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Modelling the effects of plasma on intracellular metabolism[1] TOMOYUKI MURAKAMI, Seikei University — Recently, cold atmospheric plasmas (CAPs) have been widely applied in the field of biomedicine. However, a mechanistic understanding of how CAPs exert their biological effects is still elusive. To understand the precise cell functions underlying such effects, systematic biological-reaction models suitable for CAP studies are necessary. Here, a biochemical reaction model is developed to clarify how CAPs affect intracellular metabolism. Fundamental functions of mitochondria-dependent pathways in reactive oxygen species/reactive nitrogen species (ROS/RNS)-mediated mechanisms are numerically simulated. The present computational model demonstrates that CAPs crucially influence essential cellular functions, ex the bistability in apoptosis, which in turn affect cell fate decision of survival or death. The key issues to link the CAP-physics and chemistry with biological systems will be presented and discussed in the talk.

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