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Regeneration Research

University of Dayton

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NEWS



Tuesday April 5, 2016

Regeneration Research

Imagine losing an eye, an arm or even your spinal cord. When we are wounded, our bodies, and those of other mammals, generally respond by sealing the wound with scar tissue. The newt, however, can repeatedly regenerate lost tissues, even as an adult.

Newts are the masters of regeneration. No other animal can match their regenerative abilities in body

parts including the limbs, the tail and spinal cord, parts of the eye (such as the retina and the lens), the brain, the heart and the jaws. What happens when a newt loses, for example, a leg? A mass of cells, called a blastema, is generated at the stump, from which a new, fully functional leg is eventually regenerated.

The newt is unique in having this ability even as an adult. Other amphibians with regenerative potential, such as frogs, lose this ability after metamorphosis.

Recent research led by University of Dayton Biology Professor Panagiotis A. Tsonis and Chikafumi Chiba at the University of Tsukuba in Japan, published in the current volume of the prestigious journal *Nature Communications*, has shed some light on the newt's exceptional regenerative ability and may provide further insight into regeneration in other species, including mammals.

"Many organisms will regenerate tissues when they are in early developmental stage. But newts can do this as adults even when they are old," Tsonis said. "The paper describes how the newts switch a mechanism when they become older to secure their regenerative abilities. If this mechanism is extrapolated in other animals, we might unlock it in higher animals including mammals."

The latest publication builds on more than two decades of research by Tsonis, who leads the Center for Tissue Regeneration and Engineering at Dayton (TREND) at the University of Dayton and **has authored more than 190 scientific papers and two books**. TREND "aims to understand the basic biology of how damaged tissues and organs can regenerate."

Complete information on the research published in *Nature Communications* can be **read in full on the University of Tsukuba website**.

Science publications, including **ScienceAlert**, **Gizmag** and **lflscience**, also shared the findings.

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