

**SUBJECT:**

**Composite polymer systems with the use of a hydrogel for the regeneration of cartilage**

**SUPERVISORS:**

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**DESCRIPTION:**

Very promising from the point of view of regenerative medicine are composite three-dimensional polymer systems using cross-linked hydrogels supported with additional components to mechanically strengthen the composite, which is crucial for highly loaded cartilage tissue. Hydrogel systems offer an optimal environment for cells along with the ability to deliver drugs efficiently. Important components of such systems, primarily from a mechanical perspective, can be, for example, various types of nanoparticles or scaffolds formed by 3D printing, giving the possibility of controlling process parameters, and thus - optimizing the structure of such a system. The printability of the polymer is influenced by a number of parameters such as printing pressure, needle diameter, printing speed, flow rate, and printing temperature. It is planned to investigate hybrid polymer scaffolds consisting of a printed three-dimensional polymer matrix combined with a hydrogel and the aim is to develop an optimal material system from the perspective of cartilage tissue regeneration.

**BIBLIOGRAPHY:**

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