New research sees zebrafish earn their stripes in the fight against muscular dystrophy

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New research published today in the journal *eLife* has demonstrated a new method for observing the behaviour of the protein Dystrophin in a living animal cell, in real-time. This breakthrough may provide a key to understanding how to treat the genetic disease, Muscular Dystrophy.

This, as yet incurable disease, is caused by a genetic mutation, with sufferers missing the Dystrophin protein in their muscle cells. In order to better understand the implications of this missing protein, a team of researchers from the University of Surrey and King's College London introduced human Dystrophin protein into the muscle cells of zebrafish embryos.

Using a new observational method developed by the University of Surrey, researchers successfully watched the movement of Dystrophin in the living cell. In achieving real-time observation of the protein, it is hoped scientists will gain better understanding of the role of Dystrophin in the human body. Ultimately this will assist in the development of future therapies.

"Muscular Dystrophy is an incurable genetic disease that causes much suffering as muscles waste away causing paralysis, and early death," explained Dr Richard Sear of the University of Surrey.

"Research has already shown that sufferers of the disease are missing Dystrophin but what we don't yet understand is exactly what this protein does in our bodies and why it is so important," he continued, "Our work

has developed a new method for observing Dystrophin as it moves around a living cell, which has never been done before. Using this new method our colleagues at King's College London were then able to watch Dystrophin 'at work', which is very exciting and has implications for treating this awful disease."

"What they saw is that despite Dystrophin being about 30 times bigger than an average protein, it is extremely mobile. It moves rapidly, including at the tips of muscle cells, where we think it does its job. Now that scientists can observe it at work, we will be able to better understand Dystrophin's function in our bodies, and apply this understanding in gene therapy."

Zebrafish were chosen as their embryos are transparent and so by attaching a fluorescent tag, the Dystrophin molecules could be seen at work in the zebrafish's muscle cells.

"The next step for this research is to use this new method to observe different mutated versions of Dystrophin that are known to cause disease of different severities, to try to understand the link between these mutations and the disease. From there scientists will be closer to better smaller versions of the protein that can be used in gene therapy," concluded Dr Sear.

Provided by University of Surrey