



## Selected Applications of Low Temperature Atmospheric Pressure Plasmas for Agriculture, Food Technology and Medicine

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Atmospheric pressure plasmas with unique properties of ionized gas interacting with surrounding gaseous atmosphere, liquid and solid targets are cutting-edge technology applicable in processing of non heat resistant materials. Plasma is widely used for modification and shaping physical and chemical properties of various biological substances. Plasma techniques gained much attention in food-processing sector as a promising alternative tool for maintaining of food's products safety and for food preservation. Modern agriculture, oriented towards more sustainable production is also benefiting from applications of gas discharges for enhancement of seeds germination and growth of plants; limiting of microbial infections; improvement of nutritional values; etc. Decontaminative properties of plasmas are frequently used in plasma medicine. Plasma treatment can also enhance biocompatibility of materials, improve tissue regeneration and stimulate living organisms. In this work, research results related to the plasma treatment of tomato juice comparing conventional pasteurization and ultrasound treatment are discussed. The influence on the physicochemical properties of tomato juice after plasma treatment is presented. Plasma is shown as a tool for limiting of bactericidal load on the meat surface. The impact of cold plasma technology on the growth of onion and thuringian mallow seedlings after pre-sowing stimulation is discussed. The influence of plasma on the surface properties of seeds is shown (Fig. 1). Stimulative factors generated in plasma including RONS can be extremely useful in medical applications. The effect of short-time low temperature nitrogen plasma treatment on normal mouse calvarial preosteoblasts (MC3T3-E1 Subclone 4) in HBSS solution for promoting of preosteoblasts' proliferation and enhancement of osteogenic differentiation is presented.

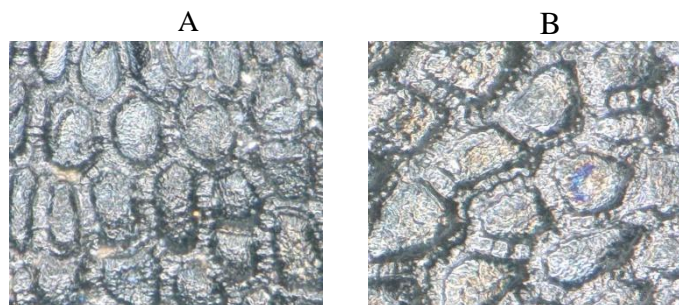


Fig. 1 Comparison of onion seeds' surface before (A) and after 240 s plasma treatment (B).

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