Cu(II) complexes with fomA protein fragments of *fusobacterium nucleatum* increase oxidative stress and malondialdehyde level.

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Streszczenie

An explanation of carcinogenesis processes may certainly contribute to the prevention and development of novel methods for cancer treatment. In this paper, we considered the probable relationship between the presence of *Fusobacterium nucleatum* in the colon and its possible influence on the development of colorectal cancer. For this purpose, intracellular and/or extracellular generation of reactive oxygen species (ROS) by mouse colon carcinoma cells (CT26) was stimulated by two fragments of FomA adhesin from *F. nucleatum* and their complexes with copper(II): Cu(II)-Ac-KGHGNG-NH_2 (**1Cu**) and Cu(II)-Ac-PTVHNE-NH_2 (**2Cu**). Incubation of the cells with copper complexes was followed with ICP-MS technique. The overall generation of ROS was shown by means of fluorescence spectroscopy with two proper probes, whereas identification of ROS was achieved by the spin trapping technique and electron paramagnetic resonance measurements. As a result, an abundant production of the hydroxyl radicals, both inside and outside the cells, was observed upon the stimulation of the CT26 cells with the copper complexes. Clearly both compounds induced strong oxidation stress which triggered a radicals' cascade that finally resulted in the pronounced lipid peroxidation. The latter was evidenced with the measured level of malondialdehyde, a biomarker of the peroxidation process. By applying *N*-acetylcysteine antioxidant to the studied system, the free radical mechanism of the lipid peroxidation process was confirmed. Hypothetically this mechanism can lead to colon cell damage and further cancerogenesis processes.