

Researchers describe one mechanism that favors rejection in transplantation of porcine cartilage in humans

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Researchers at the Bellvitge Institute of Biomedical Research (IDIBELL) led by Cristina Costa from the New Therapies on Genes and Transplantation group have shown that inhibition of one of the basic components of the complement system protects chondrocytes (cartilage cells) from porcine rejection of xenotransplantation (transplantation between animals of different species).

Complement system

The complement system is a key component in the process of innate immunity. "This is the first response of the organism to external pathogens," explained Cristina Costa " and in recent years there have been very relevant jobs that establish that the complement system may be an important therapeutic target in diseases of cartilage." In that vein, the group Cristina Costa works in xenotransplantation research of [cartilage cells](#) (chondrocytes) pig in human joints that have suffered a traumatic injury. This particular work shows that one of the components of the complement system effectors: C5 plays a major role in the rejection.

In a first phase the researchers inhibited pharmacologically C5 in an experimental mouse model and injected them with porcine chondrocytes. "We note that there is a protective effect. The animals without C5 present more preserved [cartilage tissue](#) and less cellular

infiltrate. "

Description of the mechanism

After confirming the [protective effect](#) of C5 inhibition, the researchers studied the molecular mechanisms which enable this component of the [innate immune response](#) are. The studies were conducted by exposing porcine chondrocytes in human serum " so that the results bring us one step closer to clinical application " noted Costa .

"We found that activation of the human complement system not directly cause cell death of porcine chondrocytes but activates various inflammatory processes, adhesion and secretion of cytokines and chemokines. All related to xenograft rejection. "

Cartilage transplant

Cartilage transplantation between humans is not widely applied in the clinic but has already proved successful in the regeneration of this tissue in traumatic injuries, especially in athletes. Autologous transplants are performed (with [cells](#) from the same person) or allogeneic (cells from another person). "In both cases," explains Cristina Costa " the limitation is in the number of cells. If we get that xenotransplantation work we increase the number and quality of cells available for transplantation. "

In the future, according to the researcher, "maybe we could apply the xenotransplantation of porcine [chondrocytes](#) patients of osteoarthritis or even rheumatoid arthritis " but has warned Costa "in these cases other inflammatory and immunological processes that hinder the success of transplantation are combined."

More information: Sommaggio, R., Pérez-Cruz M., Brokaw J.L.,

Máñez R. and Costa C. Inhibition of complement component C5 protects porcine chondrocytes from xenogeneic rejection. *Osteoarthritis and Cartilage* (2013). [dx.doi.org/10.1016/j.joca.2013.09.002](https://doi.org/10.1016/j.joca.2013.09.002)

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