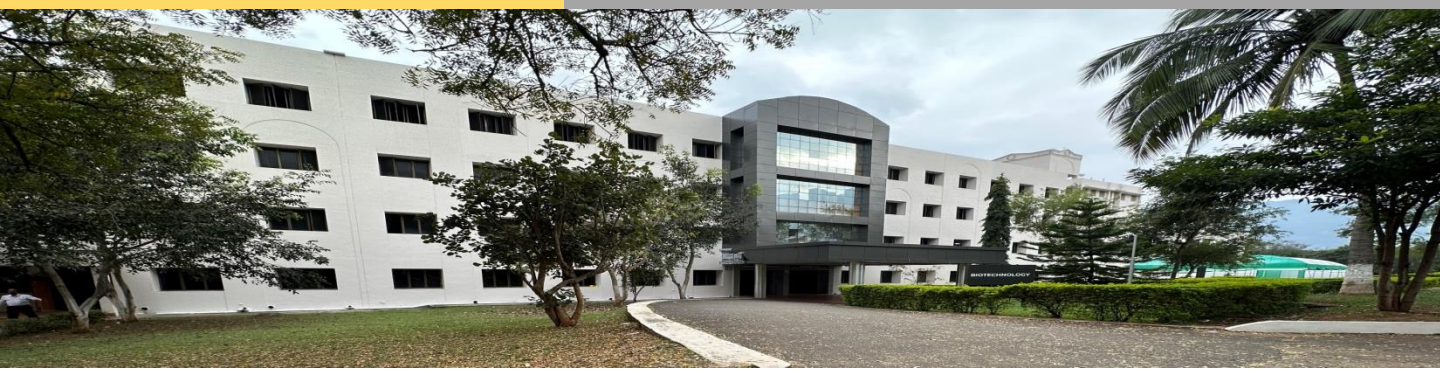
JAN 2023 ISSUE 9

BIOLUMIERE

Newsletter by the Department of Biotechnology



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Recent Trends

PANCREATIC GLUCOMETER

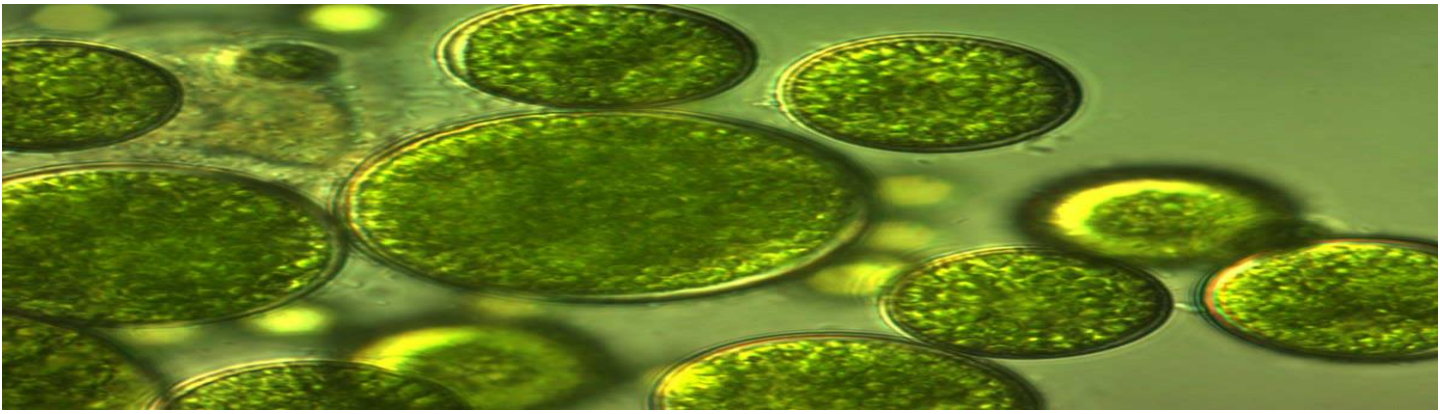
In type-1 diabetic (TID) patients, impaired pancreatic β-cells lead to insulin deficiency and build up of blood glucose. A possible solution is being developed by Seraxis: an implantable device composed of lab-grown pancreatic cells that directly respond to a patient's blood glucose. The device contains islet cells manufactured from induced pluripotent stem cells (iPSCs) and is intended to eliminate drug treatments for these patients **...[REEMA D (URK19BT1023)]**

NT CELL THERAPY

Living Cell Technologies developed a NTCell therapy which consists of an alginate-coated capsule containing neonatal choroid plexus cells that is implanted into the brains of Parkinson's patients. Choroid plexus cells supply cerebrospinal fluid, mitogens, and other factors that support neuronal growth and function. These neonatal porcine choroid plexus cells secrete cerebrospinal fluid and provide a range of factors that support nerve cell function and protective enzymes. After NTCell is implanted into a damaged site within a patient's brain, NTCell acts as "a neurochemical factory" that produces CSF and secretes multiple nerve growth factors to promote growth and repair disease-induced nerve degeneration **…[KATHARIN ANNA ROSE (UR19BT1035)]**

CRISPR-EDITED MICROALGAE

Synthetic genomics and Exxon Mobile, is developing CRISPR-edited microalgae with enhanced lipid output, which would improve oil manufacturing by potentially reducing CO_2 emissions and reliance on fossil fuels . Researchers have doubled lipid content in a genetically engineered strain of *Nannochloropsis gaditana*. It has been increased from about 20 percent in the natural form of this edible ocean algae to 40-55 percent in the engineered strain. The genetically engineered strain inhibits a suppressor of lipid production. Using various tools, the team identified certain genes that were inhibited in this low-nitrogen environment, then they set out to identify those that regulated lipid production. Using this knowledge, they employed the popular CRISPR-Cas9 genome editing system to inhibit that gene **…[SANJAY PRAVIN V R (URK19BT1038)]**



APTAMER BIOSENSORS

These are small, synthetically derived biosensors. These are single stranded oligonucleotides which binds to their cognate target with high affinity and selectivity. It is developed by invitro selection process, Systematic Evolution of ligand by Exponential Enrichment (SELEX). One of the medical application is Aptodetect lung, which is a invitro diagnostic kit with 7 multivariate biomarkers. AptoDetectTM -Lung provides risk information (low or high-risk group) by using its algorithm and quantification of total 7 proteins – 4 types of cancer growth-related proteins (EGFR1, MMP7, CA6, and KIT) and 3 types of immune-related proteins (CRP, C9, and SERPINA 3). It provides the test result from algorithm analysis. It is a high professional accurate diagnostic test, highly safe and cost effective **…[DHARSHINI S (URK19BT1028)]**

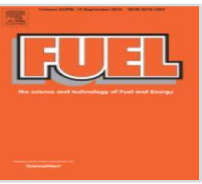
PUBLICATIONS IN HIGH QUALITY JOURNALS

BIORESOURCE TECHNOLOGY
IF: 11.889, *Elsevier, 2022*

Dr. Dibyajyoti Haldar & Team

TITLE: One pot bioprocessing in lignocellulosic biorefinery: A review.

The main goal for lignocellulosic refinery is to get high yield of low cost value added products converted from biomass. The limitation in terms of industrial context is usage of multiple bioreactors in order to get bioproducts converted from biomass. The advancements in one-pot reaction systems is critically reviewed from the present manuscript which mainly focuses on value added products production from lignocellulosic biomass.

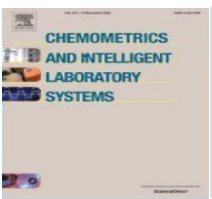


FUEL
IF: 8.035, *Elsevier, 2022*

Dr. Jibu Thomas & Team

TITLE: Advanced technologies on the sustainable approaches for conversion of organic waste to valuable bioproducts: Emerging circular bioeconomy perspective.

This review deals with the conversion of multiple biofuels such as liquid, solid, gaseous, and bioelectricity from organic waste resources transforming the organic waste to value-added bioproducts.



CHEMOMETRICS AND INTELLIGENT LABORATORY SYSTEM
IF: 4.175, *Elsevier, 2022*

Dr. Biswanath Mahanty & Team

TITLE: Multiple bioanalytical method based residual biomass prediction in microbial culture using multivariate regression and artificial neural network.

In this article, four independent analytical methods i.e., OD measurement at 540 nm and 600 nm, tetrazolium reduction assay, and intracellular protein estimation were adopted to model residual biomass growth in *Cupriavidus necator*.

ENVIRONMENTAL RESEARCH
IF: 8.431, *Elsevier, 2022*

Dr. S. Murugan & Team

TITLE: Laccase producing bacteria influenced the high decolorization of textile azo dyes with advanced study.

In this study, laccases were produced from *Bacillus cereus* (*B. Cereus*) and *Pseudomonas parafulva* (*P. parafulva*). The free and immobilized laccases performed the decolorization of three azo dyes T-blue, yellow GR and orange 3R.

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