MANIPAL UNIVERSITY JAIPUR

International Winter School-Manipal University Jaipur [IWSMUJ]-2023

[Hybrid Mode]

Course/Project Overview

Name of Project- Assessing the production of Carotenoids and Chlorophyll in photosynthetic microorganism under different cultural conditions.

Name of instructor: Dr. Monika Sogani (Department of Biosciences) and Dr. Anees Ahmed Yunus Khan (Department of Chemical Engineering)
Session: Jan.-Feb. 2023
Language of instruction: English
Number of practical hours: 72 hrs
Credit awarded: 03

Objective of Course/Project

1. To grow selected photosynthetic microorganism under suitable media.
2. To grow the microorganism under various cultural conditions like nutrient limitation and salinity stress.
3. To assess microbial growth and pigment production under different cultural conditions using a spectrophotometer.
4. To report pigments found in selected microbes using adavanced chromatography method.

Syllabus:

Media preparation, Biomass growth, Dry weight of cells and biomass concentration, cholrophyll and bacteriochlorophyll formation and estimation, Optimization of culture conditions, Working on a bioreactor, Techniques: UV-vis spectrophotometry, microscopy – Scanning electron microscopy, Fluorescence microscopy and chromatography like Gas chromatography.

Organization of Course

Project Plan		
Total practical hrs- 72 hrs		
Weeks	**Hrs**	**Objective**
1st week:	20 hrs (lab)	To grow selected photosynthetic microbes under suitable media. (project)
2nd week:	20 hrs (lab)	To grow microbes under various cultural conditions like light intensity, nutrient limitation and salinity stress.
3rd week:	20 hrs (classes)	To assess microbial growth and pigment production under different cultural conditions using a spectrophotometer. To report pigments found in selected microbes using adavanced chromatography method (Mid term exam-2hrs)
4th week:	12hrs (classes)	To report pigments found in selected microbes using advanced chromatography method (End term exam-2hrs)

Mode of lectures: Hands-on in Lab, Experiments, Mid term and End term Evaluations

Brief profile of the instructor:

Dr. Monika Sogani has been Senior Associate Professor in the Department of Biosciences, Manipal University Jaipur, since February 2021, prior to which she was associated with the Department of Civil Engineering, Manipal University Jaipur, as Associate Professor in Environmental Sciences and Engineering since 2015. She received her doctoral degree in Environmental Biotechnology and has also completed her postdoc research in Environmental Engineering at the Department of Chemical Engineering and Biotechnology, University of Cambridge, UK, on a prestigious research fellowship under the Schlumberger Foundation's Faculty for the Future program (2017–2019). She has about 18 years of teaching and research experience while working with different institutes of engineering, sciences and technology. Her research interest is the wastewater treatment and bio-energy sector including bioremediation of environmental pollutants and resource recovery. She has received various externally funded research grants and travel grants from many national and international agencies including Department of Science & Technology, Government of India (DST India), SERB India, All India Council for Technical Education (AICTE) India, Council of Scientific & Industrial Research (CSIR) India, Asian Development Bank Institute (ADBI) Tokyo, Schlumberger Foundation Netherlands, Society of Environmental Toxicology and Chemistry (SETAC) Europe, IHE Delft Institute for Water Education (UNESCO IHE Delft), German Academic Exchange Service (DAAD), etc. Dr Sogani has published more than 35 research papers/book chapters in high rated international peer reviewed journals and reputed books that include Bioresource Technology, Journal of Hazardous Materials, and Science of the Total Environment etc. and have presented her research work at more than 30+ International Conferences in Countries like India, USA, UK, Singapore, Italy, Switzerland, Germany and is also a recipient of few prestigious awards/fellowships in recognition of her research work so far.

Dr. Anees Y. Khan is working as associate professor and head of the department of Chemical Engineering at Manipal University Jaipur (MUJ). He did is masters in chemical engineering from Birla Institute of Technology and Science (BITS) Pilani (India) and PhD from Indian Institute of Technology (IIT) Bombay (India). He focused on mesoporous silica for applications in biosensing, and catalysis during his PhD. Post PhD, he worked at National Chemical Laboratory Pune (India) as Research Associate on monolithic materials. He has established Porous Materials Laboratory at MUJ where he is focusing on making a wide range of porous materials for water treatment and healthcare applications.

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