

## Special Issue on Heat Transfer in Biomedical Applications

# CALL FOR PAPERS

Heat transfer is of fundamental importance in many biomedical applications. For example, thermal excursions are used to selectively preserve or destroy cells and tissues, such as in the biopreservation, which is an innovative technology, applied to cell and tissue banking, cell therapeutics, tissue engineering, organ transplantation, and assisted reproductive technologies.

There has been a significant growth in the field of thermal therapy for the past few decades. The application of heat to living tissues, from mild hyperthermia to high-temperature thermal ablation, has produced a host of well-documented genetic, cellular, and physiological responses that are being researched intensely for medical applications, particularly for treatment of solid cancerous tumors using image guidance.

The bioheat transfer modeling is the basis of thermotherapy and relates to the thermoregulation system in a human body. Variations of temperature and heat transfer in a human body depend on the arterial and venous blood flowrates, blood perfusion rate, and metabolic heat generation, heat conduction within the tissue, and thermal properties of blood and tissue and are strongly affected by the human body geometry. Several anatomical structures can be considered as a fluid saturated porous medium as tissue can be considered as a solid matrix with blood penetrating the pore space of the medium.

A number of biomedical applications involve delivering biomodified nanoparticles to malignant cells and rapidly heating nanoparticles with an external source such as laser, ultrasound, or an electromagnetic wave to produce a therapeutic thermal effect or to release drugs. The interaction of nanoparticles with the external source and the subsequent heating effect are fundamental for the successful deployment of these novel techniques.

The aim of this special issue is to collect original research articles on the most recent analytical, numerical, and experimental results in this field, with the purpose of providing guidelines for future research directions.

Potential topics include but are not limited to the following:

- ▶ Cryobiology and hyperthermic biology
- ▶ Thermal therapies
- ▶ Heat transfer in clinical dentistry
- ▶ Heat transfer in ophthalmology
- ▶ Numerical and analytical investigations of heat transfer in living tissues
- ▶ Employment of nanoparticles for targeted heating and in bioheat transfer enhancement
- ▶ Thermal management in the implantable medical devices

Authors can submit their manuscripts through the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/abb/htbam/>.

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