Introduction to Nanobiotechnology:

Nano -Bio –Technology, Technology used at nanoscale to address the bio-applications

What is Nanotechnology?

Nanotechnology is the understanding and control of matter at dimensions of roughly 1 to 100 nanometers, where unique phenomena enable novel applications.

- Atoms
- Molecules
- Nanoparticles
- Microparticles
- Macroparticles/bulk

Nanotechnology

The American physicist and Nobel Prize laureate Richard Feynman introduce the concept of nanotechnology in 1959. During the annual meeting of the American Physical Society, Feynman presented a lecture entitled “There’s Plenty of Room at the Bottom” at the California Institute of Technology (Caltech). In this lecture, Feynman made the hypothesis “Why can’t we write the entire 24 volumes of the Encyclopedia Britannica on the head of a pin?”, and described a vision of using machines to construct smaller machines and down to the molecular level. This new idea demonstrated that Feynman’s hypotheses have been proven correct, and for these reasons, he is considered the father of modern nanotechnology. After fifteen years, Norio Taniguchi, a Japanese scientist was the first to use and define the term “nanotechnology” in 1974 as: “nanotechnology mainly consists of the processing of

separation, consolidation, and deformation of materials by one atom or one molecule".

Biotechnology

At its simplest, biotechnology is technology based on biology - biotechnology harnesses cellular and biomolecular processes to develop technologies and products that help improve our lives and the health of our planet. We have used the biological processes of microorganisms for more than 6,000 years to make useful food products, such as bread and cheese, and to preserve dairy products.

The interface nanotechnology and biotechnology (Nanobiotechnology)

Nanotechnology is the application using systems and devices with the order at nanometer scale. 1 nm= one thousandth of a micrometer or one millionth of a millimeter. Its study includes molecular systems, tubular and spherical nanostructures and well organized self-assembled devices and machines. In all these simple components at the nano-metric scale join together to form complex machines, devices or instruments by spontaneous process that involve molecular recognition and self-assembly events. Bio molecules and biological building blocks naturally act as recognition devices or machines for instance ribosome the complex protein assembly line. Complex structures such as plant and animal viruses could be made by association at the nano scale. High specificity and spontaneity of biological processes may lead for the self-association of complex organic and inorganic nano machines and nano devices.

Nanobiotechnology

Is defined as the applications of techniques of Nanotechnology for the development and improvement of biotechnological process and products. Nanobiotechnology is

the interface of nanotechnology and biotechnology and it includes the application of nanotechnology in the life sciences.