



SRM Directorate of
Entrepreneurship &
Innovation (DEI)



SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
Directed by the University of S.T.J. of S.J. 1982



Centre for Intellectual
Asset Protection

SRM TTO COMPENDIUM

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SRM TECHNOLOGY
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SRM **Innovation** and
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Birac BioNEST
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(DST - NSTEDB, Govt. of India)



The **Technology Transfer Office (TTO)** and the **Centre for Intellectual Asset Protection (CIAP)** of **SRM Institute of Science and Technology (SRMIST)** organize a series of focused initiatives—**IRIS**, **iBridge Event**, and the **Patent School Workshop**—to sensitize inventors on the importance of protecting their innovations and to enable them with effective platforms for commercialization. These events are designed to create awareness on intellectual property rights, foster industry–academia collaboration, and facilitate the translation of research outcomes into commercially viable technologies.

IRIS (Industrial Research and Innovation Summit) serves as a flagship platform that brings together researchers, innovators, startups, and industry leaders to showcase patented and patent-ready technologies developed at SRMIST. The event encourages knowledge exchange, promotes collaborative research, and highlights commercialization opportunities by connecting inventors with potential industry partners and investors.

The **iBridge Event** is an industry-focused interaction platform where participating industries present their real-world technological challenges and problem statements to the research community at SRMIST. Faculty members and researchers discuss potential solutions based on their patented technologies or ongoing research under development. In parallel, readily available technologies relevant to the visiting industry are showcased, enabling direct discussions on licensing, technology transfer, and commercialization opportunities.

The **Patent School Workshop** is a structured capacity-building programme aimed at educating students, faculty, and researchers on intellectual property rights and the end-to-end patenting process. Through hands-on sessions and expert guidance, the workshop equips inventors with the knowledge required to identify patentable inventions, draft quality patent applications, and strategically protect and commercialize their innovations.

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Sustained Release Scaffold and a Process for its Preparation

Product Description:

Problem:

In critical-sized bone defects, traditional grafting techniques and conventional scaffolds face limitations such as graft rejection, transmission of diseases and lack of controlled therapeutic drug release.

Solution:

We present a strategic approach for delivering phytochemicals through polymeric nanoparticles embedded within porous biocomposite scaffolds, enabling a controlled and sustained release profile.



Inventiveness:

- Nanoparticle-controlled release
- Porous architecture
- Bioactive reinforcement
- Synchronized degradation

Unique Benefits:

- Ease in fabrication
- Composed of natural biomaterials
- Biodegradable and biocompatible
- Promote bone formation

Ref No: IRIS/25/HC/01

Intended applications:

- Bone tissue engineering
- Drug delivery system
- Biomedical implants

Technology Readiness

Level (TRL):

TRL-5

IP Status:

Granted

Patent Application No:

202241028543

**Sustainable
Development Goals:**



Hydrogel and Process for Its Preparation

Product Description:

Problem:

Phytocompounds used for bone repair suffer from poor bioavailability and lack well-defined osteogenic mechanisms, limiting their therapeutic potential.

Solution:

This novel bioactive hydrogel enhances the bioavailability and controlled release of polyphenol-based phytocompounds, maximizing their osteogenic potential for bone tissue engineering applications.



Inventiveness:

- Bridges phytocompound efficacy
- Enhances osteoinductive properties
- Natural polymer coatings

Unique Benefits:

- Simple and scalable
- Sustained bioactive molecule
- Cost-effective, FDA-approved biomaterial

Ref No:IRIS/25/HC/02

Intended applications:

- Biomedical applications for regenerative medicine
- Bone tissue engineering for enhanced healing
- Targeted drug delivery for bone repair

Technology Readiness Level (TRL):
TRL-6

Sustainable Development Goals:

IP Status:

Granted

Patent Application No:
202241038637



Novel Plant Alkaloid-Loaded Biocomposite Sponges For Enhanced Wound Healing

Product Description:

Problem:

Chronic wounds are non-healing wounds that fail to progress within the expected timeframe (typically 12 weeks). Conventional treatment options mainly focus on passive wound protection rather than actively stimulating the healing process.

Solution:

Our solution involves biocomposite sponges functionalized with a plant-derived alkaloid that accelerate wound healing. By creating a bioactive and regenerative microenvironment, the sustained and prolonged release of the phytocompound ensures localized and effective therapeutic delivery.



Inventiveness:

- Synergistic integration of plant-derived alkaloids into biocomposite sponge
- Utilization of a naturally derived bioactive compound
- Multifunctional microenvironment

Unique Benefits:

- Ease in fabrication
- Sustained and prolonged therapeutic effect
- Biodegradable, biocompatible, and antibacterial properties
- Enhanced wound healing

Ref. No: IRIS/25/HC/03

Intended applications:

- Tissue engineering applications.
- Drug delivery system
- Wound healing.

Technology Readiness

Level (TRL):

TRL-4

IP Status:

Published

Patent Application No:

202441100124

Sustainable Development Goals:



An Eco friendly Sanitary Napkin Incinerator

Product Description:

The toxic gases emanating after incineration of sanitary napkins need to be filtered out before letting off in the atmosphere. Incinerators have to be designed to handle menstrual waste in an eco-friendly way by filtering out the harmful gases liberated out from the chimney/exhaust. With help of filters and IoT technique, the toxic levels can be reduced and monitored at regular intervals.



Inventiveness:

- 24/7 Real-Time Monitoring
- Remote Accessibility & Cloud Integration
- Sustainable solution

Unique Benefits:

- User friendly
- Toxic gas filtering
- Scalability for Large-Scale Monitoring

Ref No: IRIS/25/HC/04

Intended applications:

- Private Colleges, Universities
- Industries
- Hospitals
- Apartments

Technology Readiness Level (TRL):

TRL-6

Sustainable Development Goals:



A Bone Graft Applicator

Product Description:

A flexible instrument for bone grafting applications. Our innovative applicator improves precision, minimizes graft wastage, and enhances accessibility in complex surgical procedures.



Inventiveness:

- Adjustable Tip Technology
- Material Innovation
- Scalable Design
- Ergonomic & User-Friendly
- **Unique Benefits:**
 - Enhanced Precision & Accuracy
 - Reduced Graft Wastage
 - Improved Maneuverability
 - Competitive Market Advantage

Ref No: IRIS/25/HC/05

Intended applications:

- Dental & Maxillofacial Surgeries – Implantology, ridge augmentation, sinus lifts
- Orthopedic & Trauma Surgeries – Fracture repairs, spinal fusion, reconstruction

Technology Readiness Level (TRL):
TRL-3

Sustainable Development Goals:



IP Status:

Granted

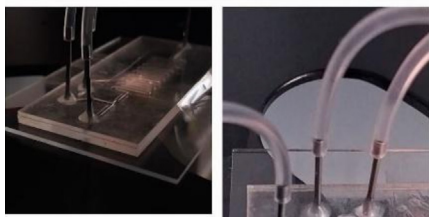
Patent Application No:
202241052029

Microfluidic Device and a Process For Its Fabrication

Product Description:

Traditional microfluidic devices often suffer from leakage, cracking, and high fabrication costs, limiting their reliability and sustainability in research and industrial applications.

This environmentally sustainable, cost-effective microfluidic device is designed to be leakproof, crack-free, and transparent, ensuring high precision, stability, and durability. The straightforward fabrication process enhances scalability and reproducibility, making it suitable for biomedical, chemical, and industrial applications.



Inventiveness:

- Leakproof and Crack-Free Design.
- Transparent Material
- Environmentally Sustainable Fabrication
- Cost-Effective and Scalable Manufacturing

Unique Benefits:

- High Structural Integrity
- Enhanced Optical Clarity
- Simple Yet Precise Fabrication Process
- Versatile Compatibility
- No temperature and pressure applied

Ref No: IRIS/25/HC/06

Intended applications:

- Biomedical Diagnostics
- Chemical and Pharmaceutical Research
- Environmental Monitoring
- Food Safety Analysis

Technology Readiness

Level (TRL):

TRL-7

IP Status:

Published

Patent Application No:

202241066271 A

Sustainable

Development Goals:



Cytokine Fusion Protein and a Method for its Synthesis

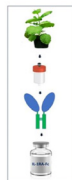
Product Description:

Problem:

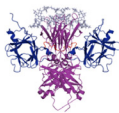
Autoimmune diseases like Rheumatoid Arthritis (RA) are driven by excessive IL-1 cytokine activity, leading to chronic inflammation, joint destruction, and poor quality of life. Current IL-1 inhibitors, such as Anakinra, have limitations like short half-life, frequent dosing, and lack of N-glycosylation, reducing efficacy.

Solution:

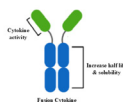
We have developed a biobetter IL-1 receptor antagonist (IL-1ra) expressed in *Nicotiana benthamiana*, featuring improved stability, enhanced pharmacokinetics, and better receptor binding efficiency compared to existing IL-1 inhibitors. This plant-based recombinant IL-1ra offers a glycosylated, cost-effective, and long-lasting alternative for treating inflammatory diseases.



Overview methodology



Modeled protein structure



Model specification

Inventiveness:

- Enhanced protein stability and bioavailability
- Extended half-life, increased protein solubility
- Reduced dosing frequency

Unique Benefits:

- Higher therapeutic efficacy
- Better pharmacokinetics
- Less frequent dosing
- Cost-effective and scalable production

Ref No: IRIS/25/HC/07

Intended applications:

- Potential therapeutic for autoimmune conditions
- Inflammatory disease research for cytokine modulation.
- Alternative to existing IL-1 inhibitors with improved patient compliance.

Technology Readiness Level (TRL):

TRL-4

Sustainable Development Goals:

IP Status:

Published

Patent Application No:

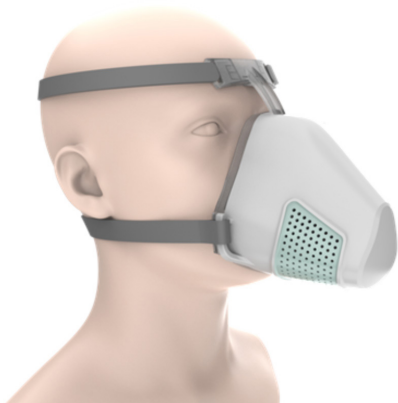
202241057225



CPAP Sense

Product Description:

An innovative CPAP system has been developed that eliminates the bulky tube while retaining full CPAP functionality. This device is an add-on designed to be installed onto existing masks, creating a tubeless positive pressure solution for treating obstructive sleep apnea (OSA). Built on Internet of Things (IoT) technology, the system allows users to initiate and control it via the Arduino IoT application. The key innovation lies in the removal of the large tube, enabling uninterrupted sleep and ultimately improving the effectiveness of OSA treatment.



Inventiveness:

- Redesign and miniaturization of CPAP PCB
- AutoPAP (AHI based) algorithm for pressure settings
- 24-Hour Cloud Storage of respiratory signals
- In-Depth Real-time analysis
- Proactive subject-specific health management

Unique Benefits:

- Unrestricted movement during sleep
- Subject-specific with reduced stray high-pressure exposure
- Timely intervention with no discomfort to the subject

Ref No: IRIS/25/HC/08

Intended applications:

- Obstructive Sleep Apnea (OSA)
- Respiratory Care Devices
- Sleep gadgets for improving quality of sleep

Technology Readiness

Level (TRL):

TRL-4

IP Status:

Grant

Patent Application No:

202341077288 A

**Sustainable
Development Goals:**



AfibTracker – A Non-Invasive Atrial Fibrillation Monitoring Device

Product Description:

Atrial fibrillation (AF) often goes undiagnosed due to the lack of continuous monitoring, increasing the risk of severe complications like stroke and heart failure. **AfibTracker** is a wrist-worn device that uses **multispectral photoplethysmography (PPG)** to detect AF non-invasively. The optical bio-sensing system captures pulse signals, storing data both on-device and in the cloud for **real-time analysis and remote monitoring**. This enables early detection and timely medical intervention, improving patient outcomes.



Inventiveness:

- Advanced Heart Rate Monitoring
- Symptom Tracking
- 24-Hour Cloud Storage
- In-Depth Analysis Anytime
- Proactive Health Management
- **Unique Benefits:**
 - Non-invasive and Convenient
 - Timely Intervention
 - Cloud-Integrated
 - Continuous Monitoring

Ref No: IRIS/25/HC/09

Intended applications:

- Diagnosis of Atrial Fibrillation
- Remote Cardiac Monitoring
- Wearable Health Tech

Technology Readiness Level (TRL):
TRL-4

IP Status:

Filed

Patent Application No:
202341027939

Sustainable Development Goals:

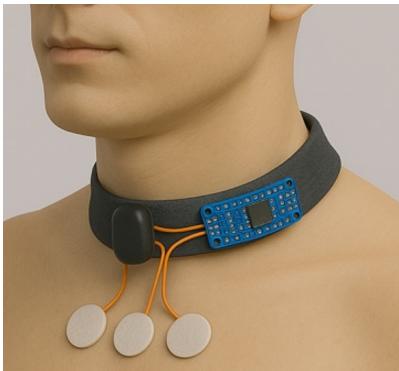


Hands-Free Electrolarynx with EMG Integration

Product Description:

Loss of vocal function post-laryngectomy significantly affects a patient's quality of life, communication, and independence.

VoxEase is a hands-free Electrolarynx that uses EMG-based signal detection to control a vibration motor, enabling speech production without manual input. The system allows intuitive, natural communication for users who have lost their voice box.



Inventiveness:

- Hands-Free Operation
- EMG Signal Integration
- Compact and Non-Invasive
- Enhanced Speech Output
- **Unique Benefits:**
 - Increased User Independence
 - Improved Comfort & Usability
 - Natural Speech Restoration
 - No Manual Activation Required

Ref No: IRIS/25/HC/RP/23

Intended applications:

- Post-Laryngectomy Communication
- Assistive Speech Technology
- Speech Rehabilitation Devices
- Medical and Home Healthcare

Technology Readiness Level (TRL):
TRL-2

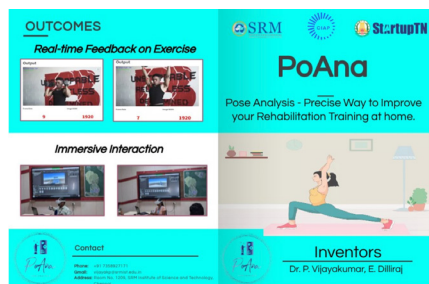
Sustainable Development Goals:



Exercise Pose Analysis System

Product Description:

Current technologies for exercise pose analysis in patients rely on sensor-based data, which may not provide real-time visual feedback. Additionally, frequent hospital visits for elderly patients with musculoskeletal disorders can be inconvenient. This innovation offers a system for self-assessment and self-evaluation of exercise poses using real-time visual feedback, allowing patients to perform rehabilitation exercises at home with improved accuracy and effectiveness.



Inventiveness:

- Real-time exercise pose correction with visual feedback
- Portable online application
- Robust algorithm supporting multiple exercises
- Home-based rehabilitation

Unique Benefits:

- Automated analysis
- Real-time self-assessment and correction
- Cost-effective
- User-friendly system
- Time-saving and compact design

Ref No: IRIS/25/HC/10

Intended applications:

- Self & Home rehabilitation
- Monitoring System at Hospitals

Technology Readiness

Level (TRL):

TRL-7

IP Status:

Granted

Patent Application No:

202341011768

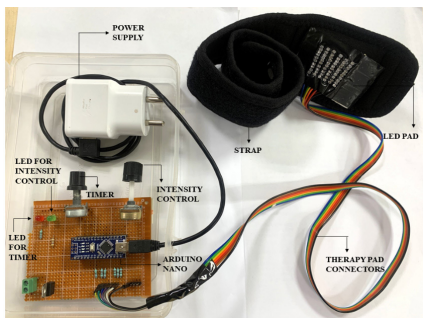
**Sustainable
Development Goals:**



A Noninvasive Therapy Device for Treating Diabetic Peripheral Neuropathy

Product Description:

Diabetic Peripheral Neuropathy (DPN) causes nerve damage, pain, and reduced mobility, significantly affecting quality of life. We have developed a non-invasive therapy device utilizing Near Infrared Region (NIR) technology to stimulate nerve healing. NIR penetrates deeper skin layers to enhance nitric oxide production, improving circulation and nerve function.



Inventiveness:

- Targeted Neuromodulation
- Wearable and User-Friendly Design
- Personalized Therapy Settings
- Low-Energy, Battery-Efficient Design
- Affordable
- **Unique Benefits:**
- Pain Relief Without Medication
- Convenient, At-Home Therapy
- Cost-Effective Treatment Option
- Noninvasive and Safe
- Personalized and Adaptive Therapy
- Enhanced Circulation and Nerve Health

Ref No: IRIS/25/HC/11

Intended applications:

- Home Healthcare & Diabetes Care
- Pain Management
- Physical Therapy and Rehabilitation Clinics

Technology Readiness

Level (TRL):

TRL-4

IP Status:

Filed

Patent Application No:

202441074335

**Sustainable
Development Goals:**



niGLUC 2.0v – A Noninvasive Sensor System and Data Analytic Framework for Blood Glucose Prediction

Product Description:

Frequent finger-prick blood glucose testing is painful, invasive, and costly, reducing patient compliance.

niGLUC 2.0v is a compact, low-cost, noninvasive glucose monitoring system that integrates Near-Infrared (NIR) spectroscopy with machine learning analytics to continuously and painlessly predict blood glucose levels with up to 99.96% accuracy, overcoming previous limitations such as skin tone variations and ambient light interference.



Inventiveness:

- Advanced ML Data Framework
- Accuracy Improved to 99.96%
- Robust to Skin Variations
- Compact and Affordable Design

Unique Benefits:

- Pain-Free Monitoring Experience
- Real-Time Glucose Tracking
- Reduces Consumable Expenses
- Promotes Regular Monitoring

Ref No: IRIS/25/HC/RP/22

Intended applications:

- Personal Diabetes Management
- Remote Patient Monitoring
- Smart Healthcare Systems
- Fitness and Wellness Insights

Technology Readiness Level (TRL):

TRL-7

Sustainable Development Goals:



Virtual Reality Pose Analysis (VR PoAna) – Gaming for Low Back Pain Management Through Exercise Therapy

Product Description:

Low back pain (LBP) is a leading cause of disability, with poor adherence to rehabilitation exercises being a major challenge. Our VR-based system integrates real-time pose analysis with an interactive gaming environment to encourage patient engagement and improve exercise adherence.



Inventiveness:

- Real-time pose estimation using AI
- Multi-threaded processing for speed
- Customizable detection settings
- Python-based scalable architecture

Unique Benefits:

- Captures live video, extracts key landmarks
- Real-time feedback via Unity VR
- AI-based movement assessment
- Data storage for progress tracking

Ref No: IRIS/25/HC/12

Intended applications:

- VR-based rehabilitation for LBP
- Real-time motion tracking in therapy
- Interactive exercise training for patients
- Remote physiotherapy and monitoring

Technology Readiness

Level (TRL):

TRL-7

Sustainable

Development Goals:

IP Status:

Granted

Patent Application No:

202341011768



Assistive Mobility Device for Individuals with Muscular Dystrophy

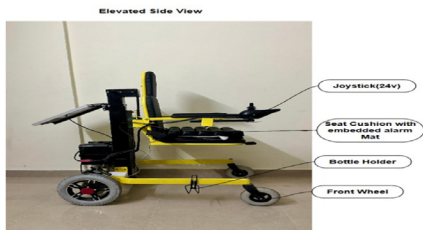
Product Description:

Problem:

Traditional mobility systems require manual assistance for repositioning and fall recovery, making them inconvenient and unsafe for individuals with limited mobility.

Solution:

This innovative assistive mobility device integrates a fully automated ground-lifting mechanism with fall detection, eliminating the need for manual intervention. It features independent wheel height adjustment, dual power sources, and an ergonomic design to enhance user safety and mobility.



Inventiveness:

- Intelligent lifting mechanism.
- Independent wheel height adjustment.
- Dual power source design.
- Ergonomic design
- **Unique Benefits:**
 - Automated fall recovery.
 - Seamless mobility across uneven terrains.
 - Increased safety with integrated fall detection.
 - Enhanced independence for muscular dystrophy patients.

Ref No: IRIS/25/HC/13

Intended applications:

- Personal mobility assistance for muscular dystrophy patients.
- Fall recovery support
- Accessible transport solutions.
- Healthcare and eldercare

Technology Readiness Level (TRL):
TRL-4

IP Status:
Filed

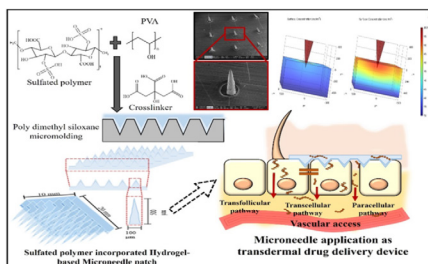
Sustainable Development Goals:



A Transdermal Patch and a Process for its Preparation

Product Description:

This hydrogel-based microneedle patch enables effective transdermal drug delivery for dermal inflammatory diseases. Formulated with biocompatible, biodegradable polymers and a novel crosslinker, it ensures targeted, anti-inflammatory action at the cellular level. Offering a painless, non-invasive alternative to traditional methods, it enhances patient comfort and compliance.



Inventiveness:

- Microneedle patch with polymers & crosslinker
- Anti-inflammatory polymer reduces swelling
- Superior mucoadhesiveness for better adhesion
- Biodegradable design minimizes waste

Unique Benefits:

- Transdermal system reduces inflammation
- Made with natural, biodegradable polymers
- Easy to prepare and apply
- Controlled degradation prevents irritation

Ref No: IRIS/25/HC/14

Intended applications:

- Treats eczema and psoriasis
- Soothes dermatitis and inflammation
- Delivers moisturizers and hydration
- Promotes faster wound healing

Technology Readiness Level (TRL):

TRL-4

Sustainable Development Goals:

IP Status:

Published

Patent Application No:

202441075861A



BIODEGRADABLE IMPLANTS

Product Description:

Problem:

Traditional medical devices such as implants, sutures, and stents often suffer from poor biocompatibility, infection risks, and limited functionality, leading to complications in patient recovery.

Solution:

Our advanced biomaterial-based medical devices integrate cutting-edge nanotechnology and additive manufacturing to enhance biocompatibility, promote tissue regeneration, and reduce infection risks. These next-generation solutions improve patient outcomes while ensuring long-term reliability and performance.



Inventiveness:

- Integration of nanoparticles for enhanced bioactivity and antibacterial properties.
- Bioresorbable stents with controlled degradation rates for safer implantation.
- Smart sutures with embedded antimicrobial coatings for infection.

Unique Benefits:

- Enhanced biocompatibility to minimize rejection and improve healing.
- Personalized and precision-engineered implants via additive manufacturing.
- Improved patient safety with infection-resistant and regenerative designs.

Ref No: IRIS/25/HC/15

Intended applications:

- Orthopedic and dental implants for long-term stability.
- Tissue engineering scaffolds for regenerative medicine.
- Cardiovascular stents with bioresorbable properties.

Technology Readiness Level (TRL):

TRL-6

IP Status:

Filed

Patent Application No:

202441087924

Sustainable Development Goals:



Maanav Sahyog – AI-Powered Wearable for Proactive Health Monitoring

Product Description:

Sudden medical crises, especially drug-induced incapacitation and stress-related anomalies, often go undetected until it's too late, particularly in low-connectivity areas.

Maanav Sahyog is an AI-powered healthcare wearable designed for continuous monitoring of vitals such as heart rate, SpO₂, temperature, and sweat activity (GSR). It offers real-time anomaly detection, intelligent alerts, and emergency assistance, ensuring user safety even without internet access through LoRa-based communication.



Inventiveness:

- AI-powered stress profiling
- LoRa-enabled offline alerts
- Adaptive health response system
- Encrypted, discreet wearable tech
- **Unique Benefits:**
 - Instant triple-tap emergency alert
 - Works in low-signal zones
 - Personalized health insights
 - Early distress and drug detection

Ref No: IRIS/25/HC/RP/16

Intended applications:

- Real-time monitoring for high-risk individuals
- Continuous tracking in hospitals & homes
- Elderly care and chronic conditions support
- Safety tool for high-stress professions

Technology Readiness Level (TRL):

TRL-5

Sustainable Development Goals:



MediSense – Smart IV Drip Monitoring System

Product Description:

Manual IV drip monitoring is prone to errors, delayed responses, and high nurse workload, increasing the risk of air embolism and compromising patient safety. MediSense – Smart IV is an intelligent IV management system that integrates weight sensors and digital twin technology to continuously track fluid levels, predict consumption patterns, and trigger automated alerts for timely intervention. It enhances safety, streamlines healthcare workflows, and supports real-time data-driven decisions.



Inventiveness:

- Weight sensors for fluid tracking
- Digital twin for system modeling
- Real-time embolism prevention alerts
- Centralized patient monitoring dashboard

Unique Benefits:

- Automatic air embolism prevention
- Reduced nurse workload
- Centralized multi-patient monitoring
- Real-time alerts and integration

Ref No: IRIS/25/HC/RP/17

Intended applications:

- Hospital wards and ICUs
- Emergency and trauma centers
- Long-term home IV care
- Mobile and remote healthcare units

**Technology Readiness
Level (TRL):**
TRL-6

IP Status:
Filed

**Sustainable
Development Goals:**



Probiotic Intervention for Pediatric Acute Diarrhea – Bifidobacterium longum Impact

Product Description:

Acute diarrhea is a major cause of morbidity and mortality in children under five, especially in low- and middle-income regions.

This study evaluates the effectiveness of Bifidobacterium longum supplementation in modulating the gut microbiome, improving clinical outcomes, and offering a cost-effective, sustainable treatment for pediatric diarrhea.



Inventiveness:

- Pediatric gut microbiome modulation
- Microbial signature identification
- Inflammatory biomarker analysis
- Sustainable clinical intervention
- **Unique Benefits:**
 - Reduced diarrheal duration/severity
 - Strengthened gut barrier function
 - Cost-effective probiotic therapy
 - Lower hospitalization burden

Ref No: IRIS/25/HC/RP/18

Intended applications:

- Integrate into child healthcare
- Reduce pediatric hospitalizations
- Promote local probiotic production
- Eco-friendly therapeutic option

Technology Readiness

Level (TRL):

TRL-2

Sustainable Development Goals:



Early Diagnostic Kit to Detect Cancer

Product Description:

Late-stage cancer detection significantly reduces treatment effectiveness and survival rates. This kit utilizes novel biomarkers to detect Circulating Tumor Cells (CTCs) at early stages, enabling timely diagnosis, prognosis prediction, and monitoring of treatment efficacy.



Inventiveness:

- Novel marker for CTC detection
- Early-stage cancer identification
- Prognosis and treatment guidance
- Enhanced diagnostic specificity

Unique Benefits:

- High diagnostic reliability
- Cost-effective early detection
- Minimally invasive testing
- Improved treatment planning

Ref No: IRIS/25/HC/RP/19

Intended applications:

- Early cancer screening centers
- Oncology diagnostic labs
- Personalized medicine platforms
- Hospital and clinical diagnostics

Technology Readiness Level (TRL):

TRL-4

Sustainable Development Goals:

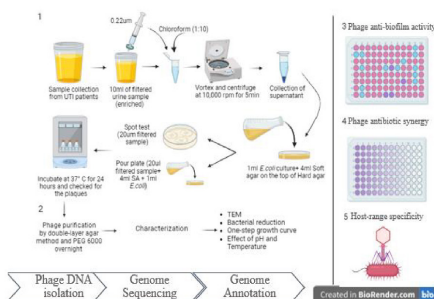


Development and Formulation of Phage Cocktail Against UTI Infections

Product Description:

E. coli-induced urinary tract infections (UTIs) are increasingly resistant to antibiotics, limiting treatment options.

We developed a phage cocktail targeting multiple E. coli strains, offering a novel, precision-based therapeutic alternative to combat antibiotic resistance and effectively treat UTIs.



Inventiveness:

- Tailored phage identification
- Optimized multi-phage formulation
- Highly specific bacterial targeting
- Novel delivery method
- **Unique Benefits:**
 - Reduces antibiotic resistance
 - Targets multiple E. coli strains
 - Preserves healthy microbiota
 - Adaptable to emerging strains

Ref No: IRIS/25/HC/RP/20

Intended applications:

- Treatment for antibiotic-resistant UTIs
- Alternative to antibiotic therapy
- Preventive care for recurrent UTIs
- Veterinary UTI treatment applications

Technology Readiness

Level (TRL):

TRL-3

Sustainable

Development Goals:



FPGA-Powered Digital Twin for AI-Based Cardiac Monitoring

Product Description:

Traditional AI accelerators face latency and energy inefficiency issues, limiting real-time cardiac diagnostics and remote monitoring.

We developed a hybrid AI-FPGA-based digital twin system that enables ultra-low latency, real-time cardiac monitoring with on-chip ECG signal generation, delivering accurate diagnostics even in resource-limited healthcare environments.



Inventiveness:

- Real-time AI inference
- Hybrid AI-FPGA design
- On-chip ECG generation
- Scalable system architecture
- **Unique Benefits:**
 - Ultra-low latency processing
 - Energy-efficient AI execution
 - Cost-effective diagnostic tool
 - High accuracy & reliability

Ref No: IRIS/25/HC/RP/21

Intended applications:

- Cardiac monitoring in hospitals
- Portable ECG wearable devices
- ICU/emergency care automation
- Edge AI in diagnostics

Technology Readiness Level (TRL):

TRL-4

Sustainable Development Goals:



A three dimensional multifunctional printing device

Product Description:

Problem:

In an age of digitalization revolutionizing every field, dentistry has not fully embraced digital solutions, limiting the potential benefits for both dentists and patients due to high costs, steep learning curves, and limited opportunities.

Solution:

We developed an indigenous, localized, made-in-India solution that overcomes these challenges by offering an affordable, easy-to-learn, and accessible digital platform, enabling better patient care and enhanced efficiency for dental professionals.



Inventiveness:

- All-in-one multifunctional miniaturized solution
- Design
- Accuracy

Unique Benefits:

- Indigenous Indian startup
- Cuts cost & space
- Affordable & versatile
- Modular & customizable

Ref.No: IRIS/25/MED/01

Intended applications:

- Exclusive for Dental Applications, 3D printing
- Milling
- Laser engraving
- Paste extrusion

Technology Readiness Level (TRL):
TRL-7

IP Status:

Published

Patent Application No:
202441059921

Sustainable Development Goals:



An Aptamer And A Corresponding Method For In-Vitro Identification Of Vibrio Cholerae

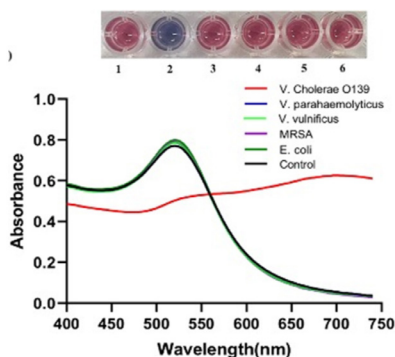
Product Description:

Problem:

There is no rapid, cost-effective method available in the market to identify *Vibrio cholerae* O139, delaying detection and response. This poses challenges for timely intervention in cholera outbreaks.

Solution:

We developed an aptamer that specifically binds to the pathogenic *Vibrio cholerae* O139, enabling rapid detection in environmental samples within 15 minutes. This affordable solution enhances early warning and control measures.



Inventiveness:

- Novel aptamer-based approach.
- Achieves detection in 15 minutes.
- Cost-effective design

Unique Benefits:

- Rapid results
- High specificity
- Affordable and portable

Ref.No: IRIS/25/MED/02

Intended applications:

- Monitoring water quality
- Supporting public health responses
- Field testing by environmental and health agencies
- Research and surveillance

Technology Readiness

Level (TRL):

TRL-4

Sustainable

Development Goals:

IP Status:

Filed

Patent Application No:

202441026241



Assistive Oral Care Device for Effective Biofilm removal in the Oral Cavity

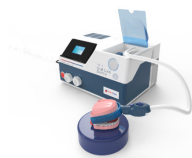
Product Description:

Problem:

Poor oral hygiene of dependent individuals in homes, hospitals, and care homes leads to various complications, including dental and general health issues, as well as psychological pain and a poor quality of life.

Solution:

Our Assistive Oral Care Device is a novel, patented mouthpiece-based oral hygiene device designed for dependent individuals. The device includes a specially designed mouthpiece, an external portable enclosure unit, and tubing with accessories to provide both mechanical and chemical cleansing, ensuring optimal oral hygiene with minimal caregiver intervention.



Inventiveness:

- Specially designed mouthpiece architecture
- Preprogrammed spurts
- Suctioning of waste liquid from the oral cavity

Unique Benefits:

- Mouthpiece-based inclusive design
- Limited dependence on caregivers
- Efficacy of oral hygiene is independent of the caregiver
- Consistent user experience

Ref.No: IRIS/25/MED/03

Intended applications:

- Individuals with loco-motor disabilities
- Dependent elderly population,
- Post-stroke rehabilitation patients

Technology Readiness Level (TRL):

TRL-4

IP Status:

Granted

Patent Application No:

IN201941017824

Sustainable Development Goals:



A Method Of Identifying And Removing Remnants Of Dental Cement From The Oral Cavity

Product Description:

Problem:

Undetected residual dental cement can lead to peri-implant disease, secondary caries, and implant failure. Conventional glass ionomer cement (GIC) lacks efficient cement detection, pH stability, and enhanced antimicrobial properties.

Solution:

GIC-CQD integrates fluorescent carbon quantum dots (CQDs) into conventional GIC, enabling easy visualization and removal of excess cement under UV light. It also enhances fluoride release, pH stabilization, and antibacterial action, ensuring better oral health and long-term implant success.



Inventiveness:

- Multifunctional enhancement improving GIC.
- Smart fluorescent technology
- Cost-effectiveness and easy integration

Unique Benefits:

- Optical and fluorescent properties
- Enhanced fluoride release for anti-cariogenic effects.
- Improved pH stability & acid neutralization.
- Biocompatibility & non-toxic nature

Ref. No: IRIS/25/MED/04

Intended applications:

- In dental procedures & treatments
- Rapid detection and removal of cement residues
- Effective for bonding crowns, orthodontic brackets, and bands.

Technology Readiness Level (TRL):
TRL-6

IP Status:

Filed & Published

Patent Application No:
202341028986 A

Sustainable Development Goals:



Portable Cold Box for Vaccines

Product Description:

Traditional vaccine transport methods relying on ice cubes are prone to temperature fluctuations, risking vaccine spoilage. Our Portable Cold Box, utilizing the Peltier effect, offers a reliable and eco-friendly solution to maintain a stable temperature, ensuring safe and effective vaccine transportation.



Inventiveness:

- Peltier effect for stability
- Real-time temperature tracking
- Compact and lightweight design
- **Unique Benefits:**
 - Maintains vaccine efficacy
 - No ice packs needed
 - Eco-friendly and energy-efficient

Ref No: IRIS/25/MED/05

Intended applications:

- Immunization cold chain management
- Safe pharmaceutical transport

Technology Readiness Level (TRL):
TRL-7

IP Status:

Granted

Patent Application No:
201841025939

Sustainable Development Goals:



PixCrypto System

Product Description:

Massive healthcare data breaches have led to financial loss, legal action, and compromised patient privacy. The PixCrypto System is an image encryption software designed to secure medical images stored in the cloud, preventing unauthorized access, insurance fraud, and darknet data trading. It ensures compliance with HIPAA, GDPR, and ISO 27799, making it a valuable solution for global healthcare providers.



Inventiveness:

- End-to-end encryption for secure data
- Encrypts all medical image types
- Data-at-rest encryption capability
- Applicable across multiple medical fields

Unique Benefits:

- Prevents unauthorized access and data theft
- Reduces cybersecurity insurance costs
- Enhances compliance with global standards
- Eliminates third-party encryption costs

Ref No: IRIS/25/MED/06

Intended applications:

- Hospital management systems
- Radiology and pathology imaging security
- Secure cloud-based medical data storage
- Insurance fraud prevention

Technology Readiness

Level (TRL):

TRL-9

IP Status:

Granted

Patent Application No:

503846

Sustainable Development Goals:

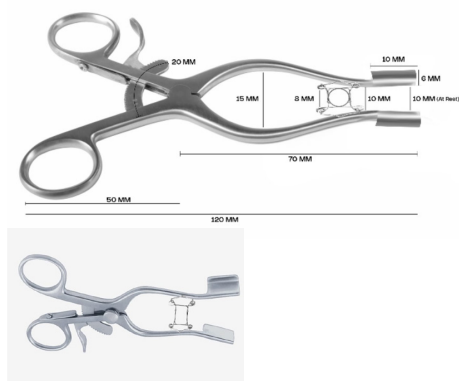


A Device for Tooth Extraction

Product Description:

Conventionally used instruments for retraction in disimpaction are Austin retractor for buccal mucoperiosteal flap and Howarth's elevator for retraction of lingual tissues. This not only hampers visibility of the operating field but also exerts undue retraction forces over the mucosa leading to mucosal tear, lingual nerve injury, increased incidence of post operative swelling and paraesthesia of areas supplied via lingual nerve.

The retractor is designed in such a way that it is self-retaining retractor once fixed and adapted around the adjacent molar using retraining band and tightening pins. It's both the working ends have forked endings to hold and retract buccal and lingual mucoperiosteal flaps without hampering visibility or accessibility.



Inventiveness:

- Self-adaptive retractor
- Amount of retraction force can be managed by tightening or loosening ratchet

Unique Benefits:

- Providing stable and constant retraction of soft tissues,
- Limited necessity for assistance
- Reduced post-operative soft tissue swelling

Ref No: IRIS/25/MED/07

Intended applications:

- Surgical removal of mandibular third molar teeth
- Soft tissue retraction
- For small lesion excision

Technology Readiness Level (TRL):

TRL-2

IP Status:

Published

Patent Application No:

202441074763

Sustainable Development Goals:



Gel Formulation For Treating Diabetic Foot Ulcer Infections

Product Description:

Problem:

Diabetic foot ulcers often lead to severe bacterial infections, which can be difficult to treat due to poor penetration of antibiotics into deep wounds and issues with sustained release.

Solution:

Aquananogel is a nano-scale, biodegradable topical formulation designed to load antibiotics into aquasomes. The drug-loaded aquasomes, ranging in size from 100 to 400 nm, are lyophilized and then developed into a gel-based dosage form. This provides effective drug delivery directly to deep wound sites for sustained and prolonged release, enhancing treatment of diabetic foot ulcers.



Inventiveness:

- Drug-loaded aquasomes at a nano size of 100 to 400 nm, lyophilized for stability.
- Patient-friendly dosage form
- Prolonged, sustained antibiotic release
- **Unique Benefits:**
- Easy dispersion
- Deep penetration
- Improved stability

Ref No: IRIS/25/PHR/01

Intended applications:

- Topical application
- Treatment of chronic wounds.

Technology Readiness Level (TRL):

TRL-6

IP Status:

Granted

Patent Application No:

16/221,540

Sustainable Development Goals:



Marvel Herbs for PCOS

Product Description:

Problem:

Polycystic Ovary Syndrome (PCOS) is a hormonal disorder in women of reproductive age, characterized by anovulation, elevated serum androgens, and metabolic abnormalities. It affects the ovaries and disrupts hormonal balance, leading to infertility and other complications.

Solution:

The selected polyherbal composition acts synergistically to prevent and alleviate the symptoms of PCOS. The herbs in the composition regulate insulin, blood sugar, cholesterol, prolactin levels, shrink cysts, and regulate androgens, providing a holistic approach to managing PCOS.



Inventiveness:

- Herbal composition that acts on multiple metabolic and hormonal pathways.

Unique Benefits:

- Effectively treats PCOS.
- Synergistic therapeutic effect
- Regulates and balances hormones

Ref No: IRIS/25/PHR/02

Intended applications:

- PCOS treatment
- Hormonal regulation
- Alleviates and prevents PCOS symptoms
- Improving overall reproductive health.

Technology Readiness Level (TRL):

TRL-5

Sustainable Development Goals:

IP Status:

Granted

Patent Application No:

16/448,298



Liposome loaded Insulin and encapsulation strategy for nasal spray

Product Description:

Problem:

Managing diabetes through daily insulin injections can be painful, uncomfortable, and burdensome for patients. It also limits compliance, especially for those with needle phobia.

Solution:

We have developed a nasal spray for insulin delivery using liposomes, offering a painless alternative to injections. Our custom microfluidic chip enables fast, efficient production of insulin-loaded liposomes, which effectively lower blood glucose levels, making diabetes management simpler and more comfortable.



Inventiveness:

- Smart liposome production via a custom-designed microfluidic chip
- High-quality liposome production
- **Unique Benefits:**
- Painless and non-invasive
- Efficient and scalable liposome production
- Enhanced insulin absorption and prolonged action
- Broad potential for drug delivery

Ref No: IRIS/25/PHR/03

Intended applications:

- Diabetes management without injections
- Rapid and efficient drug absorption
- Personalized and scalable insulin therapy

Technology Readiness

Level (TRL):

TRL-4

IP Status:

Filed

Sustainable

Development Goals:



Development Of In-Situ Gel Based On Rivastigmine Loaded Nonionic Surfactant Vesicles For Brain Delivery

Product Description:

Problem:

Alzheimer's disease is a degenerative central nervous system disorder that requires significant medication, often with severe side effects, primarily due to difficulty in crossing the blood-brain barrier (BBB).

Solution:

We developed a Rivastigmine-loaded niosomal in situ gel designed to overcome the blood-brain barrier via the olfactory pathway. This approach enables a quick onset of action, faster therapeutic effects, and reduced dosage requirements, compared to conventional drug delivery methods. The optimized formulation also enhances bioavailability and perfusion.

Inventiveness:

- Will pass the blood-brain barrier via the olfactory pathway.
- Faster therapeutic effect with quick onset
- Optimized formulation results

Unique Benefits:

- Avoids first-pass metabolism,
- Improves bioavailability.
- Improved absorption
- Reduced side effects.
- Enhanced bioavailability and perfusion.



Ref. No: IRIS/25/PHR/04

Intended applications:

- Treatment of Alzheimer's disease

Technology Readiness

Level (TRL):

TRL-6

IP Status:

Granted

Patent Application No:

202141055982

Sustainable Development Goals:



ACCULEPTO DX – Rapid Leptospira Detection Kit

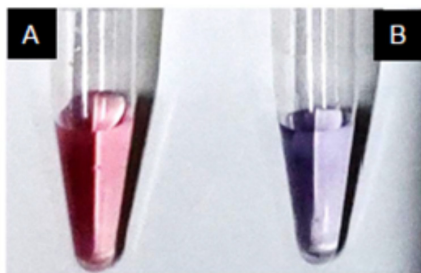
Product Description:

Problem:

Current diagnostic methods for detecting *Leptospira interrogans* are time-consuming, expensive, and require specialized laboratory equipment.

Solution:

ACCULEPTO DX is a rapid, colorimetric diagnostic test using single-stranded DNA (ssDNA) aptamers and gold nanoparticles (AuNPs) to detect *Leptospira interrogans*. The test provides a quick visual color change for easy interpretation, offering a simple, cost-effective, and accurate solution for early diagnosis.



Inventiveness:

- Aptamer-based detection for high specificity
- Gold nanoparticle colorimetric assay
- No specialized equipment required
- Rapid and portable
- **Unique Benefits:**
- Highly specific to *Leptospira interrogans*
- Results in 10 minutes for quick diagnosis
- Long shelf life (4–30°C, 18 months)
- Low-cost testing at ₹80 per test

Ref No: IRIS/25/PHR/05

Intended applications:

- Human and veterinary diagnostics for Leptospirosis
- Field-based rapid testing in rural areas
- Point-of-care testing
- Water and environmental surveillance

Technology Readiness Level (TRL):

TRL-7

Sustainable Development Goals:

IP Status:

Published

Patent Application No:

202241038353



A Biosurfactant Nano-Ferric Ionosphere Scaffold for the Treatment of Municipal Landfill Leachate

Product Description:

Municipal landfill leachate contains non-degradable toxic organics that pose serious environmental risks. The Biosurfactant Nano-Ferric Ionosphere Scaffold (BN-FIS) is an advanced, high-surface-area magnetic scaffold that sequesters and oxidizes contaminants, reducing chemical oxygen demand (COD) by over 99% while preventing secondary pollution. This cost-effective technology supports large-scale wastewater treatment applications.



Inventiveness:

- Magnetic scaffold with high surface area
- Sequesters and oxidizes toxic organics
- Generates hydroxyl radicals for oxidation
- Prevents secondary pollution formation

Unique Benefits:

- High efficiency in COD removal
- Low operational cost and footprint
- Minimal sludge production and odor
- Effective for industrial wastewater treatment

Ref No:IRIS/25/LSC/01

Intended applications:

- Municipal landfill leachate treatment
- Industrial effluent treatment (pharma, chemicals, pulp)
- Environmental sustainability initiatives
- Wastewater management for municipalities

Technology Readiness Level (TRL):

TRL-5

IP Status:

Indian Patent: (Granted)

Patent Application No:
379986

Sustainable Development Goals:



Biphasic Biosurfactant-Biocatalyst Conjugated Magnetic Nanometal Oxide Composition for Degradation of Hydrocarbon and Vegetable Oils in Wastes

Product Description:

Soil contamination with non-degradable petroleum hydrocarbons poses significant environmental risks. The Biphasic Biosurfactant-Biocatalyst Conjugated Magnetic Nanometal Oxide (BBCMNO) technology enhances oil separation and accelerates hydrocarbon degradation by reducing interfacial tension, ensuring efficient decontamination while enabling oil recovery without secondary pollution.



Inventiveness:

- Superparamagnetic nanometal oxide technology
- Enhances interfacial adhesion for oil separation
- Accelerates hydrocarbon degradation
- Enables oil recovery with minimal residue
- **Unique Benefits:**
- Effective treatment for crude oil spills
- Reduces organic residue below 250 mg/L
- Minimal sludge production and odor-free
- Cost-effective and reusable solution

Ref No:IRIS/25/LSC/02

Intended applications:

- Petroleum refinery wastewater treatment
- Automobile and edible oil industries
- Food and dairy processing plants
- Municipal wastewater treatment

Technology Readiness Level (TRL):

TRL-5

IP Status:

Granted

Patent Application No:

508905

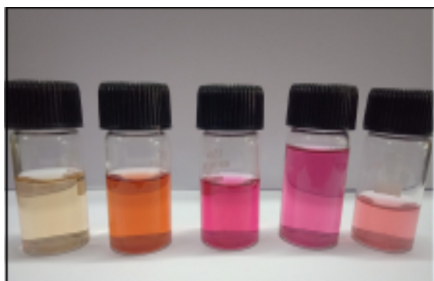
Sustainable Development Goals:



A Process for Producing a Pigment

Product Description:

Microbial pigments derived from *Streptomyces* sp. offer a sustainable and multifunctional alternative to synthetic textile dyes. These pigments, produced under optimized conditions, exhibit antimicrobial and anticancer properties, as confirmed by FTIR, GCMS, and NMR analyses. Their eco-friendly nature makes them ideal for replacing chemical dyes in textiles while also holding potential for medical and industrial applications. This innovation, protected under Indian Patent No. 507614, represents a significant advancement in sustainable dye technology.



Inventiveness:

- Screening of pigment from lichen.

Unique Benefits:

- Potential anticancer drug for breast cancer treatment.
- Medicinal properties enable its use as a natural food colorant.

Ref No:IRIS/25/LSC/03

Intended applications:

- Textile colourants
- Cosmetic applications.

Technology Readiness Level (TRL):

TRL-4

IP Status:

Granted

Patent Application No:
507614

Sustainable Development Goals:

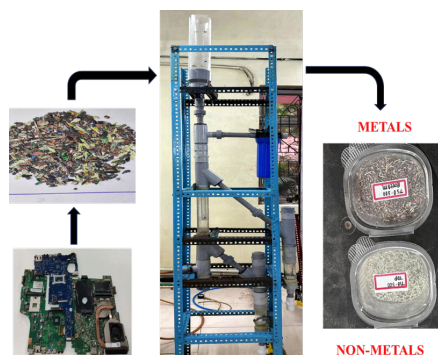


Sustainable and Cost-effective Printed Circuit Board Recycling using Continuous Countercurrent Gas-solid Fluidized Bed Reactor

Product Description:

The rapid increase in global e-waste, projected to reach 75 million tons by 2030, poses major environmental and resource challenges. Printed Circuit Boards (PCBs), a major e-waste component, contain both valuable metals and hazardous non-metals.

To address this, a pilot-scale Continuous Countercurrent Gas-Solid Fluidized Segregator (CCGSF) has been developed to separate non-metallic fractions from crushed PCBs efficiently, offering a sustainable and cost-effective solution for metal enrichment without harmful emissions.



Inventiveness:

- Density-based dry separation
- No chemicals or heat used
- Integrated low-noise design
- Industrial-scale throughput capability

Unique Benefits:

- Up to 95% metal segregation
- Low cost and compact footprint
- Easy to operate and maintain
- Scalable for large facilities

Ref No:IRIS/25/LSC/RP/04

Intended applications:

- PCB recycling and segregation
- Pre-treatment for metal extraction
- Industrial e-waste processing plants

Technology Readiness Level (TRL):
TRL-5

IP Status:
Filed

Sustainable Development Goals:



Microbial Polyethylene Degradation Using *Rhodococcus equi* in Biomedical Waste

Product Description:

Polyethylene (PE), a widely used synthetic polymer, contributes significantly to persistent plastic pollution and is resistant to natural degradation.

This research explores the potential of *Rhodococcus equi* (ATCC strain) to biodegrade PE through enzyme-mediated processes, supported by growth curve analysis and 16s rRNA sequencing for gene identification—offering a microbial-based solution for biomedical plastic waste management.



Inventiveness:

- Novel *Rhodococcus equi* application
- Enzyme-assisted PE breakdown
- Genetic analysis of degradation
- Sustainable biowaste processing

Unique Benefits:

- Reduces healthcare plastic pollution
- Enables gene-level intervention
- Green microbial degradation pathway
- Enhances hospital waste management

Ref No:IRIS/25/LSC/RP/05

Intended applications:

- Bioremediation in healthcare centers
- PE-degrading gene identification
- Biomedical waste management innovation
- Enzyme-based plastic recycling

Technology Readiness Level (TRL):

TRL-2

Sustainable Development Goals:



Antimicrobial Biosurfactants

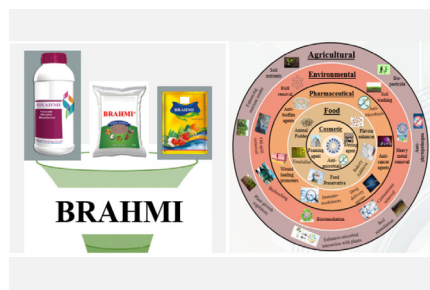
Product Description:

Problem:

Synthetic surfactants are harmful to the environment due to their toxicity, non-biodegradability, and limited eco-friendly applications. The need for sustainable alternatives in industrial processes is growing.

Solution:

We produce highly pure rhamnolipids biosurfactants through microbial/biocatalytic synthesis using immobilized enzymes/microorganisms. By integrating fermentation with ultrafiltration processes, we achieve high-yield production of rhamnolipids, setting new standards in sustainable biomanufacturing, and ensuring cost-effectiveness and circularity in the value chain.



Inventiveness:

- Microbial/biocatalytic synthesis
- Integration of fermentation and ultrafiltration processes
- Cost-effective biosurfactant production
- Scale-up strategies
- **Unique Benefits:**
 - Biodegradable and eco-friendly
 - Antimicrobial and antioxidant properties
 - Effective emulsifiers and stabilizers
 - Sustainability and circularity

Ref.No: IRIS/25/FA/01

Intended applications:

- Preservation and processing
- Formulations and packaging
- Antimicrobial and antioxidant applications
- Emulsification and stabilization

Technology Readiness Level (TRL):

TRL-6

IP Status:

Granted

Patent Application No:

412891, 465771, 370333

Sustainable Development Goals:





SRM Directorate of
Entrepreneurship &
Innovation (DEI)



SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
(Established by the University Act of SSC Act, 1983)

A System For Assessment Of Meat Quality

Product Description:

Problem:

Conventional methods for assessing meat quality, such as analyzing total volatile basic nitrogen, biogenic amines, and pH, are destructive, time-consuming, and require skilled labor.

Solution:

Our solution uses IoT-based gas sensors to detect gaseous compounds released during the spoilage of meat. The data collected from these sensors is processed through machine-learning models to predict meat quality at a lower cost, offering a non-destructive and rapid analysis.



IRIS'25
<https://www.iris.srmist.edu.in/>
INDUSTRY ACADEMIA COLLIDER

Inventiveness:

- Non-destructive quality assessment.
- Alternative to e-nose systems.
- Rapid and accurate quality prediction

Unique Benefits:

- Easily portable
- Rapid results

Ref.No:IRIS/25/FA/02

Intended applications:

- Food safety agencies
- Meat processing industry

Technology Readiness Level (TRL):

TRL-4

IP Status:

Filed

Patent Application No:

202441072021

Sustainable Development Goals:



Development of plant-based meat and Fish analogue using legumes

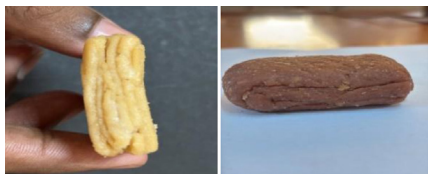
Product Description:

Problem:

The demand for sustainable, high-protein alternatives to meat and fish is increasing, but existing options often lack the desired texture, taste, and nutritional profile.

Solution:

We developed a plant-based meat and fish analogue using optimized layering techniques and response surface methodology (RSM). By incorporating legume-based protein isolates and textured proteins, our product replicates the texture, flavor, and nutritional benefits of traditional meat and fish.



Inventiveness:

- Utilizes a novel layering technique to replicate the fibrous texture of meat and fish
- Optimized formulation using Response Surface Methodology (RSM) for improved texture, taste, and protein content
- Develops a clean-label, allergen-free alternative without synthetic additives
- **Unique Benefits:**
 - Provides a high-protein, nutrient-dense alternative to conventional meat and fish
 - Offers a realistic texture and sensory experience using plant-based ingredients
 - Free from artificial additives, making it a healthier and sustainable choice

Ref.No: IRIS/25/FA/RP/14

Intended applications:

- Ready-to-cook or ready-to-eat plant-based meat and fish products for retail and food service
- Ingredient for plant-based burgers, nuggets, fillets, and other meat alternatives

Technology Readiness Level (TRL):

TRL-4

Sustainable Development Goals:





SRM Directorate of
Entrepreneurship &
Innovation (DEI)



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INSTITUTE OF SCIENCE & TECHNOLOGY
(Established by the Government of Tamil Nadu in 1983)

Preparation of Edible Spoons, Cups, and Films for Packaging

Product Description:

Problem:

Plastic utensils and packaging contribute significantly to pollution, harming ecosystems and increasing landfill waste.

Solution:

This innovation introduces edible cutlery and packaging made from underutilized, nutritious ingredients like millets and tuber starch. These eco-friendly alternatives reduce plastic waste, lower carbon footprints, and provide additional health benefits.



Inventiveness:

- Eco-friendly plastic alternative
- Nutritious composition
- Tuber starch-based films
- Sustainable and biodegradable food packaging solutions
- **Unique Benefits:**
 - Lower carbon footprint
 - Nutrient-rich ingredients
 - Biodegradable and edible
 - Versatile applications in food service and packaging

Ref.No: IRIS/25/FA/03

Intended applications:

- Edible Spoons – Sustainable alternative to plastic utensils
- Edible Cups – Eco-friendly substitute for single-use
- Edible Films – Biodegradable food wrapping for various products

Technology Readiness Level (TRL):

TRL-6

Sustainable Development Goals:

IP Status:

Patent Published

Patent Application No:

202441028731



AI-Powered Portable Milk and Milk Powder Adulteration Detection System

Product Description:

Problem:

Milk and milk powder adulteration is a common issue that compromises food safety and consumer health. Traditional methods for detecting adulterants are often slow and require complex laboratory equipment.

Solution:

This handheld device offers a reliable, AI-based solution for detecting adulterants in milk and milk powder. It uses precise sensors to identify common adulterants like sodium salicylate, ammonium, and hydrogen peroxide in real-time, with a portable, battery-operated design and one-touch operation. Bluetooth/Wi-Fi connectivity syncs results with a mobile app, ensuring easy access to data.



Inventiveness:

- AI-based adulterant detection
- Handheld design

Unique Benefits:

- Rapid, accurate detection
- Portable, battery-operated design
- Mobile app integration
- Promotes dairy transparency

Ref.No:IRIS/25/FA/04

Intended applications:

- Real-time quality monitoring
- Suitable for farmers
- Ideal for vendors
- Food safety agencies

Technology Readiness

Level (TRL):

TRL-7

IP Status:

Published

Patent Application No:

202141057323

Sustainable

Development Goals:



Finger Rich for Bhendi

Product Description:

Bhendi (*Abelmoschus esculentus*) is one of the major vegetables grown by the poor and marginal farmers to get contingent income. The crop suffers from macro and micronutrient deficiencies (Nitrogen, Phosphorus, Potassium, Zinc, Copper, Iron, manganese and Boron) which affects the normal plant growth and development ultimately decreasing crop yield and quality. In this scenario the farmers face achieving adequate marketable yield. The farmers use extra dose of fertilizers and hormones causing environmental hazards besides spending extra money on the input cost. Hence attempts have been made to develop unique foliar tonic comprising essential nutrients with key plant growth regulators, antioxidants and vitamins in a most compatible way which is cost effective and improves yield and quality of Bhendi.



Inventiveness:

- Exclusive blend of nutrients, regulators.
- Exclusively tested for Bhendi crop compatibility.
- **Unique Benefits:**
 - Yield enhancement up to 20 to 30 %
 - More harvest frequency
 - Enhance drought tolerance

Ref.No: IRIS/25/FA/RP/05

Intended applications:

- Addressing nutrient deficiencies
- Enhancing plant growth and sustained development
- Cost effective solution for farmers

Technology Readiness

Level (TRL):

TRL-7

Sustainable Development Goals:





SRM Directorate of
Entrepreneurship &
Innovation (DEI)



SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
Established by the Government of India in 1983

SRM Chillies Fresh

Product Description:

Chilli (*Capsicum annuum*) crop face several specific yield and quality-related problems, poor fruit set and flower drop, poor fruit quality, pest and diseases, inconsistent maturity and imbalanced fertilization. Foliar application of nutrients with combination of specific plant growth regulators and conjugating enzymes can overcome the above-mentioned problems and improve yield and quality of the crop. We developed an exclusive foliar tonic combining nutrients, hormones and vitamins that can augment yield and quality of chillies.



Inventiveness:

- Exclusive blend of nutrients, regulators.
- Exclusively tested for Chilli crop compatibility.

Unique Benefits:

- Improve fruit weight and length
- Decrease flower drop
- Decrease fruit drop
- Increase number of fruits
- Improves fruit set
- Enhanced vigour of the crop
- Yield enhancement up to 20 to 30 %

Ref.No: IRIS/25/FA/RP/06

Intended applications:

- Addressing nutrient deficiencies
- Cost effective solution for farmers
- Reducing increased over dose of fertilizers by soil application

Technology Readiness

Level (TRL):

TRL-7

Sustainable Development Goals:



SRM PULSE MAX for Blackgram

Product Description:

Pulses are important protein rich dietary for vegetarians. Blackgram (Vigna mungo) is sensitive to water stress during its flowering and pod-setting stages. Nutrient demand at this critical stages are heavy and inadequate supply can reduce yield. by poor pod formation, reduced pod size, and lower seed yield. In poor weather conditions, like excessive rain or wind, pollination can be reduced, leading to fewer pods and poor-quality seeds. Major disorder in blackgram is flower drop and premature pod drop leading yield loss. Foliar application of nutrients with combination of specific plant growth regulators and conjugating enzymes can overcome the above-mentioned problems and improve yield and quality of the crop.



Inventiveness:

- Exclusive blend of nutrients, regulators.
- Exclusively tested for Blackgram crop compatibility.

Unique Benefits:

- Decreases flower drop
- Improve flower and pod setting
- Increase seed yield
- Enhance relative drought tolerance
- It can increase yield up to 20 - 30 %

Ref.No: IRIS/25/FA/RP/07

Intended applications:

- Cost effective solution for farmers
- Addressing nutrient deficiencies
- Reducing increased over dose of fertilizers by soil application

Technology Readiness

Level (TRL):

TRL-7

Sustainable

Development Goals:



SRM Groundnut Peg most

Product Description:

Groundnut (*Arachis hypogaea*) is an important oil seed crop and require technology break through to increase yield especially under rainfed situation. The crop is sensitive to drought stress during critical stages like flowering and pod filling. Nutrient demand is also heavy during these stages and require proper replenishment. Nutrient stress and hormone imbalance during these periods can cause flower drop, poor pod development, and reduced seed size and oil content. Drought stress also weakens the plant, making it more susceptible to diseases. Foliar application of nutrients with combination of specific plant growth regulators and conjugating enzymes can overcome the above-mentioned problems and improve yield and quality of the crop.



Inventiveness:

- Exclusive blend of nutrients, regulators.
- Exclusively tested for Blackgram crop compatibility.

Unique Benefits:

- Improve pollination
- Improve pegging of flowers
- Increase seed size
- Increase crop vigour
- Enhance relative drought tolerance

Ref.No: IRIS/25/FA/RP/08

Intended applications:

- Addressing drought challenges
- Cost effective solution for farmers

Technology Readiness

Level (TRL):

TRL-7

Sustainable Development Goals:

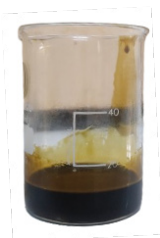


Encapsulated Black Cardamom Oleoresin for Functional Foods

Product Description:

Volatile bioactives in black cardamom oleoresin degrade quickly, limiting their stability and utility in functional food formulations.

This project utilizes supercritical CO₂ extraction for high-purity oleoresin, followed by spray drying with biopolymeric carriers to encapsulate the bioactives—enhancing their stability, shelf-life, and controlled release in food systems.



Inventiveness:

- Solvent-free CO₂ extraction
- Multi-carrier encapsulation system
- Controlled release formulation
- Green and scalable process
- **Unique Benefits:**
 - Enhanced oleoresin stability
 - Targeted bioactive delivery
 - Extended shelf-life potential
 - Suitable for clean-label products

Ref.No: IRIS/25/FA/RP/09

Intended applications:

- Functional food ingredients
- Nutraceutical formulations
- Natural flavoring agents
- Bioactive delivery systems

Technology Readiness

Level (TRL):

TRL-4

Sustainable Development Goals:



Millet-Based Instant Noodles for Sustainable Nutritional Security

Product Description:

Conventional instant noodles are high in glycemic index and lack essential nutrients such as protein, fiber, and minerals, making them unsuitable for regular healthy consumption.

This project introduces a nutritious instant noodle formulation using germinated proso and barnyard millet flours with guar gum, offering enhanced nutritional value, desirable cooking qualities, and microbiological safety for long shelf life.



Inventiveness:

- Use of minor millets
- Germination for bioavailability
- Guar gum for texture
- Nutrient-rich convenience food

Unique Benefits:

- High protein and fiber
- Improved taste and texture
- Microbiologically safe product
- Promotes local grain use

Ref.No: IRIS/25/FA/RP/10

Intended applications:

- Healthy convenience food
- School meal programs
- Retail ready-to-cook items
- Nutraceutical food products

Technology Readiness

Level (TRL):

TRL-4

**Sustainable
Development Goals:**



Antioxidant-Rich Herbal Tea Blend for PCOD Health

Product Description:

Polycystic Ovarian Disease (PCOD) is a common hormonal disorder affecting women's reproductive health, often leading to irregular menstrual cycles, infertility, and metabolic imbalances.

This herbal tea formulation serves as a complementary therapeutic option, harnessing anti-inflammatory, antioxidant, and hormone-regulating properties to support PCOD management naturally.



Inventiveness:

- Unique herbal blend formulation
- Enhanced antioxidant activity
- Natural hormone-balancing potential
- Metabolic health support
- **Unique Benefits:**
- Rich in antioxidants
- Supports hormonal balance
- Bioactives for women's health
- Natural and safe solution

Ref.No: IRIS/25/FA/RP/11

Intended applications:

- PCOD symptom management
- Hormonal health support
- Functional herbal beverages
- Nutraceutical/wellness products

Technology Readiness Level (TRL):

TRL-4

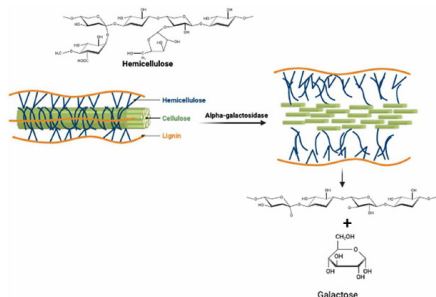
Sustainable Development Goals:



Eco-Friendly Biodegradation of Agricultural Waste using Whole-Cell Enzyme Expression

Product Description:

Agriculture occupies 4.1 billion hectares and contributes 4% to global GDP, yet improper disposal of agricultural waste increases greenhouse emissions and environmental pollution. This innovation utilizes *E. coli* overexpressing α -galactosidase to biodegrade sugarcane bagasse, enabling sustainable valorization of crop residues into bioenergy or organic fertilizers through green, enzymatic processing.



Inventiveness:

- α -galactosidase for cell-wall loosening
- Enzyme-assisted lignocellulose breakdown
- Whole-cell biocatalyst expression
- Green chemistry for valorization

Unique Benefits:

- Eco-friendly waste degradation
- Converts agri-waste into products
- Reduces soil and air pollution
- Supports circular bioeconomy

Ref.No: IRIS/25/FA/RP/12

Intended applications:

- In-situ agricultural waste remediation
- Ex-situ saccharification processes
- Bioenergy and fertilizer production
- Cleaner farming ecosystems

Technology Readiness

Level (TRL):

TRL-4

Sustainable Development Goals:



Smart Prawn Aquaculture System

Product Description:

Prawn farmers face significant challenges in water quality monitoring, disease detection, and feed optimization, impacting survival rates and profitability.

This solution integrates IoT sensors for real-time environmental monitoring with AI algorithms for disease prediction, smart feeding, and revenue estimation, improving overall farm productivity.



Inventiveness:

- IoT-enabled water monitoring
- AI-based disease detection
- Smart feed optimization model
- Revenue prediction analytics
- **Unique Benefits:**
 - Real-time water quality alerts
 - Reduced lab testing costs
 - Minimized feed waste
 - Improved prawn survival rate

Ref.No: IRIS/25/FA/RP/13

Intended applications:

- Commercial prawn/fish farming
- Aquaculture research centers
- Smart aquaculture startups
- Integrated farm management systems

Technology Readiness Level (TRL):

TRL-5

Sustainable Development Goals:





SRM Directorate of
Entrepreneurship &
Innovation (DEI)



SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
(Declared to be University by U of SSC Act, 1984)

R&D Labs Showcased

1. Environmental Biotechnology Laboratory
2. Centre for Biomechanics
3. Centre for Biomedical Research and Healthcare Innovation (CBRHI)
4. Bioanalytical and Research Services, CCTR
5. Environmental and Energy Engineering
6. Center for Immersive Technology (CIT)
7. Developmental Biology and the EBP-SRMIST Laboratory
8. e-Yantra and Digital Twin Lab
9. Fabrication Lab @ SRMIST
10. Postharvest Technology Research Laboratory
11. Functional Metabolomics
12. Zebrafish Genetics Laboratory

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