Scientists discover new clues explaining tendon injury

4 July 2012

Tendon disorders cost the UK economy more than £7bn a year and now scientists at Queen Mary, University of London have identified a vital component of tendons which could help treat them.

The research, published in the Royal Society journal *Interface* today, found that a component of tendons known as the interfascicular matrix (IFM) is essential for their function.

"Tendon disorders are highly debilitating and painful, and may herald the end of an Olympic athlete's career," said co-author Dr Hazel Screen, a senior lecturer in medical engineering at Queen Mary, University of London.

"Even today, with advancements in sports science, little is known about tendon health management, and we still do not understand why some people are more prone to tendon injury than others.

However, we have now found that the matrix which binds the fascicles together in the tendon, the IFM, is essential for tendon function and that changes to this structure may be responsible for tendon injury."

Scientists at Queen Mary, along with colleagues from University of Liverpool and University College London, are working on a project funded by the Horserace Betting Levy Board, in which they have been dissecting tendons from horses in order to better understand the role of the IFM.

Tendon injury is common in horses as well as humans, with an economic impact of more than £3bn a year in horse racing. Around 16,000 horses are in training each year and the tendon injury rate is as high as 43% with few horses returning to racing after injury.

Lead author Dr Chavaunne Thorpe from the School of Engineering and Materials Science at Queen Mary, University of London explained: "A specific tendon in horses known as the superficial digital flexor tendon (SDFT) stretches and recoils in the same way as the Achilles tendon and is injured in the same way.

"We tested how the components within the SDFT worked to enable the tendon to stretch and function effectively.

"When we looked at its capacity to stretch, we found that the IFM, previously thought to be unimportant in tendon function, was essential to SDFT extension in horses. We found that tendons with a stiffer IFM were not able to stretch as far before they failed."

The finding suggests that the IFM may be critical in preventing tendon overuse injury, and the authors are now trying to find out exactly how this is achieved.

Dr Screen added: "If we are able to manipulate the IFM, we could potentially design a diagnostic test to see whether someone is more susceptible to tendon injury than others, and also pave the way for prospective treatments."

More information: 'Specialization of tendon mechanical properties results from inter-fascicular differences ' will be published online in the Royal Society journal *Interface* on 4 July 2012. doi: 10.1098/rsif.2012.0362

Provided by Queen Mary, University of London