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## Pretreatment strategies for hydrolysis of Lignocellulosic biomass: Potential challenges and future perspective for Biorefineries

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### Abstract (300 word limit)

Biofuel seems like a buzzword these days. The term surfaces in news about global warming, energy security, environmental awareness, and economic stability. The consumption of fossil fuels has led to a decline in worldwide oil reserves.

Being most abundant and bio-renewable, lignocellulosic biomass holds enormous potential for production of biofuels, bio-based chemicals and materials for a sustainable energy future. Utilization of lignocellulosic materials in a biorefinery requires a well-designed pre-treatment technology with reasonable processing cost for deconstruction of the lignocellulose complex. Current technologies rely on chemical, physico-chemical and biochemical conversion routes for effective hydrolysis of lignocellulosic materials. Identification of novel enzymes and microbes to counteract the pre-treatment-induced inhibitory products is a prime area of research as chemical detoxification method carries financial constraints. Utilization of lignocellulosic biomass, which is the most abundant and sustainable biomass, has shown enormous potential for establishing a concrete technology for market entry, limited to the production of bioethanol and lactic acid. Great strides are required to harness biobased chemicals and polymers from lignocellulosic biomass to mitigate the energy crisis and demand for polymeric materials for human welfare. The valorization of lignocellulosic complex is still a big challenge as effective fractionation of the major biomass components—cellulose, hemicelluloses and lignin—lacks economic viability. During the presentation author will focus his successful physico-chemical pretreatment process for lignocellulosic biomass to create sugar based platform for production of biochemical and biomolecules.

**Key words:** Biofuels, Biorefinery, Hydrolysis, Pre-treatment

### Recent Publications (minimum 5)

1. Mukherjee G, Dhiman G, Akhtar N (2017) Lignocellulosic Biomass Utilization for the Production of Sustainable Chemicals and Polymers. In: Lignocellulosic Biomass Production and Industrial Applications. Scrivener Publishing LLC, USA, 215-246. 2017. ISBN 9781119323600.
2. Mukherjee G, Dhiman G, Akhtar N (2017). Efficient hydrolysis of Lignocellulosic Biomass: Potential Challenges and Future Perspectives for Biorefineries. In: Environmental bio remediation technologies and Eco-friendly cleanup measures. Springer, Switzerland, 213-237. 2017. ISBN 978-3-319-48439-6.
3. Mishra T, Mukherjee G, Kanwar P (2017). Microbial Bioremediation of hazardous heavy metals. In: Environmental bio remediation technologies and Eco-friendly cleanup measures. Springer, Switzerland, 281-293. 2017. ISBN 978-3-319-48439-6.
4. Singh SK, Yadav LS, Singh PN, Sharma R, Mukherjee G (2012). Additions to *Gliocephalotrichum* species (anamorphic Hypocreales) from fruit litter of the medicinal plant *Terminalia chebula* in the Western Ghats, India. Mycoscience 53 (5):391-395. ISSN 1340-3540.
5. Mukherjee G, Singh SK (2011) Purification and characterization of a new red pigment from *Monascus purpureus* in submerged fermentation. Process Biochemistry 46: 188-192. ISSN 1359-5113.



### Biography (150 word limit)

Dr. Mukherjee is internationally recognized in the field of microbial fermentation/bioprocess, biofuel research and Reactor designing having Interdisciplinary research experience and a proven track record of bringing bench scale research to commercialization. His experience includes present day front-line research in fermentation, scale-up of Industrially important value added products development from microbes. Dr. Mukherjee's achievement is culminated in his international Patents and various research publications including US Patent on Biomass to biofuel production. His ability to work in interdisciplinary research surroundings is evident from the fact that he worked both in various research institutes and industries. He is also participated in setting up 3 international quality R&D research facilities. Dr. Mukherjee is in the capacity of Editor, Associate Editor, and honorary member of editorial boards of various National and International indexed journals of repute with honors and awards from various scientific bodies and technical committee members of various international organizations.

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