



Umesh

Ph.D.

Indian Institute of Technology Guwahati, India

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EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
Ph.D.	Indian Institute of Technology Guwahati, India	Thesis Submitted	2021-2025
M.Tech (Biotechnology)	Indian Institute of Technology Guwahati, India	79.30%	2017-2019
M.Sc. (Microbiology)	CSJM University, Kanpur (U.P.)	62.05%	2010-2012
B.Sc. (Zoology, Chemistry)	Bundelkhand University Jhansi (U.P.)	52.80%	2005-2008
Intermediate (UP Board)	SVM Inter College, Hamirpur (UP)	72.00%	2005
High School (UP Board)	SVM Inter College, Hamirpur (UP)	56.17%	2003

EXPERIENCE

- Junior Research Fellow** June, 2019 - Jan, 2020
JRF, Translational Plant Genetic Engineering Laboratory Indian Institute of Technology Guwahati
 – Development of transgenic chilli cv. Bhut Jolokia for resistance to viruses causing leaf curl disease using RNA interference (RNAi) .
- Senior Research Fellow** Jan, 2020 - Dec, 2020
SRF, Indian Institute of Technology BHU Varanasi, India Biochemical Engineering, IIT BHU Varanasi, India
 – How Beclin-1 mediates cross-talk between apoptosis and autophagy via its terminal fragments? .

PROJECTS

- Integrated Route For Bioethanol Synthesis: Co-fermentation of Pentoses and Hexoses** 2021-2025
Ph.D. dissertation under Prof. VS Moholkar IIT Guwahati, India
- Screening of FDA Approved Drug Data Bank to Identify New Anti-TB Drugs Exploiting KatG** 2017-2019
M.Tech dissertation under Prof. Vishal Trivedi, and Prof. Souptick Chandra IIT Guwahati
- Microbial Analysis in Pharmaceutical Industries in Ranbaxy** 2010-2012
M.Sc. (Microbiology) dissertation under the guidance of Prof. Naveen Arora CSJM University Kanpur (UP)

TECHNICAL SKILLS

- Molecular biology** :DNA and RNA Isolation, Cloning, Gene expression, Polymerase chain reaction (PCR), Gel electrophoresis, Southern blotting, and Northern blotting.
- Microbiology**: Autoclave, Media preparation, Culturing, Streaking, Microbial isolation, Biochemical characterization, Gram staining.
- Computational biology**: MSA, Structure prediction, Homology modeling, Auto-dock, Gromacs, MM/PBSA for molecular docking and molecular dynamics and simulations.
- Analytical Techniques**: Handled TGA, CHNS analysis, FTIR, XRD, UV-Vis. Spectroscopy HPLC, LCMS.
- Optimization of yield** : Response surface methodology using Design of Experiments (DOE), Box-Behnken Design (BBD), Central composite design (CCD).
- Softwares**: Process parameter optimization using Designe expert. OriginPro, Autodock, Gromacs, Open babel, Linux.
- Super-computer** : Param-ishan, Param Kamrupa, Param-shivay.

GENERAL SKILLS

Culture adaptability and resilience, Presentation and public speaking, Participation in conferences and seminars, Critical thinking and problem solving, Statistical analysis, Time management and multitasking.

ACHIEVEMENTS

- MHRD Scholarship**, Ph.D., Indian Institute of Technology, Guwahati, Assam 2021-2025
- SRF Fellowship**, Biochemical Engineering, Indian Institute of Technology BHU Varanasi, UP 2020-2020
- JRF Fellowship**, Department of Biotechnology, Indian Institute of Technology Guwahati, Assam 2019-2020
- MHRD Scholarship**, M.Tech Biotechnology, Indian Institute of Technology Guwahati, Assam 2017-2019

- **GATE-XL**, Conducted by Indian Institute of Technology, Bombay 2013
- **GATE-XL**, Conducted by Indian Institute of Technology Roorkee 2017
- **GATE-BT**, Conducted by Indian Institute of Technology Madras 2019
- **CSIR-NET-LS**, Conducted by Council of Scientific and Industrial Research-University Grants Commission 2018

LIST OF PUBLICATIONS

- **Umesh**, Moholkar, V.S. *2G Bioethanol for Sustainable Transport Sector: Review and Analysis of the Life Cycle Assessments. Current Pollution Report 11, 11 (2025).*
- Shukla, V. **Umesh** & Purohit, A. *Berberine-Loaded Nanoparticles Combat Oxidative and Nitrosative Stress to Reprogram Macrophages in Rheumatoid Arthritis. BioNanoSci. 15, 82 (2025)*
- Negi, Bharat Bhushan, **Umesh** and Chandan Das. *Novel insights into mycoremediation mechanism of petroleum refinery wastewater using Phanerochaete chrysosporium: An experimental and computational approach. Journal of Water Process Engineering 70 (2025).*
- Priyanka, Kashyap, S., **Umesh**. *Exploring myostatin's role and potential applications in fisheries and aquaculture: a review. Aquacult Int 33, 75 (2025).*
- Das, Pushpita, **Umesh**, Lepakshi Barbora, and Vijayanand Suryakant Moholkar. *Comparative analysis of biodesulfurization of dibenzothiophene (DBT) and 4, 6-dimethyl dibenzothiophene (4, 6-DMDBT) by 4S pathway using molecular simulations. Preparative Biochemistry & Biotechnology 1-17 (2025).*
- **Umesh**, Prerna, K., & Dubey, V. K. *Virtual screening and repurposing of FDA-approved drugs from ZINC database to identify potential autophagy inhibitors exploiting autophagy related 4A cysteine peptidase as a target: potential as novel anti-cancer molecule. Journal of Biomolecular Structure and Dynamics, 40(12), 5266–5282 (2021).*
- **Kundu**, D., **Umesh**, & Dubey, V. K. *Interaction of selected biomolecules and metabolites with amyloidogenic proteins. Journal of Biomolecular Structure and Dynamics, 39(9), 3061–3070, (2020).*
- **Umesh**., Kundu, D., Selvaraj, C., Singh, S. K., & Dubey, V. K. *Identification of new anti-nCoV drug chemical compounds from Indian spices exploiting SARS-CoV-2 main protease as target. Journal of Biomolecular Structure and Dynamics, 39(9), 3428–3434, (2020).*

LIST OF BOOK CHAPTER/PROCEEDINGS

- Anand, Avinash, **Umesh** and Vijayanand S. Moholkar. *Biohydrogen production from microbial fermentation of organic wastes. Emerging Biofuels, 27-52 (2024).*

CONFERENCE PRESENTATIONS

- **Oral Presentation**: International Conference on Advances in Sustainable Solutions for Energy Transitions (ASSET 2025) , Indian Institute of technology Guwahati-India, Jan, 2025
- **Oral Presentation**: IX International Conference on Sustainable Energy and Environmental Challenges (IX SEEC) , Indian Institute of technology Mandi-India, Dec, 2024
- **Poster Presentation**: Environmental 2024, An International Conference on Environmental Challenges, Opportunities and Sustainable Solutions, IIT Guwahati, Dec, 2024
- **Oral Presentation**: Research & Industrial Conclave, IIT Guwahati, August, 2024
- **Poster Presentation**: Research & Industrial Conclave, IIT Guwahati, May, 2023
- **Poster Presentation**: IICHe- CHEMCON 2023, Heritage Institute of Technology , Dec, 2023

REFERENCES

- **Prof. Vijayanand Suryakant Moholkar**, Professor, Department of Chemical Engineering, IIT Guwahati, India
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 - **Prof. Lingaraj Sahoo**, Professor, Department of Bioscience and Bioengineering, IIT Guwahati, Assam, India
Email:ls@iitg.ac.in
 - **Prof. Vikash kumar Dubey**, Professor, Department of Biochemical Engineering, IIT BHU Varanasi, Uttar Pradesh, India
Email:vkubey.bce@iitbhu.ac.in
 - **Prof. Pranjal Chandra**, Professor, Department of Biochemical Engineering, IIT BHU Varanasi, Uttar Pradesh, India
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 - **Prof. Vishal Trivedi**, Professor, Department of Bioscience and Bioengineering, IIT Guwahati, Assam, India
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 - **Prof. Chandan Das**, Professor, Department of Chemical Engineering, IIT Guwahati, India
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