

# Scientists reveal new insights into tendon injury

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Scientists have discovered how tendons - the fibrous tissue that connects muscle to bone - become damaged through injury or the ageing process in what could lead to new treatments for people with tendon problems.

The University of Manchester team, working with colleagues at Glasgow University, have been investigating 'adhesions', which are a build up of unwanted fibrous tissue on internal organs that have been damaged as a result of surgery or injury.

Adhesions cause organs to stick together and are extremely painful and distressing for patients, who often have to undergo surgery and rehabilitation. The estimated cost of adhesions to the NHS is £100 million each year.

In this study, published in the journal *PLoS One*, the researchers wanted to understand how tendon adhesions form, so examined the surface of healthy [tendons](#) and discovered that they are covered by a thin layer of skin.

"Tendons attach our muscles to bone and are essential for movement," said lead researcher Professor Karl Kadler, from the Wellcome Trust Centre for Cell Matrix Research in Manchester's Faculty of Life Sciences.

"In order to do this, tendons need to glide freely but when an adhesion forms the tendon can no longer travel over the bone, which causes pain, stiffness and reduced movement.

"We reasoned that the surface of tendons must contain a special cell that stops adhesions from forming in healthy people. We discovered that the tendon is actually covered by a thin layer of epithelial cells, which are usually found in skin.

"Undamaged tendons do not form adhesions but when the tendon 'skin' is damaged, the cells inside

the tendon form an unwanted adhesion which begins to stick to nearby tissues."

The team were able to show that mice with defective cells at the surface of their tendons appeared to have difficulty walking and spontaneously develop tendon adhesions, even without surgery or injury.

Dr Susan Taylor, from The University of Manchester and co-author on the paper, added: "This study of tendon adhesions shows that the integrity of the surface of a tissue is critical in preventing adhesions. Furthermore, the discovery of this completely new layer of tendon cells changes the way we are thinking about how tendons are made during embryonic development and maintained in adulthood. Future research is aimed at finding ways of protecting the tendon epithelium in older people and in athletes."

Provided by University of Manchester

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