

# Editorial Note on Bioinert Materials

Faik N. Oktar\*

Department of Bioengineering, Marmara University, Goztepe Campus, Turkey

Journal of Bioceramics Development and Applications: An Open Access Journal, Journal of Ceramic Science, New Journal of Glass and Ceramics, Journal of Addiction Research & Therapy, Journal of Nutritional Disorders & Therap. Bioceramics and bioglasses are ceramic materials that are biocompatible. Bioceramics are an important subset of biomaterials. Bioceramics range in biocompatibility from the ceramic oxides, which are inert in the body, to the other extreme of resorbable materials, which are eventually replaced by the materials which they were used to repairing. Bioceramics are used in many types of medical procedures.

The term Bio inert Materials bioinert refers to any material that once placed in the human body has minimal interaction with its surrounding tissue, examples of these are stainless steel, titanium, alumina, partially stabilised zirconia, and ultra-high molecular weight polyethylene. Generally a fibrous capsule might form around bio inert implants hence its bio functionality relies on tissue integration through the implant.

## Bioinert materials

The term bioinert refers to any material that does not elicit a response from the host. The body's immune system is designed to identify and target foreign substances, even those placed in the body to aid it in some way, and therefore will attack and attempt to destroy the substance. In order to prevent this, special materials have been developed that do not create a negative response from the body's immune system. Such substances can be classified as bioactive, biotolerant, and bioinert. Bioinert materials allow the bone and tissues surrounding it to re-grow and integrate without causing any negative immune response. In dentistry, bioinert materials are an essential component of implants, bone grafts, prostheses, and fillings. In addition to not harming the body, a bioinert substance in dentistry will also be osteoconductive and promote osteogenesis. Such materials aid the body in providing a stable foundation for future dental work. Biologically inert, or Bioinert materials are ones which do not initiate a response or interact when introduced to biological tissue. In other words, introducing the material to the body will not cause a reaction with the host. The reason that this type of material has been conceived is because materials initiating a response may detrimentally affect the host. Bioinert materials are non-specifically downregulate in biological responses. These materials were developed originally as non-thrombogenic surfaces for vascular surgery, and are often referred to as haemocompatible; but have a number of possible applications in the eye and other biological fluid contacting environments. Bioceramics Development and Applications is an international Open Access peer reviewed journal and an official publication of International Society for Ceramics in Medicine publishes research from all related areas of Bioceramics, dental science and biomedical engineering. OMICS Group is a scientific organization and online publishing house that drives the progress of research through freely available open access journals and international conferences. With 700+ peer-reviewed journals in its list and many expert reviewers and scientists in its editorial board OMICS Group is

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## Biopolymers

Biopolymers are polymers produced by living organisms; in other words, they are polymeric biomolecules. Since they are polymers, biopolymers contain monomeric units that are covalently bonded to form larger structures. There are three main classes of biopolymers, classified according to the monomeric units used and the structure of the biopolymer formed: polynucleotides (RNA and DNA), polypeptides, and polysaccharides. Cellulose is the most common organic compound and biopolymer on Earth.

## Bioactive Biomaterials

Bioactive refers to a material, which upon being placed within the human body interacts with the surrounding bone and in some cases, even soft tissue. This occurs through a time – dependent kinetic modification of the surface, triggered by their implantation within the living bone. An ion – exchange reaction between the bioactive implant and surrounding body fluids – results in the formation of a biologically active carbonate apatite (CHAp) layer on the implant that is chemically and crystallographically equivalent to the mineral phase in bone. Prime examples of these materials are synthetic hydroxyapatite  $[Ca_{10}(PO_4)_6(OH)_2]$ , glass ceramic A-W and bioglass.

## Bioresorbable Biomaterials

Bioresorbable refers to a material that upon placement within the human body starts to dissolve (resorbed) and slowly replaced by advancing tissue (such as bone). Common examples of bioresorbable materials are tricalcium phosphate  $[Ca_3(PO_4)_2]$  and polylactic–polyglycolic acid copolymers. Calcium oxide, calcium carbonate and gypsum are other common materials that have been utilised during the last three decades.

## Acknowledgment

The authors are grateful to the journal editor and the anonymous reviewers for their helpful comments and suggestions.

## Declaration of Conflicting Interests

The authors declared no potential conflicts of interest for the research, authorship, and/or publication of this article.

**How to cite this article** : Oktar, Faik N. "Editorial note on bioinert materials". *Bioceram Dev Appl* 11(2021): 109.

\*Address for Correspondence: Faik N. Oktar, Department of Bioengineering, Marmara University, Goztepe Campus, Turkey; Email: foktar@marmara.edu.tr

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Received: 05 July, 2021; Accepted: 15 July, 2021; Published: 22 July, 2021