Special Issue

Vibrational Spectroscopy in Radiobiology

Message from the Guest Editors

Radiation therapy represents a fundamental tool in cancer treatment. Improvements in RT strategies can be attained by considering the substantial differences in radiosensitivity shown by tumor and healthy cells among patients. The ability to customize therapies requires fast and precise predictions of the cellular radioresponse. In addition, many biochemical assays adopted for detecting radiation's effects on cellular components can induce changes in the biological samples, altering their structure due to the required chemical substances and elaborated preparation procedures. Therefore, the use of new, non-invasive, and fast optical methods able to examine radiation response in vitro or in vivo across a wide variety of samples, even giving information at the level of biomolecules, can represent an extremely useful tool. Vibrational techniques such as Raman and Fourier transform infrared spectroscopy can rapidly and non-invasively investigate biochemical components of cells and tissues with minimal sample preparation. These techniques can allow the analysis of complex biological processes, attracting a growing interest in the field of radiation-induced cyto- and genotoxicity.

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