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4<sup>TH</sup> WORLD BIOTECHNOLOGY CONGRESS

May 20-21, 2019 London, UK

## Effect of various shapes of gold nanoparticles on growth on cancer and normal cells

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Recently, particular attention has been paid to the advancements in nanomedicine and its various applications. Special focus is put on the use of nanoparticles (NPs) for cancer treatment. Wide range of morphological structures and the fact that NPs can be prepared from various kinds of metallic materials (e.g. gold or silver), can be a great advantage in nanopharmacy and theranostics.

The aim of our study was characterization of the influence of gold nanoparticles, modified by selected surfactants on the cancer and normal cell lines. The cancer MDA-MB-231, MCF-7, PC-3, LNCaP and normal PNT1A cell lines were used to check the cellular response. MTT assay (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) was used as cytotoxicity test of nanoparticles and surfactants used in the synthesis of NPs. Cell cycle arrestation in a given phase can be very important in application for various cancer therapies. An impact of nanoparticles on the cell cycle using flow cytometry was analyzed.

Performed experiment gave information about cytotoxicity of gold nanoparticles. Toxicity of GNPs strongly depends on the amount and type of surfactants used in their synthesis. Both, the cell viability and proliferation decreased with increasing concentration. Gold nanoparticles also affected the cell cycle of chosen cell lines. An experiment confirmed the fact that gold nanoparticles can become a promising tool in the cancer treatment. However, it is still necessary to extend the range of nanoparticle research to animal tests and clinical trials. This research project was supported by the programme Best of the Best (Najlepsi z Najlepszyc) 3.0 from Ministry of Science and Higher Education (Poland).

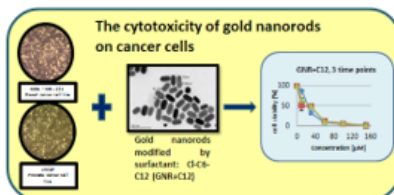


Figure 1: Scheme of the experiment carried out where gold nanorods were added to breast and prostate cancer cells. After a fixed incubation time, a large cytotoxicity effect was observed.

### Biography

Marika Musielak is a student of Medical Physics at the Adam Mickiewicz University in Poznan, faculty of physics, department of macromolecular physics. She takes part in the project under coordination of prof Maciej Kozak, that works on creation of specified shapes of nanoparticles, that can be used for cancer treatment and nanobiosensors. Since her interests lays in cell biology science, she leads the work on the cell culture to determine the effects of nanoparticles on the cancer and normal cell lines. She is keen on innovative methods of oncological treatment.

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