



PERSONA CIENCIA EMPRESA
UNIVERSITAT RAMON LLULL

Development of conductive hydrogels as cellular scaffolds for cartilage repair

1 Master research project (6-9 month)

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Summary:

Cartilage damage is a hallmark of osteoarthritis, leading to bones rubbing against each other and causing pain. Lack of blood supply prevents the delivery of nutrients and therapeutics to repair and regenerate the joint, and therefore, localised therapies present a more viable alternative. Previous studies showed that electrical stimulation promotes the production of healthy cartilage in animals. Conductive biomaterials have the potential to replace the damaged extracellular matrix and provide a regenerative therapy based on electrical stimulation. This project aims to investigate the efficacy of a cellular scaffold constructed from a hydrogel matrix modified with conducting polymers. The modification of the hydrogel structure with conductive polymers will enhance the electrical properties of the scaffold, allowing for effective electrostimulation of cells. The project will involve a comprehensive study encompassing the fabrication and characterization of the conductive cellular scaffold. The scaffold's electrical properties will be assessed, ensuring optimal electrostimulation capabilities. In vitro experiments will be conducted in terms of cellular viability and to evaluate the response of cells to electrical stimulation within the modified hydrogel matrix.