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Multi-Modality Pulsed AC Source for Medical Applications of Non-Equilibrium Plasmas DANIEL FRIEDRICHS, JAMES GILBERT, Covidien Surgical Solutions — A burgeoning field has developed around the use of non-equilibrium ("cold") plasmas for various medical applications, including wound treatment, surface sterilization, non-thermal hemostasis, and selective cell destruction. Proposed devices typically utilize pulsed DC power sources, which have no other therapeutic utility, and may encounter significant regulatory restrictions regarding their safety for use in patient care. Additionally, dedicated capital equipment is difficult for healthcare facilities to justify. In this work, we have demonstrated for the first time the generation of non-equilibrium plasma using pulsed AC output from a specially-designed electrosurgical generator. The ability to power novel non-equilibrium plasma devices from a piece of equipment already ubiquitous in operating theatres should significantly reduce the barriers to adoption of plasma devices. We demonstrate the ability of a prototype device, coupled to this source, to reduce bacterial growth in vitro. Such a system could allow a single surgical instrument to provide both non-thermal sterilization and thermal tissue dissection.

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