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AGAPAY

Robotic Exoskeleton for Upper Extremity Rehabilitation

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THE PROBLEM

With stroke as the second most common cause of death and disability in the Philippines, its impact is still a major burden not only in the physical, psychological and financial well-being of stroke patients but also to the health care system, economy and society. Conventionally, stroke patients are rehabilitated through traditional rehabilitation therapy with the aid of physiotherapists and rehabilitation specialists, in which services are currently limited in the country.

Moreover, there are no commercially available robotic exoskeletons manufactured locally.

THE SOLUTION

AGAPAY is a 12-degree-of-freedom (DoF) wearable robotic exoskeleton that addresses the need for a motor rehabilitation and physical therapy device specific to post-stroke and injured patients. The device is designed to be user-friendly, safe to use, comfortable and cost-effective, which are among its key features.

AGAPAY also includes the 3-DoF mobility of the shoulder (abduction-adduction, flexion-extension, lateral-medial rotation), 2-DoF of the elbow (flexion-extension, pronation-supination) and 2-DoF of the wrist (pitch, yaw) and 5-DoF of the five fingers for flexion-extension. Through the power transmission of its actuators, this robotic exoskeleton shall aid the patient's upper limbs to perform his/her range of motion, eventually regaining motor control. An active biofeedback control system and guided user-interface were also added to aid in the promotion of neuroplasticity.

At the end of the R&D phase, this device will provide an alternative option to traditional rehabilitation therapy that could also set the standard for robotic rehabilitation technologies in the Philippines.

TECHNOLOGY GENERATOR

De La Salle University – Institute of Biomedical Engineering & Health Technologies (DLSU-IBEHT)
DLSU-IBEHT Director: Nilo T. Bugtai, PhD
Project Lead: Renann G. Baldovino, PhDV

TECHNOLOGY DEVELOPMENT

The product is currently at Technology Readiness Level (TRL) 4. It is currently in its initial clinical trial phase wherein protocols for the developed upper limb robotic exoskeleton safety and human pilot testing will be developed and established. The research team is also looking for potential industry partners to manufacture the device.

Interested technology adopters may send a letter of intent addressed to:

Dr. Renann G. Baldovino
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Institute of Biomedical Engineering and
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Email: renann.baldovino@dlsu.edu.ph

Dr. Nilo T. Bugtai, Director
De La Salle University -
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Akapulko Lotion as Antifungal

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Fungal skin infection or dermatophytoses is one of the most common skin conditions in tropical countries like the Philippines. It is mostly contagious and can easily spread from one person to another through physical touch, or touching a surface where the fungus is present. Antifungal medicines are relatively expensive for the 2-6-week treatment period, depending on the extent of the lesions.

THE SOLUTION

Senna alata or commonly known as Akapulko is a woody bush that grows wild in the tropical climate of the Philippines and an affordable locally sourced herbal medicine. Its leaves have been traditionally used to treat fungal skin infections such as ringworms, scabies, and eczema.

The Institute of Herbal Medicine - National Institute of Health of the University of the Philippines Manila has formulated a lotion from akapulko to address fungal skin infections. The formulation contains chrysophanic acid and anthraquinones such as rhein and aloe-emodine which have demonstrated antifungal activity against dermatophytes and superficial yeast infections. Results of several clinical trials also show that the formulation is as effective as synthetic antifungal agents in the treatment of superficial skin infections.

TECHNOLOGY GENERATOR
National Integrated Research Program on Medicinal Plants (NIRPROMP)
Institute of Herbal Medicine – National Institutes of Health (NIH)
University of the Philippines – Manila
Project Lead: Dr. Nelia C. Maramba

TECHNOLOGY DEVELOPMENT

The Akapulko lotion is currently at technology readiness level 8 and is ready for adoption. Proposed selling price is PhP 120.00 per 5mL tube. The proponents are currently seeking pharmaceutical companies that will produce, manufacture and distribute the product in the Philippine market.

Interested technology adopters may send a letter of intent addressed to:

Technology Transfer and Business Development Office
University of the Philippines Manila
Ermita, Manila
ttbdo.upm@up.edu.ph

Anti-Dengue Herbal Drug Formulation

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Over the years, the global incidence of dengue has grown rapidly. According to the World Health Organization (WHO), it is estimated that there are 100-400 million infections annually. In the Philippines, the Department of Health (DOH) reported that dengue cases exceeded the epidemic threshold in 2019.

Dengue is a mosquito-borne viral infection that causes a flu-like illness that may develop to severe complications such as bleeding, organ impairment, and plasma leakage. There is no known cure for dengue infection at present and only management of symptoms could help in the recovery.

THE SOLUTION

The country has a rich plant biodiversity that may offer potential remedies for dengue. Based on existing literature, several local medicinal plants have shown activity against the dengue virus. Through a research collaboration funded under DOST-PCHRD's Tuklas Lunas® Program, a group of researchers from the De La Salle Health Sciences Institute-Dasmariñas (DLSHSI) and Pharmalytics Corporation, under the leadership of Dr. Josefino R. Alvero and Dr. Rita Grace Y. Alvero, harnessed the bioactive potential of selected herbal plants against dengue. They were able to develop a solid oral anti-dengue formulation composed of a fixed-dose combination (FDC) of three herbal medicines available locally.

This anti-dengue herbal formulation helps in weakening the severity of dengue. Results of Plaque Reduction Neutralization Tests (PRNT) showed that the formulation was able to significantly neutralize certain strains of dengue virus.

The product has completed Phase 1 clinical trials and is currently undergoing Phase 2 and 3 clinical trials. Results showed that the maximum tolerated dose predicted by the animal model was applicable to human participants. The product will be offered for commercialization once it completes its remaining clinical trials. The research team is also planning to test the formulation against related viruses such as Japanese Encephalitis, Chikugunya and Yellow Fever.

TECHNOLOGY GENERATOR
Pharmalytics Corporation and De La Salle Health Sciences Institute-Dasmariñas
Project Lead: Dr. Rita Grace Y. Alvero

TECHNOLOGY DEVELOPMENT

The product is currently at Technology Readiness Level 6. Upon completion of Phase 3 clinical trials, the researchers intend to tap the local pharmaceutical companies for mass production and commercialization. Local patent and national phase entry applications were already filed for the formulation.

Interested technology adopters may send a letter of intent addressed to:

Pharmalytics Corporation
3F Zhang Place Building, Blk 9 Lot 13, Metrosouth,
Brgy. Manggahan, General Trias, Cavite, Philippines
Telephone line: (+6328) 404-3461,(+6346) 416-6271
Email address: info@pharmalyticsph.com
Website: https://pharmalyticscorp.com/

Biotek M:
Dengue Detection Kit

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Dengue is dangerous when not treated early. Based on data from the Department of Health, 131,827 cases of dengue were recorded nationwide in 2017, with most cases affecting children from 5-9 years old. There were 732 deaths recorded in the same year. The standard test for dengue, Polymerase Chain Reaction (PCR) test, costs from P7,000-8,000, a cost too high to bear by the marginalized sector who are the most commonly affected by dengue infection. It also takes at least 24 hours to know the results.

THE SOLUTION

Biotek M is a diagnostic kit which acts as a confirmatory test for diagnosis of dengue infection in the first 0-5 days of illness, and results would be known in an hour or less. Designed to be used in hospitals or clinics with minimal laboratory facilities, using Biotek M would mean less admissions for dengue-suspected cases, therefore saving resources for both hospital and patients. This test is as efficient but is less costly than the currently available PCR technology used in dengue detection.

TECHNOLOGY GENERATOR
University of the Philippines
Project Lead: Dr. Raul V. Destura
Co-inventors: Joy Ann G. Petronio,
Carmencita C. Padilla,
Romel Gomez,
Ricky B.Vinarao,
Kristine Marie G. Flores,
Jesus Emmanuel A.D. Sevilleja,
Sharie Keanne Ganchua

TECHNOLOGY DEVELOPMENT

The product is already being sold by a spin-off company called Manila Health Tek Inc.

Interested technology adopters may send a letter of intent addressed to:

Raul V. Destura, MD, MBA, FPSMID
Manila HealthTek Inc.
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Tel No: (02)7 006-0536
talk2us@manila-healthtek.com

Community Health Information Tracking System (CHITS)

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

With the volume of health information typically collected in a government health center, it has always been a challenge for the health personnel to consolidate data into a cohesive and relevant report. Patient's information and other health-related data are collected manually using paper-based methods which are often prone to error, destruction, and alteration. Some medication errors happen due to poor handwriting, ambiguous abbreviations, and disorganized keeping of records.

Reporting health data through paper records also consumes more time which causes significant delays and reporting of inaccurate information. This may prevent decision makers from fully understanding the health status of their communities. As a result, there is also a gap in developing well-planned strategies that will combat the country's health problems and reduce inequity in healthcare access.

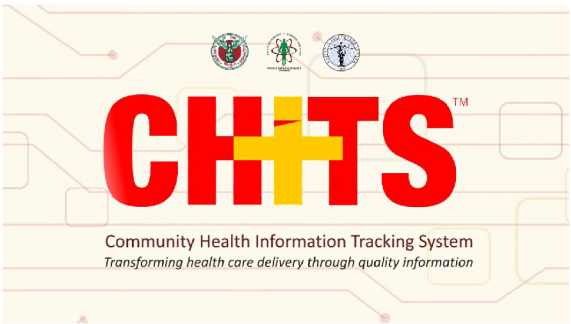
THE SOLUTION

The Community Health Information Tracking System (CHITS), one of the six Philhealth-certified electronic medical record (EMR) systems being used in Rural Health Unit (RHU) level, reduces patient's waiting time and improves monitoring of patient care through efficient data encoding and records retrieval. The technology aims to contribute to effective and efficient delivery of health services through appropriate information and communication strategy, and to aid in health decision-making at the local level. By utilizing CHITS, a patient's records can be searched for only a few seconds upon admission, while laboratory requests, results and reports can be generated automatically.

To support the efforts in digitizing health records, the entire system is designed to follow the workflow of primary healthcare facilities including the paper-based documentation process. This setup will make the process easier for health workers or users to learn and adopt the system with minimal supervision needed.

CHITS is one of the two EMRs that can seamlessly connect and interoperate with the RxBox, the PCHRD-supported biomedical device capable of measuring a patient's temperature, blood pressure, heart rate, oxygen saturation, uterine contractions, and electrocardiogram readings. It is also proven to be interoperable using an international health IT standard called Health Level 7-Fast Healthcare Interoperability Resources (HL7 FHIR) which is used for data exchange among various healthcare providers. Currently, CHITS creates a separate module for the collection, processing, and analysis of clinical and epidemiological data of patients with rare diseases, such as X-linked Dystonia Parkinsonism or XDP.

Equipped with this module, CHITS can generate detailed analysis of data for patients with XDP. The EMR module for XDP Care will be piloted in a healthcare facility in Capiz, this year. As CHITS is capable of immediate and direct transmission of electronic reports to the Department of Health (DOH) and the Philippine Health Insurance Corporation (PhilHealth), reimbursements can be processed faster.



TECHNOLOGY GENERATOR
National Telehealth Center,
University of the Philippines Manila
Project Lead: Mr. Arturo M. Ongkeko Jr.

TECHNOLOGY DEVELOPMENT

CHITS has already obtained copyright and trademark protections. Through the project, selected UP faculty researchers and staff formed an SEC-registered startup company, the Pivotal Peak Digital Health Solutions, Inc., that shall handle the commercialization of the platform.

To date, CHITS is being used in 35 Rural Health Units (RHUs) nationwide, 33 public health centers in Taguig City, 12 in Pasay City, and 91 in Quezon City.

The project team is currently seeking initial capital infusion from angel investors to cover more health facilities. Investments from venture capitalists would allow them to expand their portfolio, while training partners, technical support and deployment would allow them to expand their market reach.

Interested technology adopters may send a letter of intent addressed to:

Technology Transfer and Business Development Office
University of the Philippines Manila
Ermita, Manila
ttbdo.upm@up.edu.ph

Axis Knee System:
Confidence in Every Step

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Total knee replacement (TKR) is a crucial medical procedure, with an estimated 3-5% of the world's population requiring it every year. However, in the Philippines, only a small fraction of those who need it are able to afford it. In fact, only around 1,000 TKR cases are performed annually in the country, whereas the number should be closer to 70,000.

One of the major factors contributing to the low number of TKR cases is the shortage of trained surgeons. TKR is a complex procedure that requires specialized training, which can take at least a year to complete. As a result, there are only a few surgeons in the Philippines who are qualified to perform TKR. This scarcity of skilled surgeons limits the access to the procedure, making it difficult for those who need it to receive proper medical care.

THE SOLUTION

The Axis Knee System represents a state-of-the-art total knee replacement solution that is capable of accommodating a broad range of knee sizes. Developed by a team of proficient Filipino physicians and engineers in collaboration with consultants from Japan, China, and the United States, this FDA-approved product is manufactured locally in Orthopaedic International Inc.'s ISO 13485-certified facility in Cabuyao, Laguna. The system's patented instrumentation and surgical technique enable general orthopedic surgeons to conduct the procedure with precision and accuracy, without relying on x-rays, following a brief five-day training workshop. It is worth noting that the Axis Knee System is remarkably affordable, costing merely 50% of the price of other knee implants currently available in the market.

AXIS™ KNEE SYSTEM

TECHNOLOGY GENERATOR
Orthopaedic International, Inc.
Project Lead: Ramon B. Gustilo, MD

TECHNOLOGY DEVELOPMENT

The aforementioned product has been available for purchase in the Philippines since 2015. Patents for its instrumentation and surgical techniques have already been granted in the United States and the European Union. Currently, the product is open for international licensing.

Interested technology adopters may send a letter of intent addressed to:

Mr. Jude Sasing
President, Orthopaedic International Inc.
No. 9 West Road, Light Industry and Science Park I, Cabuyao, Laguna
jude.sasing@oii.com

BANABA TABLETS

Standardized herbal supplement with blood sugar lowering health benefits

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Hyperglycemia or high glucose level in the blood is a condition associated with diabetes. To date, diabetes has already affected millions of Filipinos and has a prevalence rate of 7.1% among adults between the ages of 20-79. Data from the Philippine Statistics Authority show that deaths due to diabetes ranked fourth in 2020.

Regulating blood glucose levels is an important aspect in managing diabetes. In addition to insulin medications, taking herbal supplements which can help lower blood sugar levels may also be beneficial. In the Philippines, there are many supplements formulated from plants which claim to have said function. However, it is unclear whether the herbal supplements are really effective, and oftentimes are not standardized, therefore generally not medically prescribed.

THE SOLUTION

Lagerstroemia speciosa (L.) Pers., commonly known as queen's crape-myrtle or banaba, is a flowering tree that commonly grows in Southeast Asia. Banaba leaf decoction is traditionally used among Asian countries as a remedy for diabetes, fever and kidney problems. Aside from its antidiabetic properties, banaba is also known for its anti-inflammatory, anti-microbial, antiviral, anti-hyperuricemia, anti-fibrotic, antinociceptive, anti-obesity, and antioxidant activities.

A research team from Herbanext Laboratories, Inc. and the University of the Philippines Diliman collaborated on a research project funded under the TUKLAS LUNAS® Program of the Philippine Council for Health Research and Development (PCHRD) to formulate a standardized herbal supplement from banaba's ethanolic and aqueous extracts. The formulation was standardized against corosolic acid and ellagic acid. These are ethanol- and water-soluble bioactive compounds, respectively, that are mainly responsible for banaba's blood glucose lowering properties. Other water-soluble bioactive compounds extracted from banaba that contribute to its blood glucose lowering activity include maslinic acid, lagerstroemin, flosin B, reginin A and penta-O-galloyl-D-glucopyranose (PGG).

Results of acute oral toxicity studies and in vitro cytotoxicity studies on liver cancer and normal kidney cell lines show that the standardized banaba formulation is safe and non-toxic. Moreover, results of glucose uptake assays conducted at the Disease Molecular Biology and Epigenetics Laboratory at the National Institute of Molecular Biology and Biotechnology in UP Diliman, have shown an enhancement in the cellular uptake of glucose. This proves that each tablet taken by the consumer contains the right amount of compounds enough to aid in lowering blood sugar levels without being toxic to the liver and kidneys.

TECHNOLOGY GENERATOR
Herbanext Laboratories, Inc. and
University of the Philippines Diliman

TECHNOLOGY DEVELOPMENT

The banaba tablets are at Technology Readiness Level (TRL) 8. The product is packaged in tablet form and is ready for adoption. An IP application for the formulation is already filed at the Intellectual Property Office of the Philippines (IPOPHL). The technology owners, led by Herbanext, welcome potential licensees who may be interested to market the technology.

Interested technology adopters may send a letter of intent addressed to:

Paul Felipe S. Cruz
Herbanext Laboratories, Inc.
Negros South Road, Bago City, Negros Occidental, Philippines
Tel No. +63 (34) 732-8106
Email: philipcruz.herbanext@gmail.com
www.herbanext.com/tawa-tawa/

eHatid LGU:
Android-Based Electronic Medical Record System for LGUs

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

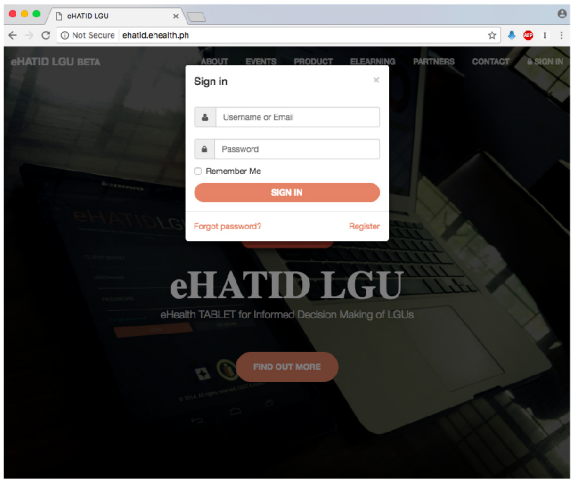
THE PROBLEM

Despite the advances in information and communication technology, the use of electronic health (eHealth) information systems among rural communities is seemingly low. This is attributable to the lack of access to available eHealth information systems and the lack of capacity building activities among local health care service personnel. There is also a need to improve transparency of patient data management which will allow local government units (LGUs) to make informed decisions on local health care programs and enhance health care delivery systems.

THE SOLUTION

The eHATID LGU (eHealth TABLET for Informed Decision-Making of Local Government Units) is an android-based electronic medical record system that was developed with the aim to improve patient data management and delivery of health care services. This mobile application allows target end-users to electronically encode and store patient data in a database even in the absence of an internet connection. The system is also equipped with health data analytics and a Mayor-Doctor communication system that allows LGUs to make informed decisions on their community health care programs. Also, the system enables the integration of patient data into eClaims benefit of PhilHealth.

To date, eHATID LGU has been distributed to 426 LGUs across the country. The eHATID team has also conducted 29 training activities that capacitated a total of 990 local health care personnel.



TECHNOLOGY GENERATOR
Institute of Philippine Culture,
Ateneo de Manila University
Project Lead: Dennis B. Batangan, MD, MSc (Heidelberg)

TECHNOLOGY DEVELOPMENT

The eHATID LGU health information system is ready for commercialization. It already has licensees and is currently transitioning into a spin-off company.

Interested technology adopters may send a letter of intent addressed to:

Ateneo Intellectual Property Office
2/F PLDT-CTC Building, Katipunan Ave., Loyola Heights, Quezon City
aipo@ateneo.edu
63(2) 8426-6001 local 5672 or 5679

GenAmplify™
COVID-19 RT PCR Detection Kit

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Coronavirus disease (COVID-19) is a global pandemic that has affected 150 million people and 220 countries to date. This is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The outbreak of COVID-19 was declared as a Public Health Emergency of International Concern (PHEIC) by the World Health Organization on 30 January 2020 due to its fast transmission across countries worldwide. It continues to leave casualties and the Philippines is no exception. COVID-19 cases in the country started to rise in March 2019 and there are already 1,054,983 confirmed cases as of 03 May 2021.

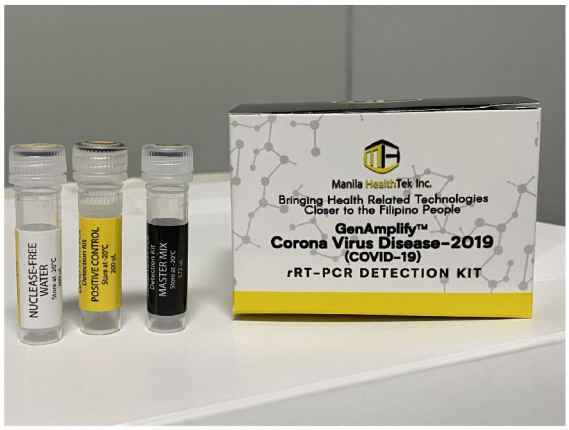
This surge in positive cases poses an immediate and strong need for a COVID-19 detection kit that is accurate, fast, and inexpensive. This will address the need for a reliable test with a shorter turnaround time for the results and is accessible to the general population so more people can be tested.

THE SOLUTION

A team of 15 scientists from the Philippine Genome Center, which includes the inventor of Biotek™ M Dengue Kit, Dr. Raul V. Destura, and the University of the Philippines Manila – National Institutes of Health (UPM-NIH) successfully developed a locally-made real-time reverse transcription polymerase chain reaction kit called GenAmplify™ Corona Virus Disease-2019 rRT-PCR Detection Kit through a research funded by the DOST-PCHRD. The detection kit tests for the presence of SARS-CoV-2 via nasopharyngeal and oropharyngeal swabs.

GenAmplify™ was developed through Next Generation Sequencing, a process that identifies the DNA and properties of several unknown organisms. It had undergone further verification processes to ensure its usefulness. It was tested in all bacteria and viruses that can be present in the lungs to make sure that the kit only yields a positive reaction to SARS-CoV-2. Further tests showed its capacity to amplify a very small size of the virus, up to 0.05 copies per one microliter, specifically.

To date, GenAmplify™ has already been rolled out to various hospitals all over the country. Since the kit is locally sourced, its production cost is relatively inexpensive hence, more supplies can be made, and delivery is faster making the kits more accessible to Filipinos who need to undergo COVID-19 testing.



TECHNOLOGY GENERATOR
Manila HealthTek, Inc.
Project Lead: Ms. Joy Ann P. Santos

TECHNOLOGY DEVELOPMENT

GenAmplify™ Corona Virus 2019 (COVID-19) rRT-PCR Detection Kit is currently at Technology Readiness Level (TRL) 9, wherein the technology is available for consumers. The second version of the kit was given a certification of validity and reliability by the Food and Drug Administration last July 6, 2020 after passing confirmatory tests of Research Institute for Tropical Medicine (RITM) and DOST laboratories.

The first batch of the test kits is rolled out to various hospitals, both in and out of Metro Manila. Manila HealthTek, Inc. is responsible for the mass production and distribution of the test kits.

Interested technology adopters may send a letter of intent addressed to:

Manila HealthTek, Inc.
109 Mayor Gil Fernando Avenue,
Santa Elena, Marikina, Manila
talk2us@manila-healthtek.com

LAGUNDI:
Anti-cough and anti-asthma medicine

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

The prevalence of common respiratory infections causes a burden to millions of people worldwide. Most children acquire multiple respiratory infections during their early years, while asthma remains to be the most common chronic respiratory condition even for adults. As healthcare remains inaccessible and unaffordable in the Philippines, Filipinos, especially those residing in rural areas, resort to relying on inexpensive alternative sources of treatments such as traditional medicines.

The problem, however, is that some traditional medicines, if not ineffective, were found toxic, have side-effects, and may cause more serious complications (e.g. kidney disease, hypertension and cancer). Hence, there is a strong need to validate the efficacy of herbal medications and develop safe and low-cost drugs that are efficient in treating common respiratory infections.

THE SOLUTION

A team of researchers from the University of the Philippines, with support from the DOST-Philippine Council for Health Research and Development (DOST-PCHRD), formulated a lagundi-based drug which can effectively ease the symptoms of respiratory infections, specifically cough and asthma. It is in syrup and tablet forms and is good for both children and adults.

The drug is a product of multiple scientific studies and clinical trials as part of the National Integrated Research Program on Medicinal Plants (NIRPROMP). Lagundi formulation was proven to be effective in preventing the spread of disease-causing microorganisms, reducing fever, decreasing the viscosity of mucus, improving the color of phlegm, alleviating shortness of breath and wheezing, and lessening the frequency of cough. “Lagundi” is a common term for Vitex negundo L., which is traditionally used to treat insect and snake bites, ulcers, rheumatism, sore throat, cough, fever, and clogged sinuses. This plant is common and widely distributed in the country.

TECHNOLOGY GENERATOR

University of the Philippine Diliman
University of the Philippines Manila
University of the Philippines Los Baños
Ateneo De Manila University

TECHNOLOGY DEVELOPMENT

Lagundi has become one of the most established and widely used herbal drugs for cough in the country through the various measures taken to promote research and development of traditional medicine. The lagundi-based medication was first licensed by PCHRD to three pharmaceutical companies in 1995 namely, Pascual Laboratories, Inc., Gruppo Medica, Inc. and Natrapharm, Inc.

The technology has been fully commercialized since 1997 by Pascual Laboratories, which released lagundi in the market under the brand name Ascof Lagundi. In accordance with the Technology Transfer Act of 2009, PCHRD then transferred the entitlement of the technology to UP Manila on behalf of the National Integrated Research Program on Medicinal Plants (NIRPROMP) in 2012.

Several other companies followed as licensees and released lagundi under different brand names, such as Plemex, RiteMed, Lagundex, and Astrol, among others. Actual market price ranges from PhP 0.94 - PhP 6.50 / 300 mg; 600 mg for the tablets and PhP 28.50 - PhP 110.00 / (60 mL) and PhP 40.00 - PhP 150.00 / (120 mL) for the syrup.

Interested technology adopters may send a letter of intent addressed to:

Technology Transfer and Business Development Office
University of the Philippines Manila
Ermita, Manila
ttbdo.upm@up.edu.ph

SeeYouDoc Analytics

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

The sudden onslaught of the COVID pandemic crippled the majority of operations in the Philippines and the world. This highlighted the major flaws in the healthcare sector of our country, such as the overburdening of the healthcare workforce, the lack of beds sufficient to take in patients and the overall lack of an effective referral system that deprives the patient of the ability to clearly navigate the health system, from selecting the suitable healthcare professional to receiving advice on necessary medical tests or treatments and referral back for further care. The Philippines Health System Review – WHO, 2018. Furthermore, the spread of the virus hindered the mobility of patients who needed to visit medical facilities for check-ups and follow-ups, resulting in a significant gap in Filipinos' access to basic medical care throughout the pandemic. Telemedicine has emerged as a solution that transcends these logistical challenges, bringing healthcare to the patient at the comfort of their own homes, and making it more accessible even to commonly marginalized sectors in rural areas.

THE SOLUTION

SeeYouDoc Corporation, an eHealth startup company in the Philippines founded in 2018, developed the SeeYouDoc Healthcare Ecosystem, a suite of powerful solutions and analytics for healthcare provider networks, community clinics, hospitals and healthcare-focused organizations. Its features include: (a) mobile and web application solutions for patients and doctors to conduct video teleconsultations; (b) an appointment system integrated with a calendar for doctors and clinics; (c) the sending of medical notes and patient records to doctors, patients, and vice versa; and (d) an online payment system.

Funded and supported under DOST-PCHRD's Startup Research Grant Program, SeeYouDoc Corp. improved their platform by developing the SeeYouDoc Analytics, which seeks to assist medical institutions and partners in managing their telemedicine platform. This platform offers (a) a dashboard page where users can see the overall performance of their organization's operations at a glance; (b) an appointment heat map where medical organizations can identify which hours and days of the week their virtual facility is serving the most appointments; (c) a doctor and patients demographics page; (d) a ratings and complaints page where patient feedbacks can be monitored; and (e) a revenue page where patients' mode of payment can be determined.

Presently, the SeeYouDoc platform is home to over 1,100 independent medical practitioners, 700 virtual clinics, 49 extensive medical fields, 32,400 patients, 35 partner institutions, and 12 partners in the public and government sectors. The Department of Health, Asian Institute of Management, and PLDT Enterprise are among its partners in this initiative.

Despite the growing trend in use of telemedicine, there still remains a general unfamiliarity in its utilization in the country. Medical facilities were slow to adapt due to numerous reasons: lack of technical ability to operate a telemedicine platform, lack of internal regulations and policies guiding doctors and healthcare staff, and absence of metrics measuring the telemedicine in their businesses, among others.

TECHNOLOGY GENERATOR
SEEYOUDOC Corp.
Project Lead: Mr. Noel Gary E. Del Castillo

TECHNOLOGY DEVELOPMENT

SeeYouDoc Analytics is currently at Technology Readiness Level (TRL) 9, which translates to commercial availability of the product. The Company is currently looking for medical facilities that may use the SeeYouDoc Analytics for operationalization of their telemedicine services. The web-based and app-based platform is now accessible for download by customers interested in availing of the SeeYouDoc's comprehensive healthcare services.

SeeYouDoc has been recognized as one of the top 101 Startup Companies in Southeast Asia in terms of Innovation, Growth, Management, and Social Impact.

Interested technology adopters may send a letter of intent addressed to:

Mr. Noel Gary E. Del Castillo
SEEYOUDOC Corp.
AIM Conference Center, Legazpi Village, Makati City
hello@seeyoudoc.com

Magnetic Distal Targeting Device

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Magnetic tracking is a decades-old technology that has applications in military weapons systems, virtual reality devices, and research instruments. The technology has also proven its use in the field of medicine. Magnetic tracking is used in computerized surgical navigation systems and eliminates the need for a line of sight or a physical connection between the object being tracked and the tracking device. It is used in distal targeting specifically for intramedullary (IM) nails, which are long metal rods with screw holes at both ends and are surgically used to treat long bone fractures. Previously, locating or targeting distal screw holes during surgery has been technically challenging as the holes can only be visualized through the use of expensive C-arm x-ray machines. The distal targeting procedure, if performed unsuccessfully, may result in medically-induced complications, such as misdrilling/malplacement of IM nails, risk of infection, delayed/non-union of fractured bones, and even refracture.

In response to this concern, a number of magnetic tracking devices and new techniques with different component configurations and software algorithms have been developed and patented. However, existing magnetic tracking methods and devices still use complex algorithms and the equations for determining position and orientation through these systems remain very complicated and hence, difficult to solve. There is, therefore, a need for a simplified magnetic tracking system.

THE SOLUTION

The Orthopaedic International Inc. (OII), through the funding support provided by the Philippine Council for Health Research and Development (PCHRD), was able to design and develop a simplified magnetic distal targeting device. This is an output from OII's PCHRD-funded project entitled, "Development of a Magnetic Distal Targeting Device for Intramedullary Nails" that is being led by Mr. Jude L. Sasing. The device is a unique and low-cost magnetic tracking device with a simplified tracking method.the magnetic tracking device and significantly reduce its cost.

The device requires only a simplified algorithm and can be operated using microcontrollers with low computing power. The device's electronic circuit is also relatively simple and can be implemented using low-cost off-the-shelf components. These innovations simplify the magnetic tracking device and significantly reduce its cost.

The development of the magnetic distal targeting device makes the performance of distal targeting a lot easier and less costly. As it eliminates the need for an expensive C-arm x-ray machine, distal targeting can be performed even in hospitals that do not have the said equipment. Through a simplified algorithm, the procedure can be performed easily without exposing surgeons, medical staff, and patients to x-ray radiation.

TECHNOLOGY GENERATOR
Orthopaedic International Inc
Project Lead: Jude L. Sasing

TECHNOLOGY DEVELOPMENT

The technology is currently at technology readiness level (TRL) 4. It is undergoing lab-scale prototype development. Patent and PCT applications for the technology are already filed. The technology owners are open to licensing negotiations with interested partners once the device is ready for commercialization.

Interested technology adopters may send a letter of intent addressed to:

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Guaviderm

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

According to the World Health Organization (WHO), skin disease is one of the top 50 causes of deaths in the Philippines in 2018. Among the skin diseases prevalent in the country are the following:

- **Pyoderma**, a bacterial skin inflammation encountered most frequently in tropical countries where heat and humidity further contributes to infection growth. The infection is caused by bacteria such as the beta-homolytic streptococcus and staphylococcus which may also lead to serious complications such as cellulitis, lymphangitis, and suppurative lymphadenitis.
- **Eczema**, a common skin problem which causes red, itchy and scaly skin. In severe cases, the skin may even weep and/or bleed. Although it is commonly experienced by children, the disease can affect persons of any age.
- **Scabies**, an infectious skin condition which can spread from person to person through close physical contact. Resembling an eczema, the infection is caused by mites burrowed beneath the skin which results in itchiness and the occurrence of pimple-like rashes.

Skin diseases may be treated through the use of topical creams, ointments, oral medications, and through injections, depending on the patient's condition. Some patients may need to be admitted in hospitals which may lead to costly hospital fees.

THE SOLUTION

Commonly known as the guava plant, *Psidium guajava* has been traditionally used to treat wounds and prevent infections after circumcision or childbirth. Deriving from this practice, the UP Manila-Institute of Herbal Medicine was able to formulate and develop a natural antibacterial solution for bacterial skin infections called Guaviderm. As it is locally developed, the Guaviderm is projected to be significantly cheaper than its competitors in the market.

Based on the clinical tests conducted by the UPM-IHM, the Guaviderm ointment contains quercetin compounds which can kill skin pathogens such as the *Streptococcus* and Methicillin-resistant *Staphylococcus aureus* (MRSA), which are normally resistant to common antibiotics.

The Guaviderm can be used for the (1) treatment of localized superficial skin infection, (2) prevention of wound infection following minor surgical or cosmetics procedures, (3) prevention of wound infection in minor wounds/injuries/abrasions to the skins, (4) treatment of secondarily infected eczematous dermatitis, and (5) treatment of secondarily infected scabies lesions.

The guava leaves used for the development of the ointment are sourced from Los Baños, Laguna. Through its production, the project team hopes to provide the local farmers a new cash crop and activate the supply chain of a locally-produced natural antibiotic for the Philippine pharmaceutical industry.

TECHNOLOGY GENERATOR
Institute of Herbal Medicine
National Institutes of Health
University of the Philippines Manila
Project Lead: Cecilia C. Maramba-Lazarte, MD, MscID, MScCT

TECHNOLOGY DEVELOPMENT

Clinical trials for the formulation are currently ongoing. The project team intends to license the product to local pharmaceutical companies after the completion of Phase 3 clinical trial.

Interested technology adopters may send a letter of intent addressed to:

Technology Transfer and Business Development Office
University of the Philippines Manila
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ttbdo.upm@up.edu.ph

INDAK:
Improving Neurocognition through Dance and Kinesthetics

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Currently, there is no existing intervention or treatment effective enough to treat dementia, a condition that deteriorates one's cognitive function. This explains why it is estimated that dementia patients will double every 20 years, from 43.8 million in 2016, to 100 million in 2050. In the Philippines, the average annual cost of care for patients with Dementia is Php 195,696.44, which is too much for an average working-class Filipino.

One of the conditions which may lead to dementia is Mild Cognitive Impairment (MCI), or a decline in one's memory. Hence, intervention is best done before MCI progresses. This may be done using drug-based and non-pharmacological approaches but the latter is less expensive and does not pose adverse effects to patients. The problem, however, is non-pharmacological approaches are still costly, and difficult to implement in communities.

THE SOLUTION

Recent studies have shown that there is a link between healthy cognition and physical exercise. With this, an interventive dance program called "INDAK: Improving Neurocognition through Dance and Kinesthetics" was developed which embraces the ability of dance, specifically ballroom dancing, to stimulate cognition, and physical and social activity.

It involves different forms of ballroom dances including Reggae, Cha-Cha, Samba, Merengue, Batcha, Swing, Tango, and Salsa. The dances also increase complexity and intensity throughout each module which is ideal to stimulate cognitive and intellectual activity. The 48-week program is conducted by a trained dance instructor where each session is done twice a week.

INDAK™
DANCE FOR THE BRAIN

TECHNOLOGY GENERATOR
Institute of Neurosciences,
St. Luke's Medical Center – Quezon City
Project Lead: Dr. Jacqueline C.Dominguez

TECHNOLOGY DEVELOPMENT

The program is being offered by the Institute for Dementia Care Asia. St. Luke's Medical Center also refers their patients to enroll in this program. About 60 senior citizens have already graduated from the program which was implemented at Barangay UP Diliman, Claret Parish, and Marikina Heights in 2018 with the support of HI-Eisai Pharmaceuticals, Inc. Currently, INDAK is being implemented in four barangays in Quezon City—Krus na Ligas, UP Campus, San Martin de Porres, and Obrero. The local government unit is actively supporting the cause.

Interested technology adopters may send a letter of intent addressed to:

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SAMBONG TABLET:
Herbal Drug Formulation for Kidney Stones

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Urolithiasis, or formation of kidney stones, is a clinical condition experienced by many Filipinos. In fact, 25% of all admissions in the Philippine General Hospital Division of Urology are urolithiasis cases. This condition, if not treated early, may lead to complete blockage of urinary flow and edema or fluid retention. Available treatments for urolithiasis and edema include potassium citrate medication and shock wave lithotripsy (SWL); and thiazide diuretics, respectively. These treatments, however, are expensive and SWL in particular is only available in tertiary hospitals.

THE SOLUTION

NIRPROMP developed an herbal drug formulation mainly composed of sambong leaves to treat kidney stones and edema. Sambong (Blumea balsamifera L.) is an aromatic shrub long used in Philippine traditional medicine as a treatment for fever, cough, headache, boils, abdominal pain and gaseous distention.

Results of clinical studies conducted by NIRPROMP show that their sambong formulation effectively reduced the size and number of kidney stones among urolithiasis patients. Also, the effects induced by sambong formulation are comparable with the effects induced by potassium citrate medication. Clinical studies also showed that the sambong formulation effectively increased the volume of urine excretion among patients experiencing edema. This diuretic effect of the sambong formulation is also comparable to effects of other thiazide diuretics but without causing urinary potassium loss.

This anti-urolithic and diuretic drug formulation derived from sambong leaves is included in the Philippine National Formulary. It provides a clinically-proven effective yet affordable, safe, and non-invasive alternative to expensive treatments for kidney stones and edema.

TECHNOLOGY GENERATOR
National Integrated Research Program on Medicinal Plants (NIRPROMP)
University of the Philippines
Project Lead: Dr.Nelia P. Cortes-Maramba

TECHNOLOGY DEVELOPMENT

Sambong tablet is already at technology readiness level 9. It has existing licensees and is already available in the market. Actual market price ranges from PhP 6.75 - PhP 9.25 / 500 mg tablet.

Interested technology adopters may send a letter of intent addressed to:

Technology Transfer and Business Development Office
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ttbdo.upm@up.edu.ph

SERPENTINA CAPSULES

Standardized herbal supplement wtih antioxidant/anti-inflammatory health benefits

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Inflammation is the body's natural response against stress and infection. Prolonged inflammation, however, may lead to pain and tissue damage. Related literature suggests that prolonged inflammation may be caused by poor diet and unhealthy lifestyle. Common inflammatory diseases include asthma, diabetes, heart diseases, and arthritis among others.

Taking herbal supplements with anti-inflammatory benefits may help in preventing the onset or in reducing the effects of prolonged inflammation. The market is, however, already saturated with antioxidant and anti-inflammatory supplements but most are not standardized and are not backed by scientific research. This may raise concerns in terms of the efficacy and safety of these products.

THE SOLUTION

Andrographis paniculata, commonly known as serpentina, sinta, or King of Bitters, is a medicinal herb commonly growing among the tropical countries in Asia. It is traditionally used as treatment for inflammation, upper respiratory tract infection, diabetes, hypertension, flu, diarrhea, and liver problems. Extracts from this plant have been documented to exhibit anti-microbial, anti-inflammatory, and antioxidant activities.

Herbanext Laboratories, Inc. and the University of the Philippines Diliman teamed up in a research project funded under the TUKLAS LUNAS® Program of the Philippine Council for Health Research and Development (PCHRD) to formulate a standardized herbal supplement from serpentina extracts that may help in preventing the onset of CIDs. The formulation is standardized against Andrographolide, a diterpenoid that is responsible for sepertina's anti-oxidant and anti-inflammatory properties.

Results of in vitro cytotoxicity studies on liver cancer and normal kidney cell lines have shown that the standardized serpentina formulation is non-toxic. In addition, results of COX-2 activation assays have shown a decrease in the level of COX-2 transcription. COX-2 or cyclooxygenase-2 is an enzyme that catalyzes the production of prostanoids which in turn drives the pathogenesis of inflammatory diseases. By decreasing the transcription or expression levels of COX-2, level of COX-2-generated prostanoids may also be lowered. This eventually may lead to the disruption of signaling pathways related to the progression of CIDs.

Aside from its anti-inflammatory properties, the serpentina formulation may also help support healthy cardiovascular functions, boost the immune system, lower the levels of bad cholesterol in the blood, and relieve pain, fever, and sore throat.

TECHNOLOGY GENERATOR
Herbanext Laboratories, Inc. and
University of the Philippines Diliman
Project Lead: Mr. Paul Felipe S. Cruz

TECHNOLOGY DEVELOPMENT

The serpentina capsules are at Technology Readiness Level (TRL) 9. The product is packaged in capsule form and is already available in the market for PhP 180.00 for a bottle of 30 capsules. Additionally, the formulation of this product has been granted a utility model registation.

Interested technology adopters may send a letter of intent addressed to:

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TAWA-TAWA CAPSULE
Herbal Supplement for Dengue

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Dengue is one of the major health problems in the country. According to the World Health Organization, a total of 71,785 cases of dengue and 277 dengue-caused deaths have been reported in the Philippines from January 1 until October 17 in 2020. While there is no available specific treatment for dengue, there is a need for safe and scientifically-tested interventions that can help reduce the symptoms of dengue among infected patients.

THE SOLUTION

In Philippine folkloric medicine, a decoction of tawa-tawa (Euphorbia hirta L.) leaves is commonly used as treatment for dengue. Scientific studies have shown that tawa-tawa is rich in bioactive compounds like phenolics and flavonoids which may be responsible for its anti-dengue properties. Researchers from Herbanext Laboratories, Inc. (HLI) led by their Company President, Mr. Paul Felipe S. Cruz have dedicated over 5 years of research to study these bioactive compounds. This led to the formulation of a standardized spray-dried tawa-tawa extract which was later on packaged in capsule form.

HLI's Tawa-tawa capsule is an herbal supplement that was developed through the funding assistance provided by the Department of Science and Technology (DOST) and Philippine Council for Health Research and Development (PCHRD) under the Tuklas Lunas® Program. This is an FDA-approved non-toxic formulation that is already available in the market. This herbal supplement claims no therapeutic properties but results of antithrombocytopenic studies provide evidence that it may help alleviate or reduce the symptoms of dengue. Said studies have shown that HLI's standardized tawa-tawa extract has significantly increased platelet count of Sprague-Dawley rats after 5 days of treatment.

TECHNOLOGY GENERATOR
Herbanext Laboratories, Inc.
Project Lead: Mr. Paul Felipe S. Cruz

TECHNOLOGY DEVELOPMENT

Tawa-tawa herbal supplement is already at Technology Readiness Level 9 (TRL 9). This herbal supplement is already available in the market. Actual market price is PhP 450.00 for a bottle of 30 capsules.

Interested technology adopters may send a letter of intent addressed to:

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Tsaang Gubat for Biliary and Intestinal Colic Pains

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Irritable bowel syndrome, presence of gallstones, and gastroenteritis are some of the abdominal pain conditions that require medical attention. In the country, about 10% of Filipinos endure the effects of irritable bowel syndrome, while around five million Filipinos suffer from the effects of gallstones. As healthcare remains inaccessible and unaffordable for most Filipinos, they often rely on traditional herbal remedies to manage these conditions. Traditional herbal remedies, however, are not standardized and lack scientific studies hence, these may rather be toxic and may lead to unwanted side effects.

THE SOLUTION

Carmona retusa (Vahl) Masamune, also known as tsaang gubat, is an affordable herbal formulation that aims to help relieve abdominal pain and diarrhea. It contains alpha-amyrin, beta-amyrin, and baurenol which have shown analgesic, anti-diarrheal and anti-spasmodic activities. Tsaang Gubat tablet has been clinically proven to be effective and safe in relieving pain from gastrointestinal colic and biliary colic. Results of studies have shown that a single dose of the formulation relieves pain from these conditions within 30 mins to 1.5 hours of administration.

TECHNOLOGY GENERATOR
National Integrated Research Program on Medicinal Plants (NIRPROMP)
Institute of Herbal Medicine – National Institutes of Health (NIH)
University of the Philippines – Manila
Project Lead: Dr. Nelia C. Maramba

TECHNOLOGY DEVELOPMENT

The tsaang-gubat tablet contains a patented formulation. The proponents are currently seeking pharmaceutical companies that will produce, manufacture and distribute the product in the Philippine market. Proposed selling price is PhP 5.00 - PhP 8.00 per 250 mg tablet.

Interested technology adopters may send a letter of intent addressed to:

Technology Transfer and Business Development Office
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ULASIMANG BATO:
Anti-Inflammatory drug formulation

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Gout is the most common type of arthritis among Filipinos. According to the Philippine Rheumatology Association (PRA), around 1.6M Filipinos are suffering from gout. Allopurinol, a xanthine oxidase inhibitor, is the standard treatment for gouty arthritis and it acts by lowering uric acid levels in the blood. However, despite its efficacy, cases of hyperuricemia recurrence among allopurinol-treated patients are still reported.

THE SOLUTION

Peperomia pellucida, locally known as "ulasimang-bato" or "pansit-pansitan", has long been used in Philippine traditional medicine for its analgesic, anti-inflammatory, and anti-hyperuricemic properties. The proponents have developed an herbal formulation from ulasimang-bato extracts that is targeted against hyperuricemia and gout. Based on their studies, optimum dosage is recommended initially at 80 mg/kg/day, and then reduced to 40 mg/kg/day after 2 weeks.

Results of their studies have shown that ulasimang-bato extract has significantly reduced serum uric acid levels and that the percent reduction is comparable with the effects induced by allopurinol. Also, recurrence of hyperuricemia has not been recorded among patients receiving Ulasimang-bato doses.

TECHNOLOGY GENERATOR

National Integrated Research Program on Medicinal Plants (NIRPROMP)
Institute of Herbal Medicine – National Institutes of Health (NIH)
University of the Philippines – Manila
Project Leader: Dr. Nelia C. Maramba et al.

TECHNOLOGY DEVELOPMENT

The ulasimang-bato herbal formulation is a patented technology and is ready for adoption. The proponents are currently seeking pharmaceutical companies who will produce, manufacture and

Interested technology adopters may send a letter of intent addressed to:

Technology Transfer and Business Development Office
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YERBA BUENA:
Analgesic drug formulation

HeaRTNovation
DOST-PCHRD INNOVATION PORTFOLIO

THE PROBLEM

Effective control of post-operative pain is an integral part of patient management. Poor post-operative pain control often leads to complications, increased risk for blood clots, prolonged patient recovery, and increased cost of health care expenses. There is a need for efficacious and safe analgesics or pain relievers to effectively manage post-operative pain.

THE SOLUTION

Mentha cordifolia Opiz; commonly known as yerba buena, mint, or spearmint; has been traditionally used in the Philippines as cure for headache, toothache, arthritis, and dysmenorrhea. A research team from the Institute of Herbal Medicine National Institutes of Health of the University of the Philippines Manila has successfully formulated an analgesic formulation from yerba buena extracts. Yerba buena leaves contain a compound called Menthalactone which has been shown to have analgesic or pain-relieving activity.

Results of clinical trials show that Menthalactone is safe and effective in relieving moderate to severe post-operative pain after circumcision, dental extractions, and childbirth (post- episiorrhaphy). It has been recorded that the formulation takes effect within 30 minutes after administration.

TECHNOLOGY GENERATOR
National Integrated Research Program on Medicinal Plants (NIRPROMP)
Institute of Herbal Medicine – National Institutes of Health (NIH)
University of the Philippines – Manila
Project Lead: Dr. Nelia C. Maramba et al.

TECHNOLOGY DEVELOPMENT

Yerba buena formulation is ready for adoption and commercialization (TRL 8). The technology generators are currently seeking pharmaceutical companies that will produce, manufacture and distribute the product.

Interested technology adopters may send a letter of intent addressed to:

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Department of Science and Technology
Philippine Council for Health Research and Development
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