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Editorial

40th Anniversary Issue: Reflections on papers from the archive on "Biomaterials and their biomedical applications"

The biomedical engineering community is well served by a number of excellent specialist journals in the field of Biomaterials; nevertheless, research on this topic does feature in the scope of Medical Engineering & Physics and a good number of the submissions we receive for publication in the Journal.

Whether natural or synthetic in origin, an understanding of their intrinsic surface and bulk properties of biomaterials is key to their safety and efficacy in what is a highly regulated environment, and the design of appropriate materials testing apparatus and protocols is essential. Studies of this kind help to inform those involved in the development of constitutive models of the materials themselves, which may be used by way of input into other modelling approaches such as finite element analyses of the devices and tissues they are intended to augment, repair or replace.

This selection from the archive, from over 100 papers that have appeared in the Journal in the past 25 years on this topic, is intended to highlight the studies that focus on biomaterial applications as opposed to tissue mechanics and modelling, which is the subject of another virtual supplement found elsewhere in this special issue. The selected papers, both fundamental and applied, range from basic studies on intrinsic mechanical properties and material property determination on the micro- and nanometre length scales, to the design of biomimetic coatings and tissue scaffolds, as well as more technical papers that concern the design and use of apparatus to assess their suitability for their intended applications. Examples include orthopaedic implants, soft and hard-tissue scaffolds and prostheses, blood-contacting devices, active implantable devices and diagnostic devices.

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Further reading

Clinical applications

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Scaffold design and fabrication

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Materials property determination and test apparatus

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