

# In vitro method for predicting the biocompatibility of medical implants

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Researchers at the Universitat Jaume I (UJI), the University of the Basque Country (UPV-EHU) and the Centre for Cooperative Research in Biosciences (CIC bioGUNE) have patented a new in vitro method for predicting the biocompatibility of materials to be used in the manufacture of medical implants, such as joint and dental prostheses, valves and stents.

The patent is based on the detection of a group of proteins linked to the inflammatory reaction. In fact, researchers have identified a profile of protein markers, related to the immune response, that can be analysed in an isolated biological sample in vitro, and whose presence above a reference level is indicative of non-biocompatibility in vivo. "This methodology," explains the researcher Nuno Araújo, "will enable us to face the experiment in vivo with more security in the future, and to reduce the number of animals involved, while reducing time and costs."

The invention consists in an accelerated test of the biocompatibility of materials that makes it possible to discard those with poorer prospects of success during the in vitro phase, thus avoiding costly investments in unnecessary in vivo studies and facilitating a faster transfer of the [new materials](#) to the clinical stage. It accelerates and significantly reduces the development of new implant materials and reduces the number of animals used for experimentation.

This methodology involves a robust correlation between the protein profile obtained in the in vitro tests and that acquired by means of in

vivo trials, which are, by definition, more reliable. Thus, through the in vitro/in vivo correlation, determination and quantification of such markers in in vitro samples predicts the biocompatibility of biomaterials-implants, joint and dental prostheses or catheters, according to main researcher Julio Suay.

The technology is useful for the sectors of manufacturers of medical prostheses and for the producers of biomaterials, as well as for research groups of R & D centres that carry out in vitro and in vivo tests applied to the development of new materials. In the healthcare sector, it is particularly useful for patients who need an implant. In fact, with a simple blood test, detailed information could be obtained about whether the patient is likely to suffer complications in [joint replacement surgery](#).

**More information:** Francisco Romero-Esparver et al. Proteome analysis of human serum proteins adsorbed onto different titanium surfaces used in dental implants, *Biofouling* (2016). [DOI: 10.1080/08927014.2016.1259414](#)

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