The aim of the research was to compare the characteristics of nanoparticles with different chemical structure and size (colloidal gold Gold 1 and Gold 2, calcium phosphate CaP and poly(lactic-co-glycolic) PLGA 1 and 2) to find the most efficient carriers of antigen — recombinant diphtheria toxoid for per os immunization. According to the MTT test, all studied particles show no significant cytotoxic impact on the studied cells in vitro, with the exception of CaP nanoparticles, which in high concentrations have cytotoxic effect on the U937 cells, and Gold nanoparticles 1 and 2, that are able to inhibit growth of the L929 cells. The most effective phagocytosis by macrophage-like cells J774 is observed for PLGA nanoparticles 1 and 2 with the immobilized antigen, while Gold nanoparticles 1 and 2 with antigen can interact with the surface of these cells without being phagocytated by them. In BALB/c mice immunized per os with antigen immobilized on PLGA 1 and 2 as well as Gold 2 carriers, the concentration of specific IgA antibodies in blood significantly increases after the second immunization, compared with controls. In the group of mice treated with PLGA 2 conjugated antigen, the concentration of specific IgG in blood after the third immunization also increases. These results show the promise of nanoparticles PLGA 1 and 2 as adjuvant for immunization per os.

**Key words:** nanoparticles, calcium phosphate, colloidal gold, poly(lactic-co-glycolic)acid, diphtheria toxoid, oral immunization.

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7. Lycke N. Recent progress in mucosal vaccine development: potential and limitations. *Nat. Rev. Immunol.* 2012, 12 (8), 592–605. [https://doi.org/10.1038/nri3251](https://doi.org/10.1038/nri3251)


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