

GEC15-2015-000198

Abstract for an Invited Paper
for the GEC15 Meeting of
the American Physical Society

Atmospheric non-equilibrium plasma sources and processes with a focus on plasma medicine & antibacterial applications¹

VITTORIO COLOMBO, Alma Mater Studiorum - Università di Bologna, Department of Industrial Engineering - Italy

Non-equilibrium atmospheric pressure plasmas (NTPs) offer an astounding versatility, relying on a wide range of physical principles and source architectures for their generation and sustainment; spanning from DBDs to plasma guns, from jet-to-jet coupled sources to hot plasmas at the production site. NTPs are being explored for an ever increasing number of biomedical and therapeutic applications. The talk will mainly consider the following subjects: investigation of the antimicrobial activity of a low power ICP source at safe levels for eukaryotic cells; investigation of antibacterial efficacy of a plasma gun source for endodontic applications; antimicrobial activity induced in static water by a DBD reactor driven by nanosecond pulses. Some preliminary results will also be given for in vivo investigation on the effects of plasma activated water against plant pathogenic bacteria and for the study on the effectiveness of a jet-to-jet coupled nanopulsed source for localized bacterial inactivation.

In collaboration with Daniela Barbieri, Marco Boselli, Matteo Gherardi, Romolo Laurita, Anna Liguori, Emanuele Simoncelli, Augusto Stancampiano, and Enrico Traldi, Alma Mater Studiorum - Università di Bologna, Department of Industrial Engineering - Italy.

¹Work partially supported AlmaPlasma s.r.l., by COST Action MP1101 “Biomedical Applications of Atmospheric Pressure Plasma Technology” and by COST Action TD1208 “Electrical discharges with liquids for future applications.”