

Insights into the role metabolomics and proteomics in bioprocess optimization and environmental remediation



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Biography

Grace N Ijoma is a senior lecturer of Biotechnology at the Pearson Institute of Higher Education for over 8 years and is currently a postdoctoral fellow at the University of South Africa. Her PhD focused on antagonistic inter-specific interactions amongst fungi. Previous paper presentation of portions of this work was presented at 8th International Conference on Environmental Science and Technology, Houston Texas, USA in 2016 and was judged first place paper. She is eclectic in her research interests and has a keen interest in several areas including Bioprospecting of niche environments, Food Microbiology, Environmental and Industrial Microbiology and Biotechnology (particularly Fermentation technology and process optimization), Microbial enzymes and biodegradation of xenobiotic compounds including polyaromatic hydrocarbons, pesticides and synthetic dyes, Ground water quality research and Microbial treatment of industrial waste water, Solid waste management. She is currently supervising undergraduate and post graduate research projects designed towards industrially relevant applications.

Abstract

Progress and industrialization in modern times has come with a myriad of associated problems. Two major problems accompanying most industrial processes is finding approaches that guarantees sustainability (both for the raw materials requirements and the actual process work flow) and dealing with the inevitable waste generated as a consequence thereof. Therefore, where possible scientists and technologists develop biological processes involving the use of biocatalysis to replace high energy coupled reactions that may have been the initial method of production of end products. These bio-catalytic processes often involve the exploitation of microorganisms (bacteria and fungi). As such our understanding of metabolic pathways, transformation, degradation, intermediate and end-product generation as well as consortia interaction common to most microbial biochemical reactions will provide credible insights towards synthesis of end products in scale-up or even allow for optimization of existing bioprocesses to maximize derived products. The application of these two key components of the 'omics field – metabolomics and proteomics is pivotal towards the improvements of bioprocess and environmental bioremediation strategies. Although advances have been made in the field of medical biochemistry and medicine in relation to the 'omics field; the same cannot be stated for industrial bioprocesses and environmental bioremediation. These two areas of endeavor exploit microbial processes, however, work in this field has focused more on taxonomic identification of consortia interactions without much done in terms of functional genomics that otherwise would have incorporated metabolomics and proteomics.

Publications

Exploring the application of biostimulation strategy for bacteria in the bioremediation of industrial effluent. *Annals of Microbiology*

Comparative evaluation of enzyme production efficiency of monocultures and paired interactions of fungi on different agricultural substrates.



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