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БІОКОМП'ЮТЕРИ

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BIOCOMPUTERS

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Biocomputers use systems of biologically derived molecules – such as DNA and proteins – to perform computational calculations involving storing, retrieving, and processing data.

The development of biocomputers has been made possible by the expanding new science of nanobiotechnology. The term nanobiotechnology can be defined in multiple ways; in a more general sense, nanobiotechnology can be defined as any type of technology that uses both nano-scale materials (i.e. materials having characteristic dimensions of 1-100nanometers) and biologically based materials. A more restrictive definition views nanobiotechnology more specifically as the design and engineering of proteins that can then be assembled into larger, functional structures. The implementation of nanobiotechnology, as defined in this narrower sense, provides scientists with the ability to engineer biomolecular systems specifically so that they interact in a fashion that can ultimately result in the computational functionality of a computer.

DNA computing is a branch of computing which uses DNA, biochemistry, and molecular biology hardware, instead of the traditional silicon-based computer technologies. Research and development in this area concerns theory, experiments, and applications of DNA computing. The term "molelectronics" has sometimes been used, but this term had already been used for an earlier technology, a then-unsuccessful rival of the first integrated circuits; this term has also been used more generally, for molecular-scale electronic technology.

In 2002, researchers from the Weizmann Institute of Science in Rehovot, Israel, unveiled a programmable molecular computing machine composed of enzymes and DNA molecules instead of silicon microchips. On April 28, 2004, Ehud Shapiro, Yaakov Benenson, Binyamin Gil, Uri Ben-Dor, and Rivka Adar at the Weizmann Institute announced in the journal Nature that they had constructed a DNA computer coupled with an input and output module which would theoretically be capable of diagnosing cancerous activity within a cell, and releasing an anti-cancer drug upon diagnosis.

In January 2013, researchers were able to store a JPEG photograph, a set of Shakespearean sonnets, and an audio file of Martin Luther King, Jr.'s speech I Have a Dream on DNA digital data storage.