

## IN VITRO METHOD FOR PREDICTING AND/OR FORECASTING THE ABILITY OF A BIOMATERIAL TO INDUCE THE REGENERATION OF TISSUES

### DESCRIPTION OF THE TECHNOLOGY

Researchers in the Advanced Polymers and Materials group at the Universitat Jaume I in Castelló have developed an in vitro method for predicting and/or forecasting the capacity of a biomaterial to induce the regeneration of bone and soft tissues.

The procedure involves testing for the existence of several types of protein clusters involved in bone and soft tissue regeneration that are attached to the surface of the biomaterial in different ways, after putting it in contact with the patient's serum.

For patients there are currently no regenerative capacity tests that have been customised and developed for those who are going to receive an implant or prosthesis.

For implant manufacturers, any change or improvement made to these medical devices, such as the application of a surface treatment or the development of new compositions of the biomaterial used in their manufacture, entails a costly and complicated process of evaluating the biocompatibility of the new product: at least 4 years are required for in vitro, in vivo and pre-clinical testing.

In addition, it has been proved that there is little correlation between in vitro and in vivo testing.

This method makes it possible to obtain the CE marking and to undertake a clinical trial to determine the effectiveness of the implants or prostheses in advance. Thus, for a new dental implant, the method could be used to determine its capacity for osseointegration as compared to a reference. And, in the development of a transepithelial abutment, the sealing capacity of the surrounding soft tissue could also be checked against a reference. This new technology would therefore make it possible to reduce the time needed to develop new products.

In addition, this in vitro method would make it possible to carry out - prior to an intervention - a personalised regeneration capacity test developed for patients who are going to receive an implant or prosthesis. This would lower the risks for the patient, reduce time and save costs.

The invention also comprises a kit for carrying out the said method.

### SECTORS FOR COMMERCIAL APPLICATION

- Prosthetics production industrial sector
  - On the one hand, the method would be of interest to companies that manufacture dental implants, hip prostheses, knee prostheses and, in general, all producers of materials that are going to be in contact with bone.
  - On the other hand, it may also be useful for companies that manufacture percutaneous medical devices, such as dental implant abutments and catheters.
- Research sector
  - Any groups performing in vitro and in vivo tests applied in the development of new biomaterials in order to determine their capacity for tissue regeneration.
- Healthcare sector
  - In particular, dental clinics, hospitals and stakeholders.

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### TECHNICAL ADVANTAGES AND COMMERCIAL BENEFITS

- Advantages:
  - No similar method has been developed as a test for bone or soft tissue regeneration.
  - At present, in vitro and in vivo tests are used, which are long, complex, costly, subject to certain ethical issues due to the use of experimental animals and not completely safe.
- Benefits:
  - Reduced risks for the patient, as well as time and cost savings.

### STAGE OF DEVELOPMENT OF THE TECHNOLOGY

Validated at the experimental level in the laboratory.

### INDUSTRIAL AND INTELLECTUAL PROPERTY RIGHTS

This invention is protected by means of an application for a Spanish patent with reference number P202130407 and filing date 6 May 2021.

### COLLABORATION SOUGHT

Development and adaptation of the technology to particular applications through specific agreements and a subsequent licensing agreement with companies.

### RELATED IMAGES



### CONTACT DETAILS

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