

strong absorption characteristics of the nanoparticles to enhance contrast of the detected X-ray image. Using X-rays to power photo-thermal therapies has three main advantages over visible-spectra wavelengths: the high penetration depth of X-rays through biological media makes non-invasive treatments very feasible, the high energy of individual photons means nanoparticles can be heated to desired temperatures with lower beam intensities, and X-ray sources are already common throughout the medical industry making future implementation on existing

equipment possible. This paper uses generalized Lorenz-Mie theory to investigate the light absorption properties of various size gold nanoparticles over photon energies in the 1-100 keV range. These absorption values are then plugged into a thermal model to determine the temperatures reached by the nanoparticles for X-ray exposures of differing time and intensity. The results of these simulations are then discussed in relation to the effective implementation of nanophotothermia and nanophotothermolysis treatments.

УДК 616-006-08

M. Mynzhanov, B. Zhetpisbayev, T. Raisov, G. Ilderbayeva, G. Ibrayeva, O. Ilderbayev

Department of molecular biology and histology, Semey State Medical University, Kazakhstan

STUDYING A FREE RADICAL OXIDATION OF AN ORGANISM IN THE REMOTE PERIOD AT THE COMBINED INFLUENCE OF γ -RADIATION AND ASBEST DUST

The purpose of research: Study in experiment of free radical oxidation role in epinephros texture and immuno-competent organs and organule; in the remote period at the combined influence of gamma radiation (6Gr) sub lethal doze and chrysotile-asbestos dust in experiment.

The results of investigation and discussion. How appointed investigations on influence of asbestos dust concentration of DC is increased in lymphocytes peripheral blood since $0,29 \pm 0,03$ from $0,37 \pm 0,03$ ($p < 0,05$), thymus since $0,49 \pm 0,03$ from $1,07 \pm 0,06$ ($p < 0,001$). At animals after dust radiations influence concentration DK in lymphocytes peripheral blood exceeded controls means in 1,3 time ($p < 0,05$). In thymus is noted tendencies to exceed ($p > 0,05$) on compare with a control index. By comparison with second course noticed reduction in 2 time ($p < 0,001$).

The level of DK an animals adrenal after becoming dusty are reduction since $1,19 \pm 0,11$ from $0,69 \pm 0,06$ ($p < 0,01$), but in spleen it increases since $1,28 \pm 0,20$ from $1,93 \pm 0,13$, that is nearly in 1,5 time on compare with index to I group ($p < 0,05$). At animals III group, had undergoes combined influence from spleen side essentially change didn't noticed, where maintenance DK almost corresponded with control size, level of DK in adrenal is reduction since $1,19 \pm 0,11$ from $0,58 \pm 0,04$ ($p < 0,001$).

Investigation of first product of free radical oxidation in the livers and in lymph nodes appointed, that maintenance DK in liver is increased since $0,69 \pm 0,05$ from $1,68 \pm 0,05$ ($p < 0,001$), in lymph nodes since $0,35 \pm 0,03$ from $0,98 \pm 0,09$, in exemplary fashion in 2,8 time ($p < 0,001$). Concentration of DK in III groups animals liver is increase on 55% ($p < 0,01$), in lymph nodes is increase on 91% ($p < 0,01$).

Had come results is concerning about that, that at influence of dust radiation and dust factors is active free radical oxidation, as possible it associated with reduction of activity antioxidation ferment in most learning organs. Under the influence asbestos dust in lymphocytes of peripheral blood and in the liver the contents of MDA remained at the level of control magnitude ($p > 0,05$). In combined exposure in lymphocytes of peripheral blood level of MDA was increased to 2,2 times ($p < 0,05$), in the tissue of the liver about 1,8 times ($p < 0,001$) in comparison with the second group the level of MDA in lymphocytes of peripheral blood increases to 1,7 times ($p < 0,05$), and in the tissue of the liver 56% ($p < 0,001$).

Authentic increase of the contents of the given index was marked in lymphatic gland as with $0,051 \pm 0,004$ to $0,11 \pm 0,01$ ($p < 0,001$) and in the II group, to $0,14 \pm 0,01$ ($p < 0,001$) in the III group; in thymus from $0,031 \pm 0,003$ to $0,14 \pm 0,02$ ($p < 0,001$) in the II group to $0,12 \pm 0,01$ ($p < 0,001$) in the III group; in the tissue of adrenal glands from $0,031 \pm 0,004$ to $0,08 \pm 0,01$ ($p < 0,01$) in the second group $0,11 \pm 0,02$ ($p < 0,05$) in the III group. In the tissue of the spleen was marked of the contents of MDA from $0,32 \pm 0,03$ to $0,18 \pm 0,01$ ($p < 0,01$) in the 2nd group and in the (III) third group was marked the increase till $0,39 \pm 0,01$ ($p < 0,05$).

Conclusions. Thus, given index chow, that in 90 days which correspond to the periods of remote consequence, when rats are affected by combined gamma-radiation 6Gr and chrysotile of asbestos dust the contents of DK and MDA increase in the lymphatic peripheral blood and in the cells of lymph nodes of intestine, thymus and liver. The continuation of the investigation which dedicated to the studying of remote effects combined exposure of ionized radiation and factors of environment on public health and holding of measures on liquidation of after-effects.