Diseased cartilage harbors unique migratory progenitor cells

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A new study finds previously unidentified fibrocartilage-forming progenitor cells in degenerating, diseased human cartilage, but not in cartilage from healthy joints. The research, published by Cell Press in the April 3rd issue of the journal *Cell Stem Cell*, provides valuable insights into the reparative potential of cartilage and may lead to development of regenerative therapies for arthritis.

Osteoarthritis (OA) is an incurable degenerative disease caused by a progressive deterioration of the cartilage that cushions and protects joints. "OA is the most common musculoskeletal disease in the elderly and is likely to be the fourth-leading cause of disability by the year 2020," explains senior study author Dr. Nicolai Miosge from Georg August University in Goettingen, Germany. "This is our motivation for the further exploration of OA treatment options, including regenerative cell biological therapy."

Previous research has suggested that OA tissue may harbor cells which possess an ability to contribute to the repair of damaged cartilage. It has even been suggested that these potentially regenerative cells may be specifically recruited to degenerating cartilage. In their study, Dr. Miosge and colleagues sought to determine whether diseased adult cartilage tissue contains progenitor-like cells that exhibit migratory capabilities.

The researchers discovered that cartilage from humans with late-stage OA contains a unique population of progenitor cells called chondrogenic

progenitor cells (CPC). The CPCs, which were not present in healthy cartilage, exhibited many characteristics associated with tissue-specific stem cells, including migratory activity and the potential to generate new cartilage. Although the origin of the CPCs was not clear, there was some evidence that they migrated from the bone marrow.

Taken together, the findings establish CPCs as an exciting future target for stimulating the repair and regeneration of damaged cartilage. "Our results offer new insights into the biology of progenitor cells in the context of diseased cartilage tissue," offers Dr. Miosge. "We hope ultimately to work towards utilizing these cells—which are already present in diseased tissue—for the development of regenerative OA therapies." Additional research is needed to identify the optimal conditions for promoting and sustaining the cartilage-producing potential of CPCs.

Source: Cell Press (news : web)