

---

## Chemical and Biological Mechanisms of Plasma Interaction with Biosystems

Alexander Fridman <sup>1</sup>

<sup>1</sup>*Nyheim Plasma Institute, Drexel University, U.S.A.*

The presentation is focused on reviewing novel research results obtained in Nyheim Plasma Institute of Drexel University on physical, chemical, and biological mechanisms of plasma interaction with plants, animal and human tissues. Both direct plasma interaction and indirect interaction through plasma activated liquids are to be discussed.

Physical processes of plasma activated liquid interaction with living tissues to be discussed include in particular analysis of plasma treated droplet instability and possible droplet explosion with chemical and biological sequences of the phenomena. Chemical processes of plasma activated liquid interaction with living tissues to be discussed include in particular analysis of non-oxidation based mechanism of plasma sterilization. Biological processes of plasma interaction with living tissues to be discussed include in particular analysis of depth of penetration of different plasma generated species and factors. Contribution of cell-to-cell communication effect to depth of penetration of different plasma generated species and factors is to be considered.

Specific attention is to be paid to agricultural and medical applications of non-equilibrium gliding arc discharges, and nanosecond-pulsed dielectric barrier discharges (DBD). Scaling up and permission challenges for industrial use of non-equilibrium plasma will be discussed in the conclusion of the presentation.