Conserved microRNAs may regulate limb regeneration in evolutionarily distant species

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Several conserved microRNAs, or short, highly conserved noncoding RNAs that are targeted to and inhibit expression of specific genes, may be involved in the regulation of limb regeneration across evolutionarily distant species, according to a study published June 29, 2016 in the open-access journal *PLOS ONE* by Benjamin King and Viravuth Yin from Mount Desert Island Biological Laboratory and the University of Maine.

Although there are species throughout the animal kingdom capable of regeneration in some capacity, this defining characteristic is not equally distributed throughout evolution. Unlike mammals, some amphibian and fish species have the ability to regenerate fully functional tissue or appendages after loss, including bone, muscle, nerves, and blood vessels. While it is known that this regeneration requires the formation of an unspecialized tissue known as "blastemal," little is known about the genetic regulation of blastema formation.

To determine whether the genetic control of blastema formation may be conserved across species, the authors of this study conducted RNA sequencing of regenerating limb tissues from three evolutionarily distant species, one salamander and two ray-finned fish, at various times following amputation, when regeneration may be occurring.

The authors found a core group of conserved microRNAs and their posited target genes that may be involved in regulation of blastema formation in all three species, including some microRNAs not previously known to act in regeneration.

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More information: King BL, Yin VP (2016) A Conserved MicroRNA Regulatory Circuit Is Differentially Controlled during Limb/Appendage Regeneration, *PLoS ONE* 11(6): e0157106. DOI: 10.1371/journal.pone.0157106

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