

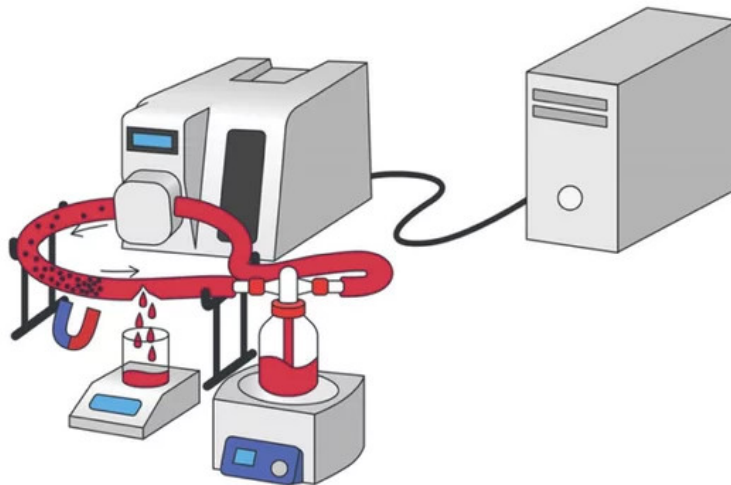
Magnetic nanoparticles are designed to prevent internal bleeding

The bleeding of organs is a very serious condition requiring immediate surgery. So, scientists from ITMO University of Russia are studying effective methods to treat through a form of attractive nano-nanoparticles.

The bleeding of organs is a very serious condition requiring immediate surgery. So, scientists from ITMO University of Russia are studying effective methods for treatment through an injectable magnetic nanoparticle.

One of the challenges in developing drugs to treat internal bleeding is that you don't want it to cause blood clots in your blood vessels.

Driven by Vladimir Vinogradov, the team tried to address this concern by creating nanoparticles consisting of an enzyme called thrombin, encased in a magnetite-thrombin-activated porous substance. into blood clots when it interacts naturally creating proteins called fibrinogen.



When tested in a laboratory-established blood model, nanoparticles do not clog when they are evenly distributed in blood vessels - actually thrombin in them is less active without magnetite.

However, when a magnet is used to focus them at a vascular simulation site, a fibrinogen injection is added to increase thrombin activity, which causes a blood clot 6.5 times more than other case. This results in a loss of 15 times the blood volume for blood clots.

Scientists now hope that a drug containing these nanoparticles could be injected into the patient's body, and the particles would then be guided into place by the magnetic fields radiating from the outside.

Vinogradov said: *"It is important to keep their size below 200 nanometers, otherwise they will not be suitable for injection. In addition, there should be synthetic conditions for the thrombin molecule to not decompose and lose fully operational, finally we can only use these biocompatible components even when the exposure process lasts"*.

This plan will be tested on animals in subsequent studies.

You finished reading the article "**Magnetic nanoparticles are designed to prevent internal bleeding**" edited by the [TipsMake](#) team. We hope this article has provided you with many useful tech tips and tricks. You can search for similar articles on tips and guides. Thank you for reading and for following us regularly.