

## APPLICATION OF MAGNETIC NANOPARTICLES

### IN BIOMEDICINE

O.V. Orel – group DM – 91

T.M. Plokhuta – EL Adviser

Nanoparticles are generally considered a discovery of modern science. But not everybody knows that they were used by artisans back in 9th century Mesopotamia to produce a glittering effect on the surface of pots.

The nano-size particles or nanoparticles are a class of materials with properties distinctly different from their counterparts.

There are a lot of applications of magnetic nanoparticles in biomedicine but the most popular are: magnetic separation, drug delivery, hyperthermia treatments and magnetic resonance imaging (MRI) contrast enhancement.

In biomedicine it is often necessary to separate out specific biological objects from their native environment. Magnetic separation using nanoparticles is one way to achieve this. The majority of medical procedures harm us instead of helping but not using nanoparticles. With the help of magnetic nanoparticles doctors can heat malignant cells while sparing surrounding healthy tissue. It is called hyperthermia treatment.

A variety of magnetic nanoparticles and microparticles are developed to deliver drugs to specific target sites in vivo. The optimization of this useful process using magnetic nanoparticles continues today. In biomedicine methods based on a magnetic resonance are powerful methods of diagnostics. Magnetic nanoparticles can raise accuracy and sensitivity of the MRI.

Nano-size particles are a real possibility for us to use new invention. Medicine and science are developing rapidly. It's a pity that we cannot use all their achievements now but time will show.