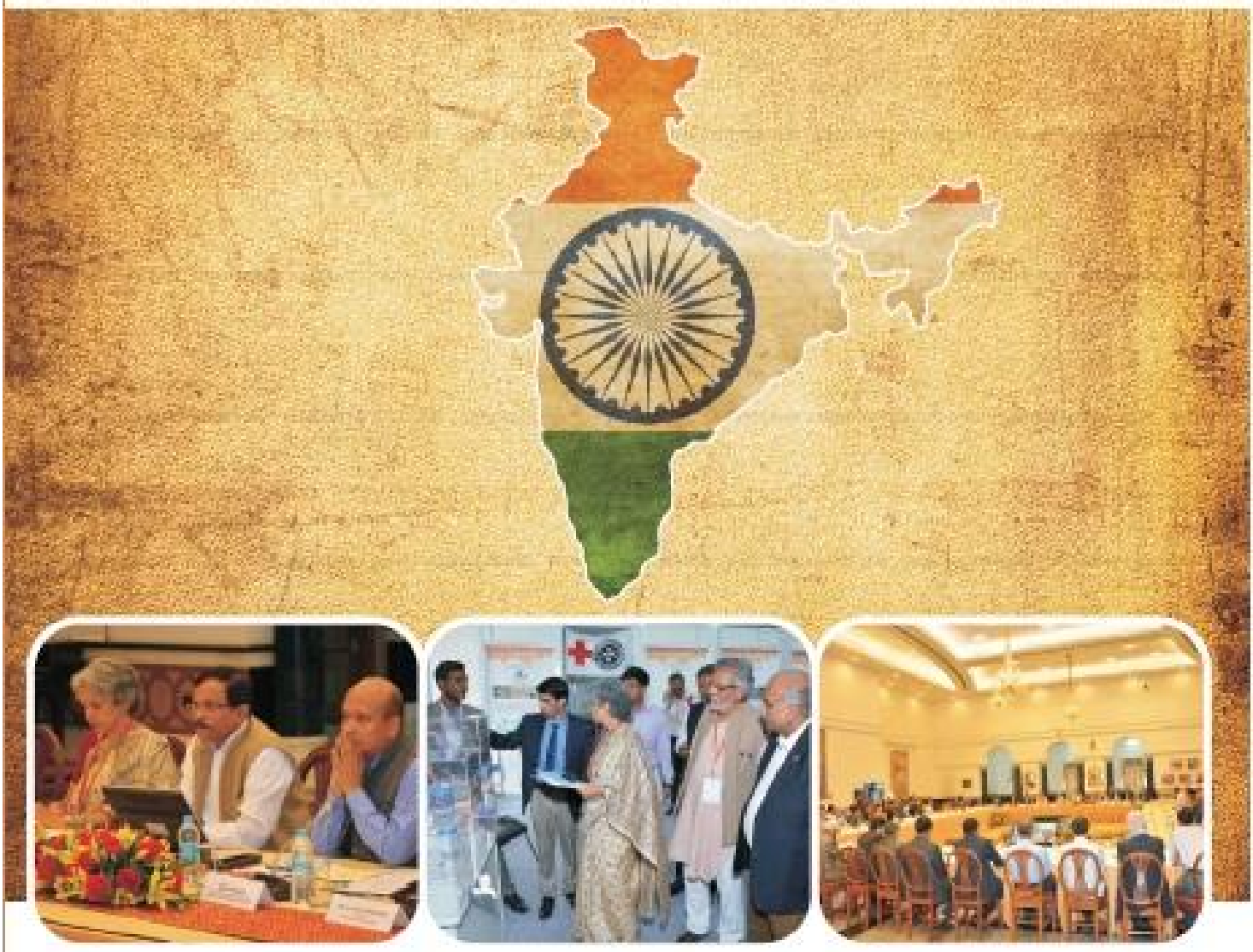
The Innovative Medical Technologies 2017

Bridging Gaps and Creating Ecosystem



Festival of Innovations
Rashtrapati Bhavan, New Delhi

NIF

Div. of ITR, ICMR

BIRAC

Innovative Medical Technologies

2017

Festival of Innovations

Rashtrapati Bhavan, New Delhi

NIF | Div. of ITR, ICMR | BIRAC

CONTRIBUTORS TO THE BOOK

The book 'Innovative Medical Technologies 2017' was prepared under the general directions of Dr Soumya Swaminathan, Secretary, Department of Health Research and Director General, Indian Council of Medical Research. The technologies were selected by a Committee under the Chairmanship of Professor KS Reddy, President, Public Health Foundation.

The report was prepared and coordinated by a core team of Division of Innovation & Translation Research comprising.

CORE TEAM

Meenakshi Sharma, Scientist E, Division of ITR & NCD, ICMR

Neeraj Choudhary, Scientist I, Division of NCD, ICMR

TECHNICAL SUPPORT

Chandershekhar, Head, Division of ITR, ICMR

Sushma Gupta, Consultant, Division of ITR, ICMR

Sadhna Srivastava, Scientist E, Division of ITR, ICMR

Rajnikant, Scientist F, Division of ITR

Rina Sinha, ICMR

Disclaimer: The information provided in this booklet on various technologies has been provided by innovators. Neither ICMR nor NIF and BIRAC are responsible for any information provided by the innovators.

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Phone: 47173300, 26388830-32

Foreword

We face a challenge. How do we bring affordable healthcare to the doorstep of our population especially in rural areas? We need to relook at the framework of our health system so that it meets the pressures of changing needs of our population. Innovations in health using tools including information and communication as well in diagnostics, in my view, are going to be crucial for increasing healthcare's reach. Innovative solutions to health issues that arise as a result of urbanization, access to clean drinking water, open defecation, climate change etc will have an impact not only at national, but at global level.

Our innovation capacity is tremendous. We need to empower our young to think independently and take a risk to transform their ideas to business propositions. I believe that innovative linkages between academia and industry are a win-win proposition for finding solutions to our local problems.

We will also need to develop indicators to measure 'Health Innovation Index' including the ones that measure health as a component of human development, how much we spend on new ideas for development, performance of our academic institutes, national and international dimensions of patent applications, ecosystem for startups in health sector among other important parameters.

Over this three year journey, exhibition of medical technologies at Rashtrapati Bhavan from different geographies and institutes of the country has become a well known and credible reference. In addition, this year's roundtable is aimed to bring policy level changes for a sustainable, multi-stakeholder approach from research to technology [SMART] so as to increase our healthcare reach. I congratulate the National Innovation Foundation team for their passionate stewardship of promotion of grass root innovations. I am happy that the same zeal is reflected by the team at ICMR. Our capacity has grown tremendously with BIRAC's joining this edition of 'Innovative Medical Technologies' at Festival of Innovations.

Soumya Swaminathan
Secretary, DHR & DG, ICMR

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About ICMR, New Delhi

The Indian Council of Medical Research (ICMR), New Delhi, the apex body in India for the formulation, coordination and promotion of biomedical research, is one of the oldest medical research bodies in the world. It is funded by the Government of India through the Department of Health Research, Ministry of Health & Family Welfare.

Vision & Mission

The Mission of the ICMR is to promote better health in India through research. It provides stewardship, conducts and supports health research, generates knowledge and ensures its utilization, and develops resources for health research in areas of national public health importance.

"To bring modern health technology to the people through innovations related to diagnostics, treatment methods and vaccines for prevention; to translate them into products and processes and in synergy with concerned organizations to introduce these innovations into public health systems''

The Council promotes biomedical research in the country through intramural as well as extramural research.

Intramural research is carried out currently through the network of Council's 32 Research Institutes/ Centers/Units located in different parts of India that address research on specific areas such as tuberculosis, leprosy, cholera and diarrhoeal diseases, viral diseases, nutrition, reproduction, oncology, etc.

Extramural research is promoted by ICMR through (i) Setting up of Centers for Advanced Research in different research areas ii) Task force studies.(iii) Open-ended research on the basis of applications for grants-in-aid received from scientists in non-ICMR Research. In addition to research activities, the ICMR encourages human resource development in biomedical research.

Infectious diseases and excessive population growth have continued to constitute the major priorities to be addressed in medical research. In recent years, research has been intensified progressively on emerging health problems such as Cardiovascular diseases, Metabolic disorders (including diabetes mellitus), Mental health problems, Neurological disorders, Blindness, Liver diseases, Hearing impairment, Cancer, Drug abuse, Accidents, Disabilities etc. Research on Traditional Medicine/Herbal Remedies was revived with a disease-oriented approach.

About NIF, Ahmedabad

Drawing upon the Honey Bee Network (HBN) philosophy, the National Innovation Foundation (NIF) - India was set up in March 2000 with the assistance of Department of Science and Technology, Government of India.

Vision & Mission

It is India's national initiative to strengthen the grassroots technological innovations and outstanding traditional knowledge.

Its mission is to help India become a creative and knowledge-based society by expanding policy and institutional space for grassroots technological innovators.

NIF scouts, supports and spawns grassroots innovations developed by individuals and local communities in any technological field, helping in human survival without any help from formal sector. It also tries to ensure that such innovations diffuse widely through commercial and/or non-commercial channels, generating material or non-material incentives for them and others involved in the value chain.

With major contribution from the Honey Bee Network volunteers, NIF has pooled a database of over 225,000 technological ideas, innovations and traditional knowledge practices (not all unique, not all distinct) from over 585 districts of the country. NIF recognizes grassroots innovators and school students at the national level in its various National Biennial Grassroots Innovation Award Functions and annual Dr A P J Abdul Kalam Ignite Children Award functions.

NIF has helped in getting several hundred grassroots technologies validated and/or value added. It has filed several patents. It has also set up an augmented Fabrication Laboratory (Fab Lab) with the help of Massachusetts Institute of Technology (MIT), Boston, for product development and strengthening in-house research. Likewise, for initial validation of herbal technologies, laboratory facilities at Society for Research and Initiatives for Technologies and Institutions (SRISTI) have been augmented. Micro Venture Innovation Fund (MVIF) at NIF, with support from Small Industries Development Bank of India (SIDBI), provides risk capital to projects at different stages of incubation.

About BIRAC, New Delhi

A not-for-profit Section 8, Schedule B, Public Sector Enterprise, set up by Department of Biotechnology (DBT), Government of India as an Interface Agency to strengthen and empower the emerging Biotech enterprise to undertake strategic research and innovation, addressing nationally relevant product development needs.

Vision

"To Stimulate, foster and enhance the strategic research and innovation capabilities of the Indian biotech industry, particularly start-ups and SME's, for creation of affordable products addressing the needs of the largest section of society"

- Foster innovation and entrepreneurship
- Promote affordable innovation in key social sectors
- Empowerment of start-ups & small and medium enterprises
- Contribute through partners for capability enhancement and diffusion of innovation
- Enable commercialization of discovery
- Ensure global competitiveness of Indian enterprises

BIRAC's aim is to play a transformative and catalytic role in building a US$ 100 billion Indian bio economy. We believe that the agents of change for building the Indian bio economy would be biotech start-ups & SMEs & hence our focus is on raising their capabilities, connecting them to global & local stakeholders such that they achieve global excellence.

Overview

"A country like India may have reached a certain level of technological advancement. It may have promoted the development of a scientific bent of mind and temperament amongst its citizens, especially the young ones. However, unless young minds are sensitised to the need for finding creative solutions to top-ranging socio-economic problems of our country, the goal of inclusive development will remain elusive. If we are able to leverage ingenuity to address social needs, it will result in social innovations beneficial to the society."

- Hon'ble President of India Shri Pranab Mukherjee
2016

FESTIVAL OF INNOVATIONS

The Festival of Innovation (FOIN), a unique initiative of the Office of the President of India started in 2015, recognizes, respects and rewards grassroots innovations and foster a supportive ecosystem. FOIN is a week-long annual event and is hosted by the President at the Rashtrapati Bhavan each year, during the month of March. In sync with the policies of the government of India, FOIN will provide a window to the creative and innovative solutions for social development through grassroots innovations, student ideas and other technologies for agriculture, rural development, sanitation, health, women and child development, biotechnology and medical innovation for grassroots.

It is organized by the President's Secretariat and is assisted by the National Innovation Foundation (NIF), an autonomous institution under the Department of Science and Technology, Government of India, and Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI), part of the Honey Bee Network.

Two editions of FOIN have been hosted at the Rashtrapati Bhavan. The first edition was held during March 7-13, 2015 and focused on the untapped potential of knowledge-rich, economically poor people. The second edition of the week-long festival was held during March 12-19, 2016. Wide participation, both nationally and internationally, was seen in these editions.

India is perhaps the only country where the head of the state hosts such a festival at his house. Further, under the Innovation Scholars In-residence program, innovation scholars hosted at the

President's house for two weeks. The program was launched by the President on December 11, 2013 and four batches of scholars have been hosted by the President till date.

FOIN 2017, the third edition of the festival, is being held during March 4-10, 2017 at Rashtrapati Bhavan, New Delhi.

Exhibition of "Innovations in Medical Science and Biotechnology"

To tackle the abysmally poor doctor-to-patient ratio and the demographic divide, our country needs technology as an enabler in ensuring quality healthcare and tackling inequity. The challenges faced in ensuring accessible, affordable and appropriate healthcare to all are in fact many as well as complex. Success will depend on development of viable technological solutions. The healthcare technologies developed across country will need to be taken forward to grass root level.

An Exhibition on **'Innovations in Medical Science and Biotechnology'** is organized for one day during the FOIN since 2015. The first two editions were organized jointly by Indian Council of Medical Research (ICMR) and National Innovation foundation (NIF) on 11th March 2015 and 16th March 2016. The third edition of this Exhibition and a roundtable on: **'A Sustainable, Multi-Stakeholder Approach from Research to Technology [SMART] - Increasing Healthcare Reach**'will be organized jointly by ICMR, NIF and DBT-BIRAC (Biotechnology Industry Research Assistance Council) on 9th March 2017.

Three Hundred and Seventy Three and **Five Hundred and Eleven** technologies from various institutes (engineering colleges like IITs, universities, medical colleges/institutes and Government Departments (ICMR, DBT, DST, DRDO, CSIR, DeitY, ISRO, Ministry of Textiles, Agriculture), startups, incubators and individuals) were received in 2015 and 2016. This year ICMR received **Four Hundred and Seventy Three** Technologies from various sectors. The display of technologies at Rashtrapati Bhavan is now a coveted event and has created ripples by creating a harmony among technology developing medical research institutes, startups, individuals, regulators, National Programs and investors. The vision of this event is to showcase disruptive technologies of public health importance developed indigenously under "Make in India' effort and help them to reach the end user.

The technologies received by ICMR are at various stages of development and include import substitutes, those that have already been commercialized by startups, ready for commercialization, those undergoing clinical validation or animal studies and prototypes. The exhibited technologies are selected through an extremely rigorous process. These are first screened by a Pre Screening Committee, which is followed by a Screening Committee meeting Chaired by Prof KS Reddy (along with Dr Partha Chakraborty, Director, IIT, Kharagpur in 2015; Dr Meenakshi Sharma, Scientist E, ICMR in 2016 and Dr Gautam Saha, Prof, IIT, Kharagpur in 2017). In 2015, the Committee shortlisted 47 technologies, 40 in 2016 and 43 in 2017. The members of committee are renowned clinicians, engineering professionals from IITs, scientists from life sciences, officials from government science departments, a representative from industry and an innovator. The selection criteria is based on six parameters novelty, functionality, user friendliness, cost effectiveness, market acceptability and any social/public health relevance. A binary scoring system for each parameter and a review of

each technology by around 3 teams of two members each removes scoring bias. The technologies are selected in key health areas including maternal and child health, infectious diseases including tuberculosis and mosquito borne diseases, non communicable diseases, disability and safe water and sanitation.

Since 2016, the selected technologies are also uploaded on National Health System Research Centre portal for Health Technology Assessment (HTA). The HTA evaluated successful technologies have the potential to be taken up by States through National Health Mission (NHM). HTA assessment cleared 15 technologies for state uptake in 2016 and 2 in 2015. Indian Council of Medical Research further promotes these technologies through different modes: provides technical expertise through closed interaction with clinicians, technical guidance and funding for field validation, forwarding technologies to other ministries for their end-use.

List of Innovative Medical Technologies for Market Place

Year 2017

S.No	Technology Innovators, Institute	Summary
1.	mCAPD – CAPD Dialysis Device ***Gowrishankar Wuppuluru*** IITM Incubation Cell, Chennai	mCAPD is a wearable CAPD dialysis device with a cloud based patient management system, allowing renal disease patients to undergo CAPD dialysis anytime, anywhere.
2.	Cardiac Patch ***Soma Guhathakurta***, Synkromax Biotech Pvt. Ltd; IIT Madras	This is an import substitute. SynkroScaff is a tissue engineered bovine pericardial patch. It is manufactured in a facility complying with GMP standards. It can be used to achieve anatomical correction of the deformities in heart and its blood vessels
3.	Pediatric Perimeter ***Prem Nandhini,*** L V Prasad Eye Institute, Hyderabad	It measures visual fields (extent of side vision) in babies. This can be helpful in detecting life-threatening disorders (e.g. brain tumor).
4.	A Hand Cranked Defibrillator ***Ashish S Gawade*****,** Jeevtronics Pvt Ltd, Pune	This is dual powered defibrillator (4 patents) which works on both grid electricity and a built-in hand cranked generator. The circuits are designed such that it reduces the overall cost of the device to 1/4th of the existing devices currently available in market.
5.	MIRCaM – Mobile Intelligent Remote Cardiac Monitor ***Anand Madanagopal,*** Cardiac Design Labs Pvt. Ltd.	MIRCaM provides real-time analysis in ambulatory ECG mode for episodes as they occur and has the potential to provide advanced diagnosis in smaller settings. It creates an automatic workflow on the cloud for reporting and alerting a cardiologist. This has the potential of providing advanced diagnosis in smaller settings.
6.	Reverse Dot Blot (RDB) kit for beta-thalassemia mutations and abnormal hemoglobin ***Ajit Gorakshakar,*** National Institute of Immunohaematology (ICMR), Mumbai	The kit contains normal and mutant oligoprobes immobilized on nylon membrane strips for detection of six common beta-thalassemia mutations and two common abnormal hemoglobin prevalent in India. It also has the additional provision to directly detect a more common thalassemia deletion found in Indians.

7.	Qora Stool Management Kit ***Urvashi Singh,*** Consure Medical, New Delhi	This kit safely and comfortably captures and directs stool into an odor proof collection bag. QoraTM offers an enhanced level of security and protection to bedridden patients by minimizing painful and costly complications often arising from fecal incontinence. The kit has the potential to redefine standards of fecal incontinence management in bedridden patients.
8.	Diagnostic for infective (L3) stage larvae of *Wuchereria bancrofti* in vector mosquito, *Culex quinquefasciatus* ***V. Vasuki,*** Vector Control Research Centre (ICMR), Puducherry	Stage (L3) specific detection assay may provide a more direct measure of transmission risk. It may be useful as a sensitive and non-invasive surveillance tool for monitoring global programme for the elimination of lymphatic filariasis.
9.	Tactile Sensory Feed Back System to Predict Peak Palmar & Plantar pressures ***Sathish Kumar Paul,*** Schieffelin Institute of Health Research & Leprosy Centre, Vellore	Tactile sensory feedback system has been developed to predict peak palmar and plantar pressures. The tactile sensors along with the data acquisition system can help detect and prevent early impairment among patients with peripheral nerve damage.
10.	Computer Numerical Controlled microscope ***Satya Tapas,*** Centre for Cellular and Molecular Platforms, Bangaluru	CNC microscope is a portable device with a compact lens system and image capturing features. It has been designed for malaria diagnosis and can be used in remote areas
11.	Labike Mobile lab ***Amit Bhatnagar,*** Accuster technologies Pvt Ltd, Gurgaon	This technology has (1) a Suitcase version and (2) a Motorcycle fitted mobile version. It is compact portable clinical laboratory having power back-up, biochemistry analyzer, centrifuge, incubator, data recorder/mini laptop with patient data management software, micropipettes and other accessories, performs 36 tests, operates on battery as well as solar power and transfers data through satellite in real time.
12.	Neonatal Resuscitation trolley with delayed cord clamping ***Subhashree,*** Phoenix Medical Systems Pvt Ltd & Madras Medical College, Madras	This is an innovative warmer with a baby receiving resuscitation platform which can be placed close to the delivery table and facilitate receiving the baby without cutting the umbilical cord with intact placental circulation. It is incorporated with all the necessary equipment required for neonatal resuscitation.

13.	Cilika - portable digital microscope ***Samrat,*** Med Prime Technologies, SINE, IIT Bombay	Cilika is a portable digital upright microscope with an indigenously designed optical system, which has a magnification of upto 1500X. A mobile phone or a tablet is used to display the magnified image, allowing it to be captured as a digital image, which can be stored, transferred or processed.
14.	Haemostatic Biomedical Products & Devices for Blood Loss Management in Road Accidents ***Amit Tyagi***, Institute Of Nuclear Medicine & Allied Sciences, New Delhi	A high viscous polymeric hydro gel formulation with a set of biocompatible polymers has been developed to reduce blood loss. Light weight nano porous polymeric scaffolds rendering efficient instant blood clotting function in addition to decontamination of the wound by means of surface de-absorption of debris and heavy metals have also been developed.
15.	NeoBreathe – A foot operated newborn resuscitation system **Avijit,** Windmill Health & SIB, New Delhi	NeoBreathe is a foot-operated, easy to use resuscitator that empowers frontline health workers to save lives in remote and hard to reach areas.
16.	A laterite based filter for arsenic removal ***Sirshendu De*** Indian Institute of Technology, Kharagpur	This is a low cost, indigenous, affordable, easy to handle, no side stream generating, gravity driven arsenic filter specifically targeted for rural population. The technology uses patented activated laterite based filter design, which delivers arsenic, iron and coliform free safe drinking water at 2 paise / litre.
17.	Suchek –Glucometer and its Strips ***Rohit Srivastava and Yogesh***, IIT, Mumbai & Biosense, Thane, Mumbai	Suchek is an indigenous, accurate, low-cost glucometer. Suchek reagent strips are as accurate as conventional glucometers, at a fraction of the price. Along with the glucometer, the companion Suchek mobile application helps save, trend and analyze blood glucose levels at an individual level or track response to treatment at a community level.

List of Innovative Medical Technologies

Year 2017

18.	PorFloR: A Fluorescence Lateral Flow Assay Strip Reader ***Vivek Borse***, IIT Bombay, Powai, Mumbai	A small handheld device that records change in intensity of fluorescence spot on a solid 2D base (e.g. paper strips) allowing qualitative and quantitative detection of an analyte.
19.	Ayurvedic Preparation for Rabies And Japanese Encephalitis ***Rajesh Kumar Ganjhu***, Pune	This is a plant product and has been found to b effective for rabies and Japanese Encephalitis.
20.	Personal Kidney Care Kit ***Sarabjeet Singh Johar***, Kanpur Test House, Kanpur	One-minute home test kit for the detection of urinary albumin. This technology can be used by patients for detection, prevention and treatment of kidney damage.
21.	Zimba Automatic Chlorine Doser ***Suprio Das***, Zimba, Kolkata	It is a community scaled automatic chlorine doser for disinfection of water at the point of collection. It weighs about 10 kg, is easy to install, doses accurately and requires very little behavior change from users. It can be retrofitted to existing water source.
22.	Advanced Electrolarynx ***Gaurav Lodha***, IIT Madras	A hand-held electrolarynx (EL) is an electronic speech aid device that enables the laryngectomee to regain vocal communicability after the surgical removal of the larynx.
23.	LED Flexible Video Endoscopy Systems ***Rajendra Raina***, Mitra Medical Services Llp, New Delhi	Flexible video endoscopes are an essential medical device for diagnosis and treatment of diseases associated with human gastro-intestinal tract. Presently, they employ high power consuming xenon lamps for illumination. This innovation eliminates the use of Xenon lamps and employs LEDs for illumination.
24.	A Molecular Technique for Mapping Of Malaria Vectors And Their Vectorial Attributes ***R K Hazra***, Regional Medical Research Centre, Bhuvaneshwar	This is a PCR-based tool for effective malaria surveillance at the village level and evaluation of vector control strategy. This technique allows quick, decentralized mapping and characterization of malaria vectors, parasite type and blood source. It can be utilized to identify and predict malaria incidences, where expert entomologist is not available.

25.	High Resolution Digital Holographic Microscope System ***Kedar Khare***, IIT Delhi	This technology allows holographic 3D imaging of cell samples in addition to the usual bright field imaging mode.
26.	NeoBolt & NeoRider ***Swostik Sourav Dash***, TTK Center for R2D2, IIT Madras	The technology is an add-on device to convert a wheelchair to outdoor mobility vehicle. The vehicle is stable over rough terrain and offers movement over long distance.
27.	Innovative Oxygen Enrichment Technology ***Rajendra Kharul***, Genrich Membranes Pvt. Ltd., Pune	Oxygen therapy is expensive and considered a luxury in India. This technology provides decentralized, innovative oxygen therapy based on hollow-fiber membrane technology at affordable cost to patients suffering from lung diseases (COPD, asthma and premature-neonates). The unit is light weight, portable and easy to operate.
28.	Digital Magnivisualizer ***Aditya Parashari***, National Institute of Cancer Prevention Research (ICMR), NOIDA	Digital magnivisualizer is useful for screening of cervical cancer. It is a portable battery powered self-illuminated multispectral multi-magnification device integrated with a high resolution camera for image capturing and is Wi-Fi enabled. It can be operated by any smart phone or Tab with android software.
29.	SWASTi: A Smart Walking Aid Stick for Individuals Having Parkinson Disease ***Uttama Lahiri, Megh Patel, Sai Ramakrishna,*** IIT, Gandhinagar	SWASTi includes microcontroller module that use proximity sensors along with self-learning algorithm to dynamically identify the risk of freezing of gait (FOG) in a patient with parkinson. On detecting the risk, SWASTi will give suitable cue to the patient while adapting to individual's walking capability to mitigate the risk of freezing.
30.	Paper-based Test Kits for Testing Antimicrobial Susceptibility ***Shantimoy Kar***, IIT Kharagpur	This technology provides a paper–based platform for detecting drug resistance characteristics of bacteria. In particular, it offers a portable, rapid, easy and multiplex able assay system to screen the bacterial drug resistance characteristics towards one or multiple drugs.
31.	Single Use Safety Syringe ***Atul Sardana***, Alfa Corpuscles Pvt. Ltd., New Delhi	The safety syringe incorporates needle stick injury and reuse prevention without any need for training. It's novel design permits manufacturing at a cost marginally above normal syringes and is designed for clinical use, phlebotomy, vaccine delivery. It can also be used as a prefilled syringe for drug delivery.

32.	Truenat ® MTB ***Chandrasekhar Nair***, Bigtec Pvt. Ltd. Bangaluru	Truenat ® MTB is a molecular diagnostic test for detection of *Mycobacterium tuberculosis* (MTB). It is a disposable microchip with pre-loaded PCR reagents – enabling the user to just add nucleic acid sample and start the test. It allows accurate detection of MTB in < 1 hour in near-patient settings.
33.	DocsApp - 24x7 Online Specialist Doctor Consultation ***Satish Kannan***, Phasorz Technologies Pvt. Ltd. (DocsApp)	DocsApp is an application that helps patients connect to specialist doctors across the country via call or chat, using their mobile phones. Doctors from 15 specialties such as gynecology, pediatrics, psychiatry etc. can be reached through the platform. DocsApp combines artificial intelligence and medical science to provide effective solutions to doctors
34.	Cathy+ Safety I.V. Cannula with SIP CLIP ***Rajiv Nath***, Hindustan Syringes & Medical Dev. Ltd, Faridabad	Cathy +I.V.Cannula is a safety engineered device to prevent needle stick injury post cannulation.
35.	QuickSee - A Handheld Autorefractor ***Ramakrishnan***, Aurolab, Madurai	The QuickSee is a portable handheld device to measure the refractive error of human eye to provide prescription for eye glasses. It employs wave-front aberrometry technique to calculate the patient's refractive error with a measurement range -8D to +10D in less than a minute
36.	ReMotion Polycentric Prosthetic Knee Joint ***Pooja Mukul***, Jaipur Foot Organization, Jaipur	The ReMotion Knee is a prosthetic knee designed for people who have lost their lower limb from above the knee. It is based on the versatile polycentric concept. It closely mimics the motion of a human knee. It is designed for mass manufacturing and injection molded using acetal polymer in an ISO 13485 manufacturing facility.
37.	Cervical Cancer Screening Tool ***Adarsh Natarajan***, Aindra Systems (P) Ltd, Bangalore	CaCx Detect is an affordable and portable, point of care cervical cancer screening tool to automate the analysis of the Pap smear slides. The slides are stained, scanned, digitized and then analyzed using computer algorithms to triage them into normal, suspected and abnormal samples. The images are then sent over a tele pathology medium to pathologists for further confirmations and recommendations.
38.	iGest - A Communication Device ***Pradeep Thangappan***, Enability Foundation for Rehabilitation, Chennai	iGest is an assistive technology specifically developed for persons with cerebral palsy who have movement and speech disabilities.

39.	MiraCradle - Neonate Cooler ***Ankit Jhanwar***, Pluss Advanced Technologies Pvt. Ltd., Gurgaon in Collaboration with CMC, Vellore	Keeping a baby at 33-34^{o}C for a period of 72 hours is the only effective treatment for birth asphyxia. MiraCradle™ is an affordable non-electronic cooling device, which uses the advanced phase change material to treat babies suffering from birth asphyxia.
40.	A Miniature Flow Analyzer ***Taslimarif Saiyed***, Centre for Cellular and Molecular Platforms, Bangalore	A lab prototype for state of the art flow analyzer with efficient integration of non expensive optics, electronics and micro fluidics techniques, to make quantitative immune monitoring affordable and accessible has been developed. This can cater to various healthcare needs including immune state monitoring in infectious diseases e.g. CD4 cell counting in HIV/AIDS, at point-of-care locations.
41.	Point-of-Care Biosensors ***Vinay Kumar***, Indian Institute of Science, Bangalore	Electrochemical technology developed at Centre for Nano Science and Engineering (CeNSE), Indian Institute of Science, Bangalore can perform eight tests on a single device : HbA1c, glycated albumin, blood glucose, Hb, serum albumin, micro albuminuria, urine creatinine, ACR for diabitic patient management.
42.	Saans. ***Nachiket Deval***, Coeo Labs Pvt. Ltd., Bangalore	"Saans", a project supported by DBT SPARSH grant, is a low cost, portable and easy to use mechanical continuous positive airway pressure (CPAP) device, which provides constant pressure, and constant volume air flow in the lungs of newborns and infants suffering from respiratory distress syndrome (RDS) thus preventing lung collapse during transportation from the rural center to a neonatal ICU.
43.	TBCCTV ***Nishant Kumar***, Embryyo Technologies Private Limited, Pune	TBCCTV is an advanced electronic medical event monitoring system for drug adherence in tuberculosis patients. It consists of an electronic pill-box with a novel sensing mechanism, a web software and a mobile software, which facilitates real-time patient monitoring.
44.	Lab on Chip Device for Blood Plasma Separation ***Ashis Kumar Sen,*** IIT Madras	Hydrophobic region in hydrophilic capillary microchannel impedes motion of blood, leads to aggregation of RBCs which acts as self-built-in-filter and facilitates separation of less viscous plasma. Under acoustophoresis, RBCs concentrate at channel center (node) and cell free plasma collects at walls (antinode) which is separated by a trifurcated channel.

Technologies Selected for Market Place

1

mCAPD – CAPD Dialysis Device

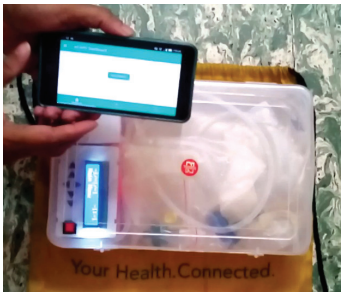
Sponsors

BIRAC and IITM Incubation Cell , Chennai

Innovator: Gowrishankar Wuppuluru
Contact Details: IITM Incubation Cell, Chennai
Email: gowripran@yahoo.com
Mobile: 9176614009
Technology Readiness Level : Prototype
Intellectual Property Right: Patent No. 687/CHE/2014 Remarks: Patent Published in Jan 2016. Request for examination submitted for PCT filed in Jan 2015. Ref No: PCT/IN2015/000206

Snapshot

mCAPD is a wearable CAPD dialysis device with a cloud based patient management system, allowing patients with renal disease to undergo CAPD dialysis anytime, anywhere without much support from their caregivers. mCAPD is a fully automated and its smart app, keeps patients connected to their caregivers/doctors. CAPD auto cycler, costing five times less than existing alternatives.



Novelty

Patients with Renal disease undergoing dialysis lose their mobility and are chained to their hospital beds. They are affected economically, physically and emotionally due to high costs of treatment and travel as dialysis centers are available in metros only. mCAPD empowers millions of patients, especially from rural areas, with a near normal lifestyle through simple, affordable, access to dialysis anytime/anywhere.

* Wearable, anytime/anywhere CAPD dialysis
* Home based care/ Management
* One fifth cost of existing device
*Simple maintenance and ease of dialysis management

* Research on recyclability has the potential to reduce cost from existing INR 30000 to 10000 per month per patient.

Safety Issues

* Can be used even in rural setting* Switching to manual mode of dialysis possible * Sterile connector minimizes risk of infection * Simple connections and fully automatic process makes it easy for patients to manage dialysis.

Third Party Validation / Clinical Trial

Animal trials in progress * Clinical trials in major metros planned * CE certification, ISO 13485 medical device standard compliance planned * Stringent electro-mechanical tests for radiation, power and ease of use

Industrial Partner : Not yet identified

Cost: INR 80,000 to 1,00,000 per unit

Public Health Implications

Will dramatically reduce the cost of dialysis, empower patients and services can be assessed in remote areas

Market Potential, Competition and Risk Envisaged

* In India alone, about 2 lakh patients with renal disease requiring dialysis are added every year. Even if we target 100 patients per month, with a cost of INR 50,000 per unit, we estimate about INR 6 crores per annum, addressing less than 0.01% of the target population * There are millions more in the country and other developing countries who can benefit from mCAPD * We plan to participate in National Dialysis Mission 2016, and introduce mCAPD in as many PHCs as possible in PPP mode.

* Baxter, Fresenius and a couple of MNCs have automatic cyclers, which cost five times and are not wearable. *mCAPD uses recyclable membrane This will make mCAPD stay at a pioneering position for many years. * Adoption by doctors and recommendation to their patients is a challenge.

2

Cardiac Patch

Sponsors
IIT, Madras

Innovator: Soma Guhathakurta & Venkatesh Balasubramanian
Contact Details: Synkromax Biotech Pvt. Ltd; IIT Madras
Email: drsoma@smbpl.com
Mobile: 9198404290
Technology Readiness Level : Developed, Made in India & Commercially Available
Intellectual Property Right: License Number: TN00004031, DATED 04/05/2016"An improved process for obtaining engineered pericardium and derivatives Inventors: Dr.Soma Guhathakurta Dr. Venkatesh Balasubramanian IIT MADRAS

Snapshot

SynkroScaff is an import substitute and is a tissue engineered bovine pericardial patch. It is manufactured in a facility complying with GMP standards. It can be used to achieve anatomical correction of deformities deformities in heart and heart blood vessels.

Novelty

Surgical patches are required in cardiac surgeries related to congenital heart diseases (12 in thousand live births) and cardiovascular interventions in adults. Presently India imports 100% of biological origin surgical patches which have limited versatility and are inadequate in meeting the demands. A tissue engineered indigenous pericardial patch has the property of regeneration and integration in the body and ease of handling by the surgeons. Our patches are superior to imported patches. The indigenously developed patches do not calcify, are hemo-compatible and do not produce thrombus. It has neither been glutaraldehyde treated nor preserved.

Safety Issues

Nil

Third Party Validation / Clinical Trial

One hundred and thirty patches have been implanted in patients in different hospitals of India.

Industrial Partner: X Biotech Pvt. Ltd.

Cost : small [4x4 cm;]: INR 6000; medium [6x6 cm] INR 8000; large[8x8 cm]: INR 10,000

Public Health Implications

The innovation will provide cardiac patches for cardiac surgeries at very low cost as compared to current imported patches making the treatment available to those who cannot afford.

Market Potential, Competition and Risk Envisaged

Cardiac surgeons and other surgeons are the end users. This is 100% import substitute; St. Judes pericardium and Brazil pericardium are available in the Indian market but they are cellular and preserved in glutaraldehyde. After this indigenous product was commercialized, the import companies slashed the price. As this is first of its kind in whole of Asia, so guidelines on biological device were not available. We have complied with regulatory authority's instructions regarding manufacturing and production and carried out validation studies.

3

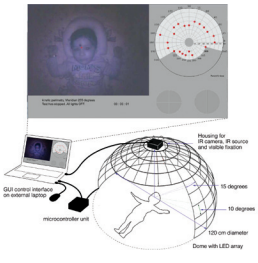
Pediatric Perimeter

Sponsors

L V Prasad Eye Institute, Hyderabad

Innovator: Prem Nandhini
Contact Details: L V Prasad Eye Institute, Hyderabad
Email: premnandhini@lvpei.org
Mobile: 8099224888
Technology Readiness Level : Ready for Commercialization
Intellectual Property Right: Indian Patent: 4341/CHE/2015, 19th August 2015, An apparatus and a method therewith to quantify visual patterns in infants PCT: PCT/IB2016/054148, 12th July 2016, An apparatus and a method therewith to quantify visual patterns in infants

Snapshot



It measures visual fields (extent of side vision) in babies. This can be helpful in detecting life-threatening disorders (e.g. brain tumor) and monitoring progress following intervention therapy in children with multiple disabilities

Novelty

Testing of baby's vision, especially visual fields, is very challenging as it requires non-movement of eyes during the test. Adults undergo this test without moving their eyes and pressing a button to indicate detection of the light. Since babies move their eyes, we used eye movement itself as a surrogate measure for visual field extent. Device algorithms quickly estimated visual fields in babies upon detection of meaningful eye movement by the clinician. Also the design of the device permitted comfortable testing even for adults with cognitive impairment.

Safety Issues

The device hosts 4 infrared (IR) LEDs having a dominant wavelength of 940 nm and RGB LED light strip having a dominant wavelength of 555 nm. These components are compliant with ISO safety standards (ISO 15004-2:2007(E)).

Third Party Validation / Clinical Trial

Pilot validation studies were done in adult participants wearing field loss simulator goggles and in adult patients with field loss. A larger scale study collecting normative data on infants with normal milestones is also underway. Comparative study in infants having developmental delays will be conducted.

Industrial Partner: Not yet identified

Cost : INR 60,000 - 90,000

Public Health Implications

Rashtriya Bal Swasthya Karyakram (RBSK) under National Rural Health Mission carries out "Child Health Screening and Early Intervention Services". It has reported around 6 to 7 babies out of 100 have a birth defect including visual impairment in India, translating to 1.7 million affected children annually. Thus there is a need for screening vision in children which may reduce economic burden due to vision impairment in the country. The pediatric perimeter would address the health need of newborns and children.

Market Potential, Competition and Risk Envisaged

The end-users for this device would be health professionals in neonatal care units, pediatric, ophthalmology and neurology clinics. Some basic training maybe required to operate the device and this might be the initial barrier towards its usage. Presently there is no such device for testing newborn. Therefore a minimal competition will be there. The threat to the IP is that the idea is simple and can be easily replicated. The device and the testing procedure are non-invasive and the risk of using this device will be minimal.

4

A Hand Cranked Defibrillator

Sponsors

BIG (BIRAC), IIPME (BIRAC+DeitY), IUSSTF, Venture Center (NCL Pune)

Innovator: Ashish S Gawade
Contact Details : Jeevtronics Pvt Ltd, Pune
Mobile: 9850819688
Technology Readiness Level: Ready for Commercialization, Production will be initiated in March 2017.
Intellectual Property Right: 1 Granted US patent US6597949 2. Indian Patent Application No. 3368/MUM/2015 3. Indian Patent Application No. 3367/MUM/2015. PCT filed in India.

Snapshot

This is dual powered defibrillator (4 patents) which works on both grid electricity and a built-in hand cranked generator. The circuits are designed such that it reduces the overall cost of the device to 1/4th of the existing devices currently available in market.

Novelty

The global burden of disease study observed that of the 2.2 million deaths, 1.8 million occurred due to cardiovascular diseases in low and middle income countries. India alone has over 6.6 lakh sudden cardiac deaths annually. Death rate in Indians due to SCA is 3 to 4 times more than that in developed countries. Number of defibrillators available is low (1 per 50 beds vs. 1 per 3 beds in UK). Ambulances in the country do not carry this life saving device. It is also not available at public places. Reasons are cost of equipment and lack of electricity in villages.

Jeevtronics defibrillator can work in rural/ small towns of India. Price to the end user is one fourth of big brands. Novelty is protected by 4 patents. Patents are around the electronics architecture inside and its key features.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Since this is a Class 2a (MDD) device, no 3rd party validation or human trials are required. Only 510K substantial equivalence is needed. This means proving that the device is equivalent to a commercially available defibrillator.

Public Health Implications

All Primary Health centers (PHC) and Community Health Centers (CHC) in the country can use this device because it can work without grid electricity and is affordable. The product has the potential of saving many lives.

Market Potential, Competition and Risk Envisaged

Penetration of defibrillators in developing countries is increasing. Thus, there is no barrier to acceptance. We offer a unique feature of additional power source built into the product with a cost which is 1/4th of the cost of imported defibrillator. It can be installed in PHCs and CHCs, ambulances, factories and public places. Indian Army is very interested in this product.

Total market size is estimated to be USD 2.2 Billion globally. Countries like India, Africa, Asia, and S America are the potential buyers

Philips, Zoll, Physio Control, BPL are the main competitors in the defibrillator segment. However, they are between 2.5 to 4 times more expensive and do not make hand cranked generator feature. Defibrillator technology is not expected to get obsolete in near future. IP is around key features and electronic architecture. We do not foresee obsolescence.

5

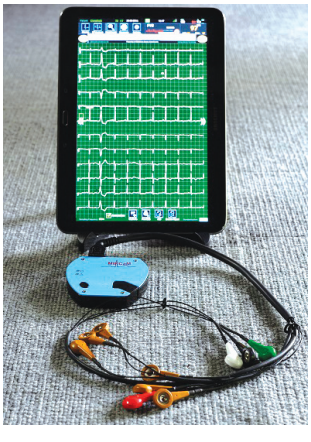
Mircam – Mobile Intelligent Remote Cardiac Monitor

Sponsors

Cardiac Design Labs Private Limited, Bangalore

Innovator: Anand Madanagopal
Contact Details : Cardiac Design Labs Private Limited
Email: anandm@cardiacdesignlabs.com
Mobile: 9035014517
Technology Readiness Level: Developed, Made in India & Commercially Available
Intellectual Property Right: Patent Filing No: Ref. No.: E-2/2440/2016/CHE, App. Number: 201641014618 Date: 2016/08/12 Title: Continuous cardiac monitoring and real time episode detection system

Snapshot



MIRCaM provides real-time analysis in ambulatory ECG mode for episodes as they occur and has the potential to provide advanced diagnosis in smaller settings. It creates an automatic workflow on the cloud for reporting and alerting a cardiologist. This has the potential of providing advanced diagnosis in smaller settings.

Novelty

The 10-second resting ECG is not an adequate tool for diagnosis of arrhythmia and coronary artery disease; ECG is required to be taken in an ambulatory-mode for complete analysis. Competitors either do resting ECG, lack real time monitoring or do arrhythmia analysis alone and processing at the backend. MIRCaM is a continuous 12 lead/variable lead ambulatory ECG monitoring device for a short/long term real time monitoring and analysis. Device can perform functions of Holter, resting ECG and a stress test. Device does ST analysis and arrhythmia detection on same data set and in real time.

Safety Issues

MIRCaM has passed the following safety tests based on the respective standards (i)RE(Radiated Emission test) - CISPR11, EN 60601-1-2 (ii)RS(Radiated Susceptibility test) - 61000-4-3, EN 60601-1-2

Third Party Validation / Clinical Trial

Successful clinical trials at the KMC, Manipal.

Industrial Partner: We are a technology services based company. Our revenues come from recurring revenues on a pay per use /subscription model. We sell the hardware at a one time cost where we put a small margin to cover our cost. The main revenues come from product usage.

Cost: INR 500-700 per patient as compared to market cost of INR 2000-4000.

Public Health Implications

This device brings high end cardiac diagnostics to smaller settings without expert technician or a cardiologist. This has tremendous implications of providing cardiac care at PHCs doorstep.

Market Potential, Competition and Risk Envisaged

Our customers consists of large, midsized and small care providers especially physician driven practices and cardiology clinics. We are planning to start billing the clients from Jan 2017. Since our revenues are based on pay per use (PPU) model, we have currently started the deployments on a deferred billing basis.

The competitors do not have intelligent algorithms for a full comprehensive analysis of ECG for all disease conditions in one device (resting & Holter). The backend processing by personal is heavy on their side and makes the operating costs high. We have implemented a full workflow along with the intelligent analysis makes the reporting very light for the backend team.

The challenge is getting the pay-per-use model workable. Smaller settings will need staff to be educated/ trained regarding this device as a point of care diagnostic device.

6

Reverse Dot Blot (RDB) kit for beta-thalassemia mutations and abnormal hemoglobin

Sponsors

Indian Council of Medical Research

Innovator: Ajit Gorakshakar
Contact Details: NIIH (ICMR), Mumbai
Email: ajit5678@yahoo.com
Mobile: 9820400096
Technology Readiness Level: Ready for Commercialization
Intellectual Property Right: Patent awarded in January 2005 (No.194149): "A process for the preparation of diagnostic kit for detection of β-thalassemia syndromes" RB Colah, AC Gorakshakar and D. Mohanty

Snapshot

The kit contains normal and mutant oligoprobes immobilized on nylon membrane strips for detection of six common beta-thalassemia mutations and two common abnormal hemoglobin prevalent in India. It can also detect another common thalassemia deletion found in Indians.

Novelty

There are about 35-45 million beta-thalassemia carriers in India. About 10,000 -12,000 babies affected with beta-thalassemia major are estimated to be born every year. This kit identifies common beta-thalassemia mutations and two abnormal hemoglobin, which cover about 90% of all the defects seen in beta-thalassemia syndromes in India. The kit is tailor-made for the Indian population and enables prenatal diagnosis to prevent birth of affected children, which is the ultimate goal of the National Thalassemia Control Programme.

Safety Issues

Nil

Third Party Validation / Clinical Trial

The preliminary validation of the kit has been done at seven well known centers in India working on molecular basis of thalassemia. The entire experimental procedure is confirmed. Final validation of the kit by these centers is remaining.

Industrial Partner: The kit is going to be commercialized by Imagenex, Bhubaneshwar, Odisha.

Cost: About INR 15000 per kit

Public Health Implications

Will be useful in diagnosis of beta-thalassemia.

Market Potential, Competition and Risk Envisaged

Laboratories offering prenatal diagnosis beta-thalassemia in first trimester of pregnancy. It is estimated that about 200 kits will be used per year.

7

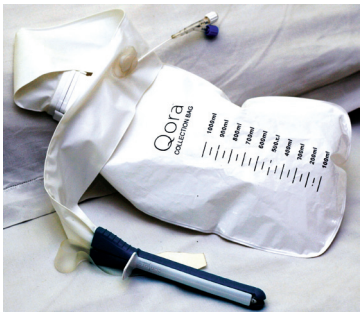
Qora Stool Management Kit

Sponsors

Stanford Biodesign & Consure Medical, New Delhi

Innovator: Urvashi Singh
Contact Details: Consure Medical, New Delhi
Email: usingh@consuremedical.com
Mobile: 09953212077
Technology Readiness Level: Developed, Made in India and commercially available
Intellectual Property Right: Patent no - US8840594B2; Publication date - 23 Sept. 2014; Filing date - 16 June 2010

Snapshot



This kit safely and comfortably captures and directs stool into an odor proof collection bag. QoraTM offers an enhanced level of security and protection to bedridden patients by minimizing painful and costly complications often arising from fecal incontinence. The kit has the potential to redefine standards of fecal incontinence management in bedridden patients.

Novelty

Nearly 100 million patients worldwide suffer from fecal incontinence (FI), the loss of bowel control. The QoraTM Stool Management Kit (SMK) is a safer and more comfortable solution that effectively collects stool and directs it into an odour proof, disposable collection bag, minimizing complications often arising from FI. This kit is FDA 510(k) cleared indwelling fecal drainage device for the management of diarrhea and fecal containment and can be used across a continuum of care facilities from ICUs to nursing homes. The device integrates a hygienic applicator to deploy a diverter inside the rectum by a minimally trained care provider or a motivated family member. It has safer intra-rectal pressures compared to intrarectal balloon catheters and is efficacious in wound management and prevention, infection control and enhances ease of nursing.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Trials have been carried out

Name of Industrial Partner: Consure Medical

Cos of Device: INR 12 to 14,000 for 29 days; Cost of Disposable: INR 2000 to 3000 (10 bags set)

Market Potential, Competition and Risk Envisaged

Consure is striving to become a market leader by disrupting the $6 billion market of fecal containment solutions with the unique distinction of being one of the few emerging market healthcare companies to have both USFDA clearance and patents in all key markets. The global market for fecal containment solutions largely consists of absorbent pads and intrarectal balloon catheters. The latter segment of the market is led by three companies, CR. Bard, ConvaTec Inc., and Hollister Inc. With a product that expands indications for use, reduces skill level required to use a device, and introduces a new level of care for patients outside the ICU, Consure plans to disrupt the market by launching three product extensions that have successfully completed all safety and efficacy studies.

Consure is also able to customize volume pricing for patients and non-traditional care providers, reducing time and cost for the end users which is a significant advantage over competitors. As a company, Consure is one of the first to perform an extensive clinical evaluation of its technology by gathering both pre- and post-use sigmoidoscopy data on all study patients

8

Diagnostic for infective (L3) stage larvae of *Wuchereria bancrofti* in vector mosquito, *Culex quinquefasciatus*

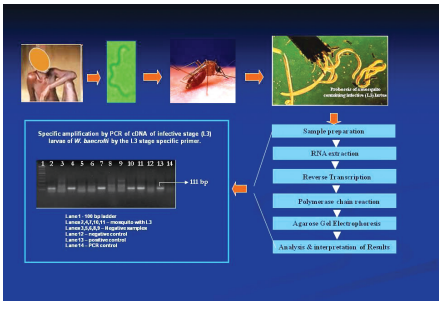
Sponsors

Indian Council of Medical Research

Innovator: V. Vasuki
Contact Details: VCRC (ICMR), Puducherry
Email: vvasuki@yahoo.com
Mobile: 9442585337
Technology Readiness Level: Developed, Made in India and commercially available
Intellectual Property Right: Indian patent No. 257150 dated 06.09.2013 on "A process for diagnosis of infective (L3) stage larvae of Wuchereriabancrofti in vector mosquito, *Culex quinquefasciatus*."

Snapshot

Stage (L3) specific detection assay may provide a more direct measure of transmission risk and may be useful as a sensitive and non-invasive surveillance tool for monitoring global programme for the elimination of lymphatic filariasis.



Novelty

This PCR based assay could detect mosquito with minimum number (1-2) of L3. It can also defect only L3 among all other stages in a pool of 25 mosquitoes. The specificity and the sensitivity of the assay is 98-100%. This assay is based on the stage specific primers, designed based on the genes up-regulated in infective stage larvae of filarial parasite, W. bancrofti.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Third party validation was carried out in four national centres and the results indicated that the assay was as sensitive and stage specific as the conventional mosquito dissection technique.

Industrial Partner: Not yet identified

Cost: About INR 1000/- per reaction containing pool of 25 mosquitoes

Public Health Implications

This assay can facilitate real time assessment of the active transmission of infection, which is useful for evaluating the success of GPELF by monitoring the decline of transmission risk following MDA.

Market Potential, Competition and Risk Envisaged

End user: NVBDCP
No competition till date
No risk involved

9

Tactile Sensory Feedback System to Predict Peak Palmar and Plantar Pressures

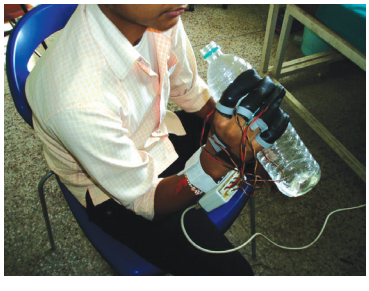
Sponsors

Schieffelin Institute of Health Research & Leprosy Centre, Karigiri, Vellore

Innovator: M. Sathish Kumar Paul
Contact Details: Schieffelin Institute of Health Research & Leprosy Centre, Vellore
Email: sathishpaul77@gmail.com
Mobile: 09442379566
Technology Readiness Level: Developed, validated and clinical trials done
Intellectual Property Right: Comprehensive injury detection and prevention tool for leprosy affected patients. Application Ref. no: 1540/CHE/2014

Snapshot

Tactile sensory feedback system has been developed to predict peak palmar and plantar pressures. The device has been developed with 10 low cost tactile sensors. The sensors along with the data acquisition system would help detect and prevent early impairment among patients with peripheral nerve damage.



Features

The peripheral nerve damage in patients leads to impairments, which if neglected, can lead to life threatening problems like amputations. This technology helps assess and provides feedback on peak palmar and plantar pressure at specific points of the hand and feet, which can help in preventing impairments.

Safety Issues

The sensor in sole and glove will be an external device, which works on a normal battery and does not pose a threat to patients using it.

Third Party Validation / Clinical Trial

The result of the follow up study on the efficacy of the sensor's gloves has been published in journals and presented at conferences.

Industrial Partner: Discussions with potential partners are currently being undertaken

Cost: INR 30,000 as compared to lowest cost of the technology available in market INR 500000

Public Health Implications

The device can be safely used by the patient and prevent major complications like ulcers, amputations etc. Its use will minimize expenses on treating and managing patients.

Market Potential, Competition and Risk Envisaged

There is a huge population of patients with peripheral nerve injuries, which can typically occur in diabetes, motor neuron diseases, leprosy etc. Hence there would be demand for this product from healthcare sector and individual patients. In developing countries where they cannot afford expensive products, this low cost product will find many takers.

10

Computer Numerical Controlled Microscope

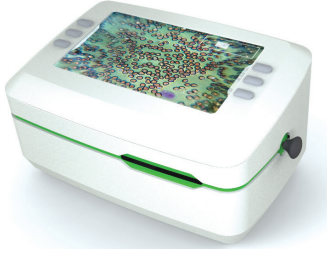
Sponsors

BIRAC, C-CAMP and SciDogma Research

Innovator: Satya Tapas
Contact Details: Centre for Cellular and Molecular Platforms, Bangalore
Email: satyatapas.dahp@gmail.com
Mobile: 8197160415
Technology Readiness Level: Prototype
Intellectual Property Right: Two patent applications under process.

Snapshot

The CNC microscope is a revolutionary technology in microscopic-based diagnosis. This microscope is a portable device with a compact lens system and image capturing features. It has been successfully designed for malaria diagnosis and can be used in remote areas in developing countries where the access to diagnostic and health services is still limited.



Novelty

Microscopy is a powerful technique for clinical diagnosis, however, it's a bulky instrument to carry and requires human expertise. Though microscopy is a gold standard method for malaria diagnosis, it has its limitations. CNC microscope is an advanced microscope with advanced features such as auto-alignment, auto-focus and auto scan. It's a battery operated portable device, which can be used in remote areas as point-of-care device. It uses artificial intelligence to diagnose infection like malaria.

Safety Issues

The CNC microscope is most advanced technology and can be used with minimum training. No safety issues are associated with it.

Third Party Validation / Clinical Trial

The project was funded by BIRAC to develop proof of concept. The device has been used and the results have been validated by doctors at MSR Medical college and Hospital Bangalore.

Industrial Partner: Not yet identified.

Cost of Technology: Manufacturing cost is INR 13,000.

Public Health Implications

CNC microscope is a cost effective, indigenous technology designed for rural set–ups with limited resources. It's a point-of-care device and can be carried to the field during outbreaks. It has image capturing and sharing features, and the data can be shared with doctors through cloud for further investigation.

Market Potential, Competition and Risk Envisaged

The global microscopy market is poised to reach USD 6.72 billion by 2021 from USD 4.68 billion in 2016. CNC microscope is expected to be used in healthcare centres, hospitals, and educational institutes and research institutes.

11

Labike Mobile lab

Sponsors
TDB, DSIR, DBT

Innovator: Amit Bhatnagar
Contact Details: Accuster technologies Pvt Ltd, Gurgaon
Email: amitb@accuster.com
Mobile: 8527895900
Technology Readiness Level: Developed, Made in India & Commercially Available
Intellectual Property Right: Patent number-265180 Patent date - 27/08/2014 Patent title -Blood testing apparatus.

Snapshot

This technology has (1) a Suitcase version and (2) a Motorcycle fitted mobile version. It is compact portable clinical laboratory having power back-up, biochemistry analyzer, centrifuge, incubator, data recorder/mini laptop with patient data management software, micropipettes and other accessories, performs 36 tests, operates on battery as well as solar power and transfers data through satellite in real time.

Novelty

Ninety five crore Indians do not have access to quality diagnostics and the reason is that conventional technology has not been designed to function effectively in the Indian scenario. This product can deliver portable and affordable economical diagnostic in remote locations. We make sure and maintain that the quality diagnostic is given in the hands of people who are operating the technology rather than to the manufactures.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Validation has been performed in reputed hospitals like AIIMS, R&R of the Indian Army, Medall, Fortis, Civil, Command hospital and several clinical diagnostics centers

Industrial Partner: Accuster Technologies Pvt.Ltd.

Cost: INR 3.80 lakh.

Public Health Implications

There is tremendous public health and economical implication in India. Currently, the product has been installed at 350 locations with the Indian Army and over locations in partnership with NGOs. The Mobile Lab is helping our clients deliver quality health services, in remote and hard to reach locations with limited resources.

Market Potential, Competition and Risk Envisaged

India and Africa are the potential markets. Accuster has been a part of Prime Minister's visit to Africa. Last year we did a business of INR 10 Cr but the potential is much bigger.

Competition of this technology is not there till now. It will be difficult for others to compete as Accuster addresses challenge to reach remote areas in a holistic manner and ensures quality and affordable services at the doorstep.

Risk and barrier are resources and funds for scaling up.

12

Neonatal Resuscitation Trolley with Delayed Cord Clamping

Sponsors

Phoenix Medical Systems Pvt.Ltd.

Innovator: Subhashree
Contact Details: Phoenix Medical Systems Pvt Ltd, Madras
Email: subhashree@pmsind.com
Mobile: 9360202287
Technology Readiness Level: Developed, validated and clinical trials done; will be developed within a year.
Intellectual Property: E-2/3611/2016/CHE

Snapshot

This is an innovative warmer with a baby receiving resuscitation platform, which can be placed close to the delivery table to receive the baby without cutting the umbilical cord and keeping the placental circulation intact. It is equipped with all necessary equipment required for neonatal resuscitation. This warming system resuscitates the neonate without cutting the umbilical cord. Resuscitation with Intact Placental Circulation (RIPC) was indigenously developed by Phoenix Medical System Pvt. Ltd., Chennai with expert collaboration from the Institute of Child Health, Neonatology Department, Chennai.

Novelty

Resuscitation with intact placental circulation (RIPC) is crucial in babies. This allows continued oxygen supply from placenta. However, RIPC is a big challenge with the available conventional warmer because of its large size and un-favorable design.

It is an overhead radiant warmer in a much smaller size (160x80x60 cm) than the conventional warmer with 180° rotatability, facilitating the resuscitator to approach the baby receiving cradle from any direction. Infant receiving bed is height adjustable and has unique rotating and sliding-out features enabling reach within 50cm of mother's perineum. Base is shorter (80x60 cm) than conventional warmer with easy mobility and so permitting close positioning to delivery cot. The device accommodates warming mattress which is made up of a phase change material, which can run without electricity and will keep the baby warm at the required temperature, T-piece resuscitator, oxygen blender, suction apparatus and APGAR timer in a modular design.

Safety Issues

Efficacy and safety are established in simulation models and 20 uncomplicated deliveries in various settings.

Third Party Validation / Clinical Trial

A service evaluation study is underway to determine feasibility and safety of this device in actual clinical situations in Institute of Obstetrics and Gynaecology, Chennai.

Industrial Partner : Phoenix Medical Systems Pvt. Ltd.

Cost: It is 3/4th lower than the cost of any international device.

Public Health Implications

In premature or compromised babies, delayed cord clamping serves as essential life support. It helps better child survival and has long term health benefit. Almost 29% of all newborn don't survive without getting enough oxygen and supplements at the time of birth. With this technology the baby will enjoy initial warmth as well 30% more blood with packed RBC, Ion supplements, stem cells, antibiotics during the first few minutes of birth.

Market Potential, Competition and Risk Envisaged

There will be considerable demand from healthcare personnel who do neonatal resuscitation, child birth centers and community and peripheral hospitals.

13

Cilika - Portable Digital Microscope

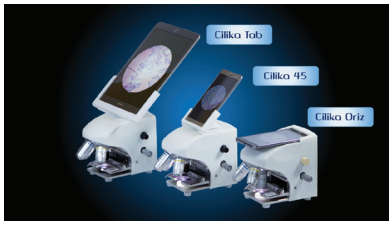
Sponsors

MedPrime Technologies, Tata Trusts

Innovator: Samrat
Contact Details: Med Prime Technologies, SINE, IIT Bombay
Email: samrat@medprimetech.com
Mobile: 9969578133
Technology Readiness Level: Ready for commercialization
Intellectual Property Right: Application No: 201621038757 Date: 2016/11/14 Title: Portable Upright Bright Field Microscope With Smart Device Compatibility Application no. 4743/MUM/2015 Date: 21/12/2015 Title : A Portable Microscope

Snapshot

Cilika is a portable digital upright microscope that comprises an indigenously designed optical system, which provides magnifications of upto 1500X. A mobile phone or tablet is used to display the magnified image, allowing it to be captured as a digital image, which can be subsequently stored, transferred or processed.



Novelty

Currently, there is a large dependence on bulky, expensive bench top microscopes for diagnosis, making it difficult to obtain test results quickly in rural areas. Digitization of the images requires interfacing with a computer through a camera mount, making it expensive and less portable. This device has an indigenously designed optical system that provides portability and stability without compromising on magnification and resolution; the magnified image can be viewed and captured as digital images on the phone screen. It can be subsequently stored, transferred or processed. It allows PoC diagnosis, reducing time and cost and enables automated diagnosis of diseases through image processing.

Safety Issues

Nil.

Third Party Validation / Clinical Trial

Validation study with SRL diagnostics, Mumbai for use of the device in histopathology, hematology and microbiology.

Industrial Partner: MedPrime Technologies

Cost: INR 35,000 - INR 56,500

Public Health Implications

(i) Allows PoC diagnosis of diseases such as malaria, sickle cell disease in rural areas (ii) Enables quicker diagnosis, since transportation of samples to city for analysis is not required and treatment can start immediately (iii) Cost per test is reduced due to elimination of transportation costs (iv) With the possibility of automated diagnosis using image processing, the device can be used even by semi-skilled health workers.

Market Potential, Competition and Risk Envisaged

The demand will be from healthcare personnel who do neonatal resuscitation, child birth centers, community and peripheral hospitals. There is no competition for this technology in the Indian market and imports are highly priced.

14

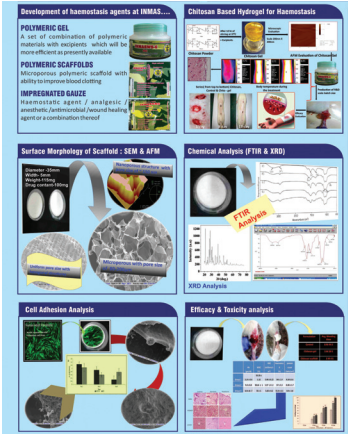
Haemostatic Biomedical Products & Devices for Blood Loss Management in Road Accidents

Sponsors
INMAS, DRDO

Innovator: Amit Tyagi
Contact Details: Institute Of Nuclear Medicine & Allied Sciences, DRDO, New Delhi
Email: amityagi@gmail.com
Mobile: 9873803015
Technology Readiness Level: Ready for Commercialization
Intellectual Property Right: No

Snapshot

A high viscous polymeric hydrogel formulation with a set of biocompatible polymers has been developed to reduce blood loss. A light weight nanoporous polymeric scaffold rendering efficient instant blood clotting function in addition to decontaminating the wound by means of surface de absorption of debris and heavy metals has also been developed.



Novelty

One of the important aspects in road accident management is to manage the haemostasis i.e. to minimize blood loss. In India, 17 people died in road accidents every hour and 53 people were injured in 2015, as per a report published by the National Crime Records Bureau. There is no formulation available for blood loss management in road accidents. Internationally available formulations do not fulfill requirements in India. This formulation will be able to stop bleeding from small capillary, lacerations, venous and arterial cuts after cleaning.

Safety Issues

Polymers used in the development of the formulations are widely used in the food and Pharma sector. Pre-clinical safety and efficacy studies have been completed as per regulatory norms.

Third Party Validation / Clinical Trial

Carried out in-house

Industrial Partners: Onida Health Care, Ghaziabad and Venus Remedies Ltd., Himachal Pradesh

Cost: INR 25 per 30ml tube And INR 100 per 2x2 inch

Public Health Implications

This will be helpful in road traffic accidents.

Market Potential, Competition and Risk Envisaged

The general population, first aid kits in vehicles, Central Police Organization, Indian Armed Forces etc.

15

NeoBreathe – Foot Operated Newborn Resuscitation

Sponsors

IUSSTF, DST, BIRAC, DBT, Bill &Melinda Gates Foundation Grand Challenges Canada Villgro Innovations Foundation

Innovator: Avijit Bansal
Contact Details: Windmill Health & SIB, New Delhi
Email: avijit@windmillh.com
Mobile: 9811802954

Technology Readiness Level : Developed, made in India and commercially available

Intellectual Property Right: (1) Design Registration: Indian Design Registration No.275868 Date of Registration: 19 Sep 2015. Title: Pedal (2) Indian Patent 4049/DEL/2015 Priority date: 10th Dec 2015, Title: Apparatus for Manual Ventilation (3) Indian Patent 1814/DEL/2012 Filing Date: June 12, 2012 Title: Resuscitation Apparatus

Snapshot

Nearly eight lakh babies die from birth asphyxia annually. Most can be saved with basic resuscitation, which is difficult using current devices. NeoBreathe is a foot-operated, easy to use resuscitator that empowers frontline health workers to save lives. Invented at SIB, AIIMS, Delhi and made in India by Windmill Health.

Novelty

Birth asphyxia can be avoided by giving artificial breathing for a few minutes. This is currently done by bag-mask, which is difficult to use as face-mask. Seal is difficult to achieve with one hand. NeoBreathe is a foot operated resuscitator that frees one hand of the user. This makes it easier to create effective face-mask seal using both hands. Therefore, a single person can do complete CPR.

Safety Issues

NeoBreathe has built in enhanced protection from high pressure surge. This is achieved by proprietary protective technology in addition to pressure release mechanism. As such NeoBreathe offers better protection to patients than prior-art bag-mask devices.

Third Party Validation / Clinical Trial

User evaluation shows nurses can deliver 20% more breaths within the targeted optimal range when using NeoBreathe compared with bag-mask. Dr. Somashekhar et al found the same results in their independent user evaluation and presented the data at PAS, Baltimore, 2016. About 20 pilot users across 10 states have found no adverse events over several months of product usage.

Industrial Partner: Developed by: Windmill Health Technologies Pvt. Ltd. Commercialization in partnership with Phoenix Medical Systems Pvt. Ltd.

Cost: INR 25,000

Public Health Implications

Birth Asphyxia is the third largest cause of newborn deaths globally. Skill barrier is one of the most well recognized factors responsible for these deaths, which are preventable by definition. This technology has the potential to bring down deaths due to birth asphyxia and therefore IMR in areas facing shortage of skill in birth attendants. The device requires no electric power and can be re-used for at least 3 years. This device is extremely low cost in terms of rupees per death averted and requires minimal training

Market Potential, Competition and Risk Envisaged

There are 2.2 crore births in India annually and 13.6 crores worldwide. As per WHO and basic standards of medical care, a resuscitation device and a person capable of using it should be present at every childbirth. This makes the market potential tremendous, with a massive growth outlook as health facilities improve globally. Kalorama Market research shows a global market of USD 3 Billion for resuscitators of which 1.5 Billion is for manual resuscitators like NeoBreathe. In India, we estimate a market for 70,000 resuscitators devices annually.

16

Laterite Based Filter for Arsenic Removal

Sponsors

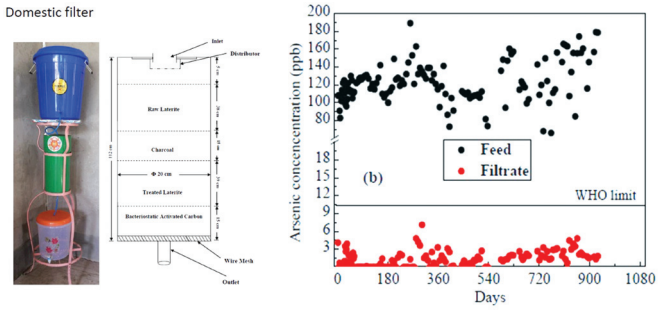
Department of Science and Technology (DST), UNICEF

Innovator: Sirshendu De
Contact Details: IIT, Kharagpur
Email: sde@che.iitkgp.ernet.in
Mobile: 9434017363
Technology Readiness Level: Developed, made in India and commercially available

Intellectual Property Right: 1) "Design of a laterite based arsenic filter for domestic and community scale", filed for Indian Patent (597/KOL/2013, Issued April 17, 2013). 2) "Development of high capacity and cost effective arsenic adsorbent using modified laterite", filed for Indian patent (614/KOL/2009).

Snapshot

The present technology is about developing a low cost, indigenous, affordable, easy to handle, no side stream generating, gravity driven arsenic filter specifically targeted for rural population. The technology uses patented activated laterite based filter design, which delivers arsenic, iron and coli form free safe drinking water at 2 paise / litre. This technology has been developed for both domestic and community use.



Novelty

Commercial filters are unable to remove arsenic and other solutions generate dangerous spent streams while achieving the target. Moreover, the majority population affected lives in rural areas and are extremely poor. This is a completely indigenous technology. The key features of this product include: removes Iron, Arsenic

and Coliform in one single pass; 5-7 years filter life; spent adsorbent satisfies TCL protocol and hence is easily disposable; domestic filter does not require any electricity; Filtered water is priced at 2 paise/litre.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Validated by UNICEF.

Industrial Partner: Vas Bros Enterprises Pvt. Ltd., Ranchi

Cost: 2 paise / litre of Arsenic free water

Public Health Implications

The technology is very low cost and can be accessed by rural population in arsenic affected areas.

Market Potential, Competition and Risk Envisaged

2.5 million people are affected by the arsenic menace in India alone.

17

SuChek –Glucometer and its Strips

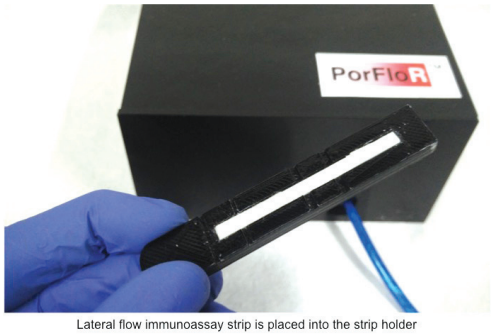
Sponsors

Indian Council of Medical Research

Innovator/s :Rohit Srivastava and Yogesh Patil
Contact Details: IIT, Mumbai & Biosense, Thane, Mumbai
Email: rsrivasta@iitb.ac.in; yogesh@biosense.in
Mobile: 9867980408, 9819046205
Technology Readiness Level: Developed, Made in India & Commercially Available
Intellectual Property Right : 112/mum/2014, Patent pending

Snapshot

With a mission of making "universal healthcare" possibility, Biosense Team has developed 6 innovations for Maternal health, Diabetes, Kidney, Hypertension. SuChek is Indigenously developed and manufactured glucometer& strip. SuChek offers Bluetooth connectivity, simplicity and affordability. **"SuChek is 'The Answer' to manage Diabetes in a Smart & Digital way"**



Lateral flow immunoassay strip is placed into the strip holder

Novelty

Diabetes diagnosis and mass screening had been difficult with existing devices because of lack of connectivity, usage of unconventional battery types, field inaccuracies due to temperature and humidity. Current technologies need support of handwritten records which are difficult to comprehend.

Suchek is 100% indigenous glucometer which is accurate, suitable for diverse climatic conditions, affordable. It can connect to Smartphone/computer via Bluetooth to transfer recorded data which is synced to Cloud Server automatically. This enables real time prevalence, individual patient monitoring in most transparent digital way to our decision & policy makers.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Accuracy in compliance with latest ISO 15197: 2013 international standard for glucometers. Less than 100 mg/dl has error less than +/-15mg and more than 100 has error less than +/-15%. Validated by NABL approved Lab on 400 samples.

Industrial Partner : Biosense Technologies Pvt Ltd

Cost: INR500 for Meter & INR 5 per step

Public Health Implications

Healthcare expenditure will reduce by 50% on glucometer & strips. *More Undiagnosed diabetic will be diagnosed if adopted for mass screening. *Can be used by ASHA & ANM *Training and software in state languages *Authentic, Real time secure data even if network is Not Available, High risk case Notification, Population screening. *Prevalence & individual Case monitoring linked with AADHAR ID

Market Potential, Competition and Risk Envisaged

ASHA workers & ANMs & Govt Patients:- 10 million users *Diabetic patient:- 10 million users *Private Doctors & hospitals & their patients: 5 million users

Chinese and alike exporters of existing basic glucometer companies will launch similar technology in next 3-5 years. Their price advantage will attract price sensitive and not quality focused customers.

Lack of regulation allows non-professional dealers to import substandard strips and meters. Multi-Nationals can make dies-crediting efforts with the fear of losing their business.

Technologies Selected for Exhibition

18

PorFloR: A Fluorescence Lateral Flow Assay Strip Reader

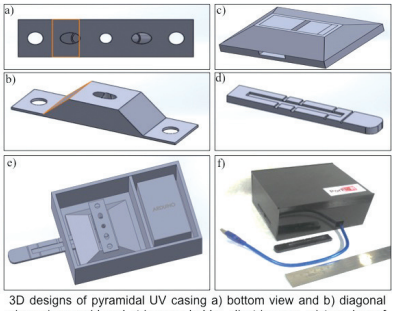
Sponsors

Department of Biotechnology (DBT)

Innovator: Vivek Borse
Contact Details: IIT Bombay, Mumbai
Email: vivek.borse@iitb.ac.in
Mobile: 9421676755
Technology Readiness Level : Developed, Validated, Clinical Trials Done
Intellectual Property Right: Filed the trademark application for the name PorFloR; awaiting registration

Snapshot

A small handheld device that records change in intensity of fluorescence spot on a solid 2D base (e.g. paper strips allowing qualitative and quantitative detection of an analyte.



3D designs of pyramidal UV casing a) bottom view and b) diagonal view, c) pyramid and strip case holder, d) strip case, e) top view of assembled PorFloR™ and f) final packaged PorFloR™

Novelty

The marketed readers available for the lateral flow immunoassay test strip analysis disadvantages regarding cost of the device, its sensitivity, durability and customization ability, etc. PorFloR addresses these issues.

PorFloRTM has UV excitation source, colorimetric sensor and other simple and cheap electronic parts that are easy to assemble and test. This makes it small, portable, easy-to- use, low cost, handheld point-of-care device which is robust and durable in nature.

Safety Issues

It operates on the simple 5V power supply. Therefore, there is no issue for the safety of the operator

Third Party Validation / Clinical Trial

No third party validation has been done. The sensitivity and calibration of PorFloRTM was performed using quantum dots as the fluorescence model spotted on nitrocellulose membrane surface.

Industrial Partner: Not yet identified

Cost : Less than INR 1000

Market Potential, Competition and Risk Envisaged

Clinicians, diagnostics/pathology labs, hospitals are the potential customers. All the diagnostic set up use strip based detection systems, whereas this device is one-time investment. Commercialization of this device will therefore not be difficult with many potential buyers.

Indigenously developed PorFloR device is a very low-cost device as compared to other available devices. The material used for the development is cheaper and technology is an open source technology, It has no threat to be obsolete.

We are clinically testing lateral flow immunoassay test strips using PorFloR. There is no barriers to acceptability of this device.

19

Ayurvedic Preparation for Rabies And Japanese Encephalitis

Sponsors

Indian Council of Medical Research

Innovator : Rajesh Kumar Ganjhu
Contact Details: Pune
Email: rajeshganjhu@gmail.com
Mobile: 9168381171
Technology Readiness Level : Developed, Animal Trials Done
Intellectual Property Right : Patent application No. 3672/MUM/2013 Jointly owned by ICMR & Dr Ganjhu.

Snapshot

This is a plant product and has been found to b effective for rabies and Japanese Encephalitis.

Novelty

It may be the first solution to the rabies and Japanese Encephalitis which do not have any therapeutic treatment worldwide.

Safety Issues

Safety and Stability studies need to be conducted. Process is in progress with ICMR.

Third Party Validation / Clinical Trial

NIV - Pune has conducted animal trials against J.E & Haffkine Institute against Rabies

Industrial Partner : ICMR has signed NDA with KAPL - Bangalore.

Cost : INR 8000 for 2 weeks treatment in adults; INR 4000 for 2 week treatment in children

Public Health Implications

It will be an life saving Ayurvedic medicine.

Market Potential, Competition and Risk Envisaged

Approx Revenue for J.E can be around 100 crores per annum & 100 Crores for Rabies. Till now there is no competition. It is a therapeutic therefore, acceptance will be high. It does not hamper vaccine business of multinationals.

20

Personal Kidney Care Kit

Sponsors

Kanpur Test House, Kanpur

Innovator : Sarabjeet Singh Johar
Contact Details: Kanpur Test House, Kanpur
Email: sarabjeetjohar@yahoo.com
Mobile: 9336128689
Technology Readiness Level : Ready for Commercialization
Intellectual Property Right : Patent No. 2 6 8 9 3 7 Dated 23-9-2015 Title : "A KIT FOR THE QUICK DETECTION OF PREOTEIN IN URINE FOR ASSESSING KIDNEY'S HEALTH"

Snapshot

One-minute home test kit for the detection of urinary albumin. This technology can be used by patients for detection, prevention and treatment of kidney damage.

Novelty

The kit can prevent premature deaths owing to undetected kidney damage in unaware persons. When kidney gets damaged, albumin is secreted into urine, indicating serious threat. The kit selectively identifies urinary album within seconds. This can prevent total kidney failure and eventual dialysis. Biochemistry Labs use dipsticks. Introduction of URINE ALBUKIT is an economical & quick diagnostic tool.

Safety Issues

The reagents used for testing protein (albumin) in urine in the kit are all odorless, non-explosive, non-volatile, non-fuming, and non-inflammable in nature, hence very safe to use.

Third Party Validation / Clinical Trial

*After clinical study (2011) an extensive report was given appreciating URINE ALBUKIT, by US Doctors & Technologists and by Dr. K. H. Norton (VP Marketing/Business Development of M/s One Touch EMR), at Austin, Texas, US.

* The kit has won DST-Lockheed-Martin India-Innovation-Growth-Program (IIGP) 2011 Award from Govt. of India.

Industrial Partner : Not yet identified.

Cost : From one test kit about 100 urine samples may be tested, and cost per test is estimated to be INR 10 to 12 only.

Public Health Implications

It is a diagnostic tool for instant diagnosis of any sort of kidney damage, and monitoring of kidney's health. The applicant has received excellent feedback from some of the doctors.

Market Potential, Competition and Risk Envisaged

The market size of Urine ALBUKIT is extremely likely to be running in multi-crores of rupees. Since kit is meant for use by the common man, the common man itself may be motivated to purchase the same from the market once it is launched and advertised. As it is a simple technology, clinicians will find it easy to prescribe.

21

Zimba Automatic Chlorine Dozer

Sponsors

D-Lab at Massachusetts Institute of Technology (MIT), Self

Innovator : Suprio Das
Contact Details: Zimba, Kolkata
Email: firefly.power@yahoo.com
Mobile: 9830582422
Technology Readiness Level : Developed, Made in India & Commercially Available
Intellectual Property Right : Patent Application no. 692/KOL/2011 dated 20.05.2011 entitled "An automated device for batch mixing of one or more liquids with water/fluid in fixed volumetric ratios"

Snapshot

It is a community scaled automatic chlorine dozer for disinfection of water at the point of collection. It weighs about 10 kg, is easy to install, doses accurately and requires very little behavior change from users. It can be retrofitted to existing water source.

Novelty

Each year over 1 million children under the age of five die from diarrhoeal diseases, a leading cause of death which is due to unsafe drinking water. In India, 1,600 children die daily from water borne diseases. Chronic diarrhea in early childhood can also contribute to potentially adverse long-term consequences for child development. The device has no moving parts and requires no electricity. It doses the water precisely at the source, irrespective of water pressure or flow rate and can be retrofitted to variety of water sources like bore-well hand pumps and piped water. The chlorine dose may be adjusted as per requirement.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Evaluation of the technology for consistency and accuracy of dosing was conducted by researchers from Stanford University and ICDDR at a slum in Dhaka, Bangladesh. The finding is available in the published paper. http://washdev.iwaponline.com/content/early/2016/02/06/washdev.2016.027

Industrial Partner : Manufactured in-house from plastic injection moulded parts that are out-sourced from small scale injection molding units.

Cost : INR 7,000.00 (raw material and labor cost only)

Public Health Implications

There will be positive impact on Public Health and economy by way of improved health, less number of man-days/school-days lost and reduction of downstream treatment costs. This will also cause reduction in IMR.

Market Potential, Competition and Risk Envisaged

Communities not having access to safe drinking water are the end-users. Government agencies, Non-government organizations working in communities, Disaster Management Groups and Humanitarian Relief Organizations are the target customers. The need for providing safe drinking water at a low cost is huge in all developing countries of Asia, Africa and Latin America.

There is no known competing technology at present that is automatic, community scaled and works without electricity to dose chlorine to flowing water at such a precise proportion.

The technology is already in use at a number of places.

22

Advanced Electro larynx

Sponsors

Centre For Innovation(CFI), IIT, Madras

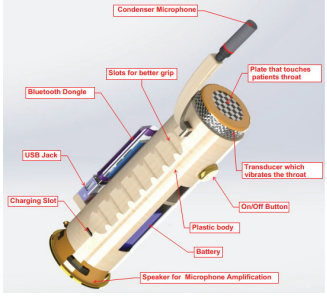
Innovator: Gaurav Lodha
Contact Details: IIT Madras
Email: glodha0@gmail.com
Mobile: 9414116170

Technology Readiness Level : Developed, Animal Trials Done

Intellectual Property Right : Provisional Patent No "Advanced Electro larynx: A biomechatronic device for voice rehabilitation of laryngectomees" - 201741004843

Snapshot

A hand-held Electrolarynx (EL) is an electronic speech aid device that enables the laryngectomee to regain vocal communicability after the surgical removal of the larynx.



Novelty

This device is aimed to help laryngectomees regain the voice and communicate vocally with additional features, mainly bringing down the cost to common-Indian. It has complex features that overcome the difficulties faced by users of existing basic electrolarynx like monotonous and robotic speech, feeble voice, inconvenient usage of device and lack of basic features like voice recording. It has almost 8 times lower price than the price of a similar device with limited features. Other features are seamless control from an android smart phone by an indigenously developed android app; wireless interface between the device and phone via bluetooth for transmitting pulses; voice recording in real time for self-evaluation and recovery tracking.

The design of the device is 3D printer compatible. The entire model can be printed in 3 hours, thus reducing the time of assembling electronics and hence the testing time. Less power consumption for the same

output. The transducer circuit works on mere 6V for 5 hours on a single charge making it usable for almost 1-1.5 days without a charge.

Safety Issues

Nil

Third Party Validation / Clinical Trial

All the evaluations and assessments are done on a real time laryngectomee who is using an Electrolarynx from past 10 years

Industrial Partner: Nil

Cost: Approximately INR 4000

Public Health Implications

Around 10,000 laryngeal cancer cases are treated annually, but only about 3,000 people undergo surgery each year. We will be directly impacting these cancer patients in their rehabilitation process, along with those affected by trauma and accidents.

Market Potential, Competition and Risk Envisaged

Target customers are laryngectomee, cancer institutes and NGOs. Device will help in speech rehabilitation. Business Model: We will - have a substantial profit margin on each device because the making cost is quite low. We'll use our expertise on service and repair of the device; generate revenue through the accreditations from NGO's, audiologists and speech pathologists from various national institutes.

Market Size There are numerous laryngectomees who don't have enough assets to buy the device and thence remain voiceless throughout. As we can sell the device at a price 10 times lower than the current one, even existing users would prefer to buy this advanced device. There are two major American companies, TruTone and Servox who sell the device at a price more than 750$, that is too high to afford for Indian sufferers. A basic handheld EL in India costs INR 10000 whereas our advanced device costs around INR 4000.

23

LED flexible Video Endoscopy System

Sponsors

Mitra Medical Services, New Delhi

Innovators: Nitin Mahajan & Rajendra Raina
Contact Details: Mitra Medical Services Llp, New Delhi
Email: rajendra4652@gmail.com
Mobile: 7838184467
Technology Readiness Level : Developed, Made in India & Commercially Available
Intellectual Property Right : Patented in Japan

Snapshot

Flexible video endoscopes are an essential medical device for diagnosis and treatment of diseases associated with human gastro-intestinal tract. Presently, they employ high power consuming xenon lamps for illumination. This innovation eliminates the use of Xenon lamps and employs LEDs for illumination.

Novelty

Presently, Video Endoscopes need to be Imported from abroad. In line with Governments policy of Make In India, Mitra Company Is the first and only company to manufacture such high end medical devices In India.

Using our intense R&D efforts, we have modified the traditional endoscopy systems by eliminating the need of glass fibres and also bulky xenon lamp based light by using custom LEDs at the tip of the endoscopes. This has not only improved the longevity of flexible video endoscopes since glass fibres in traditional endoscopes are brittle and subject to breakages with use , but also have made the system eco-friendly and less power consuming by using LEDs instead of short life Power guzzling xenon lamps.

Safety Issues

Nil.

Third Party Validation / Clinical Trial

Our Products are tested and approved by Government Labs Like ERTL and Carry Certifications Like ISO 13485, ICMED etc.

Industrial Partner: Commercialized and marketed by Mitra Medical Services.

Cost: The cost per unit starts with INR 7.5 Lacs

Public Health Implications

No Public Health Issue Economic Implications :Prevention of outflow of Foreign Currency.

Market Potential, Competition and Risk Envisaged

Hospitals, institutes, clinics, nursing homes, diagnostic centres are the end users Based on our innovation and experience, more and more international players are shifting to LED technology for obvious reasons. Already accepted and being used.

24

A Molecular Technique for Mapping of Malaria Vectors and Their Vectorial Attributes

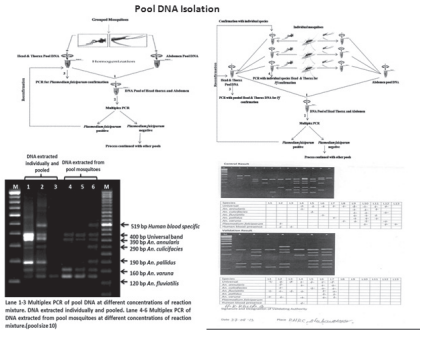
Sponsors

Indian Council of Medical Research

Innovator : R K Hazra
Contact Details: Regional Medical Research Centre, Bhubaneswar
Email: rupenkh@yahoo.co.in
Mobile: 9938074561
Technology Readiness Level : Ready for Commercialization
Intellectual Property Right : Nil

Snapshot

PCR-based tool for effective malaria surveillance at the village level and evaluation of vector control strategy. This technique allows quick, decentralized mapping and characterization of malaria vectors, parasite type and blood source. It can be utilized to identify and predict malaria incidences, where expert entomologist is not available.



Novelty

In absence of entomologist at village/district levels, it is not possible to identify prevalence of various malaria mosquito species and their attributes. Neither it is possible to monitor and evaluate whether implemented malaria control strategy is effective. Presently there is no entomological indicator to dynamically respond to public health situation: a)effective surveillance of malaria vectors at village level where entomologist is not available b)precise identification of mosquito species, their blood source, and parasite type c)implementation at CHC/PHC level in decentralized manner d)protocol gives accurate results in short time of 1-3 days e)provides indicators to evaluate effectiveness of malaria control strategies

Safety Issues

Nil

Third Party Validation / Clinical Trial

VCRC, Puducherry; NIMR, Delhi; NVBDCP, Odisha

Industrial Partner : Not yet identified

Cost : INR 210 per pooled samples(10 number of mosquitoes)

Public Health Implications

The technology will have public health implications in monitoring and evaluation of Malaria control programme.

Market Potential, Competition and Risk Envisaged

National Vector Borne Disease Control Programme.

25

High Resolution Digital Holographic Microscope System

Sponsors

DBT and BIRAC-BIG.

Innovator : Kedar Khare
Contact Details: IIT Delhi
Email: kedark@physics.iitd.ac.in
Mobile: 9868278691

Technology Readiness Level : Developed, Made in India & Commercially Available

Intellectual Property Right : Microscope technology patent: No. US9135682B2 granted to IIT Delhi on 15 Sept. 2015. Patent on diagnostic application of DHM technology: Filed in August 2016 (201611027124).

Snapshot

This technology allows holographic 3D imaging of cell samples in addition to the usual bright field imaging mode.

Novelty

Majority of cell imaging (diagnostic or basic research) relies on staining or fluorescent labeling of cells. This involves wet lab processing and expensive reagents. The DHM system can image unstained cells in their natural form in 3D and can have wide ranging applications from pathology to basic research. Capability of holographic 3D imaging of cells is not readily available in most microscope products. Changes in 3D morphology of cells can be imaged. The technology requires minimal wet lab processing. Single shot high resolution operation of this technology is superior to worldwide competitors at a much reduced cost.

Safety Issues

Nil

Third Party Validation / Clinical Trial

The technology has been used for a BIRAC-BIG project in collaboration with AIIMS. Based on 120 patient sample data, the technology has shown impressive results on cervical cancer stage classification. An IP on these findings has been filed.

Industrial Partner: Commercialization by Holmarc Opto-Mechatronics Pvt. Ltd. Kochi in collaboration with Xinova/Intellectual Ventures India. Developed in collaboration with IIT Delhi.

Cost: Range INR 10-15 lakhs depending on optional add-ons. Competitor European companies selling price is in range INR 1-1.5 Crores. IIT Delhi innovation makes the system simpler thus reducing overall cost without compromising on imaging performance.

Public Health Implications

The DHM technology can provide 3D cell morphology information not usually available to pathologists, thus enabling alternative methodology for cell classification and diagnostics. Since the technology does not require cells to undergo extensive wet lab processing, the recurring costs on expensive reagents or fluorescent labels can be reduced significantly. The technology can find multiple applications across pathology labs, biotechnology industry and Bio-science research institutes.

Market Potential, Competition and Risk Envisaged

Thousands of pathology labs in India and even larger number worldwide that routinely perform cell imaging for diagnostics.

Currently three European companies (Ovizio Inc, Lynceetech Inc., PhiAB Inc.) and a Japanese company (Pi Photonics Inc.) offer digital holographic microscope products. However due to IITD's innovative design and algorithmic breakthroughs in the present invention, the microscope system has highly reduced cost without compromising on imaging performance.

Holographic imaging is not a well-known methodology among pathologists or Biomedical researchers. Adoption of this technology will therefore require efforts on suitable application development. Efforts for making users aware of this technology will have to be made.

26

NeoBolt & NeoRider

Sponsors

Standing Wheelchair - Wellcome Trust, UK; Add-On Devices - TTK Center for R2D2

Innovator: Swostik Sourav Dash
Contact Details: IIT Madras
Email: swostik619@gmail.com
Mobile: 9840843715
Technology Readiness Level : Developed, Validated, Clinical Trials Done
Intellectual Property Right : Patent Filed, Number - 6952/CHE/2015, Filed on 16 December 2016

Snapshot

The technology developed is an add-on device to convert a wheelchair to outdoor mobility vehicle. The wheelchair user can independently attach the add-on device to his/her wheelchair and go outdoors. In the outdoor mode, the vehicle is stable over rough terrain and offers movement over long distance.

Novelty

Many people with disability, primarily in rural areas, do not come out of their house. They have no employment, no community engagement. Many persons with disability cannot transfer independently onto a tricycle/tri-scooter. And regular wheelchairs are UN-usable outdoors. There is no mobility solution which provides complete independence indoors and outdoors. The technology will enable wheelchair users to be employed and more functional. The add-on device can be independently attached by the wheelchair user. The vehicle can be taken over any terrain safely. Wheelchair users can cover distances over 20-30 km independently.

Safety Issues

The device is meant to be used outdoors on uneven roads, potholes. This offers a risk of tipping on roads. The risk has been mitigated through anti-tippers on the device which make the device stable on any terrain.

Third Party Validation / Clinical Trial

Short term trials have been conducted with more than 100 wheelchair users. The response from the wheelchair users has been extremely positive and they opine that this device can significantly improve their quality of life.

Industrial Partner: Not yet Identified

Cost: INR 50,000

Public Health Implications

The technology can significantly improve the quality of life of people with disability. WHO estimates that 1% population of any country needs wheelchairs. In India, more than 1.5 Lac wheelchairs are distributed every year. During our field visits and interaction with more than 400 wheelchair users and rehabilitation professionals, we have found that independent outdoor mobility is a primary challenge for wheelchair users. This severely restricts their employment and community engagement. Our technology is addressed towards meeting this very gap.

Market Potential, Competition and Risk Envisaged

Potential Market Volume: 20,000 Units / Year. Potential Market Revenue: INR 100 Crores.

Currently there is no competition in India for this technology. In future, cheap Chinese substitutes may become available in India, but customization for people with disability, training them and servicing will be a challenge for Chinese.

We have tested this technology with end-users and we currently do not anticipate any barrier to get accepted.

27

Oxygen Enrichment Technology

Sponsors

BIG from BIRAC, NCL Venture Centre, Pune NSTEDB

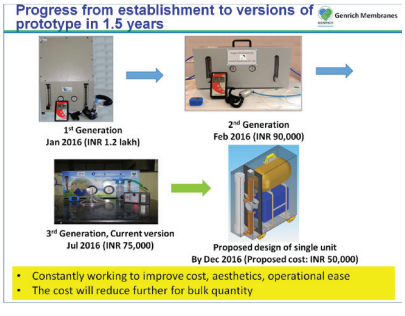
Innovator: Rajendra Kharul
Contact Details: Genrich Membranes Pvt. Ltd., Pune
Email: rk.kharul@genrichmembranes.com
Mobile: 8308822216

Technology Readiness Level : Developed, Made in India & Commercially Available

Intellectual Property Right : Licensed from CSIR-NCL (under Lab-to-market). Part of the know-how is protected by patents. Patent to be filed for up gradation in technology

Snapshot

Oxygen therapy is costly and considered as luxury in India; thus out-of-reach for BoP population. We aim to provide decentralized, innovative oxygen Therapy based on hollow-fiber membrane technology at affordable cost to needy patients suffering with lung diseases (COPD, Asthma, premature-neonatal).Unit is light weight, easily portable and easy to operate.



Novelty

In India, 54 million patients are suffering from COPD/asthma. Presently oxygen therapy is based on cylinders/ plants and is costly & unaffordable to BoP population. This oxygen enrichment unit provides oxygen therapy to the patients at cheaper, affordable rate. Indigenously developed HF-membrane based oxygen enrichment unit enriches oxygen in air from 20.8% to ~35 % at ambient temperature, requires less energy, is maintenance free, easily transportable and customized for homecare.

Safety Issues

Our OEU consists of membrane module (a nonmoving part of equipment) and a compressor, operated at 5 bar pressure.

Third Party Validation / Clinical Trial

Not done yet.

Industrial Partner: Not yet identified.

Cost: INR 1,00,00,000

Public Health Implications

In India around 54 million patients with lung diseases from BoP population need oxygen therapy for chronic lung diseases. This device will provide oxygen therapy at a low cost to both adults and children with lung disease.

Market Potential, Competition and Risk Envisaged

Market size: ~54 million BoP patient population Revenue: INR ~450 Cr for COPD and Asthma patients

There is no membrane-based oxygen concentrator available. Other competitors are O2 cylinders which have cost issues. PSA based concentrators need frequent replacement of adsorbents, are sensitive to moisture, are imported and costly. This device is a cheap, decentralized, novel way of oxygen therapy.

This proposition of using OEU for oxygen therapy is novel. Market percolation with this new concept and technology is going to be one of the important challenges. Rigorous trials / performance evaluation and certifications are required to be carried out.

28

Digital Magnivisualizer

Sponsors

Indian Council of Medical Research

Innovator: Aditya Parashari,
Contact Details: National Institute of Cancer Prevention Research, NOIDA
Email: adityaanjana_parashari@yahoo.co.uk
Mobile: 9873316396

Technology Readiness Level : Prototype

Intellectual Property Right : Design application No. 283268, dated 9th May 2016 Provisional Patent Application No.201611014610, dated 27th April 2016)

Snapshot

Digital Magnivisualizer is a portable battery powered self-illuminated multispectral multi-magnification integrated with a high resolution camera for image capturing system with Wi-Fi capability and can be operated by any smart phone/ Tab having android software. Specific camera is locked with specific smart phone/ i-pad/ note book for its connectivity.

Novelty

AV Magnivisualizer (developed by the same inventor) do not have image capturing or documentation system It will be a suitable device for visualizing the cervix and oral cavity and capturing the image for documentation and one can send the low resolution image/ video from the field/remote places like PHCs to the expert in centralized hospitals immediately mobile phone having internet connectivity.

Safety Issues

No safety issue for patients. It is external visualizing device.

Third Party Validation / Clinical Trial

This is an extended version of AV MAGNIVISUALIZER for which the validation study has already been carried out.

Industrial Partner : Yet not identified.

Cost: INR 30,000 approx.

Public Health Implications

It will be a suitable device for visualizing the cervix and oral cavity and capturing the image for documentation and one can send the low resolution image/ video from the field/remote places like PHCs to the expert in centralized hospitals immediately mobile phone having internet connectivity.

Market Potential, Competition and Risk Envisaged

Community Health Centers, Primary Health Care Centers are potential buyers. Private Practitioners may also use it. Competition is from colposcope for visualizing the cervix. There is no instrument for visualizing the oral cavity in field except general purpose torch.

29

SWASTi: A Smart Walking Aid Stick for Individuals having Parkinson Disease

Sponsors

Government of Gujarat

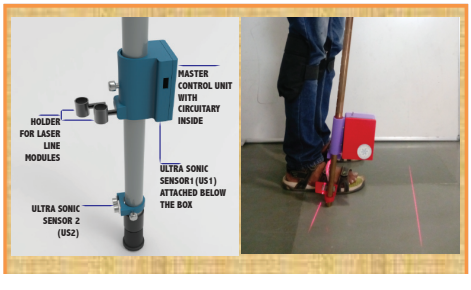
Innovators: Uttama Lahiri, Megh Patel, Sai Ramakrishna
Contact Details: IIT, Gandhinagar
Email: uttamalahiri@iitgn.ac.in
Mobile: 7874468228

Technology Readiness Level : Developed, Validated, Clinical Trials Done

Intellectual Property Right: Title: A Walking Aid System for a Parkinson's Disease Affected Person Co-inventors: Uttama Lahiri, Megh Patel, Sai Ramakrishna. Patent Application: 201621015918 filed on May, 2016.

Snapshot

SWASTi includes microcontroller module that use proximity sensors along with self-learning algorithm to dynamically identify the risk of freezing of gait (FOG) in a patient. On detecting the risk, SWASTi will give suitable cue to the patient while adapting to one's individualized walking capability to mitigate the risk of freezing.



Novelty

Parkinsons disease affects ~1% of individuals aged >60 years globally with progressive disability and not eliminated by treatment. This leads to motor disturbances e.g., FOG overcome by cueing. Prohibitively-costly technology-assisted systems deliver cues continuously irrespective of FOG with unsatisfactory outcome. SWASTi predicts FOG, addresses start-and-turn hesitation, and delivers cues in an individualized manner.

Low-cost SWASTi -has portable microcontroller-based module (mountable on ordinary walking stick) and two light-weight belts (for calf muscles). -user-friendly with cutting-edge technology, requires no specialized knowledge for operation. -delivers cues wirelessly to the user (unlike wired feeling caused by currently-existing techniques). -can work outdoors.

Safety Issues

SWASTi offers external cues non-invasively to the user and therefore has no safety issues.

Third Party Validation / Clinical Trial

Preliminary clinical trials have been carried out in urban areas, e.g., in and around Ahmedabad (Gujarat) and rural areas, e.g., Hooghly (West Bengal). In this, individuals diagnosed with PD were enrolled. Preliminary findings are promising.

Industrial Partner: Discussions with a commercial partner, 'Arogya Medtech Pvt. Ltd., Kolkata in progress.

Cost : Approximately INR 5,000/-

Public Health Implications

SWASTi is an assistive device which has potential to improve quality of life of patients of parkinsons disease.

Market Potential, Competition and Risk Envisaged

It is estimated that in India there are 6-53 PD patients / 100,000 individuals. The total direct financial cost of PD per annum to the Indian community is estimated to be in excess of A$ 4.2 billion. Hence SWASTi is going to tap one of the largest markets of healthcare industry.

Currently, the technology-assisted walking aids are often exorbitantly costly, delivers external cueing in an open-ended manner without being adaptive to one's individualized need. Technology-assisted tools/devices (that can compete with SWASTi) that are low-cost suitable for both urban and rural community do not exist.

From our initial interaction, SWASTi will be very well accepted by the healthcare procedure and users.

30

Paper-Based Test Kits for Easy Testing of Antimicrobial Susceptibility

Sponsors

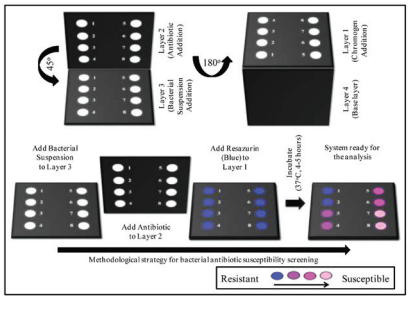
IIT Kharagpur.

Innovator: Shantimoy Kar
Contact Details: IIT Kharagpur
Email: shantimoykar@gmail.com
Mobile: 8900601848

Technology Readiness Level : Prototype

Intellectual Property Right: "A Portable Paper-based Microfluidic Platform for Rapid Diagnosis of Antimicrobial Susceptibility Assays"; 201631023867, dated 12.07.2016, (Status: Filed).

Snapshot



Developed technology provides a paper–based platform for detecting drug resistance characteristics of bacteria. In particular, it offers a portable, rapid, easy and multiplex able assay system to screen the bacterial drug resistance characteristics towards one or multiple drugs.

Novelty

At the present scenario, increasing antimicrobial resistance is a global threat to the human mortality. To meet this global challenge, there is a dire need of developing a platform for rapid testing of antimicrobial susceptibility assays of one or multiple drugs against a particular bacterial strain. A multiplexable paper- based device has been developed for simultaneous testing of drug resistivity of a specific bacterial strain. The involved colorimetric detection approach reduces the diagnostic cost significantly. Inherently present capillary force makes the kinetics faster so that it tenders the final results ~ 5-6 hours, much faster than the gold standard protocols.

Safety Issues

Handling of pathogenic strains of bacteria needs to be done as per standard guidelines, including use of bio-safety hoods. In field, the platform is recommended to operate within an enclosed chamber. After use, the device needs to be disposed by following standard disposal protocol.

Third Party Validation / Clinical Trial

Yet to be optimized in terms of clinical benchmarking.

Industrial Partner: Yet to be identified

Cost: Development cost for a single device for the testing of single antibiotic is around INR 40-50 (the estimation may change for mass scale fabrication and target antibiotic).

Public Health Implications

The device has major potential of timely detection of antimicrobial resistance which will have an impact on patient management. Further the technology is simple and economical. It will be a major asset in drive against antimicrobial resistance.

Market Potential, Competition and Risk Envisaged

The target customer of this particular device is primarily the healthcare system and the population in rural, semi-urban areas.

Few paper-based technologies have already been successfully implemented for blood sugar detection (glucometer) and for pregnancy kits. However, till date, there are no such commercialized platforms available for testing of antimicrobial susceptibility assays.

To make it an alternative to the gold standard practices, the performance of the device has to be accepted by the medical community; which can be achieved through clinical benchmarking.

31

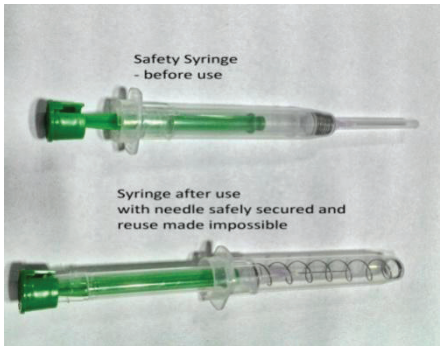
Single Use Safety Syringe

Sponsors

DBT under the SBIRI - BIRAC and by GSBTM via GBVF (Gujarat Biotech Venture Fund), ICMR

Innovator: Atul Sardana
Contact: Address: Alfa Corpuscles Pvt. Ltd., New Delhi
Email: atul.sardana@alfacorpuscles.com
Mobile: 9811349395
Technology Readiness Level : Ready for Commercialization
Intellectual Property Right: Indian Patent Application Number 457/DEL/2010 Publication Date 19th May 2012 International Application Number PCT/IB2011/050898 Title: Single Use Safety Syringe with Spring Actuated Needle Stick Injury Prevention and Auto Disable Mechanism.

Snapshot



The safety syringe incorporates needle stick injury and reuse prevention without any need for training. It has a novel design that permits manufacturing at marginal cost above normal syringes and is designed for clinical use, phlebotomy, vaccine delivery and can be used as a prefilled syringe for drug delivery.

Novelty

Unsafe injections, including reuse and needle stick injuries, place patients and caregivers at risk of disability and death by causing 21 million hepatitis B, 2 million hepatitis C and 260 000 HIV infections annually leading to 1.3 million early deaths (one death every 24 seconds) and 535 million $ in direct medical cost.

This technology is a fourth generation syringe which incorporates both reuse and needle stick injury

prevention mechanism in the same syringe which are passively deployed, thereby reducing operator dependency and ensuring compliance. U.S.P. of the Safety Syringe • Unique 5 part design • No chance of reuse • low cost of production • Useable for hypodermic injections and phlebotomy • No training required • No issue of blood spatter/ patient discomfort syringe • permanently disabled after use • available as clinical syringe/ Pre-filled syringe/ vaccine Delivery syringe.

Any Safety Issues

Nil

Third Party Validation / Clinical Trial

Conducted pre clinical validation of the safety syringe as per ISO 594, ISO 7886, ISO 11040, ISO 23908 and ISO 10993 standards. We have secured DCGI and IEC approvals for a multicenter, open label, prospective trial to evaluate safety and effectiveness of the safety syringe.

Industrial Partner: Planned field trial of prefilled and vaccine delivery safety syringe

Cost: Distribution price: INR 5; Retail price: INR 10 - 12 per unit

Public Health Implications

Eighty seven percent of injuries from needle stick were identified as preventable. Injection safety represents a very cost effective intervention in preventing transmission of blood borne pathogens in health care workers and patients. Single use devices are a very cost effective investment in health for prevention of these infections.

Goal 6 of Millennium Development Goals (MDGs) is to combat HIV/AIDS, malaria and other infectious diseases. Goals #4 and #6 together are to reduce child mortality and improve maternal health, respectively. The elimination of unsafe injections is vital for achieving these goals.

Market Potential, Competition and Risk Envisaged

The world market for safety engineered medical devices is estimated to exceed 2 billion $ with a 20% CAGR. Prevalence of reuse in developing and transitional countries ranges from 1.5% to 69.4%. The Indian Health Ministry has mandated the use of safety engineered syringes in all public healthcare institution .

Our “4th Generation” safety syringe should be available in the market at nearly the same cost as a ‘2nd Generation’ auto disable syringe, which is already in use in most government and private hospitals . It can be given to international agencies like WHO-UNICEF-UNFPA-Red Cross for immunization programs in India and other countries

Predicates available in international market are: 1. Unitract Syringe, Unilife 2. QSTAT Safety Syringe, QSTAT 3. RevVac Safety Syringe, Revolutions Medical 4.Vanish Point Syringe, Retractable Technologies Inc 5. Integra Syringe, Becton Dickinson These are currently not available in India, are sold at retailed prices above $ 1 a piece in the US and have limitations which have been overcomed by our product.

32

Truenat® MTB

Sponsors

BIRAC, CSIR & ICMR

Innovator: Chandrasekhar Nair
Contact Details: Bigtec Private Limited, Bangalore
Email: bc@bigtec.co.in
Mobile: 9448377317

Technology Readiness Level : Developed, Made in India & Commercially Available

Intellectual Property Right : Multiple patents filed for the microPCR device Truelab® Uno and the microchip technology used with the device. The patents have been granted in various geographies like USA, China, Singapore, etc

Snap Shot

Truenat ® MTB is a molecular diagnostic test for detection of Mycobacterium Tuberculosis (MTB). It is a disposable microchip with pre-loaded PCR reagents – enabling the user to just add nucleic acid sample and start the test. It allows accurate detection of MTB in < 1 hour in near-patient settings.

Novelty

TB is a public health problem, control of which is hindered by lack of affordable and rapid diagnostics. PCR is the gold standard for testing. However, because of the expense and other infrastructure requirements, its use is limited to centralized laboratories. Results can take days to disseminate, delaying prompt action. Truenat ® MTB is run on a portable, battery-operated device, Truelab®. It is low-cost, user-friendly and does not require laboratory infrastructure, allowing gold standard PCR testing in any setting including rural areas, PHC's, etc. Rapid results, in < 1 hr, enable fast and accurate treatment initiation and prevent spread of disease in the community

Safety Issues

The proprietary reagents developed by Bigtec for sample processing ensure that the biological sample gets decontaminated. The entire testing process happens in a closed system, minimizing risk to the operator.

Third Party Validation / Clinical Trial

Truenat® MTB has been tested by Hinduja Hospital in Mumbai who have declared it suitable for TB detection at point of care. The studies have been published in peer reviewed journals like PloS One. ICMR is conducting a multi-centric validation of Truenat® MTB at 4 sites across India. Initial results are promising

Industrial Partner: Molbio Diagnostics Private Limited

Cost : INR 800

Public Health Implications

The sensitivity of smear microscopy tests for TB detection is very low but it remains the most commonly used test because it is inexpensive and rapid. A person untreated for TB will continue to spread infection and will infect 10-15 people on average. Testing suspected patients at point-of-need will have significant implications in the control and spread of TB. If suspected patients can be tested and diagnosed rapidly, then doctors can make evidence based decisions on treatment of patients. Only those patients with confirmed TB can be given anti-TB medication and counseled to prevent spread, conserving resources and preventing mis-use of drugs that leads to development of resistance. Further, ability to deploy testing equipment in cities, towns and villages with poorly-equipped labs will ensure that patients do not have to travel large distances to get tested, nor will samples have to be transported long distances. Delays in diagnosis can be drastically brought down.

Market Potential, Competition and Risk Envisaged

End users are diagnostic laboratories, hospitals, clinics, and other health-care settings

There are other TB PCR tests in the market, however these can be performed only in centralized laboratories. They require specialized equipment and trained manpower. They are also very expensive.

Greater awareness of the benefits afforded by rapid and accurate detection of MTB by PCR will see greater adoption of this technology in India, where TB is a significant public health burden.

33

DocsApp – 24X7 Online Specialist Doctor Consultation

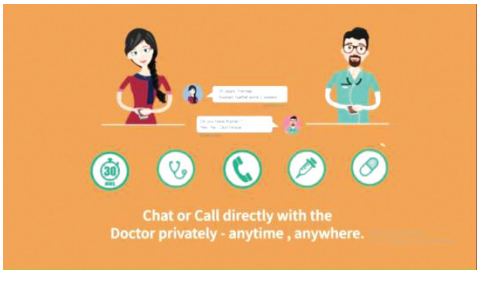
Sponsors

Phasorz Technologies Pvt Ltd (DocsApp)

Innovator : Satish Kannan
Contact Details: Phasorz Technologies private Limited (DocsApp), Bangalore
Email: satish@docsapp.in
Mobile: 9902689900
Technology Readiness Level : Developed and in Market
Intellectual Property Right : Nil

Snap Shot

DocsApp is an application that helps patients connect to specialist doctors across the country via call or chat, using their mobile phones. Doctors from 15 specialties such as gynecology, pediatrics, psychiatry etc can be accessed in less than 30 minutes on the platform. DocsApp combines artificial intelligence and medical sciences in order to provide solutions to assist doctors.



Novelty

According to WHO standards there should be 1 doctor for 1000 people, but in India we have 1 doctor for over 1700 people, if you take specialist doctors into account this number is much worse. Adding to the woes, 97% of specialist doctors practice in the top cities, the rural population has no access to quality healthcare. DocsApp strives hard to overcome the challenges in the Indian healthcare system. With DocsApp anyone can consult a specialist doctor via chat or call in less than thirty minutes, from anywhere at any time. It is affordable. We have 1200+ doctors in over 17 specialties ; 24X7 access to doctors.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Not done

Industrial Partner: Phasorz Technologies private Limited (DocsApp)**,** Bangalore

Cost: Per patient charge of Rs 99 to Rs 200/-

Public Health Implications

This will provide access to healthcare to patients in rural areas

Market Potential, Competition and Risk Envisaged

People from healthcare and patients are end users. This number is around 30 crores. Competition is from other established companies in the healthcare sector. Skepticism of people to accept mobile technologies for healthcare, poor internet connectivity, inhibitions to talk to a doctor online and disclose personal details are the challenges.

34

Cathy+ Safety I.V. Cannula with SIP CLIP

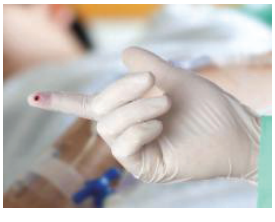
Sponsors

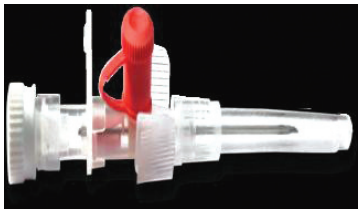
Hindustan Syringes & Medical Devices Ltd

Innovator : Rajiv Nath
Contact Details: Hindustan Syringes & Medical Dev. Ltd, Faridabad
Email: hmduk@hmdhealthcare.com
Mobile: 9810029272
Technology Readiness Level : Developed, Made in India & Commercially Available
Intellectual Property Right : International application number : PCT/SE2010/050884

Snap Shot

Healthcare provider face risk of Blood Borne Infection from needle stick injury during infusion therapy. Cathy +I.V.Cannula is a safety engineered device to prevent needle stick injury post cannulation.





Novelty

According to WHO, if safety cannula are made mandatory in hospitals, then around 80 % of all hospital staff can be saved from needle stick injuries. There are 2 million reported needle stick injuries & more than 1 million unreported injuries. Cathy+ Safety I.V.Cannula with SIP CLIP is an effective solution for safeguard against needle stick injury to doctors as well as paramedical staff. The auto protection technology of Cathy+ I.V. Cannula is designed to provide `Involuntary activated safety` due to presence of a protection device SIP CLIP, which encapsulates the tip of the used needle when introducer needle is extracted from the catheter; post cannulation. SIP CLIP prevents accidental needle stick injury.

Safety Issues

Next generation Cathy+ I.V. Cannula with SIP CLIP is designed not only to minimize health risks associated with accidental needle injuries but will also help bring down substantially the overall cost resulting from diseases like Hepatitis and HIV due to needle stick injuries.

Third Party Validation / Clinical Trial

Samples of Cathy +I.V. Cannula were given for clinical trial in leading hospitals and were found to be of satisfactory quality.

Industrial Partner: HMD is having technical collaboration with M/s.Vigmed of Sweden to manufacture Safety I.V.Cannula.

Cost: This is based on Quid ProQuo. whereby HMD will be OEM sub-contractor to Vigmed for European market and Licensee for the Indian and Developing World market and sell under HMD brand.

Public Health Implications

Eighty percent of Hospital staff will be saved from needle stick injury & resultant blood borne infections.

Market Potential, Competition and Risk Envisaged

Market size for non safety I.V. Cannula is 120-150 million per year 120 million I.V. Cannula in India; 1 Billion I.V. Cannula outside of India. Potential exists for complete change over. Barrier are resistance to pay higher prices.

Competing products are more higher priced from Europe & USA. New product produced by less than 10 companies in the world and has no competition at present from alternative technologies.

High product price is the risk.

35

Quicksee - A Handheld Autorefractor

Sponsors

United States India Science & Technology Endowment Fund (USISTEF)

Innovator : Ramakrishnan
Contact Details: Aurolab, Madurai
Email: ram.mahadevan@aurolab.com
Mobile: 7708694983
Technology Readiness Level : Developed, Validated, Clinical Trials Done
Intellectual Property Right : Patents filed in India, Europe, Japan, South Korea, and USA.

Snap Shot

The QuickSee is a portable handheld device to measure the refractive error of human eye to provide prescription for eye glasses. It employs wave-front aberrometry technique.

Novelty

QuickSee is an inexpensive, handheld device that helps to quickly carry out refractometry and prescribe eyeglasses

Safety Issues

Nil

Third Party Validation / Clinical Trial

Clinically evaluated on over 1,200 people at the New England College of Optometry (Boston, USA), Fundación Jimenez Diaz (Madrid, Spain), Arvind Eye Care System (Madurai, India), Sankara Eye Hospital (Bangalore, India), Wenzhou Medical College (Wenzhou, China), and other smaller pilot sites.

Industrial Partner: Under commercialization - Aurolab (a part of Aravind Eye care system).

Cost: Approximately INR 1,00,000 per unit.

Public Health Implications

It has a scope to cater to more than one billion people suffering from poor vision worldwide (130 million in India), breaking barriers to obtain appropriate eyeglasses in low resource settings with minimal trained professionals.

Market Potential, Competition and Risk Envisaged

Our customers will be the major eye care providers in developing countries like eye institutes, NGOs, primary health centers, individual optometrists and optical shops. Although the price and lack of portability of autorefractors limited their widespread adoption amongst eye care professionals, the QuickSee with its disruptive price, portability, and accuracy will encourage its widespread adoption.

36

Remotion Polycentric Prosthetic Knee Joint

Sponsors

Indo-US Science & Technology Endowment Fund

Innovator : Pooja Mukul
Contact Details: Jaipur Foot Organization, Jaipur
Email: reconrehab@gmail.com
Mobile: 9829214948
Technology Readiness Level : Developed, Made in India & Commercially Available
Intellectual Property Right: Patent filed. IP is with the US partner- D-Rev.

Snap Shot

The Remotion Knee is a prosthetic knee designed for people who have lost their lower limb from above the knee. It is based on the versatile polycentric concept. It has a dynamic centre of rotation with varying knee flexion. It closely mimics the motion of a human knee.

Novelty

According to the latest World Health Organization report on disability, only 5-15% of amputees in the developing world have their needs met. The Remotion Knee is a high performance, affordable, biomimetic knee. By virtue of its geometry the design provides stability during stance and ease of knee flexion in swing. It costs US$ 80 or INR 5500 only.

Safety Issues

The Remotion knee has undergone extensive laboratory tests, confirms to ISO10328 standards, is FDA approved and CE marked. It has so far been tested for use on patients weighing upto 80Kg.

Third Party Validation / Clinical Trial

Multi-centric trials have been conducted in India and Indonesia with very encouraging user feedback. The pilot studies in 500 patients in India was funded by the Indo-US Science and Technology Endowment Fund.

Industrial Partner : D-Rev a not for profit company based in the US.

Cost : INR 5500

Public Health Implications

By restoring the mobility of amputees, the technology provides them access to education, healthcare and employment. The social returns on investment are immense, by converting a resource burner to a resource earner. The device thus also works as a poverty alleviator.

Market Potential, Competition and Risk Envisaged

According to the World Health Organization there are over 30 million persons in need for prosthesis. Of all lower extremity amputees, nearly 30% are above knee and will need a prosthetic knee joint. The life of an assistive device is about 3 years; hence all these patients will also need a joint replacement every 3 years. Joints made in China may be priced competitively in future. Lack of trained manpower to fit the Remotion Knee to patients is a challenge.

37

Cervical Cancer Screening Tool

Sponsors

Indo US Science and Technology Forum, BIRAC (DBT), Millennium Alliance, Villgro Innovations Foundation

Innovator : Adarsh Natarajan,
Contact Details: Aindra Systems (P) Ltd, Bangalore
Email: adarsh@aindra.in
Mobile: 9845754008
Technology Readiness Level : Prototype Developed. Validation Studies Planned
Intellectual Property Right: Both Indian patent and PCT applications have been filed.

Snap Shot

CaCx Detect is an affordable and portable, point of care cervical cancer screening tool to automate the analysis of the Pap smear slides. The slides are stained, scanned, digitized and then analyzed using computer algorithms to triage them into normal, suspected and abnormal samples. The images are then sent over a Tele pathology medium to pathologists for further confirmations and recommendations.

Novelty

Cervical Cancer is the largest cancer in Indian women. Although few automated slide scanners and image analyzers are available, there are no integrated point-of-sample collection solutions with a tele pathology modality for screening cervical cancer. In addition, the centralized nature and the expensive price of these automated products, puts them out of the ambit of affordable and universal healthcare.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Validation phase is planned by middle of 2017

Industrial Partner: Not yet identified

Cost : Around INR 200/test

Public Health Implications

American Society of Clinical Pathology recommends that women between the ages of 21 and 65 years should have a Pap test once every 3 years for early detection of cancer. This increases survival rate (>90%). The product has the potential to provide every woman in India with access to screening.

Market Potential, Competition and Risk Envisaged

There are 350 million women of reproductive age in India who may utilize this product 14-15 times over their lifetime. This gives a potential market of nearly 5 billion tests in next 20 years in India alone.

Revenue Model: Multiple pricing models is intended: a. price-per-test for small pathology labs] b. asset sale – for higher volume facilities. c. asset lease – those with moderate volumes where capital expense can be spread over time. d. yearly/monthly subscription.

Competition: from current screening tools for cervical cancer like PAP smear testing, visual Inspection using acetic acid [has low sensitivity] and HPV DNA testing. We are targeting a fully loaded end user price to be at 200/-. This positions our solution as a cheaper and higher quality solution than existing pap smear services. If the cost of the HPV DNA test comes drastically down, this is more likely to be used as screening tool making PAP smear only a secondary test.

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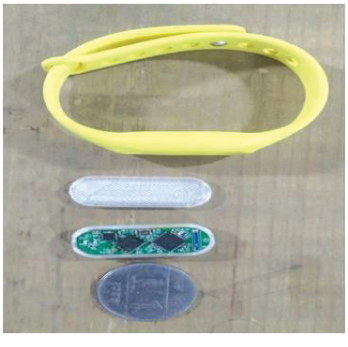
iGest – A Communication Device

Sponsors

Ministry of Micro, Small and Medium enterprises (MSME), Govt. of India

Innovator: Pradeep Thangappan
Contact Details: Enability Foundation for Rehabilitation, IITM Incubation Cell, Chennai
Email: pradeep@enability.in
Mobile: 9750959770
Technology Readiness Level : Prototype
Intellectual Property Right : Yet to be filed

Snap Shot



iGest is an assistive wearable technology specifically developed for persons with cerebral palsy who have movement and speech disabilities and monitors physiotherapy. The main objective is to save the time of the therapist and to solve the issues faced by the therapists in helping the people with cerebral palsy.

Novelty

Children with cerebral palsy, autism and mental retardation require constent therapy for improvements in their daily activities and to reduce further deterioration. Therapists face communicational and motivational issues in training these children. To overcome all these issues, iGest helps to monitor the therapy sessions and may encourage children to maintain consistency in therapy sessions.

iGest consists of IMU uses sensors accelerometers, gyroscopes, magnetometers. The sensors acquire signals from the gestures occurring during movement in a physiotherapy session. iGest is connected to the smart phone or a tablet through Bluetooth and the signals are monitored in comparison to the perfect range of data. The exercises done by an individual are saved on the tablet / smart phone which are forwarded to the therapists for assessment. The diagnosis is made by the physiotherapists and not by iGest. The wrist band will be reengineered into various accessories according to their applications on different parts of the human body.

Any Safety Issues

Nil

Third Party Validation / Clinical Trial

Not done

Industrial Partner: Not yet identified

Cost: INR 3000.00

Public Health Implications

The technology has the potential to provide quality of life to children with cerebral palsy and autism.

Market Potential, Competition and Risk Envisaged

The end users are the therapists and the people under consistent physiotherapy.

The already available technology is just to monitor. More advanced versions with additional features may be developed by others. Challenge is monitoring the therapy and getting feedbacks from the therapist.

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MiraCradle - Neonate Cooler

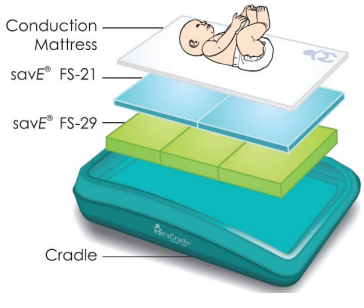
Sponsors

Pluss Advanced Technologies Pvt. Ltd., CMC, Vellore

Innovator : Ankit Jhanwar
Contact Details: Pluss Advanced Technologies Pvt. Ltd., Gurgaon
Email: ankit@pluss.co.in
Mobile: 9650819998
Technology Readiness Level : Developed, Made in India & Commercially Available
Intellectual Property Right : PCT application filed on 17th June 2014, Application no. PCT/IN2014/000400 EU application no. - 14813816.7 MY application No. MBB767216 US application No. 14779965 NG application No. NG/PT/C/2015.1537 Brazil Application No. BR 11 2015 024821 7

Snap Shot

MiraCradle - Neonate Cooler is an affordable passive cooling device which uses the advanced Phase Change Material to treat babies suffering from birth asphyxia. Developed in collaboration with CMC Vellore, it is simple, easy to use and costs just 1/10th of the available electronic devices.



Novelty

Around 650,000 newborn babies die because of birth asphyxia every year and cooling a baby to 33°C for 72 hours is the only successful medical intervention. However, an equipment to cool the baby is expensive and costs INR 15 lacs. MiraCradle has just brought down this cost to INR1.5 lacs Key advantages of the technology are: 1. Affordability – Costs 1/10th of the present electronic devices 2. Non-electronic – Will work even in the remote areas 3. Simple and Easy to use: No maintenance costs 4. Precise temperature control between 33-34°C 5. Long lasting – Life of more than 5 years

Safety Issues

The only safety issue is the possibility of over cooling of the baby which has been duly addressed by introducing safety checks and effective training manuals.

Third Party Validation / Clinical Trial

More than 70 babies have been treated at CMC Vellore using the device and a paper has also been published in the Neonatology Journal published by Karger. Clinical data has also been collected from 8 other medical colleges.

Industrial Partners: CMC Vellore - Development Partner Clinical data collection: 1. St. Johns Medical College, Bangalore 2. JIPMER Puducherry 3. SRMC Chennai 4. Jubilee Mission Medical College, Thrissur 5. Cloudnine Hospital Gurgaon.

Cost : INR 1.5 lacs approx.

Public Health Implications

Twenty percent of newborn deaths are because of birth asphyxia which accounts for more than 150,000 newborn deaths in India. MiraCradle can help bring down these deaths by at least 50% in the next 3-5 years

Market Potential, Competition and Risk Envisaged

The end user is any hospital with a Level 2 Neonatal Intensive Care Unit. We estimate the market size of atleast 40,000 units across the world and a total market size of Rs 600 crores.

Competition is expected in future from the Phase Change Material manufacturers in Europe and USA but it has been protected through patent. However, a low cost version of the electronic device can be one of the biggest threats for the device in future.

The technology has been accepted in the market and it is at present being used in about 60 hospitals across India. The uptake by National Program will be helpful in making this technology reach the remotest parts of the country and save lives.

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Miniature Flow Analyzer

Sponsors

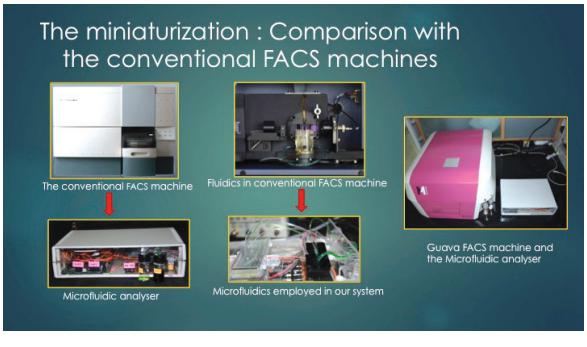
Department of Biotechnology (DBT), Govt. of India

Innovator : Taslimarif Saiyed
Contact Details: Centre for Cellular and Molecular Platforms, Bangalore
Email: taslim@ccamp.res.in
Mobile: 9620959162
Technology Readiness Level : Ready for Commercialization

Intellectual Property Right : Provisional Application no- 04067/CHE/2011 Date of filing – 4th Feb 2012 PCT Application no – PCT/IB2013/050871 Date of filing – 1st Feb 2013 National filing – August/September 2014 US, EP, South Africa, JP, Vietnam, Nigeria, ARIPO, EURASIA, South Korea, China and India.

Snap Shot

A state-of-the art flow analyzer with efficient integration of non-expensive optics, electronics and micro fluidics techniques, to make quantitative immune monitoring affordable and accessible to a large number of unreached patients in developing/ under-developed countries.



Novelty

Current state-of-the art flow analyzers, which are used for quantitative HIV patients' immune monitoring require around INR 40-50 lakhs of initial investment and an additional INR 2-5 lakhs per year in maintenance costs. This makes it difficult to place these machines in every primary healthcare unit making qualitative or quantitative testing inaccessible to rural patients. There is, therefore, a need for a less expensive, user friendly and portable flow analyzer that can quickly give quantitative information on the impact of infections like HIV on patient's immune health in both urban and rural areas around the world.

The technology, a miniature flow analyzer in lab-on-chip form combines principles of optics, flow cytometry, micro fluidics device fabrication and nanoelctronics to allow rapid cell analysis and quantification. This technology would benefit patients directly by having availability of such devices in small healthcare centers too and also at an affordable cost. While this technology is currently being developed with a primary target being AIDS health monitoring, it can also be adapted to cell culture assays, detection of water contamination, platelet and other blood cell counts and oncological tests.

Safety Issues

Nil

Third Party Validation / Clinical Trial

Not yet done

Industrial Partner: commercialized by an Indian company working with NDS, NDDB for application in the field of Animal Biotechnology

Cost: Cost of development is around INR 2 crores.

Public Health Implications

This device would make a large difference in the current set up where patients will be benefited directly by having availability of such devices in small healthcare centers at an affordable price.

Market Potential, Competition and Risk Envisaged

The current technology competition is from Beckton Dickinson, Beckman Coulter and other flow cytometry technology players. The risk would be delayed deployment of the technology.

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Point-of-Care Biosensors

Sponsors

BIG-BIRAC, Department of Biotechnology, Govt. of India

Innovators: Navakanta Bhat, Vinay Kumar
Contact Details: IISc, Bangalore
Email: chandertech7@gmail.com
Mobile: 9108934728

Technology Readiness Level : Prototype

Intellectual Property Right : Vinay Kumar and Navakanta Bhat: "Device and method for detection of haemoglobin and its complexes, PCT International Application No. PCT/IB2015/056832; "Device and method for non-enzymatic and electrochemical detection of glucose bioanalyte", PCT International Application No. PCT/IB2015/056854; "Electrochemical biosensor and a method of sensing albumin and its complexes", PCT International Application No. PCT/IB2015/056619; "Electrochemical biosensor and method for detecting urine creatinine and albumin to creatinine ratio", Indian Patent Application No. 2412/CHE/2015; Navakanta Bhat, Vinay Kumar, Ashwin V.M., Suraj Hebber, "Smart strip with strip identifiers, system and process for electrochemical detection of bioanalytes", Indian Patent Application No. 849/CHE/2015

Snap Shot

Electrochemical technology developed can perform eight tests on a single device : HbA1c, glycated albumin, blood glucose, Hb, serum albumin, micro albuminuria, urine creatinine , ACR. CeNSE was dedicated to Nation by Prime Minister Shri Narendra Modi on Feb 2015. Electrochemical technology is highly accurate, less sample volume (blood or urine) required, low cost, easy to manufacture. There is no need of clean room or silicon manufacturing setup.

Novelty

According to International diabetes federation, 382-million world population is diabetic and the number may increase up to 592 million by 2035. Diabetes caused 6.1 million deaths in 2013. India with 65.1 million

diabetic patients is diabetes capital of the world. Current technology provide a comprehensive point of care testing of diabetes management.

This is a low cost disposable patterned electrode sensor for quantitative and accurate measurement of glycated hemoglobin (gives average of 90 days glucose levels) and glycated albumin, total serum hemoglobin for anemia and total serum albumin, ACR and blood glucose for diabetes management. Instead of using immunological assays, which tend to be unstable, our technique relies on appropriate chemical functionalization of electrodes. We are also exploring techniques to measure glycated albumin in blood, which would give 14 days' average blood glucose level.

Safety Issues

Electrochemical technology is very safe, glucometer device is already in the market and easily available over the counter.

Third Party Validation / Clinical Trial

Ongoing clinical trials at Anand Laboratories , Bangalore, Samatvam: Science and Research For Human Welfare Trust: Jnana Sanjeevini Medical Center, Bangalore

Industrial Partner: A start-up company "PathShodh Healthcare Pvt. Ltd." (http://pathshodh.com/index.php) has been incubated in Indian Institute of Science, Bangalore.

Cost: Approx. INR 25,000; devices available in the market cost few lacs.

Per test cost as an example for HbA1c and ACR: INR 150 and 50 compared to INR 300 and 500 in market.

Public Health Implications

Diabetes is a global health burden on the world economy. Blood glucometers are available in the market since 1980s but bare glucometers are not sufficient in the management of diabetes and its complications. Our device will provide a comprehensive diabetes management in a cost effective way. This will help in better patient management and reduce the number of deaths.

Market Potential, Competition and Risk Envisaged

In India there are more than 7 Lacs private clinicians and they don't have in-house Pathology Laboratory. There is a need for this type of technology for home diagnostics as well as for the private clinicians also. The inventor of this technology is himself a juvenile diabetic patient from last 16 years and comes from a rural area of U.P. states. This is a harsh reality that India has highest number of diabetes population and we cannot manufacture even the glucometer devices with a good accuracy and low cost. We went a step ahead and invented this technology so that we can serve the nation and world.

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Saans

Sponsors

DBT BIRAC- Sparsh Grant, FICCI- Millennium Alliance

Innovator : Nachiket Deval
Contact Details: Coeo Labs Private Limited, Bangalore
Email: nachiket@coeo.in
Mobile: 9902870475
Technology Readiness Level : Developed, Made in India & Commercially Available
Intellectual Property Right : Reference: India 3558/CHE/2014

Snap Shot

"Saans", a project supported by DBT SPARSH grant, is a low cost, portable and easy to use mechanical Continuous Positive Airway Pressure (CPAP) device, which provides constant pressure, and constant volume air flow in the lungs of newborns and infants suffering from respiratory distress syndrome (RDS) during troubled breathing, thus preventing lung collapse during transportation from the rural center to a neonatal ICU.

Novelty

As per WHO, the incidence of respiratory distress in the newborn period ranges from 2.9% to 7.6%, and 4.3% of newborns may require CPAP /oxygen therapy. A recent study suggests that around 15 million babies are born premature every year, and around 1.14 million of these die because of respiratory distress. In India alone we lose around 162000 babies annually to RDS of which around 32 % deaths are while they are transported to a tertiary care centre for neonatal ICU care. Saans is a low cost and easy to use mechanical device, which is used to maintain a constant pressure, and constant air flow in the lungs of newborns and infants to prevent alveolar collapse and to keep the lungs open during troubled breathing in various settings. This low-cost CPAP device would be used in the intra-hospital transport of critical babies in both rural and urban hospitals. The product being of an entirely mechanical assembly operates without any power and could be used by a minimally trained person (like parents).

Safety Issues

CPAP technology is recommended by WHO for neonates suffering with RDS. We are making a manually CPAP device, thus, there are minimal safety concerns, which also have been mitigated in the design.

Third Party Validation / Clinical Trial

The technology has been tested on bench top medical mannequins, with simulation of neonatal lung capacity and resistance and has showed very promising results.

Industrial Partner: We would be partnering with government agencies, NGOs and other rural healthcare channels to make his product reach the masses. We are in talks with WISH foundation for pilot launch.

Cost : INR 14000.

Public Health Implications

The device will aid tremendously in reducing adverse outcomes during neonatal transport and will substantially reduce the burden of RDS.

Market Potential, Competition and Risk Envisaged

In India, approx 3.5 million premature deliveries take place annually of which 4 lakh neonates suffer from respiratory distress. Our target is Government procurement, for disbursement in every PHC and CHC across India. We are also looking at rural private nursing homes and maternity centers as potential users.

Currently there are neonatal CPAP device available in the market however they have complex electronics and require oxygen cylinder and electricity for their operation also there are no transport CPAP devices available.

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TBCCTV

Sponsors

Bill and Melinda Gates Foundation, USAID and RNTCP under the Grand Challenges in Tuberculosis Control in India

Innovator: Nishant Kumar
Contact Details: Embryyo Technologies Private Limited, Pune
Email: nishant.kumar@embryyo.com
Mobile: 9765816343
Technology Readiness Level : Developed, Animal Trials Done
Intellectual Property Right : 2293/MUM/2015 Title-"System for monitoring the drug adherence and alerting the non-adherence"

Snap Shot

TBCCTV is an electronic medical event monitoring system designed specially to monitor the time of pill intake by a tuberculosis patient. The technology consists of a mobile pill box with an integrated SIM based circuit for SMS communication. The pill sensing circuit is based on a tearable, conductive ink technology.

Novelty

A TB patient undergoes a six-month regimen of antibiotics under the DOTS program. Non-adherence to the regimen increases the likelihood of contracting multi-drug resistant (MDR). 1. Fits with the existing DOTS programme 2. A zero-patient burden solution 3. Conductive ink tracks do not need any calibration 4. Automated reporting and workflow 5. Can identify the non-adherent patients in almost real-time.

Safety Issues

The device is completely safe to use.

Third Party Validation / Clinical Trial

Field trials going on in Maharashtra

Industrial Partner: Embryo Technologies Private Limited

Cost : Per device - INR 5000; Operational cost per patient - INR 1000. Device can be reused for a maximum of 4 patients.

Public Health Implications

India has the biggest pool of TB patients. MDR TB is prevalent due to non-adherence of drugs in patient population. Currently RNTCP spends INR 5000 on medicine per TB patient. For a multi-drug resistant TB patient, the medication costs around INR 2,00,000 and the duration of treatment is 2 years with lesser chances of survival. Hence robust drug adherence monitoring systems are required to prevent MDR cases.

Market Potential, Competition and Risk Envisaged

Currently, no technology in the country addresses the problem of real time monitoring of drug compliance in TB patients. We do not foresee any threat / obsolescence of the IP as electronic medical event monitoring for drug adherence will be a cost effective way of ensuring drug adherence. - product cost has to be brought down by 30 percent, which is possible as soon as the number of units increase in production - misuse of the SIM card by the patient.

44

Lab on Chip device for Blood Plasma Separation

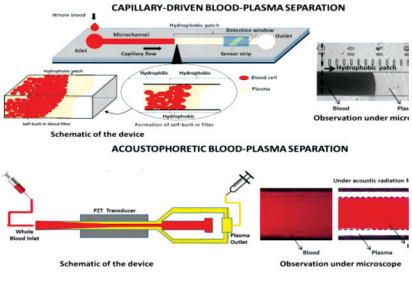
Sponsors

Indian Institute of Technology Madras

Innovators : Ashis Kumar Sen, M. Sneha Maria, S. Karthick
Contact Details: Indian Institute of Technology, Madras
Email: ashis@iitm.ac.in
Mobile: 9176651005
Technology Readiness Level : Prototype
Intellectual Property Right: IITM ICSR IDF No. 1385, Application No. 201641015681
Title - "Method for blood plasma separation based on acoustocapillary and asymmetric capillary flow", Application filed on May 05, 2016

Snap Shot

Hydrophobic region in hydrophilic capillary microchannel impedes motion of blood, leads to aggregation of RBCs which acts as self-built-in-filter and facilitates separation of less viscous plasma. Under acoustophoresis, RBCs concentrate at channel center (node) and cell free plasma collects at walls (antinode) which is separated by a trifurcated channel.



Novelty

Use of microfluidics technology for the sample preparation step would miniaturize and enable easier integration with detection modules. The point-of-care diagnostic tests will then be made simpler and overcome the difficulties with sample handling, transportation and storage. Such devices will increase the quality, reproducibility, and reliability of the assay results.

Safety Issues

Nil.

Third Party Validation / Clinical Trial

The working of the device has been validated with the help of human blood samples. The capillary blood plasma separation device gives 22.5% plasma recovery from whole blood in 15min with ~99% purification efficiency. The acoustophoretic plasma separation device can separate plasma from whole blood at the rate of 10µl/min.

Industrial Partner: No commercial agency/enterprise has been directly contacted till date.

Cost: INR 1000 approx.

Public Health Implications

The proposed techniques have potential application in Point-Of-Care diagnostics and can help in accurate assessment and diagnosis of diseases. These devices will increase the quality, reproducibility, and reliability of the assay results. The cost-effective, self-driven capillary-driven plasma separation device will serve resource poor settings such as rural areas and military camps. The high-throughput acoustophoretic device will help in continuous monitoring of plasma analysis in ICU patients.

Market Potential, Competition and Risk Envisaged

Most blood tests require the separation of plasma from whole blood for better accuracy and sensitivity. The proposed techniques can be integrated with miniaturized detection modules resulting in point-of care diagnostic devices. Therefore, the end-users will include doctors, clinicians and in- and out-patients.

In contrast to similar blood plasma separation devices reported in literature, the proposed device is much simpler in terms of design and fabrication and offers higher rate of plasma separation and enhanced purity.