

Dr. Muhammad Rizwan Tabassum

PhD/Post-PhD in Energy Engineering, Incharge Punjab Bioenergy Institute (PBI), Consultant Pak Suzuki Motors, Assistant Professor, Principal Investigator-PSP, Project Reviewer on Renewable Energy, Pakistan Science Foundation, Head of Bioenergy Laboratory for Renewable Gas Production (LRGP), Incharge Microbiology and Hi-Tech Lab., University of Agriculture, Faisalabad, Pakistan.

Fellow of International Energy Agency, Task 37 (IEA), Fellow of Marine and Renewable Energy Ireland (MaREI), Fellow of Science Foundation Ireland (SFI), Environmental Research Institute (ERI), University College Cork (UCC), Lee Road, Cork, Ireland.

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Biography

Dr. Muhammad Rizwan Tabassum has a **PhD in Energy Engineering**: Biomethane Production from Macroalgae from University College Cork, Ireland (2013-2016). He has the vast experience in the field of bioenergy (from field to fuel; such as biomass choice, pre-treatment, storage, biofuel production and downstream processing) and published 22 papers (Total Impact Factor = 170) on the topics of biomass pre-treatment, anaerobic digestion (batch and continuous digestion systems), advanced biofuel production systems and enzyme applications. His work has been cited over 900 times in the peer-reviewed press with an H factor of 13. He has been involved in many national and international research projects and has completed many projects. He has supervised 35 postgraduate students and taught many courses related to the field. He has more than 15 years of experience in teaching, research, and project management related to biofuel production. Patent registration for the state-of-the-art design of a bioreactor for waste-to-energy conversion is in process, as fabricated by PCSIR Lahore. Muhammad's key area of interest is gas and liquid transport fuel production from 2G and 3G feedstock.

He is among the top 3% scientists and 9th in University College Cork as ranked by AD Scientific (Index ID: 1792582) in the field of Marine Science and Engineering.

Scientific/Administrative Achievements

- Component Leader of a Joint Project of UAF and PAKSUZUKI Motors for Bio-CNG production for transport fuel worth 272.425 Million PKR
- Preparation and submission of PC-IV of Punjab Bioenergy Institute (PBI)
- National/International Collaborations
- Designed and Developed Lab-scale Bioreactors (Batch and Continuous Reactors) at UAF (Patent Filed)
- Process development for gaseous fuel production from Macroalgae under EU 2020 directive for renewable energy targets (Under TASK-37, International Energy Agency)
- Process development and improvement for ethanol production ISP, Uppsala, Sweden
- Cloned and expressed cellulase gene in *Pichia pastoris*, Pakistan
- A 50% chemical saving by using enzyme technology in Packages Ltd. Lahore, Pakistan (2005)
- Fully funded PhD Scholarship Award from Science Foundation, Ireland (2013 to 2016)
- Research Productivity Incentive from GC University, Faisalabad (2013)
- ERASMUS scholarship for Project on Bioenergy 2011-12 (Sweden-Denmark)

- Governor's Scholarship in M. Sc. Biotechnology
- 1st position in B.Sc. (Roll of Honor)

Education

- **PhD/Post-PhD in Energy Engineering**
University College, Cork (UCC), 2013-2016, **Ireland.**
- **Master of Science in Biology/Biotechnology**
Swedish University of Agricultural Sciences, 2010-2012, **Sweden,**
- **Master of Science in Biotechnology**
Institute of Biochemistry and Biotechnology, University of the Punjab, 2002-2004, **Pakistan**
- **Bachelor of Science (Zoology, Botany and Chemistry)**
The Islamia University, Bahawalpur (IUB) 2000-2002, **Pakistan**

Employment/Experience

- **Incharge Punjab Bioenergy Institute (PBI)** April 2022 to Present
- **Assistant Professor**, Head of Bioenergy/Biogas Production and Management Laboratory and Microbiology at Punjab Bioenergy Institute (PBI), University of Agriculture, Faisalabad August 26, 2017 to August 25, 2018 (HEC-IPFP fellow) and on visiting contract till April 2022
- **Research Scholar, Centre for Marine and Renewable Energy, Ireland (MaREI), Science Foundation Ireland**
2013-2016
- **Lecturer, Department of Bioinformatics and Biotechnology, Govt. College University, Faisalabad, Pakistan**
October 2012 – June 2013
- **Research Officer, National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan**
February 2008 – August 2010
- **Lecturer, Department of Biology, Govt. Postgraduate College Haroon Abad, Pakistan**
January 2006 – December 2007
- **Researcher, Packages Ltd. Paper mills, Lahore, Pakistan**
November 2004 – August 2005

Summary of Research Projects (UAF-Pakistan)

Title of the Projects (Worth 6.9 Million PKR)	Sponsor & Amount	Status
“Process development for Mono- and co-digestion systems for Biomethane Production from bio-waste” as PI (2018-2019)	HEC-Start-up grant (0.5 Million PKR) Million PKR	Completed
“Public awareness campaign for recycling home garbage employing waste to energy concept “as PI (2018-19)	HEC-SIOP (1.0 Million PKR)	Completed

“Development of an efficient anaerobic digestion process for enrichment of CH ₄ by overcoming electron transfer limitations”	HEC-NRPU (5.4 Million PKR)	Completed
Establishment of Punjab Bio Energy Institute (PBI) at the University of Agriculture, Faisalabad. (Through ADP)	Govt. of the Punjab, ADP (PKR 756.572 Million)	Ongoing
Biogas Plant Design, Construction, Operation, Maintenance, and Application of Biogas as a Vehicle Fuel and Organic Fertilizer Under Pak Suzuki Biogas Program (PSBP)	PAK-SUZUKI Motors (PKR 272.425 Million)	Ongoing
Commercialization of Biogas as an Alternate Energy and a by-product, Bioslurry as Green Fertilizer for Rural Community	Endowment Fund Secretariat (EFS), University of Agriculture, FSD (9.990 million PKR)	Short listed
Performance evaluation of Integrated Drip Irrigation System (IDIS) for the cultivation of Multiple Crops to calculate Energy and Water Conservation Potential	Endowment Fund Secretariat (EFS), University of Agriculture, FSD, (9.770 million PKR)	Short listed
Designing and Development of Fully Automated Indigenous Pilot-scale Bioreactor for the Quantification of Greenhouse Gases Produced During Anaerobic Digestion of Waste Material	Pakistan Science Foundation 7.500 Million PKR	Under Review for Shortlisting
Process Development for the Quantification of Greenhouse Gases Captured During Anaerobic Digestion of Waste Material by Designing and Developing a Fully Automated Indigenous Pilot-scale Bioreactor.	Higher Education Commission, Pakistan, under NRPU 15 million	Short listed

National and International Research Projects Completed (3)

- Biomethane production from Macroalgae (Ireland)
- Integrated Storage and Pre-treatment of Lignocelluloses for Bio-fuel Production (Sweden)
- Cloning and over expression of cellulase gene for ethanol production (Pakistan)

Industrial and Academic Collaboration/Partners

- Pak Suzuki Motors
- Faisalabad Waste Management Company (FWMC), Faisalabad
- University of the Punjab, Lahore
- Government College University, Lahore
- National University of Science and Technology (NUST), Islamabad

- University of Engineering and Technology (UET), Lahore, PCSIR Laboratories, Lahore
- BioTech, for Global Health, Lahore

Postgraduate Student Supervised (35), Ongoing (3)

Administrative Assignments

- Full-time Incharge, Punjab Bioenergy Institute (PBI)
- Consultant, Pak Suzuki Motors on Biomethane Production as a transport fuel from waste
- Convener Departmental Industrial Advisory Board (IAB) for Outcome Based Education (OBE), Pakistan Engineering Council (PEC)
- Convener of committee for preparation of inventory record for PC-IV at PBI
- Convener of committee for revival of Punjab Bioenergy Institute
- Convener of committee for release of pending payments
- Coordinator for assistance to Audit officer for Audit Para PBI
- Respondent for report submission on Climate Smart Agriculture (CSA) on Bioenergy component supported by USAID, Pakistan
- Focal person for the Compliance of DG M & E report 2019
- Incharge Solar Park, Department of Energy Systems Engineering
- Coordinator for the Compliance of orders of Honorable Ombudsman, Lahore
- Member of a committee constituted by Director on Drip Irrigations System
- Member project review committee, Directorate of Planning and Development UAF
- Member campus committee, Directorate of Planning and Development UAF
- Member Purchase/repair committee by the Treasure, UAF
- Member Inquiry committee to probe theft/robbery of transformer etc. by the Principal Community College, PARS campus, UAF
- Convener of committee for preparation and submission of funding proposal for organizing an International Conference to CPEC academic research and development unit HEC
- Member of a committee for rectification of Drip Irrigation System at PBI
- Member, Technical committee on ENERGY constituted by the competent authority for the Establishment of High-Tech Agro-Industrial Zone in Faisalabad

Selected Publications (Citations 900; H factor 13; Total IF=170)

1. **Muhammad Rizwan Tabassum**, Ala'a H. Al-Muhtaseb, Mujtaba Baqar, and Abdul-Sattar Nizami, **2025**, "Gaseous Transport Fuel Production from Seaweeds: Influence of Salinity, Kinetics and Segments on Anaerobic Digestion Process" under review at *Fuel* (**IF= 6.7**)
2. Zartasha Sarwar; Muhammad Khawar Abbas; Naveed Akhtar Shad; Kanwal Akhtar; Ameena Mobeen; Waseem Abbas; Kh. Abd El-Aziz; **Muhammad Rizwan Tabassum**; Muhammad Zulqarnain; Hafiz T. Ali; Sumara Ashraf, **2024** "Anticancer and acute toxicity studies of cellulose-coated Vanadium oxide nanomaterials" *Journal of Molecular Structure* **1322**: 140633. (**IF= 4.0**)
3. Nazar, R., Rabia, Q., Mujtaba. B., **Tabassum, MR.**, and Abdual-Sattar N. Waste management of solar cells in South Asia: an environmental concern of the emerging market. *Environmental Science and Pollution Research*, **2023**: p. 1-18. (**IF=5.2**)

4. **Muhammad Rizwan Tabassum**, Anjum Munir, Furqan Asghar, Waseem Amjad, Jerry D Murphy, 2019. Unlocking the biomass potential of Pakistan: opportunities and challenges. Conference Abstract, Green Energy Technologies: Opportunities and Challenges, October 29-30, 2019, p. No. 5
5. **Muhammad Rizwan Tabassum**, Maham Iftikhar, Amna Akhtar and Nimra Qadeer 2019. Can a solar paint turn the entire home into a green energy source? *Conference Abstract, Green Energy Technologies: Opportunities and Challenges*, October 29-30, 2019 p. No. 9
6. **Tabassum, M.R.**, Xia, A., Murphy, J.D. 2018. Biomethane production from various segments of brown seaweed. *Energy Conversion and Management*, 174, 855-862 (**IF=11.5**)
7. **Tabassum, M.R.**, Xia, A., Murphy, J.D. 2017. Potential of seaweed as a feedstock for renewable gaseous fuel production in Ireland. *Renewable and Sustainable Energy Reviews*, 68, 136-146 (**IF=16.8**)
8. **Tabassum, M.R.**, Xia, A., Murphy, J.D. 2017. Comparison of pre-treatments to reduce salinity of *Laminaria digitata* harvested in different seasons and enhances the relevant biomethane yields. *Energy*, 140, 546-551 (**IF=8.86**).
9. **Tabassum, M.R.**, Xia, A., Murphy, J.D. 2016. The effect of seasonal variation on biomethane production from seaweed and on application as a gaseous transport biofuel. *Bioresource Technology*, 209, 213-219 (**IF=11.9**).
10. **Tabassum, M.R.**, Xia, A., Murphy, J.D., 2016. Seasonal variation of chemical composition and biomethane production from the brown seaweed *Ascophyllum nodosum*. *Bioresource Technology*, 216, 219-226 (**IF=11.9**).
11. **Tabassum, M.R.**, Xia, A., Murphy, J.D. 2016. Biogas production generated through continuous digestion of natural and cultivated seaweeds with dairy slurry. *Bioresource Technology*, 219, 228-238 (**IF=11.9**).
12. Xia, A., Jacob, A., Christiane Herrmann, **Tabassum, M.R.**, Murphy, J.D. 2016. Production of hydrogen, ethanol, and volatile fatty acids through co-fermentation of macro-and micro-algae. *Bioresource technology*, 205, 118-125 (**IF=11.9**).
13. Ao Xia, Amita Jacob, Christiane Herrmann, **Tabassum, M.R.**, Murphy, J.D. 2015. Production of hydrogen, ethanol, and volatile fatty acids from the seaweed carbohydrate mannitol. *Bioresource technology*, 193, 488-497 (**IF=11.9**).
14. Volkmar Passoth, **Tabassum M.R.**, Harikrishnan Anjaly Sukumaran Nair, Matilda Olstorpe, Ievgeniia Tiukova, Jerry Ståhlberg, "Improved ethanol production from wheat straw by integrated storage and pre-treatment (ISP)", *Enzyme and Microbial Technology*, Vol. 52 (2013): 105-110 (**IF=3.71**).
15. Mahjabeen Saleem, **Tabassum M.R.**, Riffat Yasmeen and Muhammad Imran, "Potential of xylanase from thermophilic bacillus sp. XTR-10 in bio-bleaching" *International Biodeterioration and Biodegradation*. 63 (2009): 1119-1124 (**IF=4.91**).