

Foreword

Biomedical engineering (BME) is a fast developing interdisciplinary area of research and technology, aimed to improve health and quality of life. During last decades, investigations in BME have been intensified around the world. More attention has been paid to the application of novel scientific achievements and engineering solutions in medicine. On the other hand, in the centre of interest have been possible effects of the technical environment, like electromagnetic fields, on the human physiology and health.

The Biomedical Engineering Centre of the Tallinn University of Technology (TUT) as a research centre was established in 1994. The BME Centre was involved in the Centre for Nonlinear Studies, the Centre of Excellence in Estonia 2002–2007, in the part of biosignals interpretation and brain research. From 2006 the BME Centre was renamed the Department of Biomedical Engineering and incorporated into the Technomedicum of TUT, established by the Senat of TUT to promote cooperation in research and education with hospitals.

This special issue on biomedical engineering includes papers of scientists from the Australian Centre of Radiofrequency Bioeffects Research as well as from the Department of BME and North Estonia Regional Hospital on several topics. Most of the papers are related to biological effects of electromagnetic fields and radiation (Hinrikus et al., Pirogova et al., Lass et al., Cvetkovic et al.) or clinical application of the field (Anier et al.). Modulated microwave radiation has been shown to cause significant changes in human resting EEG and behaviour (Hinrikus et al.). A possibility of modulating protein activity, using infrared and visible light radiation, has been discussed (Pirogova et al.). Changes, introduced by modulated microwave radiation, were detected in the sensory part of the visual perception process (Lass et al.). A pilot study has been conducted to investigate whether multiple electrophysiological activities could be altered when exposed to an extremely low frequency pulsed electromagnetic field (Cvetkovic et al.). A more robust and less expensive method for electrical stimulation of the heart has been proposed and investigated (Anier et al.). An analysis of pulse wave parameters in cardiovascular diagnostics has been carried out (Hlimonenko et al.). Very specific is estimation of nutrition during dialysis using optical spectral analysis (Fridolin et al.).

As a guest editor I am thankful to all the authors, reviewers and editors for excellent cooperation.

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