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# Health monitoring System and Connecting Doctors (Hospitals) using BIOCHIP

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**ABSTRACT** - The main theme of is to monitor the health status of the patient time to time and maintain all those records in a mobile app. The patient who are admitted in hospital is implanted with a **BIOCHIP**. They are designed to be very sensitive and tell us when something is wrong and can predict ahead of time when a patient is sick, even before they know. The regular process is to check the condition of patient individually by collecting blood samples, taking blood pressure reading time to time which involves time and money. In addition to these some machines are available in market but not in a correct working state and previous readings can't be restored.

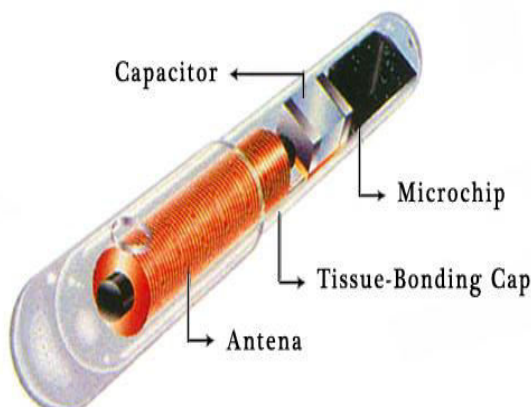
In some cases, the patient's health changes suddenly and can't be predicted by the doctors. The health becomes worse all of a sudden due to which many lives are lost. If we are able to monitor the health condition of a patient time to time the number of deaths may be reduced to certain extent. If the patient is in severe condition, sometimes they are suggested to shift to other hospital. It takes time for shifting of patient and availability of all the previous health records may not be possible at the point of time. It becomes easy for the doctors to treat the patient with right medication if health condition of patient is well known.

The diagnostic technology puts living cells into a tiny biochip smaller than the size of a dime that's then implanted into a patient. They are designed to be very sensitive to their environment and are good at picking up a particular disease.

**KEYWORDS:** Bio-Chip, Doctors, Patients, Hospitals, Recorders.

## I. INTRODUCTION

The biochip is used to simultaneously analyze a panel of related tests in a single sample, producing a patient profile. The patient profile can be used in disease screening, diagnosis, monitoring disease progression or monitoring treatment.



**Figure 1:** Sample model of Bio-Chip

### Components of Biochip:

A biochip consists of mainly two components. They are:

1. Transponder
2. Reader



Figure 2: Components of Bio-Chip

### 1. Transponder:

Biochips consist of a passive transponder i.e.; these transponders require a low electrical charge to activate. Transponder again classified into four parts. They are

1. Antenna coil
2. Computer microchip
3. Tuning capacitor
4. Glass capsule

**Antenna coil:** Antenna coil is mainly used in the transponder is to send and receive the signals from scanner. Antenna coil is seemed to be very small in size in the transponder of biochip.

**Computer Microchip:** Computer microchip is mainly used for storing the unique identification number. The identification number which is given to the patient for their unique identity.

**Tuning capacitor:** It stores a small electrical charge sent by the reader or scanner. Charge activates the transponder to send back the id number encoded in the computer microchip.

**Glass Capsule:** It is made of a biocompatible material specifically soda-lime glass. Glass capsule is mainly used for holding the antenna coil, computer microchip, tuning capacitor.

### 2. Reader:

It consists of an "exciter" coil which creates an EM field that, via radio signals and provides the necessary energy (less than 1/1000 of a watt) to "excite" or "activate" the implanted biochip. A receiving coil that receives the ID number sent back from the "activated" implanted biochip.

## II. LITERATURE REVIEW

Biochip, a bio-microarray gadget, has been broadly examined and created to empower huge scope genomic, proteomic and useful genomic investigations. A biochip contains three elements: DNA microarray, protein microarray, and microfluidic chip. With the joining of microarray and microfluidic frameworks, a miniature absolute investigation framework, which is frequently called a lab-on-a-chip (LOC) framework, is delivered. Advances of nanotechnology have ceaselessly diminished the size of the biochip which thus decreased the assembling cost and expanded the high throughput ability. Because of the advantages of low cost, high throughput and scaling down, this innovation can possibly be a urgent and useful asset for clinical exploration, diagnostics, drug advancement, toxicology studies, and patient choice for clinical preliminaries [1].

### FDA approves implantable chip to access medical records

The US Food and Drug Administration has endorsed Verichip, an implantable radiofrequency distinguishing proof gadget for patients, which would empower specialists to get to their clinical records. Specialists trust that utilization of the gadget will result in be better therapy for patients in crises or when a patient is oblivious or needs clinical records. A few groups have raised apprehensions, in any case, that it could prompt encroachments of patients' protection. The chip is the size of a grain of rice and is embedded under nearby sedation underneath the patient's skin in the rear arm muscles space of the correct arm, where it is imperceptible to the unaided eye. It contains an interesting 16-digit ID number. A handheld scanner passed close to the infusion site initiates the chip and shows the number on the scanner. Specialists and other clinical staff utilize the distinguishing proof number to get to the patient's records on a safe information base through scrambled web access [2].

### **Biochips can detect cancers before symptoms develop**

The new innovation, known as a biochip, comprises of a one-centimeter by one centimeter exhibit that includes anyplace between a few dozen and a few hundred "spots," or little drops. Scientists at the U.S. Branch of Energy's Argonne National Laboratory have fostered a chip that can save lives by diagnosing certain malignant growths even before patients become indicative. Every one of these drops contains a one-of-a-kind protein, immunizer or nucleic corrosive that will connect to a specific DNA arrangement or antigen. A tumor, even in its most punctual asymptomatic stages, can bog off proteins that discover their way into a patient's circulatory framework. These proteins trigger the invulnerable framework to get going, delivering antibodies that manage which proteins have a place and which don't [3].

### **Implantable Chip Approved for Medical Records: FDA Clears First Implantable Microchip for Human Use**

Specialists may before long have the option to find individuals' clinical records in a similar way pet proprietors can find lost creatures: by utilizing a small implantable micro processor that is put under the skin. The FDA has endorsed the principal implantable radio frequency ID micro processor for human use. Known as VeriChip, the gadget is intended to assist specialists with getting to a patient's clinical records. The chip is about the size of a grain of rice and contains a 16-digit check number that is gotten by a scanner that discharges a modest quantity of radio recurrence that actuates the chip and communicates the number back to the scanner. A comparable implantable miniature chipping framework has been utilized in pets and domesticated animals for recognizable proof purposes. VeriChip is suggested for addition in the rear arm muscles, between the elbow and the shoulder of the correct arm. The chip is embedded in a concise outpatient strategy utilizing a neighborhood sedative [4].

## **III. PROPOSED WORK**

The working of Biochip basically incorporates the accompanying advances.

**Step1:** The administrator creates a low-power electromagnetic field through radio signs

**Step2:** The fixed biochip gets turn on

**Step3:** The enacted chip communicates the recognizable proof code converse to the administrator through radio signs

**Step4:** Reader fortifies they got code to transform it into advanced structure lastly shows it on LCD.

### **1) Transponder**

Transponders are two sorts' to be specific dynamic transponder and inactive transponder. This is a detached transponder which implies that it doesn't contain any of its own energy or battery while in uninvolved, it isn't dynamic until the administrator actuates it by giving it a low electrical charge. This transponder comprises of four sections, for example, radio wire loop, PC CPU, glass case, and a tuning capacitor.

- The PC central processor stores an extraordinary distinguishing proof (UID) number that goes from 10 digits to 15 digits in length.
- The radio wire curl is little, crude and this sort of receiving wire is utilized to convey and get the messages from the scanner or peruser.
- The charging of the tuning capacitor should be possible with the little sign i.e., 1/1000 of a watt which is sent by the administrator.
- The glass case holds the radio wire loop, capacitor, and central processor, and it is made with a biocompatible material specifically soft drink lime glass.

### **2) Reader**

The peruser contains a loop in particular "exciter" and it shapes an electromagnetic field through radio signs. It offers the necessary energy (<1/1000 of a watt) to enact the biochip. The peruser conveys a getting loop for accepting the ID number or communicated code sent back from the energized embedded biochip.

### **Biochips:**

Biochips are of mostly three sorts. They are protein microarray, miniature fluidic chip, DNA microarray.

### **Protein microarray or protein chip:**

A protein microarray or protein chip strategy is utilized to follow the activities just as associations of proteins, and to discover their capacity for a huge scope.

### **Microfluidic chip:**

Microfluidic biochips or lab-on-a-chip are changing a few applications like DNA examination, atomic science technique on the grounds that exact and controlled trials can be directed at a lower cost and quicker speed.



**DNA microarray or DNA chip:**

A DNA microarray (likewise normally known as DNA chip or biochip) is an assortment of minute DNA spots joined to a strong surface. Researchers use DNA microarrays to gauge the articulation levels of huge quantities of qualities. Biochips can distinguish malignant growths before manifestations create: specialists might actually tailor medicines dependent on their own autoantibody profile. This innovation is intended to exploit the data contained inside the patient's own science acquiring new and better demonstrative data that specialists could use to comprehend and battle disease better.

**Biochips: Take Your Health Data Wherever You Go:**

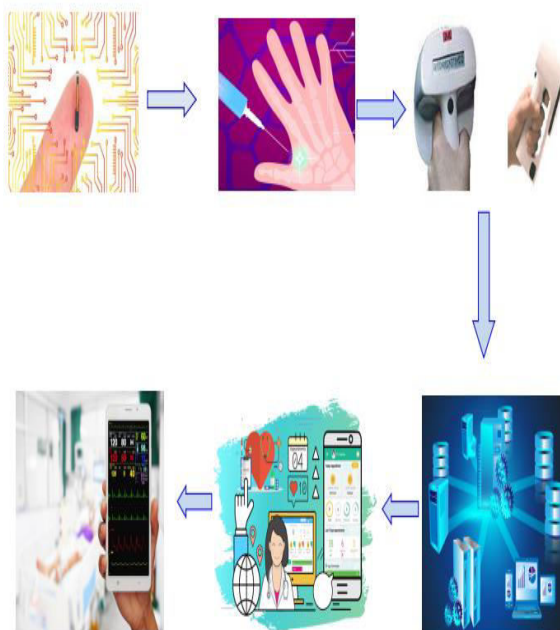
Perhaps the most recent advancement utilizing radio waves – radio recurrence ID (RFID) biochips – is a distinct advantage for the manner in which clinical experts store, access, and assess quickly changing patient wellbeing information. By utilizing this chip, we can follow an individual or creature anyplace on the planet. This chip is utilized to store and refresh the data of an individual like clinical monetary and socioeconomics. The biochip can be relevant in the clinical field as a BP sensor, glucose locator, and oxygen sensor.

**Advantages of utilizing biochips in a human body:**

Essentially, the biochips regularly are embedded into the skin simply over every client's thumb, utilizing a needle

- (a) The principal advantage of utilizing a bio chip is we can recognize the illness before the human feel it and the chip hint the patient about the disorder of the patient.
- (b) Mainly it decreases the deficiency of time and make it effectively open and accessible to specialist.
- (c) The biochip gathers the wellbeing status of the patient subsequently there is no need of doing test on numerous occasions.
- (d) The passing pace of the patients can be decreased.
- (e) Finally, the biochip sends the full data of the patients to the application we are making. This application will store each detail of the patient and the specialist can undoubtedly be seen and he can begin the treatment of the patient without taking of any test.

**IV. SYSTEM ARCHITECTURE**



**Figure 3: Proposed System Architecture**

**ALGORITHM:**

**Step 01:** Patient going to the hospital.

**Step02:** Implanting the biochip unique identification number in patient's body.

**Step03:** Reading the health conditions of the patient's time to time by the transponder and reader

**Step04:** Health conditions are stored in database and updated into mobile app.

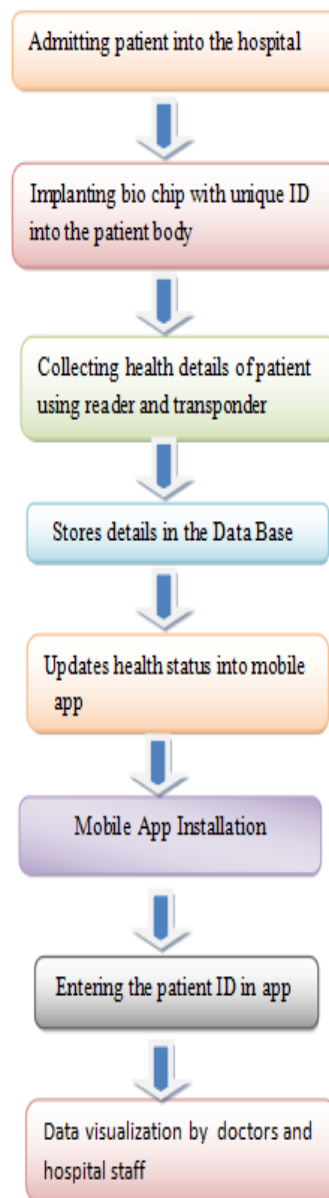
**Step05:** The app is created to store the patient health information will be updated whenever readings are taken.

**Step 06: Installation** of mobile app.

**Step07:** Entering the unique id of patient in app, health records can be visualized by doctors.

**Step08:** The previous health records of patient can also be visualized in case of shifting patient from hospital.

**DATA FLOW DIAGRAM:**



## V. CONCLUSION

This paper provides a comprehensive review on usage of biochip in developing wireless health care monitoring system. It enables lab-on-a-chip for monitoring oxygen levels in blood, glucose concentration and blood pressure levels as well. A number of significant breakthroughs have been accomplished as a part of this work for miniature analysis of different health parameters. The biosensor arrays are well suited to produce optimized, accurate and fast measurements.

We also developed healthcare system through mobile app which is of low-cost and can be used by concerned people available at any place and at any time which makes it user friendly. The fully integrated biochip is only 1 X1X 0.25 in in dimensions and facilitates all the functionality required for testing clinically relevant parameters from human blood. We believe the results of this work can have a significant impact toward the development of rapid and affordable point-of-care testing systems. In future this can be used to for DNA analysis, molecular biology procedures, proteomics and detection of cancer diseases.

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## BIOGRAPHY



Dr.Venkata Kishore Kumar Rejeti pursued Bachelor of Technology from Vignan's Engineering College(JNTUH) in 2006, Master of Technology from JNTUK in 2013 and Ph.D from ANU in 2019. Currently working as a professor in Department of Computer Science and Engineering in KKR & KSR Institute of Technology and Sciences, having teaching experience of 14 Years. He has published more than 20 research papers in reputed international journals including conferences and it's also available online.

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