CONTENT

CONTENT

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▶ 1 PATENT FILED: PI 2018703367
▶ 1 TRADEMARK: 2018073780

myeco-POFA Shield:
A Remedy for Fungi Growing World

Fungus growth affects our well being

myeco-POFA Shield demonstrates excellent inhabitation against fungus growth due to hydrophobic nature of the coating

Field Validation of myeco-POFA Shield in Transportation & Buildings

Introduction

- ***myeco-POFA Shield*** is a nano-solution, first of its kind that is extracted and engineered based on palm oil fuel ash waste (POFA) . **3 million metric tons** of POFA dumped annually occupies valuable land, create environmental pollution and health hazard. Therefore, the waste is converted to ***myeco-POFA Shield*** for consumer to prevent fungus growth.

Problem Statement

Fungi are everywhere. Invasive fungal infections has caused various problem to humankind

- Adverse health effect- infect the heart, blood, brain, bones and other internal organs-kill about 1.5 million people worldwide every year.
- Businesses lose- $61 billion a year because of Sick Building Syndrome
- Fungus infections is one of the key issues in entire Hospitals

Inventiveness and Novelty

- Non-toxic active ingredient based on waste materials
- It is a nano-coating liquid that can bind easily on concreate, tiles, textile
- Non-toxic active ingredient based on waste materials with WCA 171° with tilting angle of 2°.
- Excellent durability due to self-healing characteristic

Intellectual Property Status

- 1 patent filed- PI 2018703367
- 1 trademark- 2018073780

Usefulness and Application

myeco-POFA Shield has a broad prospect of applications in construction and building, transportation, textile production and anti-corrosion. The benefits are as follows

- "Waste to wealth" initiative that contributing to Sustainable Development Goals (SDG)
- Prevent fungus growth due to lotus effect which keeps surface dry
- Greatly reduces the need of fungicides or hazardous cleaning products to remove fungus
- Reduce conventional cleaning thus saving water, time, energy and environment

Status of Invention

Prototype ready and Field Validation ongoing

Market and commercial potential

Global Fungicide Market is 19 billion US Dollar for 2018 and expected to grow up to 21 billion US Dollar in 2021. Potential future revenue for Malaysia is estimated at an average of 0.01% per annum-2.1 million, covering 5% of the total 139 Government & 91 private Hospitals exist in Malaysia.

Potential Partners

Process Tech Design Sdn Bhd
Ceramic Tiles Company

Knowledge Management

ISI Publication-2 (Surface & Coatings Technology, Journal of Nanomaterials)
International Conference Procceding - 2
Financial support by RUI and FRGS

Impact of the product

myeco-POFA Shield reduces the use of toxic fungicides thus safe the environment. It contributes the global needs to address fungal infection in various segments- buildings, healthcare & shipping. The utilization of palm oil fuel ash waste to form an affordable product support our nation vision of waste to wealth for sustainable tomorrow.

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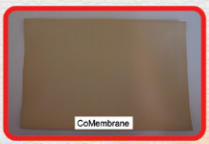
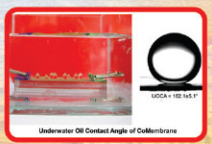
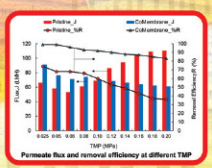
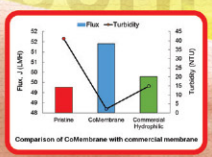
CoMembrane: Nature-Inspired Coating of Membrane for Emulsion Oil Separation

- COPYRIGHT & PATENT APPLICATIONS
- PATENT SEARCH: NOVEL, INVENTIVE & INDUSTRIAL APPLICABLE









CoMembrane

- CoMembrane is an invention of the coating process inspired by mussel foot adhesives for modification of membrane surfaces material.

PROBLEM STATEMENTS

- Increasing of oil concentrations and stable emulsion droplets in effluent due to improper dumping will affect the environment and human health.
- The commercial organic polymers have the drawbacks of materials on the hydrophobicity properties which tends into severe fouling problems.
- The conventional modification methods are complex and involve high equipment cost.

INVENTIVENESS AND NOVELTY

- CoMembrane is formulated using the natural and low cost of polyphenolic derived from plants.
- CoMembrane provides hydrophilic and underwater oleophobic surface properties with low oil adhesion.

INTELECTUAL PROPERTY STATUS

- Copyright and Patent applications.
- Patent Search: Novel, Inventive & Industrial Applicable.

USEFULNESS AND APPLICATION

- The process can be applied onto commercialize membrane or own fabricated membrane.
- The process can be implemented for any types of membrane modules.
- It has good chemical stability and high permeability with efficient removal of emulsion oil.

STATUS OF INVENTION

- Lab-Scale.

COMMERCIAL POTENTIAL

- The process can be applied without high-end equipment and no new equipment required for the existing plant.
- The facile and low cost process for membrane surface modification method.
- The results of CoMembrane comparable to commercial membrane product.

POTENTIAL PARTNERS

- Membrane fabricator industries and environmental service companies.

KNOWLEDGE MANAGEMENT

- This project is financially supported by E-Science Fund Grant (305/PJKIMIA/6013394).

- Outputs: Scientific Publications.

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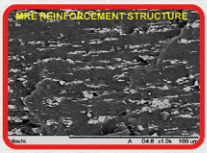
Magnetorheological Elastomer - An Innovative Anti-Vibration Rubber from Waste Materials

▶ COPYRIGHT : (LY2018004329)
▶ PATENT SEARCH :
NOVEL AND INDUSTRIAL APPLICABLE



Introduction

Magnetorheological Elastomer *(MRE)* is an innovative vibration absorber that is engineered based on natural rubber, industrial waste Nickel Zinc Ferrite particles and waste latex glove. Utilization of industrial waste Nickel Zinc Ferrite and waste latex glove in MRE would reduce the environmental problem due to improper industrial waste management and shortage of land fill solid waste disposal for rubber glove.

Problem Statement

- Recent devastating earthquakes around the world has exposed a need for buildings that can withstand vibration
- Vibration failure could also occurs in automotive engine mounting, railways and machines
- Vibration often leads to failure of structures and machine parts

Conventional damping material requires:

- Natural rubber reinforced carbon black filler.
- Carbon black filler is derived from non-renewable resources- petroleum based
- High energy usage to produce carbon black.
- Global warming issue

Novelty and Inventiveness

- Utilization of Waste Latex Glove in MREs. Reduce shortage of land fill solid waste disposal for waste latex glove.
- Elimination of carbon black for damping rubber. Utilization of waste ni Zn Ferrite as filler in MRE. Reduce the environmental problem due to improper industrial waste management and minimize the depletion of petroleum resources-reduce global warming issue
- Material costs is cheaper than conventional damper

Intellectual Property Status

- Copyright granted by MyIPO (LY2018004329)
- Patent Search (USM/IO/PT/HA/18006)- Novel and industrial applicable

Usefulness and Application

- Anti-Vibration Automotive Products
- Railways pad
- Vibration pad for machine
- Noise reduction
- Earthquake house bearing

MRE damper offers several distinct advantages when compared with conventional damper.

- Excellent vibration damping, shock resistance and chemical resistance
- MREs can be used alone or adhere to metal inserts or mounting plates.
- Maintenance Free- does not corrode and requires no lubrication
- Low production costs.

Status of Invention

- Prototypes development – Kumpulan Jebco (M) Sdn. Bhd.- Automotive Anti-Vibration Rubbers

Market and Affordability

- Industrial Engineering rubber market is projected to grow to USD 33.82 Billion by 2022, CAGR of 4.6%.
- The growing demand from the automotive, and building & construction industries in the Asia Pacific acts as a key growth driver.
- The frequent unstable earthquake disaster around the world is contribute to damper industries to shakes up market
- MRE material costing is 20-28% lower compared with conventional products. (MRE= RM 5.13/KG vs Competitor Products = RM 6.50-RM 7.10/KG)

Potential Partners

- Automotive, machinery, construction and structure industries

Knowledge Management

- FRGS
- Publications – 6 ISI Journals

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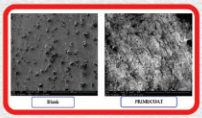
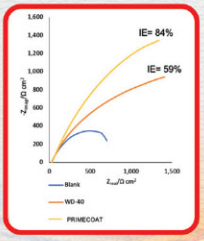
PRIMECOAT:
Smart Corrosion Protection Coatings for Building And Construction

► FILED FOR COPYRIGHT (LY2019000358)

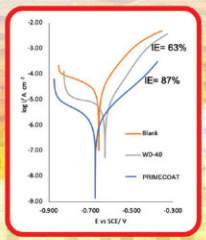
SEM Analysis



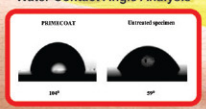
Electrochemical Impedance



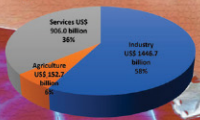
Electrochemical Polarization



Water Contact Angle Analysis



Global Cost of Corrosion by Sector (Billion US$ 2013)



Introduction
- PRIMECOAT is a primary hybrid sol-gel coatings, a potent corrosion inhibitor (caffeine) to enhance resistance against corrosion and stability of coating.

Problem Statement
- Toxic, hazardous chemicals, high disposal costs (such as chromate, phosphate) are popular coating treatments. Strong demand for 'greener' coatings.
- Economic impact of corrosion (major issues: energy and material loss), mild steel corrodes during the industrial acidic applications.
- Hybrid sol-gel films formulated using organic precursors (eco-friendly) exhibit micropores and cracks: leads to pitting corrosion.

Inventiveness and Novelty
- PRIMECOAT is utilization of caffeine (from tea leaves residue) as corrosion inhibitor incorporated into hybrid sol-gel matrix (metal alkoxides: APTES and TEOS) to coat metal substrates.
- Novelty check on Scopus: Novel
- Formulated from less toxic, cost effective and safe chemicals.

Intellectual Property Status
- Filed for copyright (LY2019000358)

Usefulness and Applications
- PRIMECOAT function as shield to cease propagation of corrosion damage, restrict the current passage on the substrate and limits water penetration.
- It is hydrophobic coating (effectiveness of coating against corrosion), can be serviceable on any pure metal and alloy.
- The product shows good corrosion performance (> 85% inhibition efficiency) compared to commercially available coatings.

Status of Invention
- Completed R&D process.
- Field testing: collaboration with JKR and UEKATSU (M) Sdn. Bhd.
- Prototype available.

Commercial Potential
- High potential commercialization: Ingredients used are eco-friendly, cheaper and readily available.
- The cost of PRIMECOAT approximately RM 36 per 1L, which slightly cheaper than commercial coatings (RM 65 per 1L).
- This product has low cost production to produce an efficient coating.

Potential Partners
- Public Service Department (JKR-Civil Engineering)
- Local Construction Company

Knowledge Management
- Human Resources: 2 PhD and 3 MSc candidates
- Grant: USM Short Term Grant 304.PKIMIA.6315100
- Publication: 5 scientific articles in ISI cited journal

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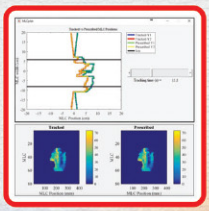
SafeRT 2.0:
Software for Safe Radiotherapy Treatment of Cancer

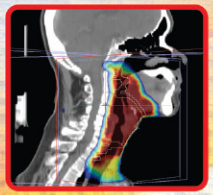
▶ FILED FOR COPYRIGHT: (LY2019000353)

Introduction
SafeRT version 2.0 is a software to verify the accuracy of advanced radiotherapy treatment delivery and to monitor the performance of the radiotherapy linear accelerator using real-time treatment delivery data



Problem Statement
Radiotherapy treatment is a sophisticated but an effective means of treating many types of cancer.
Quality assurance of the radiotherapy linear accelerator is important to ensure safe and accurate delivery of the targeted high radiation dose.

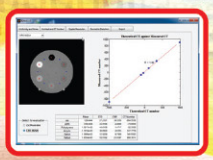
Inventiveness and Novelty
A computer algorithm that calculates the accuracy of the cancer treatment using real-time treatment parameters data from the radiotherapy linear accelerator.



Intellectual Property Status
Filed for copyright - LY 2019000353

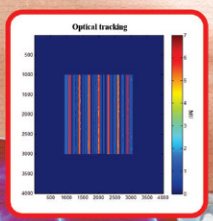
Usefulness and Application
Simplifies the measurement process with a detector, but at the same time efficiently ensure that the radiation delivered to cancer patient is accurate.

Status of Invention
Clinical trials - national audit of radiotherapy treatment accuracy



Commercial Potential
Unique features: comprehensive, versatile, time-saving and low-cost.
Improve cancer patients cure rates and quality of life

Potential Partners
Manufacturers of radiotherapy linear accelerator
Cancer hospitals / institutes



Knowledge Management
Supporting grant: Prototype Research Grant Scheme 203/CIPPT/6740047
Scientific publications
Postgraduate students

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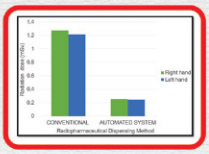
► PATENT APLLICATION IN PROGRESS
► PATENT SEARCH: NOVEL, INVENTIVE & INDUSTRIAL APPLICABLE

A Smart Dispenser for Dispensing High-Dose Radiopharmaceutical

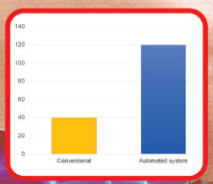


Finger Dose Analysis-Figure 1

Whole-body dose analysis- Figure 2

Accumulated dose for right hand-Figure 3

Accumulated dose for left hand-Figure 4



Number of patients that can be treated in a day - Figure 5

Introduction
The product invention is a cost-effective dispenser system that transfers radiopharmaceutical from a shielded chamber to a vial/syringe with prescribed dose and it is integrated with real-time volume and real-time radioactivity measurement.

Problem Statement
- Manual dispensing technique involves manual withdrawal of radiopharmaceutical by using a syringe and it is a laborious process.
- Radiopharmaceuticals are gamma emitters, thus, nuclear medicine personnel receive radiation burden to the hands and whole-body resulting from manual practice.
- There is a risk of spillage during dispensing of radiopharmaceutical.
- Commercial radiopharmaceutical dispensers are very expensive

Novelty and Inventiveness
- The product invention provides a method for dispensing radiopharmaceutical driven by peristaltic pumps integrated with real-time volume and real-time radioactivity measurement to deliver a total amount of dose required for patient treatment
- It is a cost-effective dispenser that can be performed by using either AC or DC power supply.

Intellectual Property Status
- Patent search was done and it is proved that the product invention is novel, inventive and industrial applicable.

Usefulness and Application
- It is used to dispense radiopharmaceutical automatically from a shielded chamber to a vial/syringe with real-time volume and real-time radioactivity measurement for patient treatment.
- With the use of automated product invention, it reduces radiation exposure to nuclear medicine personnel significantly.
- It enhances the accuracy and precision of volume and radioactivity measurement.
- It reduces the risk of radiopharmaceutical spillage.
- It is a mobile unit.

Status of Invention
- The Time Readiness Level (TRL) of this invention is at stage 7. The work is in collaboration with Nagase Laundauer Sdn Bhd and National Cancer Institute, Putrajaya.

Commercial Potential
- The product invention is a cost-effective radiopharmaceutical dispenser system that provides real-time volume and real-time radioactivity measurement for dispensing high-dose radiopharmaceutical.
- Lack of affordable commercialised dispenser system in the market that can provide a single process to obtain real-time volume and real-time radioactivity measurement during dispensing of radiopharmaceutical.

Potential Partners
Chemopharm Sdn. Bhd and radiopharmaceutical industry/laboratories.

Knowledge Management
Research grant: 1 USM Bridging Grant
Publication: 2 ISI and Scopus-indexed journals

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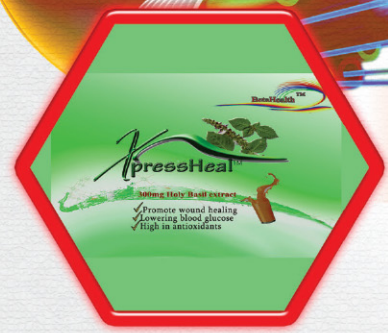

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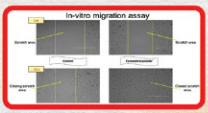
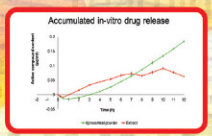
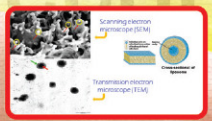
XpressHeal Drink

► TRADEMARK: BetaHealth™







What is XpressHeal drink?
- *Ocimum tenuiflorum* L., commonly known as *ruku* in Malaysia, is an underused plant cultivated as ornamental plant in Malaysia.
- XpressHeal Drink invention is a plant-based product formulations of water extract of leaves of *Ocimum tenuiflorum* and food grade emulsifier powder that showed wound healing properties *in vitro* and *in vivo* study.
- *Ocimum tenuiflorum* contained high antioxidant (Rabeta & Lai, 2013), antimicrobial (Mousavi et al., 2014), , lowering blood glucose (Mousavi et al., 2016), anti-cancer (Lam et al., 2018), sucrase inhibitory and non-enzymatic glycation properties (Antora et al., 2018), low side effects for methanol extract in the histology studies (Mousavi et al., 2018), 3,4-dimethoxycinnamic acid, caffeic acid, diosmetin, luteolin, kaempferol, rosmarinic acid, apigenin, and genistein that control the blood glucose in diabetic rats (Mousavi et al., 2018) and wound healing properties (Rohini et al., 2019).

Problem statement
- The morbidity rate of diabetic foot amputation is high in Asia.
- Every 30-second leg is lost due to diabetes in some part of the world.
- The costs of treating diabetic foot complications are higher than the treatment costs for many common cancers.
- It shows the failure of current treatment methods of wound healing.
- Religious and vegetarian lifestyle choices may prohibit certain consumer groups from taking animal-based wound healing products.

How XpressHeal drink address wound healing problem?
- XpressHeal powder treated cells migrated and closes the scratch area almost 100% within 12 h at optimized concentration when compared to negative control and other treatment groups.

Technical description
- Increased content of the active compounds in formulation indicates that, improved in bioavailability (availability up to 10 h).

Inventiveness and novelty
- First and novel drink from plant source to promote wound healing.
- This product also suitable to people who do not like snakehead fish and sea cucumber, which are a popular species with wound healing properties.

Comparison to competing product

	XpressHeal drink	Snakehead fish tablet	Sea cucumber drink
Price	RM27.00/box (10sachets/box)	Snakehead Fish Tablet 450mg (60s RM 88.00	Sea Cucumber Jelly 350ml RM101.50
Cost per day	RM2.70	RM6	RM3.4

Commercialization
- Market ready for diabetes, foot ulcer and any injuries consumers.
- Potential application: functional drink, functional food, pharmaceutical, anti-aging cosmetics.

Impact of product
- Supportive of the use of natural products in wound care.
- Increasing the consumption of ruku leaves, extra income to the farmer.
- Ocimum tenuiflorum showed high activity of antioxidant, thereby providing protection from diabetic complications.
- Diabetic patient is at high risk of minor cuts or injuries that can develop into foot ulcers if not treated properly.

Intellectual Property Status
- Under trademark BetaHealth™ (Application No. 2018062582 in Class 32).
- This project was supported by RUi grant number 1001/PTEKIND/812176 obtained from Universiti Sains Malaysia (154,300.10).

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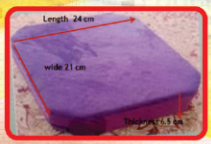
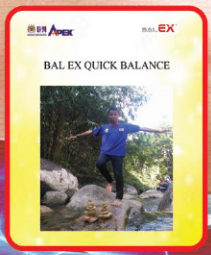
Fatimah Desa

Bal Ex Quick Balance

- PATENT APPLICATION
- COPYRIGHT
- TRADEMARK : Bal Ex®





INTRODUCTION

- Bal Ex Quick Balance is a specialized and structured balance rehabilitation module using foam.
- Structure manual book and video guided to help patients with various balance disorders.
- Rehabilitation Module consists of 6 level targeting specific functions of balance organs.
- Assessment tool.

PROBLEM STATEMENT

- Globally, balance disorders are common (affecting 1 in 10 people) serious and complicated
- Available similar rehabilitation tool i.e post urography expensive (>RM 500 000)
- Balance disorders can lead to:
  - Psychological symptoms (e.g. depression)
  - Social impacts (e.g. isolation)
  - Vocational impacts (e.g. problems carrying out job appropriately)
  - Financial impacts (e.g. treatment cost)
  - Impaired quality of life (e.g. cannot function normally in daily life)

INVENTIVENESS AND NOVELTY

- This clinical product is affordable as it is extremely cost-effective
- Was developed by doctors, scientists specializing in the vestibular and engineering field

INTELLECTUAL PROPERTY STATUS

Application for Patent done under USM
Manual Book and DVD – Copyright under USM & MyIPO
Trademark Registered No. 2011010805: Bal Ex®

USEFULNESS AND APPLICATION

- Bal Ex Quick Balance will make it easier for patients to do balance training at home or workplace without the need to go for too frequent visits to the therapy unit or hospital.
- Patients can carry with regular therapy with reference to this manual.
- Help patients to reduce the signs and symptoms of imbalance of the body
- Stimulate the brain of a patient to fully recover and be able to adapt to the body equilibrium problems faced by the patient.

STATUS OF INVENTION

Completed and ready to used.

COMMERCIAL POTENTIAL

Already been used and sold to several private practices.

- Population size of 28 million, the number of adults (>15 years) is about 19 million
- Since 1 in 10 people is affected, the estimated number of adults with balance problem is 2.8 million
- Targetted local distributors such as:
  - Private Hospitals
  - Private Clinics
  - Medical & Health Sciences Institutions
  - Ministry of Health Centers:- General Hospitals, Rural Clinics and Health Clinics.
  - International distributors (countries that utilize English, Malay, Chinese, Japan,Indonesia and Arabic language)

POTENTIAL PARTNERS

- Eartistic Hearing and Balance sdn. bhd.

KNOWLEDGE MANAGEMENT

- Bal Ex Quick Balance is one of the latest and innovative protocol for balance rehabilitation.

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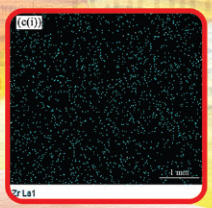
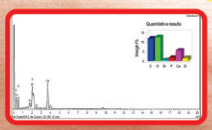
GiZiDent (GIC-NanoZr-Si-HA Hybrid Material for Dental Application)

- PATENT APPLICATION IN PROGRESS
- PATENT SEARCH: NOVEL, INVENTIVE & INDUSTRIAL APPLICABLE





Introduction
GiZiDent is a modified conventional glass ionomer cement (GIC), a type of tooth-colored restorative material widely used in dentistry globally.

Problem statement
Conventional GIC in the market however has limited use due to its relatively inferior mechanical and aesthetics properties that limits their usage.

Inventiveness and Novelty
GiZiDent was formulated by incorporating nanoZrO_2-HA-SiO_2 compound with special technique and specific ratios into conventional GIC. The hybrid of nanoZrO_2-HA-SiO_2 homogenously dispersed throughout this new invention of GIC.

Intellectual Property Status
Patent application in progress.
Patent Search: Novel, Inventive & Industrial Applicable.

Usefulness and Application
GiZiDent showed significant improvements of physical, mechanical and aesthetic properties compared with conventional GIC. It can be used widely as a restorative dental material in high stress bearing areas, as core build-up, as aesthetics anterior restoration and in Atraumatic Restorative Treatment (ART).

Status of Invention
Prototype

Commercial Potential
About 2.3 billion people worldwide (WHO, 2015) and 9 out of 10 Malaysian particularly had experienced of dental caries. Prevalence of untreated caries was 44.31% out of total oral conditions (Global Burden of Oral Condition (GBD) study, 2010). GiZiDent provides as a good option to treat the dental caries.

Potential Partners
Dental companies and health based industry.

Knowledge Management
- Research University grant (RUI 1001/PPSG/812164)
- Publications : 1 ISI, 3 SCOPUS
- Students : 1 PhD students (ongoing), 1 MSc student (graduated) and 2 undergraduates elective students (finishing and graduated)

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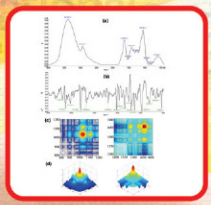
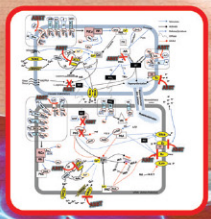
Assoc. Prof. Mariam Ahmad

► TRADE SECRET

Multi-pathway Anti-Hypertensive Agent: ABBT





Introduction

- ABBT *contains G. elata, A. macrocephala, G. uralensis, P. cocos, and C. reticulatae* and was proven to be experimentally successful and could potentially be an effective anti-hypertensive drug for future use on humans.

Problem Statement

- Hypertension is one of the major health concerns that are associated with various concomitant diseases as well as complications in kidney and cardiovascular.
- Although synthetic anti-hypertensive drugs are widely available in the market, drugs tolerances are reported for monotherapies, and even more reports concerning their adverse effects.
- Hence, the current study aims to establish a new anti-hypertensive formula by applying a new syndromic-disease combination theory of Traditional Chinese medicine.

Inventiveness and Novelty

- ABBT is a new evidence-based anti-hypertensive formula in compliance with Traditional Chinese Medicine Syndromatic Theory.
- This evidence-based finding will greatly enhance the overall landscape of complementary medicine and boast the growth of herbal medicine industry in Malaysia to compete in the international stage.

Intellectual Property Status

- Trade Secret Protection under USM

Usefulness and Application

- Unlike conventional anti-hypertensive drugs that only utilizes single pathways, ABBT is able to employ multiple pathways when exerting vasodilatory effect such as through NO/sGC/cGMP cascade and PGI_2, followed by muscarinic pathways and calcium channels.
- ABBT is a potential candidate for replacing current anti-hypertensive drugs with no reported side effects or damage to internal organs.

Status of Invention

- The formula is ready for commercialization and can be made into various form of products such as pellets, capsules, tea bags, sachets and decoction.

Commercial Potential

- ABBT has immense commercialization potential with a wide market demand as rate of hypertension in the general population keeps rising.
- ABBT provides affordable price which can serve the society.

Potential Partners

- Pharmaceutical companies such as EMAN Biodiscoveries Sdn. Bhd.

Knowledge Management

- This product is financially support by RUI 1001/PFARMASI/812195.
- Outputs: Scientific Publication (3 ISI Journals, 1 Scopus Journal)

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MODUL TASMAR
MODUL TERAPI SENI
PENGURUSAN KEMARAHAN REMAJA

Adolescents' Anger Management Art Therapy Module

Introduction
- Adolescents' Anger Management Art Therapy Module is a creative and practical module to help adolescent manage their anger.

Problem Statement
- Uncontrolled anger can be harmful, which leads to many disciplinary & criminal cases.
- Statistic of school violence & malfunction behaviour (bully, crime, destructive behaviour) have shown disturbing patterns.
- Signs of anger can easily be identified among those that express overtly however difficult to identify among those that repressed (passive anger).
- Creative & theoretical base intervention modules need to be introduced, to manage anger in a more healthy way.

Inventiveness and Novelty
- The first anger creative art therapy module in Malaysia.
- Simple designs consisting eight sessions.
- High validity (82.3%) & reliability (.96)

Intellectual Property Status
- Copyright (LY2019000236)

Usefulness and Application
- Hands-on intervention – manage anger in practical & simple ways.
- Comprehensive and flexible with creative activities.
- Self-explanatory process and procedures to educate anger issues.
- Creates holistic personal development through psychoeducation.

Status of Invention
- Complete module ready to use and ready for TOT.

Commercial Potential
- Training and CPD for counselors with minimum fees per individual (RM350) per package. Networking with Malaysian Board of Counsellors.

Potential Partners
- Malaysian Board of Counsellors, Hospital, Social Welfare Department, Ministry of Education and helping profession sectors.

Knowledge Management
- Financial support by RUI (1001/PGURU/816226).
- Outputs: academic publication.

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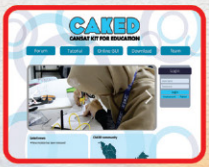
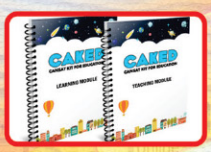
Innovative Cansat Kit for Education (i-CaKEd)





Introduction

- i-CaKEd is first developed in Malaysia to aid teaching and learning in STREAM education based on Aerospace Technology towards the Fourth Industrial Revolution.

Problem statement:

- Lack of interest from secondary school student in STREAM
- School do not have teaching and learning module using aerospace technology to develop a 21st-Century skill for secondary school student.

Novelty and Inventiveness

- Space technology-based teaching and learning module embedded with activities to develop 21st- century skill for the secondary school student.
- Implement IoT module, web-based data harvesting and sharing, and community networking for a global learning experience.

Intellectual Property Status

- Copyright protection (No: LY2018001863)

Usefulness and Application

- CanSat module integration, test and launch for hands-on collaborative project-based learning activities
- Interactive teacher's guide to strengthening student's understanding of STREAM
- Offline and Online GUI for web-based data storage for CanSat launch.
- A website for CaKEd community building to encourage knowledge sharing and transfer.
- Graphical programming environment

Status of Invention

- Technology Readiness Level 6 - Prototype for demonstration.

Market and Commercial Potential

- Secondary school world wide, STEM Training Centre, Hobbyist

Potential Partners

- Malaysia Space Agency, Ministry of Education

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Probiotic Animal Feed from Food Waste Via Double Stage Fermentation

Introduction
- Food waste can be described as edible food materials that are produced and made available to be consumed by human but left uneaten.
- Each year, there is an estimated 1.3 billion tons of food for humans is lost and wasted globally (Gustavsson et al., 2011).
- Recovering food waste for animal feeding (ReFeed) - solve problems faced in waste management such as food waste (Zheng et al., 2018).
- For instance, producing animal feed from food waste can reduce food waste problem effectively (ReFED, 2016).

Problem Statement
- In Malaysia, the primary protein source for the majority of Malaysian populations is the broiler meat. Therefore, demand of broiler meat become increase year by year.
- Statistics have shown that consumption of chicken meat per capita is about 37.7 kg. (Ministry of Agriculture, 2005).
- Therefore, it is very important to have a sustainable production of chicken meat.
- In 2015, the food waste in Malaysia reached 15,000 tonnes daily
- Therefore, there is a need for an appropriate management of food waste (Ma et al., 2009a).
- Current method: Use animal feed can lead to animal disease.

Inventiveness And Novelty
- **Inventiveness:**

1. Using specific and special microbes to convert food waste to become animal feed and fulfil Malaysia and International Standard for Chicken Feed.
2. Chicken feed from this process also completed with probiotic.

- **Novelty**

1. The process conversion food waste to become chicken feed via double stage fermentation. Currently not have any record from any sources about this method. This process allows supportive probiotic to growth in this chicken feed.
2. Process of control raw material to get the consist of nutrient for every batch of end products (chicken feed).

Intellectual Property Status
- Copyright: Food Waste To Probiotic Chicken Feed via double stage fermentation
- Trade Secret: Microorganism and probiotic to convert food waste to chicken feed

Usefulness And Application
- Reduce price of chicken feed. Currently, market price 1 kg of chicken feed is RM 2/kg. However, with this innovation chicken feed can be reduced until RM 0.70/kg
- Chicken feed from this innovation completed with probiotic, then it will increase the quality of chicken meat and healthiness of chicken.
- Solve problem of solid waste management. 60% solid waste in the landfill is food waste.

Status Of Invention
- Complete and capable to scale up with various type of food waste
- Non exclusive licensing

Commercial Potential
On going to licensing for transfer knowledge (Non exclusive)

- Received research contract from partners to using their food waste to convert consistent nutrient of probiotic chicken feed.

Potential Partners
1) E-Idaman Sdn. Bhd
2) Green Resources Recovery Sdn Bhd
3) Urus Sisa Sdn Bhd

Knowledge Management
This innovation come from concept of Biological process and solve the problem of solid waste management. Then it distribute to industry to increase generate income and solve the local problem about quality and quantity chicken meat.

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TExIT

(Text Explorer, Identifier & Translator)

Smart and Flexible Mobile Dictionary

Introduction
- TExIT is a flexible mobile application with text recognition for word searching, text translation into multi languages and identifier for active ingredients in chemical products.

Problem Statement
- Typing and searching chemical substances is a conscientious job.
- Moreover, illiterate users struggle finding out about facts/instruction on torn product labels and reading foreign languages.
- From more than 200 dictionary applications, they generally serve basic functions without OCR, copy/paste and switching online/offline.
- Thus, we provide a multi-functions dictionary as the solution for the said problems.

Inventiveness And Novelty
- Integrate multiple functions with flexible usage in one mobile apps.
- Set up a readable and readily issued database from unprepared household chemical and pesticide databases to a more readable and readily issued file.
- Easy-to-use apps which potential to change ways of data retrieval, learning new languages, data sharing and knowledge manipulation.

Intellectual Property Status
- Copyright number: LY2018004899

Usefulness And Application
- The OCR scan and translator able to reduce typing error, speed up translation and translate signboard while travelling.
- TExIT brings a sustainable mobile application for various users, with different background and phone capabilities, locally and internationally.

Status Of Invention
- Beta version

Commercial Potential
- Students, doctors, researchers.
- Household chemical and pesticide users for home and industries.
- This application provides affordable price which can serve the bottom billion.

Potential Partners
- Malaysia Pesticide Board.
- National Poison Center USM.
- Chemical and pesticide-based industry.

Knowledge Management
- Publication: Ruhaiyem, N.I.R, Mahalingam, S., Syed-Mohamad, S.M., 2018, Intelligent Mobile Dictionary and Thesaurus, The 10th International Conference on Robotics, Vision, Signal Processing & Power Applications (ROVISP 2018), Penang, Malaysia.

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