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UNIVERSITAT POLITÈCNICA DE VALÈNCIA

COMPOSITE BIOMATERIAL FOR MEDICAL IMPLANTS WITH HIGH MECHANICAL AND REGENERATIVE PERFORMANCE

DESCRIPTION OF THE INVENTION

New composite material in the form of a mesh that is interpenetrated with (reabsorbable) hyaluronic acid and an acrylate such as (non-reabsorbable) ethyl polyacrilate, in order to obtain a dehydrated hyaluronic acid foam (through lyophilization of an aqueous gel of polysaccharide intertwined via its reaction with divinyl sulphone), in which the ethyl acrylate is previously polymerized throughout the entire volume of the foam.

The combination of these two components allows the hyaluronic acid to be strengthened, increasing the mechanical properties of the resulting material via the acrylic polymer stage, whilst maintaining the advantages of the hyaluronic acid. Among other benefits, the hyaluronic stage blends the composite material with other cellular cultivations and/or tissue in the case of an implant, due to the fact that it constitutes the major component of the extracellular matrix of most types of cells.

APPLICABLE BUSINESS SECTORS

The technology developed here is of interest to the implant material sector and also to the biological research material sector.
This material can be used as an aid in cell cultivation or to develop biomedical regenerative implants in a variety of types of tissue, such as cartilage, bone, myocardium and even nerve tissue.

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

This material allows for a good regeneration of tissue, promotes the formation of blood vessels as they enter into the pores when the hyaluronic acid is absorbed. In addition, the inflammation is reduced as the martial is bioinert and avoids adhesion.

Implants with other materials such as Gore-Tex or Teflon exist, which, although they avoid adhesion, do not function satisfactorily and can even generate fibrosis and other problems through sock-type meshes that do not have mechanical properties.

DEVELOPMENT STAGE OF THE TECHNOLOGY

The technology is still in the “in vitro” laboratory stage, having carried out the physical-chemical and mechanical characterization. It requires experimentation on animals (for example, pigs) and subsequent clinical trials on humans. If the technology is applied to bone or cartilage, the clinical trials would not be necessary, as the materials have already been validated.

INDUSTRIAL PROPERTY RIGHTS

The technology has been patented by the UPV, with the Spanish patent pending number P201231147, with a priority listing dated 19/07/2012.
The extension of this patent via PCT is expected within a year of this date.

COLLABORATION REQUIRED

The UPV is looking for a firm in the implant sector in order to work collaboratively to enable preclinical and clinical trials to potentially exploit the technology through licensing. Connections have been made with hospitals and research clinics to carry out the next steps.

CONTACT

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