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**PROSPECTS FOR APPLICATION OF CARBON NANOTUBES IN MEDICINE**

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Carbon nanotubes (CNTs) are carbon allotropes with cylindrical nanostructure. Nanotubes can be one- and multi-walled, and are currently produced in sufficient amounts for various commercial applications. Their diameter is changed in the nanometer range, and the length can reach a few microns. Initial nanotubes are prototypes, but it is difficult to use them in biology, because they are poorly soluble in aqueous solutions and have a strong tendency to aggregate. Interestingly, the initial nanotubes - mainly poorly soluble in aqueous solutions – that were the first used almost in all of toxicological studies.

A European company with the CARBIO project (Multifunctional Carbon Canotubes for Medical Use) began to show a considerable interest in the carbon nanotubes potential as a drug delivery system and sensors for diagnostics and therapy at the cellular level. Being rolled in a bullet-tube, CNTs can stock up medicines, sensors or heating elements. The team made an interesting scientific breakthrough. They developed a method of using CNTs for transport and release of anti-cancer drugs: doxorubicin, carboplatin which are used in chemotherapy for a wide range of cancers. CARBIO team is able to control the solubility of nanotubes, which allows them to regulate the release rate of the drug inside. Regardless of solubility, physical and chemical characteristics of the material in the capsule doesn't vary.

The project aroused international interest and became the catalyst for development offers, both in Europe and in other parts of the world. Many scientists are working to develop artificial muscles, create intellectual sensors, medical implants and many other things, requiring more power and strength on a small scale. However, it is very difficult to create a "smart" muscle which is effective, fast and powerful, and, at the same time, is able to twist and turn/ In search of a a strong and flexible material, scientists turn to CNTs.

The potential for industrial, scientific and technical use of the new material is boundless. This artificial muscular fiber may be useful for the production of energy for microfluidic devices, for creating realistic facial expressions in robots, and creating small toys. We can also use artificial muscular fibers to create "smart" tissue inside the human body. Artificial muscles work best at high temperatures, and this fact limits their potential. But researches don't stop and continue experiments, study possibilities of this unique material.