

Human ability to grow cartilages



Issue

Researchers from Duke University have shown that compounds called microRNAs, which are found in humans may help in cartilage regeneration.

Background

Organisms like salamanders, zebrafish and Mexican walking fish are known to be experts at regenerating lost limbs. They execute this extraordinary feat by using a circuit of microRNA (miRNA) in their body. The same microRNA, which has lately been discovered in humans can be further utilized to regenerate lost body parts.

Details

The team studied the human lower limb cartilages and found that the microRNAs were highest in ankles compared to knees and hips. The top layer of cartilage had a higher concentration compared to deeper layers of cartilage.

Understanding of this 'salamander-like' regenerative capacity in humans, and the critically missing components of this regulatory circuit, could provide the foundation for new approaches to repair joint tissues and possibly whole human limbs.

The team also quantified the expression of three miRNA (miR-21, miR-31, and miR-181c) in the cartilage and found that they help activate the collagen proteins.

They studied and analysed different proteins in the cartilages and their ages and noted that the newly formed ones had few or no amino acid conversions and older proteins had many.

Cartilage in the ankles were young, and those at the knee were middle-aged whereas hips had the oldest cartilage, which explains why ankles heals quickly in comparison to hips and knees.



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