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Overview of Biochip Technology

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Abstract: Microarray biochips are replacing the conventional biochemical analyzers by integrating all necessary functions.
These chips are essentially addreviated laboratories that can perform hundreds or thousands of synchronic biochemical reactions. These paper insights on how biochips enable researchers to quickly screen large numbers of biological analytic.

Keywords: microarray, biochip, reader, trasponder.

1. Introduction: The biochip is the guessed computer logical circuit.biochip will also useful to storing the physical as well as chemical properties of data. Biochip will used in medical to perform thousands biological action in minor second. Biochip will also used to find people lost people who will face some problem. Biochip will help to detect the genes. Biochips would help significantly in stimulate the recognition of the estimated 80,000 genes in human DNA, an ongoing world-wide research collaboration known as the Human Genome Project.

2..histroy of biochip:

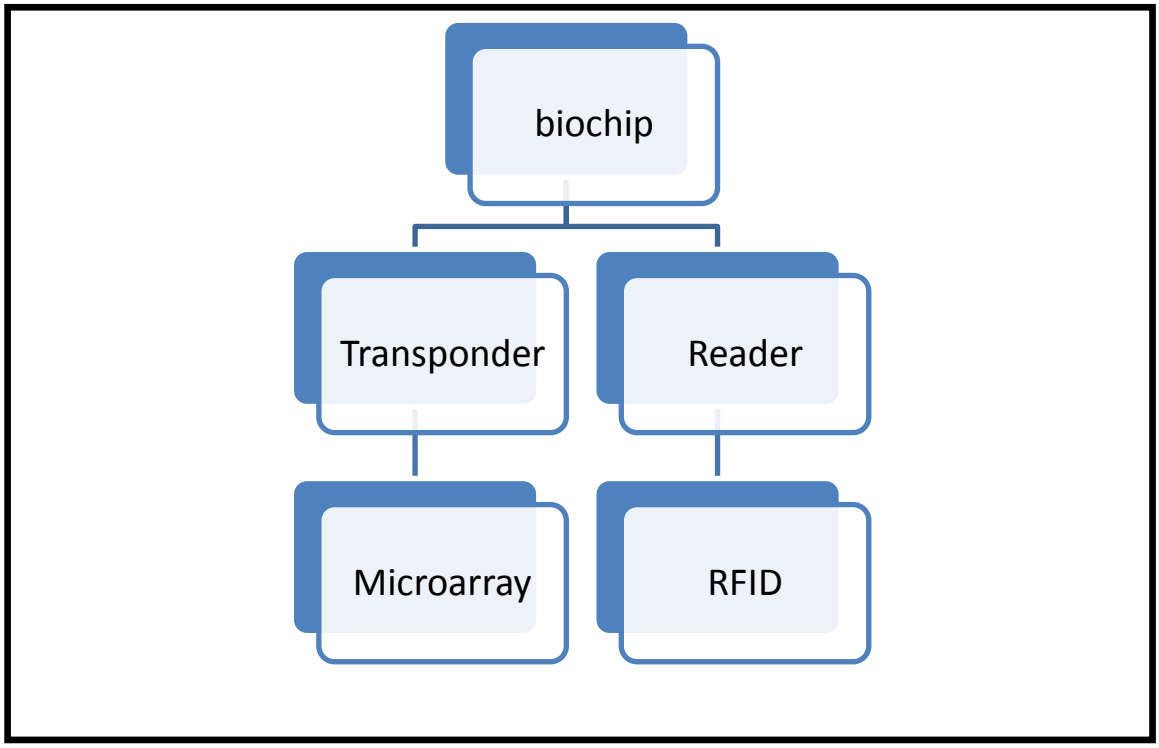
The development biochip has long history, starting work on underlying sensor technology. Developed in 1983 for monitoring fisheries. Large scale of development of biochips in 1990s. Today the large variety of biochip is technologies are in development. In 1986 Leroy Hood gave fluorescence-base DNA sequence which facilitated the of the reading DNA sequence. In 1980 Fred Sanger and Walter Gilbert were awarded Nobel Prize for their pioneering DNA sequencing approach. Biochip invented in 4G generation and development still continued in due to various applications. Biochips are also continuing to evolve as the collection of assays that provide the technology platform. One interesting development with this regard is the recent

Efforts is to couple so that representational difference analysis with high throughput with DNA array analysis. The RDA technology allows the comparison of DNA from two separate tissue sample simultaneously.

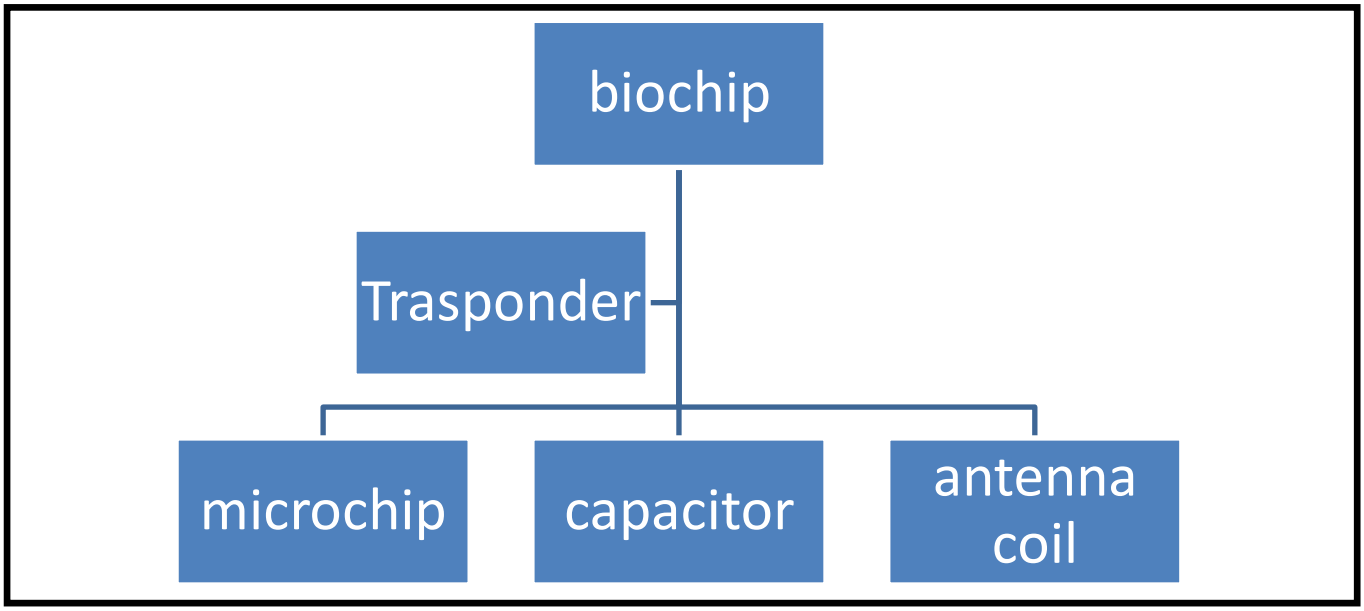
2. Structure of biochip:

It is important to realise the biochip is not a single product that from the technology platform. Many developments over the pasts two decades have contributed to its evolution sense. In a sense of a biochip was made by possible work of Fred Sanger and Walter Gilbert. Who was awarded Nobel in 1980 for there pioneering DNA sequence approach that widely used today? DNA sequencing is chemistry in combination with in current, as well as microspore agars gels laid the foundation o considering miniaturizing molecular assays.

2.1 Type of biochip working:



2.2: Transponder:



subjacent

Computer microchip: The microchip store the unique testimony numbers 10 to 15 digits long. The storage capacity of current microchip is delimited capable of storing only a single ID number.

Antenna coil: this is conentionanally a simple, coil of copper wire around a ferrite or iron core. This is slight, primitive, radio antenna, receives and sends the signal from reader or scanner.

Tuning capacitor: The store the inadequate amount of electrical imputation less than 1to1000 of watt sent by reader or scanner.

2.2 Reader: The reader will consist the electromagnetic field. This will take very few minutes for giving the biological result. The microchip is described as a sort of word search function that can quickly sequence DNA[2]. The development of biochips has a long history, starting with early work on the underlying sensor technology[3]. To achieve these ends, DNA, RNA, proteins, and even living cells are being employed as sensing mediators on biochips. Numerous transduction methods can be employed including surface Plasmon resonance, fluorescence, and chemiluminescence [7]. The multiple technologies needed to make a successful biochip from sensing chemistry, to micro arraying, to signal processing, requires a true multidisciplinary approach [4].

3.How it works

The reader generates a low-power, electromagnetic field, in this case via radio signals, which "activates" the implanted biochip. This "activation" enables the biochip to send the ID code back to the reader via radio signals. The reader amplifies the received code, converts it to digital format, decodes and displays the ID number on the reader's LCD display. The reader must normally be between 2 and 12 inches near the biochip to communicate. The reader and biochip can communicate through most materials, except metal.

3.1 Subtype of biochip working

1. Chips that follow footsteps

2. Glucose level detectors

Chips that follow footsteps

The civil liberties debate over biochips has obscured their more ethically benign and medically useful applications. Medical researchers have been working to integrate chips and people for many years, often plucking devices from well known electronic appliances. Jeffry Hausdorff of the Beth Israel Deaconess Medical Center in Boston has used the type of pressure sensitive resistors found in the buttons of a microwave oven as stride timers. He places one sensor in the heel of a shoe, and one in the toe, adds a computer to the ankle to calculate the duration of each stride. "Young, healthy subjects can regulate the duration of each step very accurately," he says. But elderly patients prone to frequent falls have extremely variable stride times, a flag that could indicate the need for more strengthening exercises or a change in medication. Hausdorff is also using the system to determine the success of a treatment for congestive heart failure. By monitoring the number of strides that a person takes, can directly measure the patient's activity level, bypassing the often-flowed estimate made by the patient.

Glucose level detectors

Diabetics currently use a skin prick and a handheld blood test, and then medicate themselves with the required amount of insulin. The system is simple and works well, but the need

A light emitting diode starts off the detection process. The light that it produces hits a fluorescent chemical: one that absorbs the incoming light and re-emits it at a longer wavelength. The longer wavelength of light is detected, and the result is send to a control panel outside the body. Glucose is detected because the sugar reduces the amount of light that a fluorescent chemical re-emits. The more glucose is there the less light that is detected.

S4MS is still developing the perfect fluorescent chemical, but the key design innovation of the S4MS chip has been fully worked out. The idea is simple: the LED is sitting in a sea of fluorescent molecules. In most detectors the light source is far away from the fluorescent molecules, and the inefficiencies that come with that mean more power and larger devices. The prototype S4MS chip uses a 22 microwatt LED, almost forty times less powerful than a tiny power-on buttons on a computer keyboard. The low power requirements mean that energy can be supplied from outside, by a process called induction. The fluorescent detection itself does not consume any chemicals or proteins, so the device is self sustaining. to draw blood means that most diabetics do not test themselves as often as they should. The new S4MS chip will simply sit under the skin, sense the glucose level, and send the result back out by radio frequency communication.

Biochip provides interfacing between living system and electro mechanical and computation device. The chip may use in such varied application as artificial sensors prosthesis portable/disposable laborites or even importable device such as enhance the human life.

Biochip promises the dramatically change in future medical science and human life in general. With the advance of bio and nano technology two strong paradigms of integrated electronics and life are emerging. Biochip can provide the construction of sophisticated human sensing system such ac nose and ear.

The second paradigm is chip for sensing biology that will provide the interaction with living bodies and build the new diagnosis tool(such as diabetes glucose meter) or new medicine. A tiny microchip is size of grain rice, is simply placed under the skin. It is also designed as to be injected simultaneously with vaccination or alone. The biochip inserted into the subject of hypodermic spring. Injection safe and simple comparable to common vaccins.Anesthasia is not required or reoomended.in dogs and cat the biochip is usually injected behind the neck between the shoulder blades.trown and LTD market and implant featuring is patented Zip quill which you simply press in ,no spy ring I needed. According to AVID once implanted the identify tag is virtually to retrieve the number that never be altered.

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5.Future of biochip

The immediate prospects of biochip depend on rage of technology and economics issues. One is the question of reusability. The current biochips are of necessity disposable, in part because the current device is not physically robust. For example nucleic acid probes tend to break away from supporting glass plate. A decade from now this problem may have better address making the chip more reusable and perhaps at the same time permitting probes with long spans generic data and fixable today. In this way manufacturing improvement might facilitate more powerful for generic analysis.

On other hand it may be it may be better manufacture biochip so inexpensive that they can be used once and then discarded another issue of biochip is versatility. Current biochip single purpose and any hardware device. even if further biochip do not become programmable in the fashion of computer chip, then they become usable for multiple purpose, such as the analysis of tissue sample or numerous pathogen. An overarching issue is standardization. For diagnostics purposes any medical test supple is administer and its result is interpreted in the standardized way.

Beyond that it seems desirable for biochip performing different test to have an output detectable by the same radium device. Hence the race is underway to create a biochip platform or motherboard capable of handling a wide range of biochip, irrespective of internal biochip of given detail biochip function.

In these particular two companies affymetrix and molecular dynamic have formed the generic analysis technology consortium. The hope is establishing industry wide standards for the reading of biochip.

Most biochip is 2D array of sensors place carefully in grid arrangement. The position of sensors on chip determines its functioning. For example for sensors are XY co ordinate that might sense the antibody of HIV while the sensors at might sense the antibody for Faenza virus.

To place the sensors in precise co ordinate sophisticated and expansive micro dipostioning technique is used. Sensors are placing essentially one at a time or serially on a chip.

They are developing biochip indexing biosensors function in its shape, instead it's positioning on chip.

Thus the sensors are placed anywhere image recogansation software can they used to read chip.

The benefits are multifold are as follows:

- The sensors can be batch produced and then assembly together in panel proving high thought put and high yield.
- The sensors can be packed tightly together, unlike deposited with micro deposition system.
- The sensors are in 3D nature and thus produced higher signal than 2D.
- Because are sensors produced offline and assembled later then they can be custom tailored for their specific application.

6.Reader importance in biochip working

Biochips are fast accurate, miniaturized and can be accepted to become economically advantage attribute that they make analogous to computer chip. One expects to see an accelerated trends ultra miniaturization, perhaps entirely novel media and increased to ability to analyze not only generic material but also other type of biomolecular one excepts to an eventual harmonization technique, so that dominate fabrication strategies will emerge at least for certain type of application, including flavors format of generic analysis and other for antibodies and other proteins. Since the potential application are vast both for research and clinical use, the potential market for biochip is very huge a powerful force for their continued development.

Conclusion:

The working of microarray biochip in DNA restructuring system work will present. The biochip will present. The biochip will read, diagnosis, it will also provide imaginary image will provide. We can expect that advance in micro fluidic biochip technology will enable the efficiency of devices that will allow highly perceptive analysis of complex biological relations in real time that to with a low cost discernment.

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