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Microplasma Generation of Reactive Oxygen Species for DNA Oxidation J.S. SOUSA, LPGP, CNRS-UPS, Orsay, France and IPFN-LA, IST, Lisboa, Portugal, G. BAUVILLE, B. LACOUR, V. PUECH, LPGP, CNRS-UPS, Orsay, France, M. TOUZEAU, LTM, CNRS-UJF-INPG, Grenoble, France, J.L. RAVANAT, CEA, Inac, SCIB/LAN, CEA-UJF, Grenoble, France — We have developed arrays of microcathode sustained discharges (MCSD) for the generation of singlet delta oxygen (SDO) at atmospheric pressure. In $He/O_2/NO$ mixtures, SDO densities higher than 1.0 $10^{17}cm^{-3}$ have been efficiently produced and transported over distances longer than 50cm, providing SDO fluxes greater than 100mmol/h. Additionally, ozone (O_3) densities up to $10^{16}cm^{-3}$ have also been obtained. As the ratio between SDO and O_3 can be easily and finely tuned in the range 10^{-3}-10^{+3}, these arrays of MCSD are very useful tools for examining the reactivity of these reactive oxygen species (ROS) with biological components. Experiments were performed showing that SDO and O_3 are able to oxidize DNA. We observed that O_3 is much more efficient than SDO at degrading DNA. While O_3 oxidizes all DNA nucleobases almost indifferently, SDO reacts mainly with Guanine. We also report that 4-OH-8-oxodGuo is produced by the SDO oxidation of dGuo, and can, thus, be used as a SDO biomarker. A more detailed study on the reactivity of ROS with DNA is currently in progress.

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