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Perspective

A Short Note on Biological Computers

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DESCRIPTION

Biological computers are specialised microcomputers that are created exclusively for medical applications. The biological computer is an implantable device that is primarily utilised for molecular or cellular functions such as monitoring the body's activity or creating therapeutic effects.

The emerging new science of nano biotechnology has enabled the development of bio computers. Nano biotechnology can be described in a variety of ways; in a broad sense, it refers to any technology that employs both Nano-scale materials (i.e. materials with typical dimensions of 1-100 nanometres) and biologically based materials. Nano biotechnology, according to a more narrow definition, is the design and engineering of proteins that can subsequently be built into bigger, functional structures. The application of Nano biotechnology, in this narrower meaning, allows scientists to construct bio molecular systems particularly so that they interact in a way that can eventually result in the computational functionality of a computer. Bio computers do computations using biologically generated materials.

A bio computer is made up of a metabolic route or series of metabolic pathways utilising biological materials that have been engineered to react in a specific way depending on the system's conditions (input). The output, which is based on the engineering design of the bio computer and can be understood as a sort of computational analysis, is a pathway of reactions that takes place. Biochemical computers, biomechanical computers, and bioelectronics computers are three distinct types of bio computers.

Biochemical computers attain computational functionality by utilising the vast range of feedback loops found in biological chemical reactions. In biological systems, feedback loops can take many various shapes, and many distinct inputs can provide both positive and negative feedback to a biochemical process, causing an increase or decrease in chemical output, respectively. The presence of molecules that bind to and thus alter the chemical reactivity of any of the aforementioned factors, as well as the quantity of catalytic enzymes present, the amount of reactants present, the amount of products present, and the presence of molecules that bind to and thus alter the chemical reactivity of any of the aforementioned factors, are examples of such factors. Given the ability of these biochemical systems to be regulated through a variety of mechanisms, one can design a chemical pathway that consists of a collection of molecular components that react to produce one product under one set of chemical conditions and another product under a different set of conditions.

The existence of a certain product produced by the pathway can be interpreted as a signal, which can be combined with other chemical signals to provide a computational output based on the system's initial chemical circumstances. Electronic computing can also be done with bio computers. Computations are accomplished by interpreting a specified output that is based on an initial set of conditions that act as input, just like biomechanical and biochemical computers. The nature of the electrical conductivity detected in the bio electronic computer is the measured output in bio electronic computers. This output consists of proteins that have been carefully constructed to conduct electricity in extremely particular ways based on the initial conditions that serve as the bio electronic system's input. This is how the technology merged with the medical field.

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