

RADICAL REGULATORY PROPERTIES OF RADIOSENSITIZERS BASED ON NITROAZOLES

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Radiotherapy of tumors is a common method of cancer treatment. Under the action of radiation on living organisms various carbon-centered radicals (CCR) of biomolecules are formed. In the presence of O₂ CCR at diffusion-control rate converts to oxygen-centered radicals (OCR). It's believed that further transformations of CCR and OCR are responsible for the development of the damaging effects of radiation on living organisms.

Hypoxia is a distinguishing feature of the core of many cancer tumors. Tumor resistance to ionizing radiation is considered to be due to non-fixation of biomolecules damage by O₂. Irradiation under conditions of low oxygen levels is predominantly associated with reaction of CCR. Therefore, oxygen mimicking compounds should enhance efficiency of radiotherapy by the induction of OCR reactions of biomolecules.

In the present work by means of steady state radiolysis, GC-FID and LC-MS-ESI methods we have compared the reactivity of hypoxic radiosensitizers sanazole and metronidazole, as well as a number of novel synthesized nitro derivatives of 1,2,4-triazole and imidazole towards CCR. We have established that studied nitroazoles effectively oxidize hydroxyl-containing CCR preventing their further transformations. The data obtained in this study can help to enhance the efficiency of cancer radiation therapy by application of nitroazoles.