# Study clears way to growing replacement body organs

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A discovery involving Monash University scientists promises to pave the way to producing replacement organs for damaged hearts, kidneys and bowels, using patients' own stem cells.

The research, pioneered by a team of scientists led by the Director of the Australian Regenerative Medicine Institute at Monash University, Professor Peter Currie, could overcome the severe shortage of donor organs for transplants.

The scientists focused on the zebrafish, a small, fast-growing tropical fish native to Southeast Asia, which is used widely as a model for human biology.

They found that a protein called Meox1, active in stem cells, is central to directing muscle growth. The ground-breaking results have been published in the latest edition of the prestigious journal, *Cell Stem Cell*.

Scientists world-wide have long been growing miniature organs in petri dishes, using them to better understand disease and natural self-repair mechanisms in the body, and for drug testing. Monash University has been at the forefront of these fields.

"But, we have known almost nothing about how organs grow in the living animal – the cellular basis of how stem cells make all that tissue," Professor Currie said.

"If we're ever going to grow complete organs in the laboratory or directly in a patient's body, we have to know how to grow them properly.

"My lab is exploring one of last frontiers of developmental biology – how organ growth is regulated by stem cells.

"Prior to our work in this field, we didn't even know that these growth-specific stem cells existed or how they were used. Just knowing that they exist leads us to the possibility of orchestrating them, controlling them, or reactivating them to regrow damaged tissue."

Professor Currie said while the stem cell discovery represented a significant advance in knowledge, the timeline for producing replacement organs in the laboratory remained unknown, though closer now to science fact than fiction.

**More information:** Phong Dang Nguyen et al. Muscle Stem Cells Undergo Extensive Clonal Drift during Tissue Growth via Meox1-Mediated Induction of G2 Cell-Cycle Arrest, *Cell Stem Cell* (2017). DOI: 10.1016/j.stem.2017.06.003

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