

Network of proteins influences the advancement of osteoarthritis

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A network of carbohydrate binding proteins—so-called galectins—plays an important role in the degeneration of cartilage in osteoarthritis. A research group at the MedUni Vienna was able to demonstrate this correlation, in cooperation with international study partners. In osteoarthritis, certain galectins are produced by the cartilage cells themselves and accelerate the degeneration process of the cartilage matrix.

Whilst galectins do play a role in [cartilage](#) development during childhood growth, they essentially do not occur in healthy adult cartilage. The researchers working with Stefan Tögel from the Department of Orthopedics and Trauma Surgery at the MedUni Vienna/Vienna General Hospital have now discovered that the quantity of galectin-8 found in the cell samples was correspondingly greater with an increasing severity

of cartilage degeneration. After its production, this protein is released by the [cartilage cells](#) and connects with the cell surfaces, where it causes inflammatory processes and accelerates the matrix degradation of the cartilage tissue. Other galectins, which are otherwise able to perform various functions in the cell, apparently also play an accelerating role here.

Research in the field of glycobiology

In previous studies, Stefan Tögel's research group has succeeded in demonstrating for the first time the functional significance of glycobiology for the pathogenesis of osteoarthritis, and has identified galectin-1 and galectin-3 as being inflammation accelerators. Glycobiology essentially describes the structure and function of glycans (sugar chains), which are able to influence a broad spectrum of biological processes through interaction with carbohydrate binding proteins (e.g. galectins).

"Our approach in researching the role of glycobiology in osteoarthritis and other degenerative cartilage diseases is very new," explains Stefan Tögel. "We are essentially treading new ground with our studies." The aim is new therapy approaches in the treatment of [osteoarthritis](#), which will halt its advancement. Because once cartilage tissue is lost, it can no longer be regenerated. For this purpose, it could be possible to develop antagonists for the respective [galectins](#), which will prevent them from attaching to the cell surfaces. "Galectins may also be suitable as biomarkers, which will enable an early diagnosis through a blood test or with a sample of the synovial fluid," explains Tögel.

Osteoarthritis is a [degenerative joint disease](#), which leads to a change in the structure of cartilage and bone, and can even result in joint deformity. It usually results from many years of over-straining. Joint diseases are among the leading causes of chronic pain and immobility in old age, and

constitute a serious socio-economic factor in the health sector due to the increasing life expectancy of the population. No treatment has been available to date, which could halt the progressive loss of cartilage tissue in an osteoarthritic joint, or even reverse this.

More information: Daniela Weinmann et al. Galectin-8 induces functional disease markers in human osteoarthritis and cooperates with galectins-1 and -3, *Cellular and Molecular Life Sciences* (2018). DOI: [10.1007/s00018-018-2856-2](https://doi.org/10.1007/s00018-018-2856-2)

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