



## Design and Micromechanical Behavior of Orthopaedic Devices for Bone Repair and Regeneration

Guest Editors:

**Prof. Paulo R. Fernandes**

IDMEC, Instituto Superior  
Técnico, Universidade de Lisboa,  
1049-001 Lisbon, Portugal

**Dr. André P. G. Castro**

1. IDMEC, Instituto Superior  
Técnico, Universidade de Lisboa,  
1049-001 Lisbon, Portugal  
2. ESTSetúbal, Instituto  
Politécnico de Setúbal, 2914-761  
Setúbal, Portugal

Deadline for manuscript  
submissions:

**closed (20 June 2023)**

### Message from the Guest Editors

Although bone has the capacity of self-regenerating, there are a number of bone defects and fractures for which the support of an artificial device is required for complete bone regeneration. These orthopedic devices can be permanent, such as those for joint replacement, or temporary, such as some fixation plates and biodegradable bone scaffolds. The design and material of such devices must be carefully defined, in order to respond to their biomechanical demands. Therefore, the development of devices with controlled micromechanical behavior is essential to avoid device failure and lead to successful bone repair and regeneration.

This Special Issue aims to collect the most recent developments on the design of bone implant devices with controlled structure and material, focusing on their design, fabrication, and physical and biomechanical characterization.





an Open Access Journal by MDPI

## Editor-in-Chief

### Prof. Dr. Maryam Tabrizian

1. Department of Biomedical Engineering, Faculty of Medicine and Health Sciences, McGill University, Montreal, QC H3A 2B6, Canada

2. Faculty of Dentistry and Oral Health Sciences, McGill University, 3640 Rue University, Montreal, QC H3A 0C7, Canada

## Message from the Editor-in-Chief

*Materials* (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

## Author Benefits

**Open Access:** free for readers, with article processing charges (APC) paid by authors or their institutions.

**High Visibility:** indexed within Scopus, SCIE (Web of Science), PubMed, PMC, Ei Compendex, CaPlus / SciFinder, Inspec, Astrophysics Data System, and other databases.

**Journal Rank:** JCR - Q2 (*Metallurgy & Metallurgical Engineering*) / CiteScore - Q2 (*Condensed Matter Physics*)

## Contact Us

Materials Editorial Office  
MDPI, St. Alban-Anlage 66  
4052 Basel, Switzerland

Tel: +41 61 683 77 34  
[www.mdpi.com](http://www.mdpi.com)

[mdpi.com/journal/materials](http://mdpi.com/journal/materials)  
[materials@mdpi.com](mailto:materials@mdpi.com)  
[X@Materials\\_Mdpi](https://twitter.com/Materials_Mdpi)