Special Issue

Advanced Assessment of Medical Devices

Message from the Guest Editors

The preclinical assessment of implantable medical devices is essential for enhancing both their safety and efficacy before reaching the patient. In light of recent high-profile clinical failures, preclinical testing regimes which previously used simplified or averaged conditions and ex situ analysis have faced increased scrutiny. This fails to capture clinically relevant failure modes and provides limited actionable or predictive data on the long-term performance of devices, hindering the effective translation and adoption of emerging technologies. This Special Issue of Bioengineering on Advanced Assessment of Medical Devices aims to showcase device development and assessment that goes beyond the current state of the art by inviting contributions from the community in the following areas (among others):

- Advanced preclinical testing;
- Device–biology interaction;
- Co-creation with patients, clinicians, regulators, and industrial partners;
- Machine learning and in silico digital twin methodologies;
- Predictive models for device behaviour in vitro and in vivo;
- High-throughput methodologies for biomaterial characterisation.

Guest Editors

Dr. Andrew Robert Beadling

Prof. Dr. Michael Bryant

Prof. Dr. Richard M. Hall

Deadline for manuscript submissions

closed (30 April 2025)

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Bioengineering
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
bioengineering@mdpi.com

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Message from the Editor-in-Chief

You are invited to contribute a research article or a comprehensive review for consideration and publication in *Bioengineering* (ISSN 2306-5354). *Bioengineering* is published in open access format – research articles, reviews and other contents are released on the Internet immediately after acceptance. The scientific community and the general public have unlimited and free access to the content as soon as it is published. *Bioengineering* provides an advanced forum for the science and technology of bioengineering. We would be pleased to welcome you as one of our authors.

Editor-in-Chief

Prof. Dr. Anthony Guiseppi-Elie
Department of Biomedical Engineering, Texas A&M University, College Station, TX 77843, USA

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