

- **INTRODUCTION**

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

The idea behind blending biology with technology is due to the limitations faced by the semiconductor designers in decreasing the size of the silicon chips, which directly affects the processor speed. Biocomputers consists of biochips unlike the normal computers, which are silicon-based computers. This biochip consists of biomaterial such as nucleic acid, enzymes, etc.

- **CURRENT TECHNOLOGY**

Currently, biocomputers exist with various functional capabilities that include operations of "binary " logic and mathematical calculations.

Tom Knight of the MIT Artificial Intelligence Laboratory first suggested a biochemical computing scheme in which protein concentrations are used as binary signals that ultimately serve to perform logical operations.

W.L. Ditto, who in 1999 created a biocomputer composed of leech neurons at Georgia Tech which was capable of performing simple addition.

In March 2013. a team of bioengineers from Stanford University, led by Drew Endy, announced that they had created the biological equivalent of a transistor, which they dubbed a "transcriptor". The invention was the final of the three components necessary to build a fully functional computer: data storage, information transmission, and a basic system of logic.

- **ADVANTAGE**

1. Performs millions of operations at same time
2. Ability to use large amounts of working memory
3. Lightweight
4. Low power used to keep in original state
5. Has ability to solve hardest problems in a matter of weeks
6. Environmentally friendly

- **DISADVANTAGE**

1. Molecular operations are not perfect
2. DNA computing involves a relatively large amount of error
3. As size of problem grows, probability of receiving incorrect answer eventually becomes greater than probability of receiving correct answer.
4. Sometimes there are errors in the pairing of DNA strands
5. Simple problems solved faster on electronic computers
6. Human assistance is required
7. Time consuming lab procedures
8. No universal method of data representation
9. Information can be untransmittable

- **ADVANCED TECHNOLOGY**

**Biochemical computers**-Biochemical computers use the immense variety of feedback loops that are characteristic of biological chemical reactions in order to achieve computational functionality

**Biomechanical computers** -the mechanical shape of a specific molecule or set of molecules under a set of initial conditions serves as the output

**Bioelectronic computers** - measured output is the nature of the electrical conductivity that is observed in the bioelectronic computer. This output comprises specifically designed biomolecules that conduct electricity in highly specific manners based upon the initial conditions that serve as the input of the bioelectronic system

- **REFERENCES**

<http://en.wikipedia.org/wiki/Biocomputer>

<http://www.edufive.com/seminartopics/computer/CS14.html>