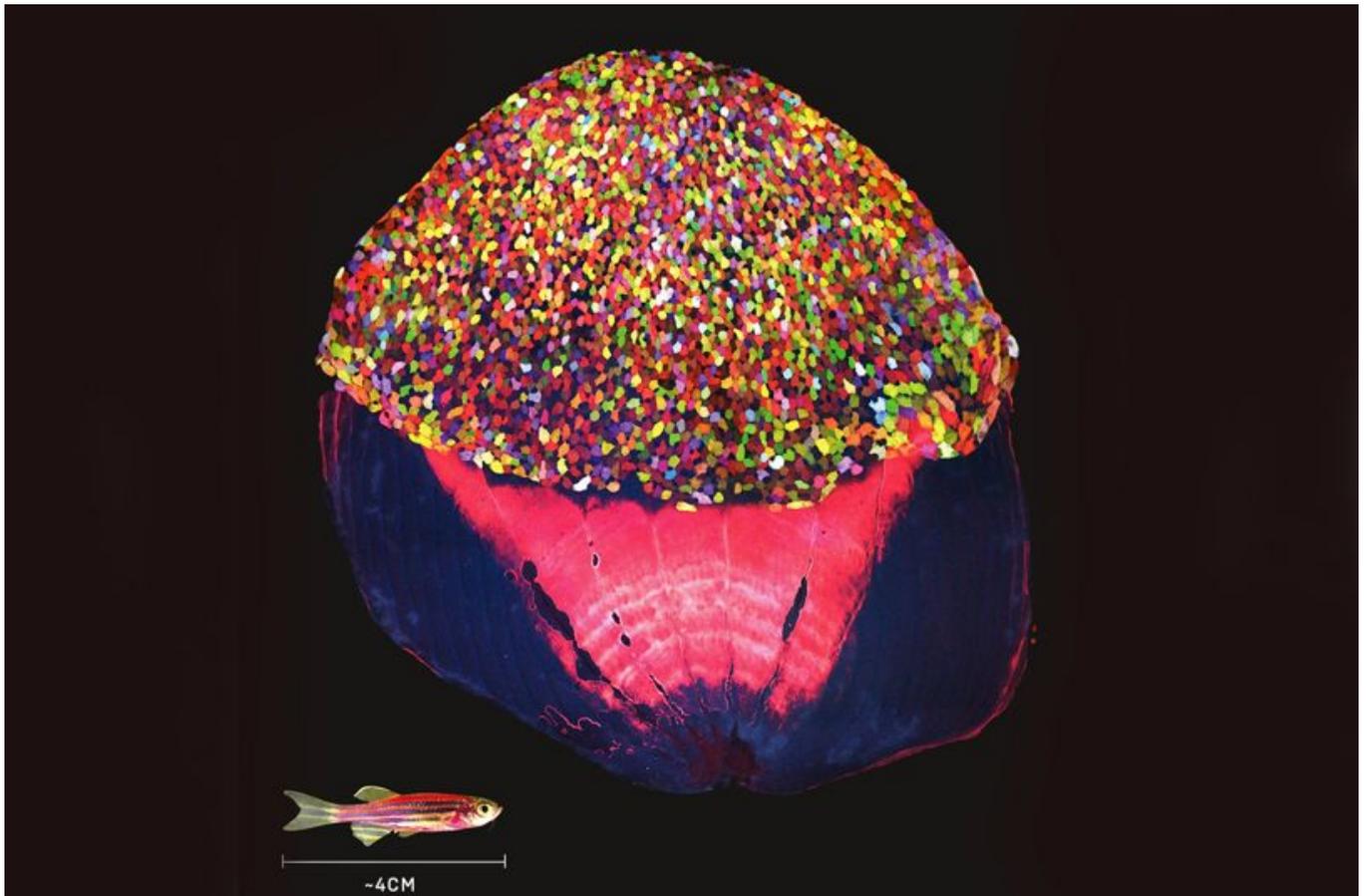


Cells

This psychedelic zebrafish scale could unlock the secrets of regeneration

Scientists are colour tagging individual Zebrafish cells to understand how they regenerate

WIRED CELLS



The scale above is 1.2mm wide; the average coloured cell is 18µm wide

Credit **Duke University**

No, this isn't a doughnut - it's a close-up of one zebrafish scale. Every cell on the surface of the fish - including its eyeballs - has been genetically engineered to produce a vibrant pigment to distinguish it from its neighbouring cells. Researchers at [Duke University](#) in North Carolina are calling their creation a "skinbow".

The scale started life as one of hundreds of zebrafish [embryos](#) injected with genes that cause [cells](#) to produce red, green and blue proteins. Each cell produces a unique combination of those proteins and so appears as a specific hue. They produce thousands of colour combinations, says Stefano Di Talia, an assistant professor of cell biology who worked on the study. "But under fluorescent lights we can only distinguish around 80 colours."

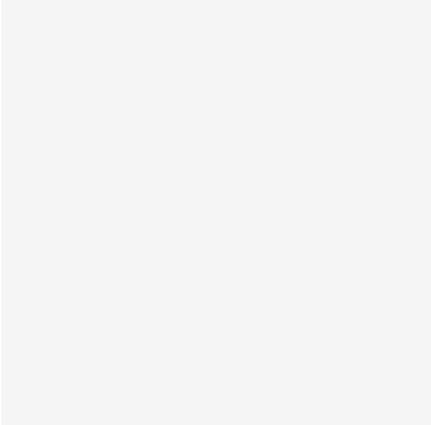
Zebrafish skin cells are identical, but with this pigmentation researchers are able to differentiate them. "Usually each cell is only in contact with seven or eight others," says Di Talia. "The probability that a cell will touch one of the same colour is low - 80 per cent of cells are a different colour from their neighbours."

The purpose of this tagging is to help researchers understand zebrafishes' powers of regeneration. Lead researcher Kenneth Poss tracked individual cells over days and observed how they responded when the fishes' skin was damaged. "Once there's an injury, the cells start to move around," Poss says. "Some cells grow by 50 to 100 per cent to replace lost skin." Zebrafish can regrow whole fins after amputation - but the reason why is unclear.

"They are highly regenerative," says Poss. "We're still trying to figure out why mammals aren't able to regenerate tissues like salamanders and [fish](#)."

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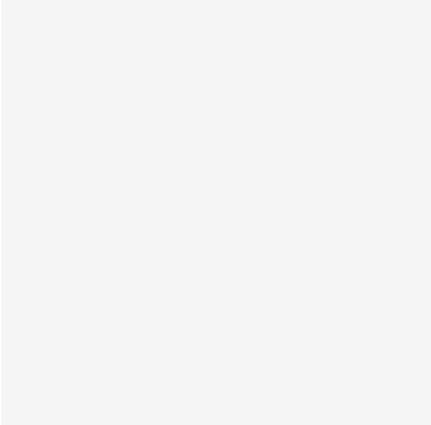
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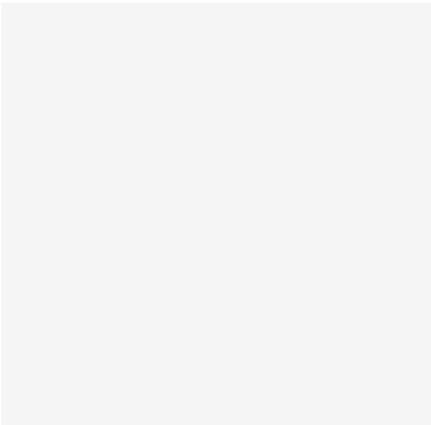
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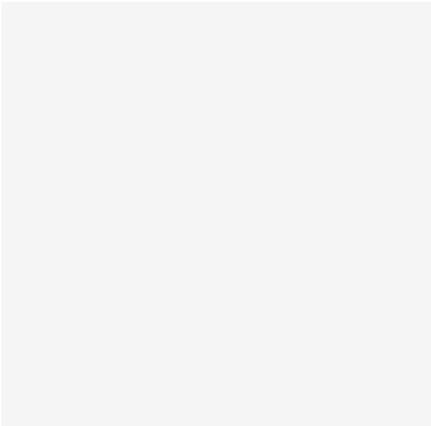
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