Future Career

TeeGene Biotech Ltd.

Dr Pattanathu Rahman

Be the change you wish to see in the world.

- Mahatma Gandhi
Biosurfactant Bacteria - Teesside

Culture Collection = 122 bacterial strains from Northeast England

Properties:
- Non-toxic, Non-hazardous
- Thermostable
- Low surface tension
- Emulsify: wide range of hydrocarbons - Stable emulsion

RESEARCH TO SPINOUT

- Microbial diversity in oil spilled samples
- Initially started for oil degradation study
- Foaming in the flasks triggered the idea to characterise the biochemical
- Discovered biosurfactants
- BfB KTN Funding – novel bacteria/biosurf
- Lead to the creation of TeeGene

Highly-effective biotechnology based surface-active multi-functional products
Scale up of Bioprocess

- BBNWE – BBEPP
- INTERREG IVB programme of the European Union
- TeeGene received innovation voucher and conducted feasibility studies and scale-up trials at the Bio Base Europe Pilot Plant in Ghent, Belgium.
Biosurfactant Manufacturing Cost

Low (£10^3)

Medium (£10^5)

High (£10^7)

Product Cost

Low

Medium

High

Market Requirements

Tonnes

Milligrams

Detergents

Health Care

Industrial Cleaning

Oil Fields

Fracking

Construction

Mine & Minerals

Detergents

Leather

Food

Paints & Coatings

Textiles

Crop Protection

Paper & Pulp

Health Care

Anti-ageing

Cosmetics

Personal Care

Anti-microbials

Bio-therapeutics

Drug Delivery
In this project, we will build a genome-scale multi-omic model of Pseudomonas for multi-level maximisation of growth rate and biosurfactant production through the cell membrane.

Biosurfactant mediated nanomaterial synthesis by plants and enhancement of precious metal recovery from contaminated sources.

After the phase of optimisation, plants trials will be conducted using industrial effluents high in precious metals and on road verges.
ALGAL BIOREFINERY

- waste water P, C, N
- Microalgae
- HTC
  - algal HTC char
  - P in HTC liquor
- HTC char
- TAG
- Biodiesel, nutraceuticals, etc.
- Biochar

Collaboration with New Zealand

- UK/NZ workshop on Industrial Biotechnology and Bio-Engineering
- UCL, University of Sheffield, Teesside University
- BBSRC International workshop in Aug 2017
- (CBMNet/Phyconet/British High Commission)
COLLABORATIVE LINKS

- **2017:** Innovate UK delegation to India to tackle waste water issues
- **2016:** British High Commission delegation to New Zealand for Agri Biotech R&D
- **2011:** International delegation: Participation of UK Prime Minister initiative sponsored CPD project on New Biofuel Technologies, Thailand
- **2010:** President of NEEDIL (Northeast England and Tamilnadu Network)
Research

• DEFRA – Biorecycling (2005-2008)
• EU-Life-3 BIOREGEN (2007-2011)
• RS/DST biofuel conference (India) - 2015
• Prime Minister’s Initiative – British Council – UK/Thai Biofuels CPD Course

Enterprise

• Enterprise project of the Year -2016
• IChemE –Best Start-up award - Runner-up
• British High Commission R&D delegation to NZ
OPPORTUNITIES FOR EARLY CAREER RESEARCHERS

• BBSRC – HVCfP – BIV: UG/PG Life Science students worked – studentships

• BBSRC – CBMNet – BIV: P/T Postdoc worked for 6 months

• BBSRC – CBMNet – POC : F/T Postdoc worked for 6 months

• BBSRC – MinB Network BIV: Graduate studentship for 6 months

• Future opportunities will be advertised through CBMNet email circulation list
Thanks

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And

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