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A portable source of a volumetric cold plasma jet for biomedical applications

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A portable plasma sterilizer has been developed that pumps a plasma-forming gas (argon) through a swirler, which creates a helical vortex gas flow in the discharge gap. At a gas flow rate of $>5\times10^{-5}$ kg/s, the gas flow swirls, filling the entire cross-sectional area of the anode at the nozzle outlet with streamers. The non-thermal plasma generated in the discharge gap is carried away by the argon flow, forming a cold plasma jet. The bactericidal effect of non-thermal plasma on the vegetative form of Escherichia coli strains has been demonstrated.

Keywords: streamer discharge, nonthermal argon plasma, gas swirler, plasma jet, plasma inactivation of microorganisms.

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