Plasma Biomedicine: Modelings and Experiments on Cancer Treatment, Tooth Bleaching, and Decontamination

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Non-thermal atmospheric pressure plasmas have attracted great interests and been widely used in biomedical applications to interact with living tissue, cell, and bacteria. Gold nanoparticles conjugated with anti-FAK antibody have been introduced to cancerous cells to enhance selective killing of cancerous and normal cells, and the mechanism of cell apoptosis induced by plasma has been investigated [1,2]. Tooth exposed to helium plasma jet with hydrogen peroxide or alike has become brighter and the production of hydroxyl radicals decomposed from hydrogen peroxide have been enhanced by plasma exposure [3]. Sterilization by non-thermal plasma devices and the global and PIC modelings of these plasmas will also be presented.