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DIAGNOSTICS AND APPLICATIONS OF ATMOSPHERIC PRESSURE PLASMAS FOR TRIGGERING OF CELL MECHANISMS

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Abstract. Cold plasmas with their rich plasma chemistry with ample amounts of Reactive Oxygen and Nitrogen Species (RONS) are driving the development of applications in the fields of Plasma Medicine and Plasma Agriculture (see Adamovic et al. 2022). One of the applications is by using Plasma Treated Liquids (PTLs). When aqueous solutions (water, cell medium, saline solution etc.) are exposed to cold plasma, reactions occurring in the gaseous phase and at the gas-liquid interface, introduce short and long-living RONS, such as OH, O, O_3, H_2O_2, NO_2^-, NO_3^-, into the aqueous phase (see Bradu et al. 2020). We have used several configurations of atmospheric pressure plasma sources that were powered in the range of frequencies from kHz to GHz. They were chosen according to the application and characterized in detail by optical emission spectroscopy, electrical characterization, ICCD imaging, mass spectrometry etc. The applications by using PTLs of these sources include decontamination of bacteria, cancer cell treatment, wound treatments and toxicity tests.

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