

## Therapeutic reactive oxygen generation

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### ABSTRACT

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An increase of the intracellular reactive oxygen species (ROS) concentration leads to the development of oxidative stress and, thus, to the damage of cell components. The cause-and-effect relations between these processes have not been fully established yet.

The ability of photo excited supramolecular composites containing fullerenes C<sub>60</sub> immobilized at nanosilica particles to generate reactive oxygen species (ROS) in cells of two types (rat thymocytes, and transformed cells of ascite Erlich carcinoma, EAC, and leucosis L1210) is demonstrated.

The damaging effect of photo excited C<sub>60</sub>-composites are shown, which appeared to be selective and manifested in transformed cells, but not in thymocytes. It has been shown that after the irradiation of aqueous solutions or cell suspensions in the presence of fullerene C<sub>60</sub>, the generation of reactive oxygen species is observed.

It has been shown that the influence of photo excited fullerene C<sub>60</sub> on metabolic processes depends on the composition of C<sub>60</sub>-containing complex and on the type of the cells. The damaging effects of photo excited fullerene C<sub>60</sub>-containing composites were demonstrated to be selective. The data presented suggest that the application of fullerene C<sub>60</sub>-containing composites for the selective activation of ROS-dependent death program in certain types of tumor cells is very promising.

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**Key words:** reactive oxygen species, fullerenes, photo excitation, tumor cells.

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