Osteoarthritis

Evidence of osteoarthritis has been found in ice-aged skeletons. Today, over twenty-seven million Americans suffer from osteoarthritis, the most prevalent form of arthritis. It is often a result of knee-joint damage such as tearing of a ligament or meniscal cartilage. The articular cartilage that covers the ends of bones in the knee joint deteriorates, causing pain and loss of movement as bone begins to rub against bone. Osteoarthritis in the knee is typically associated with loss of articular cartilage, and research has focused on both preventing that loss and treating that damage. Tammy L. Haut Donahue has reason to believe that the knee-joint meniscus may contribute much more to osteoarthritis than previously thought.

Menisci are two C-shaped rings of fibrocartilage in the knee that primarily function to protect the underlying articular cartilage by distributing the load in the knee. Haut Donahue has shown that knee-joint damage, such as a ligament tear or meniscal tear, causes the menisci, among other tissues, to produce elevated levels of an inflammatory molecule, interleukin-1, that can degrade the matrix of the meniscus and prevent it from protecting the underlying articular cartilage.

"Blocking the action of interleukin-1 at its receptors can arrest the degradation of the meniscus, enabling it to continue to function and protect the underlying articular cartilage from wearing away," notes Haut Donahue.

Future studies will focus on whether this treatment can slow or prevent osteoarthritis associated with traumatic knee damage. The inquiry has the potential to revolutionize how clinicians treat patients. By understanding the biology and biomechanics of the knee-joint meniscus—and the response of the knee-joint menisci to knee damage—the work of Haut Donahue and her team could give patients an additional five to ten years of function before the need for artificial joint replacement.