

Spanish researchers obtain bioceramics for implants from shark teeth

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Researchers have obtained bioceramics from shark teeth, which have applications in the regeneration of bone tissue, particularly in the fields of traumatology and odontology. Given the degree of innovation and the positive results obtained after preliminary trials, the European patent is currently pending.

These new implants, which according to the Spanish scientists could be on the market very shortly, will broaden the range of materials for biomedical use, and constitutes an innovative solution utilizing marine resources.

This breakthrough has been achieved within the framework of the recently completed European project MARMED, which funded groups from ten research institutions to work in a coordinated manner for three years to create new ways of evaluating marine discards and byproducts for designing and obtaining the next generation of biopolymers and bioceramics.

"The treatment of [marine resources](#) is not being undertaken in a sustainable way, which leads to the discarding of byproducts with a high potential for recoverability," explained Julia Serra, researcher in the New Materials group of the University of Vigo and BIOCAPS member. "The MARMED project has made it possible for us to carry out actual case studies in collaboration with industry, to develop [biomedical materials](#) with a high added value, using marine by-products from companies in the sector," she added.

Researchers from the Instituto de Investigación Biomédica responsible for this finding obtained apatite bioceramics from the discarded teeth of blue and shortfin mako sharks.

Calcium phosphate materials and, in particular, hydroxyapatites are those most in demand in tissue engineering for the repair, replacement or regeneration of bone defects in both orthopaedic and maxillofacial surgery. Currently, the most extensive source of biological apatites is bovine bone, but recently, this has become controversial because of the confirmation of the risk of transmission of bovine spongiform encephalopathy –commonly known as [mad cow disease](#) – by the Food and Drug Administration (FDA).

This makes the alternative developed by the BIOCAPS researchers especially valuable, because it avoids these risks by obtaining these biomaterials from marine sources.

The process for obtaining bioceramics from [shark teeth](#) starts with washing and drying, followed by milling and pyrolyzation (a high-temperature treatment to eliminate any organic waste). The result is an inorganic granular powder sifted in different sizes according to the application required, and that has been tested by in vitro and in vivo assays. These trials, carried out in collaboration with researchers from the BIOCAPS area of endocrinology, metabolism and nutrition, have recorded very good results and have demonstrated an absence of toxicity.

Provided by Universidade de Vigo

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