

# Gold-coated Nanoparticles for the Diagnosis and Therapy of Cancers

SibFU's scientists, as part of a research team, have developed a method for the production of hybrid nanoparticles with a magnetic core and a gold shell, the properties of which make it possible to use them for early detection and treatment of oncological diseases, the TASS reports.



A team of Russian scientists, which included Svetlana Saykova, professor of the Department of Physical and Inorganic Chemistry of Siberian Federal University, has developed a new method for producing hybrid nanoparticles based on nickel ferrite. They combine high magnetic permeability and biological inertness. When placed in an alternating magnetic field of a certain frequency, the nanoparticles will heat up to the desired temperature, absorbing the energy of the electromagnetic field. Introduced into a patient's body, they will enable medics to destroy cancer cells at the earliest stages of the disease without any harm to human health.

The safety of nickel ferrite particles for an organism is ensured by gold coating. The authors proposed to grow it on the surface of nanoscale magnetic cores by treating the material with solutions of aurichlorohydric acid and methionine amino acid.

The researchers proved the effectiveness of the method by the results of electron microscopy and X-ray photoelectron spectroscopy. The authors believe that the developed technology can be used in the production of nanoparticles based on other types of metals and iron oxides.

*„In future, nanoparticles can also be used as vectors for targeted delivery of drugs and diagnostic agents. With the help of an external magnetic field, they can be easily directed to specific organs and tissues along with drug molecules attached to their surface. In combination with low cost, this makes these nanoparticles promising for biomedical applications for the diagnosis and treatment of cancer,“ explained **Svetlana Saykova**.*



The research team also included specialists from the Institute of Chemistry and Chemical Technology and Kirensky Institute of Physics of the Krasnoyarsk Research Center of the Siberian Branch of the Russian Academy of Sciences. The Results published in Metals journal.

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