



THE VICTOR CHANG
CARDIAC RESEARCH INSTITUTE

MEDIA RELEASE

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Can Zebrafish Hold The Clue To Muscle Repair In Humans?

The humble Zebrafish, normally found in the waters of India or in your local aquarium, could hold the key to understanding how muscle can be regenerated in humans suffering muscle degeneration.

Diseases of the skeletal muscles – the muscles that move your arms and legs – are a major cause of premature death and disability. Also called myopathies or dystrophies, the commonest type of these diseases, for example, affects young boys, with death due to respiratory or heart failure commonly occurring in the 2nd or 3rd decades of life. Determining how our muscles develop, grow and repair themselves (that is regenerate) after an injury is, thus, critical to understanding and, hopefully in the future, treating these diseases.

Fish may be on a lower rung than humans on the evolutionary tree, but the Zebrafish Laboratory at the Victor Chang Cardiac Research Institute has found new evidence that Zebrafish can repair damaged muscle more effectively than humans.

The key difference is thought to lie in the muscle stem cells of the Zebrafish which, unlike human muscle stem cells, are capable of not just repairing muscle but also producing new muscle fibres.

“While Zebrafish might appear to be quite different to humans, they actually have a muscle development program which is very similar to humans,” said Associate Professor Peter Currie who led the research. “This means what we learn in the Zebrafish can be applied to human muscle development.

“The main difference between human and Zebrafish muscle development lies in the way muscles form after birth,” continued Associate Professor Currie.

“During human development we stop making new muscle fibres some time shortly after birth. After that the only way muscles can bulk up and gain more strength - a process called hypertrophy – is by the existing muscle fibres enlarging.

“Zebrafish are quite different – they not only repair muscle, as humans do, but they can also keep producing new muscle fibres throughout their life.

“Our work is significant as it has allowed us to have a better understanding of how muscle regeneration occurs in Zebrafish. It is also the first time muscle development has been described in an organism other than humans, mice or chickens,” added Dr Georgina Hollway lead researcher.



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“The long term goal of this research is to hopefully be able to learn from these findings so one day we may be able to manipulate muscle development in humans, so that even after birth we may also be able to produce new muscle tissue.”

People who experience muscle wasting diseases or who have lost heart muscle following a heart attack would be just two groups who would benefit from the ability of being able to regenerate muscle.

The findings will be published this week in the very prestigious International journal - *Developmental Cell*.

Established in 1994, the Victor Chang Cardiac Research Institute (VCCRI) is committed to excellence in research into heart disease and cardiovascular biology, cardiovascular research training, and facilitating the rapid application of research discoveries to patient care.

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