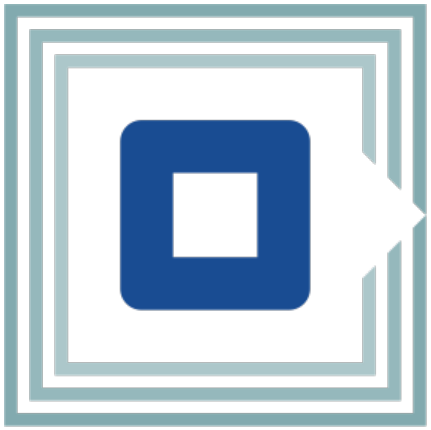

KTN

the Knowledge Transfer Network

Innovate UK
Technology Strategy Board

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Pitches		
Energy		
Namdar Baghaei-Yazdi	Biotech Consultants Ltd	UK
Carlos Garcia	Electric Research Institute	México
Eduardo Blanco-Davis	Liverpool John Moores University	UK
Jorge Aburto Anell	Mexican Petroleum Institute	México
Belinda Murillo	Energy Mex	México
Agri-tech		
Sarah Burbi	Coventry University	UK
Jorge Miguel Paulino Vázquez Alvarado	Instituto Nacional de Investigaciones Forestales Agrícolas y Pecuarias (INIFAP)	México
Roberto Parra-Saldívar	Instituto Tecnológico de Monterrey (ITESM)	México
Luis Hernández	Stela Genomics	México
Health		
Enrique Sucar	National Institute of Astrophysics, Optics and Electronics (INAOE)	México
Various Sectors		
Liam Good	Tecrea Ltd	UK
David McElroy	Ingenza Ltd	UK

ENERGY

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Biotech Consultants Ltd.

- **About your organisation**

- Developing bioconversion technologies to convert hydrolysed biomass based sugars (C5 & C6) into value added products, such as biofuels and other bio-based products and have expertise in:

  (1) Isolation of novel thermophiles; (2) Having a large culture collection of thermophilic bacteria (*Geobacilli*); (3) Fermentation Optimisation (Efficient fermentation process & know-how; Complete analysis of primary metabolic fermentation products; Feedstock flexibility – Experience in hydrolysing and fermenting wheat straw, miscanthus, DDGS, sugar beet pulp.

- **About you/your team**

- ***Dr. Namdar Baghaei-Yazdi***: Managing Director (MD) with over 25 years of experience in Microbiology and Biotechnology research and commecialisation, especially in the fields of biofuels and biomaterials. Namdar has his name on a number of publications and patents and has a BSc degree in Microbiology from King's College London and a PhD in Biotechnology from Imperial College.
- ***Dr. Muhammad Javed***: Chief Science Officer (CSO) with over 25 years of experience in microbiology research and he has filed ten patents. He has gained significant experience in engineering the metabolism of bacteria and archaea. Having an excellent understanding of primary metabolic flux analysis he has gained invaluable experience of the fermentation process development for metabolic products especially those of thermophilic ethanol production.

- **Contact Details:** E-mail: n.b.yazdi@dial.pipex.com ; Tel: +44-7962 387925

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MÉXICO GOBIERNO DE LA REPÚBLICA | CONACYT Consejo Nacional de Ciencia y Tecnología | Innovate UK

The Challenge

- To utilise any available biomass feedstocks in Mexico to produce biofuels and bio-based platform chemicals
- To apply our know-how to the agro-industrial problems that Mexico faces
- To develop an infrastructure for a strong bio-economy in Mexico using the most efficient bioprocesses and microorganisms

The Opportunity

- The rich agricultural base of Mexico to generate various type of biomass feedstocks.
- The connection with the best academic and research institutes in Mexico to develop the process that were mentioned in the 'Challenge' section.
- Knowledge transfer from the UK companies and research institutes and universities to Mexico.

Project Idea

- Development of the most efficient ways of producing biofuels and bio-based chemicals from agricultural wastes and residues in Mexico.
- Minimization of agro-industrial wastes in Mexico.
- Development of strong bio-based industries and biorefineries in Mexico.

What partners do you need? Those

- who are specialised in feedstock hydrolysates;
- can provide biomass feedstocks;
- developing Synthetic biology tools;
- specialised in cost-effective product recovery;
- specialised in metagenomic analysis of microorganisms;

Electric Research Institute (IIE)

IIE is a 40 years old public leading institution dedicated to innovation, technological development and applied scientific research, in order to develop technologies applicable to the electrical and oil industries. It provides support to the **Energy Sector in the electrical generation, transmission and distribution processes as well as the improvement of oil processes.**

We have **more than 20 laboratory infrastructures** for research and technological development and almost 600 researchers specialized in different disciplines.

We are part of the **Mexican Center of Innovation** in Solar, Geothermal and leader in Wind Energy.

The team

Carlos F. Garcia

Master in Telecommunication Systems from the University of Essex , U.K.,.IEEE Senior Member, CIGRE Member and CIME Member. Researcher and Project Manager with the Department of Control, Electronics and Communications.

Javier Meneses

M.Sc. In the Faculty of Technology from The University of Manchester Institute of Science and Technology (UMIST), Manchester, U.K., IEEE Senior Member, Researcher and Project Manager with the Department of Control, Electronics and Communications.

Contact details

Nora Perez
International Relations Coordinator
nrperez@iie.org.mx

Carlos F. Garcia
Researcher and Project Leader of
Radio and telecommunications
cfgarcia@iie.org.mx

Link: www.iie.org.mx

The Challenge

- Sensing physical properties of the electric power transmission lines and towers e.g. structural damage, foundation aging, insulator contamination, leakage current, vibration, phase conductor broken strands and corrosion.
- Assessment of a Wireless Sensor Network (WSN) interfaced to a SCADA system as input of condition monitoring.
- Assessment of energy harvesting resources to power sensors.

The Opportunity

- To develop a custom Wireless Sensor Network (WSN)
- To develop a custom interface to a SCADA system to assess the condition of transmission towers and phase conductors.
- To study the feasibility to implement a WSN for the power grid.

Project Idea

- Phase 1: State-of-the-art research on sustainable Wireless Sensor Networks (WSN) for each physical property with a solution outline.
- Phase 2: Implementation of a minimal pilot system.
- Conclusion and recommendations

What partners do you need?

- R&D Centres and Universities involved in Smart Grid.
- Electric power utilities.
- Business organizations interested in establishing a bilateral partnership and collaborative research with a market need to implement a WSN in UK's National Grid infrastructure.

Liverpool John Moores University

Logistics, Offshore and Marine Research Institute (LOOM)

- About your organisation
  - The Institute has a strong reputation for its work in risk assessment of large maritime systems.
  - Focuses on two main research areas, one being risk-based design and operation of large maritime engineering systems, and the other simulation and optimisation of logistics supply chains.
  - Has attracted external funding of more than £4m from the EPSRC, EU, HSE, industry, etc.
  - More importantly, we have a strong connection to industry, including a formal partnership agreement with Mersey Maritime, the business cluster organisation which represents over 1700 businesses in the maritime and energy sector in the region.

- About the team:
  - Dr Eduardo Blanco-Davis, senior lecturer and a Mexican national.
  - Prof Ian Jenkinson, Head of the Department of Maritime and Mechanical Eng.
  - Prof Jin Wang, Director of Logistics, Offshore and Marine Research Institute

- Contact details:
  - E.E.BlancoDavis@ljmu.ac.uk

Newton Fund

MÉXICO GOBIERNO DE LA REPÚBLICA | CONACYT Consejo Nacional de Ciencia y Tecnología | Innovate UK

The Challenge

- Emission reduction and monitoring
- Offshore renewable energy technology deployment
- Safe, secure, resilient and efficient operations of large maritime systems under uncertainties.

The Opportunity

- Modelling , simulation and optimisation for vessels, port terminal operations, accident investigation, and offshore installations. Additionally, modelling/management software applications for shipyard systems.
- Simulator and risk assessment based training in high risk sectors.
- Application of vehicle emissions reduction technologies to the maritime transport sector.

Project Idea

- Implementation of emissions technology in the offshore/petroleum and shipyard industry.
- Implementation of the vehicle emission technology in the Mexican market.
- Performance improvement in operations of marine systems such as ships, offshore installations, port terminal and maritime logistics chains.

What partners do you need?

- Mexican Universities
- Mexican Business
- For additional proposals, UK businesses.

Mexican Petroleum Institute

IMP competencies:

1. **Bioethanol:** IMP is leading a consortia (IPN, INIFAP, enterprises) to develop versatile and adaptable processes to several biomass feedstock (agave bagasse, cane sugar bagasse, spent malt grain, corn stover, wheat straw, forestry residues, grasses) to produce bioethanol. IMP has developed:
   - Biomass fractionation to sugars and lignin at moderate reaction conditions
   - Low formation of fermentation inhibitors
   - High conversion of carbohydrates to sugars (80-100%) and lignin fractionation

2. **Biojet fuel:** We're developping a process of conversion of inedible vegetable oils using IMP catalyst . IMP design a process scheme for the biofuel production.

3. **Biodiesel:** To develop a heterogeneous catalyst, acid/basic, highly active to produce biodiesel by chemical transformation of fatty acids present in vegetable oils and or animal fat into their corresponding alkyl esters in a continuous flow plant.

4. **Biosurfactants:** IMP has been developing a technology for pipelining of extra heavy crude oils through inverse emulsions and bioproducts. IMP developed a pipelining technology comprising:
   - Handling and pipeling extra heavy crude oil with a viscosity higher than 30,000 cP
   - Preparing inverse emulsion, i.e. oil in water emulsion.
   - Viscosity and pressure drops during pipeling equivalent to dilution or heating technologies for pipelining
   - Tuning of emulsion stability for operation versatility
   - Biodegradable surfactants and demulsifiers
   - Crude oil dehydration for further refining

5. **Bioproducts:** To obtain value-added bioproducts from carbohydrates, lipids and lignin.

About you/your team:

I am the Manager of Biomass Conversion Department. In our department we are 12 scientific researchers.

Contact details:

Jorge Aburto Anell, jaburto@imp.mx, +5255-91758247, +5255-91757017

The Challenge

- **Bioethanol:** Demonstrate the technical and economic feasibility of the bioethanol production in Mexico
- **Bioturbosine:** Develop a water-resistant catalyst to be used during isomerization step.
- **Biodiesel:** Scale up biodiesel production
- **Biosurfactants:** Scale up biosurfactant & biodemulsifiers production.
- **Bioproducts:** Technical and economical studies to identify promising technological routes to certain bioproducts.

The Opportunity

- To use the IMP knowledge about technological roadmaps for biomass feedstock fractionation into sugars and lignin to study the feasibility.
- To have a technology for transporting heavy and extra heavy crude oil under Mexican conditions.
- Bioprocess scale up.

Project Idea

- Biofuels and bioproducts scale up.
- Waste and Biomass Valorization in Mexico to produce biofuels/bioproducts.
- Studies of technical and economic feasibility for biofules production in Mexico using waste.
- Biofuels life-cycle assessment.
- Baseline scenarios for biofuels introduction in Mexico.

What partners do you need?

- A partner with enough infrastructure for bioprocess scale up
- A partner with experience to analyse and integrate different scenarios, based on our knowledge of Mexico feedstock
- An enthusiastic partner who is willing to work with us!

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MÉXICO CONACYT Innovate UK

Mexican Technology Platform

Energy-Mex TWG from the MTP

Energy-Mex

We are a meeting point between companies and national academics seeking to develop and promote scientific and technical progress in the energy sector.

Currently part of the strategic agenda includes research in **biogas, energy efficient and nanotechnology to improve solar cells**.

At present there are 13 active members from different academics institutions and industries, that conform the group.

Contact details:

- Group leader: J. Fausto del Castillo **fausto@gscomp.com.mx**
- Technical contact: Belinda Murillo **belinda.murillo@gscomp.com.mx**
- Project Manager: Efren Salmeron **efren.salmeron@gscomp.com.mx**

KTN the Knowledge Transfer Network

The Challenge

- Reduce industrial waste to obtain Biogas
- Energy efficiency for low-income communities.
- Using organic materials to reduce cost and improve solar cells
- Advanced materials to reduce energy waste.
- Advanced materials to improve solar cells/ batteries

The Opportunity

- Increasing the use of raw materials from the country we could increase the industry.
- Also using the industrial waste to generate biogas or advanced materials we reduce cost for the industry.

Project Idea

- Biogas from industrial waste: building the necessary infrastructure to take advantage of industrial waste.
- Energy efficiency for low-income communities: desing of flat plate heater that will be economical and durable
- Advanced materials to improve mechanical properties and reduce weight of common materials/Advanced materials to promote energy efficiency : composites with diversal nanoparticles to improve this propierties
- solar cells with organic materials: using organic raw materials

What partners do you need?

- Polymer and chemistry industry.
- Demonstration plants for validation and certification processes for the production of biogas.
- Producers of plastic parts.
- Electronic producers

AGRI-TECH

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Centre for Agroecology, Water and Resilience

- About your organisation

  University Research Centre with expertise in resilient and sustainable agriculture across all sectors, including policy and social science

- About you/your team

  Dr Sara Burbi - Veterinarian with experience in monitoring & evaluation of farm sustainability, farmer engagement on socio-economic issues related to sustainable livelihoods, and farmers' attitudes to climate change with potential impact on the uptake of innovation in farming practices

- Contact details

  Dr Sara Burbi, DVM MSc PhD MRCVS

  Research Fellow, Agroecological Livestock Systems

  T.: +44 (0)2477 651632 or M.: +44 (0)7557 425487

  E-mail: sara.burbi@coventry.ac.uk

The Challenge

- Improve sustainability of agroecological SMEs (AE-SMEs)
- Maintain / increase productivity
- Integrate environmental assessment with socio-economic assessment of AE-SMEs

The Opportunity

- Scientifically evaluate agroecological farming practices
- Establish holistic sustainability standards for AE-SMEs
- Integrate Social, Economic and Environmental sustainability assessment

Project Idea

- Scientific assessment of SMEs: analysis of soil, water, forage, produce (fresh, milk, meat, eggs and so on) to evaluate environmental impact
- Assessment of farm management practices (environmental-economic)
- Assessment of socio-economic interactions and factors influencing farmers' attitudes to innovation

What partners do you need?

- AE-SMEs in the UK (e.g. Pasture-Fed Livestock Association PFLA)
- AE-SMEs in Mexico
- Local laboratories or Higher Education facilities to provide analytical services
- Local farmers groups, cooperatives, farmers networks (e.g. for workshops & knowledge exchange activities)

INSTITUTO NACIONAL DE INVESTIGACIONES FORESTALES AGRICOLAS Y PECUARIAS

- INIFAP is a public institute which has the mandate to generate scientific and technological innovations in agriculture and forestry, as a response to demands and needs in the agro-industrial chains and in the several types of producers in order to contribute to sustainable development by improving competitiveness, and to maintain the natural resource with a co-work between other institutions, public and private organizations associated to the Mexican producers.

- The team is composed by researchers specialist in agronomy, plant breeding, nutrition, plant physiology and economy.

- Contact details: Dr. Jorge Miguel Paulino Vázquez Alvarado. Campo Experimental Zacatepec Km. 0.5 Carr. Zacatepec-Galeana, Zacatepec, Mor. C.P. 62780 Tel. +52 553 871 8700, Ext. 86614 E-mail: vazquez.Jorge@inifap.gob.mx

- Christopher J. Atkinson, Prof. Medway Campus, Central Avenue, Chatham Maritime, Kent, ME4 4TB, UK; Tel: +44 (0) 1634 883634 E-mail: c.j.atkinson@gre.ac.uk

The Challenge

- Toxicity level about jatropha.
- Establishing certified production systems, both, field and industry level.
- Identification of markets/economics

The Opportunity

- Economic & social benefit to low income farmers on marginal land.
- Production processing markets, beyond oil (protein consumption).
- Animal feeds stuff supplement.

Project Idea

- Develop a genotype non-toxic jatropha.
- Develop certified production systems, both, field and industry level.
- Develop oil jatropha derivatives.
- Develop jatropha pasta uses.
- Technology transfer and capacity building

What partners do you need?

- Researchers in : Biochemistry, chemical & molecular analyses linked certification food chain, Dietary and nutritional analyses, Processing marketing knowledge/ innovation.
- Pharmaceutical, animal feed or food processing companies:

Tecnológico de Monterrey

- About your organisation

  In the area of agri-tech, we have a strong knowledge of biocatalyst production, strong team of multidisciplinary researchers and companies, consortium of Scientific experts, state of the art large scale facilities, dynamic and flexible team, consulting experience, international work experience, +17 articles and 11 patents.

- About you/your team

  The Environmental Bioprocesses group is conformed by two post-doc, 4 PhD students, 3 MSc collaborators, 8 Master students, 4 research assistants and 15 undergraduate students. We focus our research in: Wastes revalorization, enzymatic processes, microalgae biotechnology, bioreactors engineering, and food and high value compounds.

- Contact details

Dr. Roberto Parra-Saldívar
Tecnológico de Monterrey, Campus Monterrey
CEDES 405-I
+52 (81) 83582000 ext. 5561
r.parra@itesm.mx

The Challenge

- Food security
- Natural products
- Green chemicals
- Non-petroleum fuels
- Low productivity cell cultures

The Opportunity

- Natural fatty acids $13 billion USD
- Prebiotic ingredients, supplements $23.1 billion USD
- This market is expected to grow to nearly $36.7 billion USD

Project Idea

- Prebiotics
- Agroindustrial waste
- Enzymatic production and purification
- Bio-fuels

What partners do you need?

- Agricultural Companies
- Enzymatic Companies
- Food and additives companies

Newton Fund

MÉXICO GOBIERNO DE LA REPÚBLICA

CONACYT Consejo Nacional de Ciencia y Tecnología

Innovate UK

StelaGenomics

- **About StelaGenomics:**

- Small company specialized in **agri-tech research** and development. Operations in Mexico and the USA.
- Developed "A novel fertilizer and **weed control system** for **plants** and **algae**". Technology validation in: tobacco, maize, soybean and cotton.
- Experimental labo and greenhouse facilities.
- Worldwide IP Portfolio.

- **Our Scientific Board** Chairman is Dr. Luis Herrera-Estrella, a world recognized authority in biotechnology. **Scientific, technology and business teams** focused in translation of scientific breakthroughs into viable commercial solutions.

- **Contact us:**

Luis Hernández (Business Manager): lhernandez@stelagenomics.mx

Adriana Cantorán (Project Manager): acantoran@stelagenomics.mx

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The Global Food Challenge

- By 2050, we will need to feed more than 10 billion people, requiring a 70 % increase in global food production.

Agriculture major challenges

- Depletion of world phosphorus reserves.
- Excessive and inefficient use of phosphorus fertilizers.
- Emergence of weed resistance to herbicides.

The Opportunity

- Implementation of an effective dual fertilization and weed control system: "Phosphite Replacement System"

Phosphate-based Fertilizer	Phosphite-based Fertilizer
Form insoluble compounds on the soil	Phosphites are highly stable on the soil
A large number of bacteria metabolize phosphate	Only 15 bacteria are known to metabolize phosphite
Weeds compete for P and other resources (Ni, H2O, etc.)	Weeds will not compete with transgenic plants
Excess application may lead to environmental P pollution	Less P application is required
Application of herbicides is required	Less or no additional herbicides are required
High production costs	Less than half of the amount of P fertilizer – no herbicide

Consolidated Market UK+Mex (Wheat +Barley)

•Potential Market $6.5 US Bill/ Year.

•12% Estimated Production Savings.

•+ Environmental Benefits.

Project Idea

- **Development of commercial varieties of genetically modified (GM) wheat and barley crops** that effectively metabolize phosphite (Phi) as a sole source of phosphorous.
- Full development of commercial varieties of GM wheat and barley is expected to take 6 years.
- Scope and deliverables for grant application will consider only the milestones that can be accomplished in 24 months. Further collaboration beyond Innovate UK-MX funding is essential.

Partners of interest

- Company involved in wheat and barley seed market with:
  - Premium wheat and barley germplasm.
  - Expertise in regulatory issues
- Research Institute with:
  - Capabilities in wheat and barley transformation.

HEALTH

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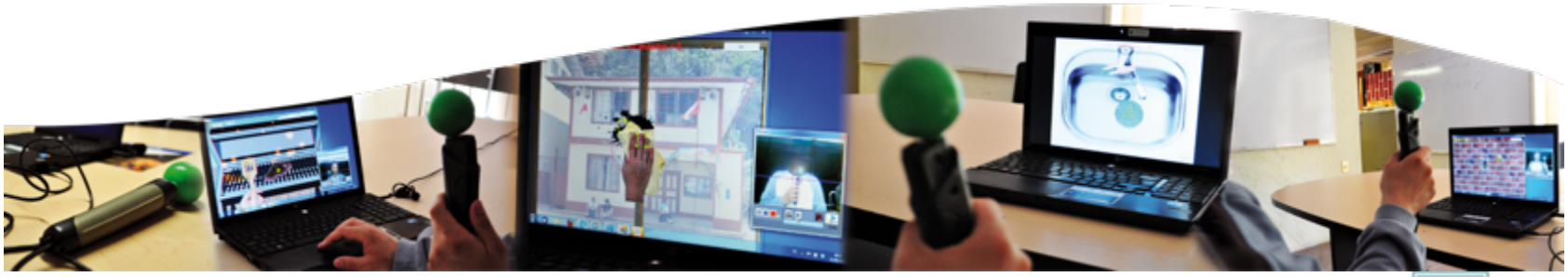
INAOE / ProbaYes

- The National Institute of Astrophysics, Optics and Electronics (INAOE) is a research center that does research and development in several areas. It has several grupos working on health applications. ProbaYes is a technological company that specializes in software development. Together we have developed “Gesture Therapy”.
- Our team includes researchers, engineers and medical doctors that have been developing for the las 8 years a technology for virtual rehabilitation that we call “Gesture Therapy”
- Contact details: L. Enrique Sucar, esucar@inaoep.mx, enrique.sucar@probayes.com +52 1 222 239 14 70, +52 222 225 10 24



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The Challenge

- A number of health problems result in motor disability: stroke, palsy, dystonia or trauma. Stroke alone affects 800,000 annually in the US
- Many patients affected by those disorders can recover their motility with rehabilitation therapy
- Current rehabilitation practice is guided by a therapist, and it takes months / years for recovery
- Most persons do not achieve the full potential of the therapy because of the high cost or the loss of motivation

The Opportunity

- There is a need for low-cost rehabilitation alternatives that can be used at home and in small clinics, without the need of an always present therapist.
- The current world market for rehabilitation systems is in the order of $1,000 million dollars with an anual growth of 34%.

Project Idea

- Gesture Therapy is a virtual rehabilitation technology to support motor training of the upper limbs.
- It can be used at home or in the clinic without the need of a therapist.
- It helps the patients recover motor dexterity in both, arm and hand, using a safe and motivating environment.
- It has been clinically validated in 3 controlled clinical trails.

What partners do you need?

- Technology company specializing in medical equipment.
- Academic/research partner in the UK
- Rehabilitation clinic in the UK.

VARIOUS SECTORS

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Tecrea Ltd

- About your organisation
  - Competencies: Nanomedicine, drug delivery, microbiology
  - Area: HEALTH (both human and animal)

- About you/your team

  Tecrea Ltd, is a platform nanomedicine company. We are a team of scientists with experience in nanotechnology, microbiology, drug development. Our technology improves cell and tissue delivery of drugs, with applications in human and animal health and bioprocessing.

- Contact details

Liam Good, Director, **Tecrea Ltd**
London Bioscience Innovation Centre, 2 Royal College Street, NW1 0NH, London, UK
office:+44(0)20 7468 5272; mobile: +44(0)75 2705 0673; liam.good@tecrea.co.uk; www.tecrea.co.uk

The Challenge

- Cell and tissue delivery of reagents and drugs

The Opportunity

- Human Health
- Animal Health
- Bioprocessing

Project Idea

- Reformulate API to improve drug efficacy.
  - Improve cell delivery
  - Improve tissue delivery
  - Control release
  - Target delivery to disease site
  - Disease areas: infection, inflammation, skin diseases

What partners do you need?

- Biopharma and Pharma companies seeking to formulate or reformulate drugs to improve health applications.

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MÉXICO GOBIERNO DE LA REPÚBLICA

CONACYT Consejo Nacional de Ciencia y Tecnología

Innovate UK

- About your organisation
  - Ingenza is a synthetic biology/industrial biotechnology R&D company with a broad customer base across the chemicals, pharmaceuticals, food/feed and fuel industries. Our customers include (i) chemical companies, looking to source capabilities in microbial/molecular biology and bioprocess development for the production of biobased chemicals and biofuels, (ii) therapeutics companies looking to outsource the application of synthetic biology for natural product pathway and/or protein engineering/optimization and (ii) other SMEs/academics looking to transition early stage research through POC and on to spinout/startup in human therapeutics.
- About you/your team
  - We have teams of scientists working across molecular biology, microbiology/fermentation and organic chemistry. We have expertise in microbial strain construction, protein expression and enzyme evolution. We do microbial fermentation (5L) and mammalian cell culture (2L) all the way to large scale (>2M L). We have capabilities in bioprocess development, DSP, chemical synthesis as well as developing proprietary synthetic biology tools and other enabling technologies.
- Contact details
  - David McElroy, Ph.D. Chief Business Officer. david@ingenza.com

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The Challenge

- Bullet 1
- Bullet 2
- Bullet 3

The Opportunity

- Bullet 1
- Bullet 2
- Bullet 3

Project Idea

- Natural product pathway engineering in microbes for crop pest control / yield protection applications.
- Microbial engineering for enhancement of animal nutrition and feed utilization.
- Microbial engineering for the expression of enzymes used in animal feed, cellulosic conversion and other industrial applications

What partners do you need?

- Market-facing distributors/seller of agri-tech products/solutions
- Developers/producers of agri-tech/enzyme-based products/solutions

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Thank you

gabriela.juarezmartinez@ktn-uk.org

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