



*Special Issue Reprint*

## **Radiation Damage in Biomolecules and Cells**

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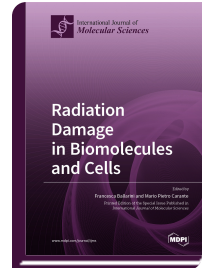
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The papers collected in this Special Issue deal with the effects of ionizing radiation at molecular and cellular levels, as well as possible applications in medicine and radiation protection. In particular, some works analysed the early stages of the interaction between ionizing radiation and DNA focusing on DNA cluster damage, which is widely considered as an important step towards subsequent endpoints. Other studies investigated the consequences of hypoxia on the evolution of the initial DNA damage, and one work analysed genome-wide DNA alterations in irradiated human cells. Concerning radiation therapy, the response of cancer cells to different radiation types was characterized both in vitro and in vivo, and possible strategies to enhance such response were investigated; furthermore, FLASH radiotherapy was reviewed. In the framework of cancer therapy side effects, the consequences of high doses on gene expression in healthy cells were analyzed, and the RBE (Relative Biological Effectiveness) for late effects in the central nervous system was predicted by the BIANCA biophysical model. Finally, the protective role of melatonin and Vitamin D, as well as hypothermia, was reviewed, valine radiolysis was investigated, the changes in radio-sensitivity of embryos during the early developmental stages of the preimplantation were analyzed, and epigenetic modifications induced by ionizing radiation were reviewed.



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