Editorial

Nano- and Biophotonics

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Nano- and biophotonics is a multidisciplinary scientifically rising field connecting together chemists, material engineers, physicists, optical engineers, and biologists. The field has high academic as well as industrial significance involving development of various devices usable for data sensing and manipulation, for example, for optics communication, as well as monitoring techniques that may be applicable for detection of cancer and other common diseases. The papers accepted for publication in this special issue implement the above-mentioned general description while showing the capability of various scientific disciplines to be implemented for biophotonic and biomedical applications.

In the paper entitled “*Uniformly immobilizing gold nanorods on a glass substrates*” the authors present a new technique for uniformly disposing gold nanorods and nanoparticles on glass substrate. This activity can be applicable for biomedical imaging and treatment applications in which the nanoparticles are used to backscatter the applied illumination or when they are heated by external electromagnetic or photonic source in order to kill cancer cells that are in proximity to the nanoparticles.

In the paper entitled “*An analytic analysis of the diffusive heat flow equation for different magnetic field profiles for a single magnetic nanoparticle*” magnetic nanoparticles are being utilized to kill cancer cells. In this case the external magnetic field heats the nanorods and thereafter the cancer cells as well. The paper presents a physical modeling to the heat flow equation and numerically predicts the impact of the external magnetic field on the time-varying temperature of the nanoparticles.

In the paper entitled “*A self-powered medical device for blood irradiation therapy*,” the authors present a novel

biomedical treatment device based upon special pill that is powered due to the flow of blood in the veins. The pill is used to illuminate the blood vein internally thereby realizing blood irradiation therapy.

The paper entitled “*The effect of nanoparticle size on cellular binding probability*” is once again aiming for biomedical applications in which nanoparticles are used to detect and cure cancer cells. The paper discusses the probability for the binding of the particles to such cells as a function of their size and dimensional proportions.

The paper entitled “*Integrated polypyrrole flexible conductors for biochips and MEMS applications*” deals with the development and characterization of integrated polypyrrole flexible conductors. Such conductors can be used as part of biochips or as part of micro-electromechanical system (MEMS) devices for biomedical procedures.

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