

## Innovative Bio-Apatites of Marine Origin

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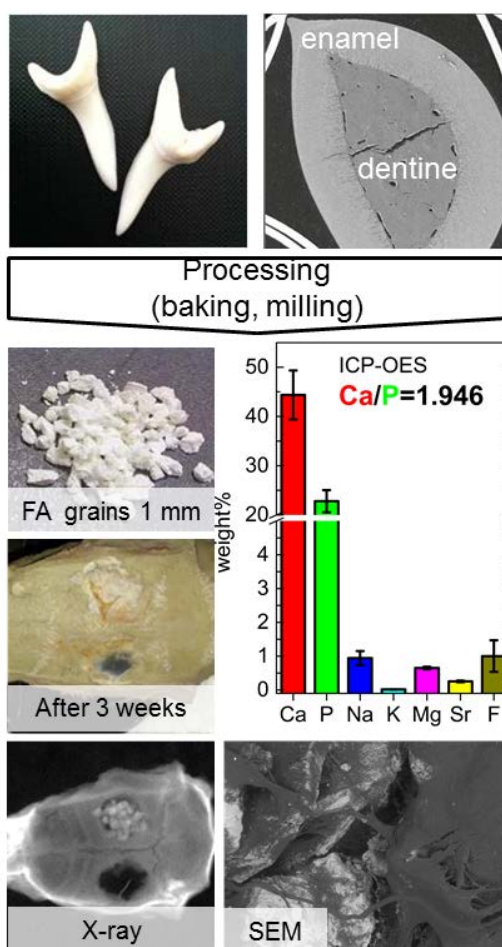
### Description

Nowadays, the most widespread biomaterial for clinical applications as bone void filler and bone tissue regeneration is hydroxyapatite (HA). Current sources of this biomaterial are either synthetic and from human or bovine origin, but these materials suffer from several drawbacks regarding performance and biosafety:

**Synthetic HA:** It does not present the mechanical properties of bone HA, and has a limited functionality to produce the tensor effect and reduce the volume of the defect.

**Human and Bovine HA:** These materials display the right mechanical and bioactive properties, but have the risk of rejection and lack of access to biomaterial in the case of human HA, and also have the risk of transmitting diseases from the tissue (e.g. prionic diseases, as declared by the FDA).

To overcome these problems, a new marine apatite-based biomaterial has been obtained from shark's tooth. It is a cheap and abundant raw material containing Fluorine and other cell growth stimulating elements. Its unique chemical composition makes it an innovative Fluorapatite (FA) biomaterial (isolated or mixed with other HA types) with superior characteristics, which can replace the current HA materials at a very competitive price.



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### ***Innovative aspects and advantages***

- Benefits of FA over synthetic, human or bovine HA:
  - It has improved mechanical characteristics compared to synthetic HA in in vitro and in vivo assays.
  - It is a safer biomaterial with better biocompatibility and lack of disease transmission.
  - It comes from a low cost abundant raw material which makes it a cheaper than commercial HA.
- Moreover, the FA also has new added features:
  - It contains fluorine and other elements, which improve mechanical performance and cell attachment and proliferation.

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### ***State of the art***

- Full product characterization.
- Optimized laboratory scale process.
- In vivo studies performed.
- Pilot scale business model.
- CE marking in process.

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### ***Patent status***

European Patent application

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### ***Type of collaboration***

Licensing of the technology and collaboration on the commercialization of the product.