the fruit fly and discovered a new group of stem cells that are involved in the repair of injured tissue. Exercises such as running and lifting weights cause damage to muscles but they recover and are suitable for work again. How is this achieved?

"We thought we can study this in the most easily accessible model, i.e. the fruit fly. These are small flying insects we often see hovering over ripened banana. We were puzzled as to how an insect could fly for so long, much like how we humans run and walk throughout our life. It is a simple question with vast implications to understand things about muscles in general. The fruit fly emerged as a simple model," says Rajesh Gunage, a senior author of the

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Senior author of the study

new study that was published recently in the peer-reviewed *eLife Science*.

Pin prick experiment

Researchers designed a simple 'pin prick' assay as

an experimental strategy. The 'pin prick' assay involves using a tiny metal pin with dimensions that are close to those of an adult's eyebrow hair. "Using this we could induce non-life-threatening damage to the tiny flight muscles of the fly and observe them for recovery of flight," says Dr. Gunage.

Flight muscles, as the name suggests, are involved in flying and are equated to human muscles of the leg or arm. Much like the recovery of damaged muscles in the case of a runner who re-

covers from it and starts to run again, researchers were surprised to see fruit flies take wing again after a brief period of recovery.

Detailed analysis led to the discovery of novel stem cells. Team members observed that the pin injury activates stem cells and causes them to multiply. These new cells then become part of the injured muscles to help them recover from the injury.

"Anybody can do this experiment even at home. All you need is a small pin and a banana. Banana attracts small flying insects such as the *Drosophila*. All you need to do is prick them in the thorax with a pin to injure their muscles. Initially, they fail to fly due to injury but soon, due to stem cells, the damage is reversed and they are set into action again. Within no time you can see them resume their normal flight," says Dr. Gunage.

Finding answers to questions such as how a different diet, regular exercise affect muscles or even about a possible drug expected to enhance muscle function can now be found. "It just makes many difficult experiments easy to perform with much less effort," the research team noted. — India Science Wire