# NANOTECHNOLOGY AND ITS APPLICATIONS IN MEDICINE

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Nanotechnology advances the medicine due to ability to create new nano-materials and nano-devices with dimensions less than 100 nm. Various nanotechnological approaches allow manipulation of matter on an atomic or molecular scale, thus making possible synthesis of materials with different properties as a result of their low dimensions, as follows new applications from bulk materials.

Gas sensors and biosensors based on oxide semiconductors are widely investigated in the last decade [1-11], including bimedical – health field too. Devices with nanoscale dimensions (nano-devices) are of greater interest due to possibility to integrate it in large scale, arrays and versatile applications. Such nano-devices and even micro-devices showed already in laboratory conditions a great potential for the development of biomedical applications, i.e. human breath analysis, gas detection, medicine-drug delivery, etc.. As an example, it can serve clinical research studies showing that diabetes patients have higher concentration of acetone vapour in their breath, compared to healthy persons [3]. As an example, developed acetone vapour sensors with nanoscale dimensions are of interest in some healthcare cases.

Another field of applications is anti-bacterial activity of oxide semiconductors, which can be controlled and enhanced by changing its morphology, dimensions and other properties. This field is followed by antiviral and antitumor applications on nano-materials.

Drug delivery is another field for nano-materials and for nano-devices applications. As an example of nanotechnology results are micro- and nano-tubes of oxide semiconductors or rolled graphene/nanographite for versatile applications.

The current report will summarize some advanced oxide applications of nanotechnology for medicine and healthcare.

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