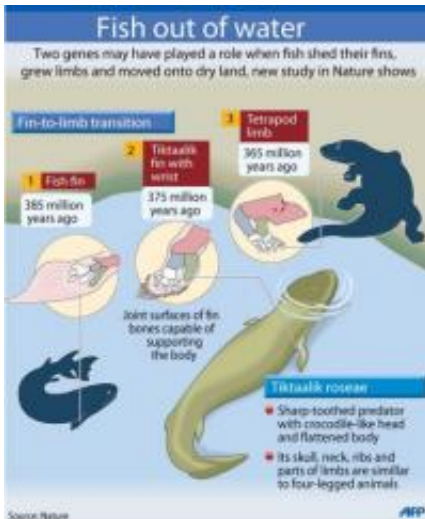


Fish out of water: Gene clue to evolutionary step

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Fossil evidence suggests that around 365 million years ago, fish, or fish-like creatures, emerged from shallow seas, moving onto land with the help of primitive, eight-fingered limbs, which later simplified to five digits under evolutionary pressure.

The newly-found genes control proteins called actinotrichia, whose tough, thin fibrils form a scaffold on which pectoral fins develop.

They were spotted by a team led by Marie-Andree Akimenko, from the University of Ottawa in Canada, as it was scanning development in the [zebrafish](#), a highly-studied lab animal.

Neither of the genes are present in four-limbed

vertebrates known as tetrapods, which became the basis for terrestrial animals, the researchers realised.

When the two genes were switched off in zebrafish [embryos](#) through [genetic engineering](#), the fish developed only truncated fins, without bony rays.

The switchoff also unleashed a pattern of gene activity seen in research elsewhere, in the development of limbs and digits in terrestrial animals.

Further work is needed to confirm the theory, as it is unclear whether the fin genes were knocked out to help make the transition to land -- or whether they were eliminated after the transition, as they were no longer needed.

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