

Nanobiotechnology: Biochips connecting to the DNA computers- A tool for biomedical application

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Mankind ought to get marvelled by the enigma of what the nano-future holds for it! Feeling the biotech atmosphere every moment of our day, all of us ought to know a gist of what the scintillating DNA computers are!

These computers as we know do everything right from the most basic arithmetic operation to detecting encrypted signals, hacked codes, crime detection at the forensics etc etc. And ofcourse does it a zillion times faster than normal computers that are made of the microprocessors, microcontrollers/integrated circuits etc given that the error propability rates are ridiculously high. The DNA computer works almost the same as any electronic computer except that it follows a biological route. More than 10 trillion DNA molecules can fit into an area of than 1 cubic centimeter (0.06 cubic inches). With this small amount of DNA, a computer would be able to hold 10 terabytes of data, and perform 10 trillion calculations at a time. By adding more DNA, more calculations could be performed The DNA logic gates rely on DNA code. They detect fragments of genetic material as input, splice together these fragments and form a single output. These logic gates might be combined with DNA microchips to create a breakthrough in DNA computing.

One great barrier that comes in front is the error rates. When a normal computer that uses a signal integrated IC this DNA computer would obviously have great error rates as here we aren't dealing with completely manmade artificial electronics. If just this small problem could be avoided the DNA computer would just be ground breaking success. So it is a proposal that instead of just using the biochips in DNA computer we can use both the integrated circuits and the biochips as well, that are connected by transmission lines. Coming to the technical aspect of it, (the gene) DNA embedded on the chip, lets say the to it that the radio frequency is accurate), so that the problems that are in the height of necessity to us can be performed by the biochip, the other normal operations by our IC. The PIT (Programmable Interval Timer::: that triggers an interrupt when it reaches the programmed count) acts as a mediator between the biochip and the integrated circuit. This PIT is catogerised under CMOS (A BASIC CIRCUIT) used in whichever form can act as a mediator. It can be a one-shot timer or a periodic one. Depends on our requirement. The same principle can be extended to the biomedical applications wherein The biochips would detect any mismatch or complications in our bio-samples to be detected(just the same principle applied in the biosensors , after this the connection is missed and would go with the signal IC where other programming is right royally done and the outputs are given out. The whole of this proposal is possible unequivocally only if the logic I/O signals are appropriate and the transmission lines work at the right time and of course if the equipments are adequate. This would prove to be economically viable and highly efficient in less time. G.

Biography

Krithika Shankaran a third year bachelor's student pursuing my five year course on Industrial Biotechnology at SASTRA UNIVERSITY, one of the best institutes in India. I have planned to continue my career with a dual Phd in electronics and bio-nano technology. I am working on biosensors coupled with basic mechanisms of biochips here under the dean of my department. Other than that my oratory skills are very good. I have a talent for music and tennis. I already have a bachelor's degree in Hindi Literature.

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