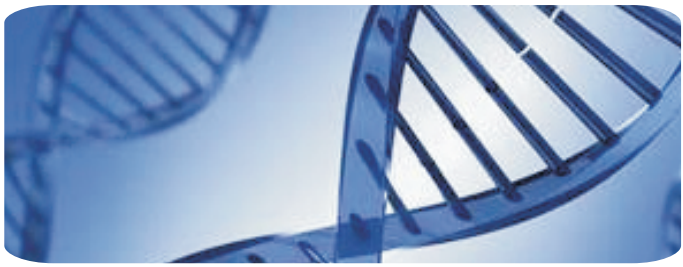
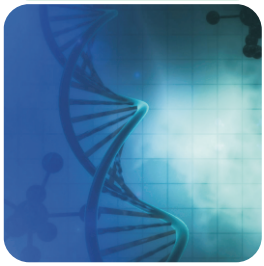
Recent Advances in Biotechnology

Oloke Julius Kola et al.





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Preface

This book is written to exhibit the successes of our team in producing novel strains of different microorganisms for solving different human problems using biotechnology techniques. The book is a compilation of the well defended PhD thesis of my formal five doctoral students. Theses papers belong together as all of them are addressing how different attributes of various microorganisms can be enhanced for solving human problems through biotechnology practice.

Description of methods of enhancing microbial performance like cross-breeding and mutagenesis are often not specific for a particular organism. Research project students and other researchers at industries often face a lot of difficulties in adopting unspecific experimental protocols for their work. In this book specific experimental protocols for enhancement of microbial performance are accompanied with exciting results. Since these protocols can be reproduced; they could be easily adapted by others for similar projects.

The book will be very useful for teaching post graduate and undergraduate students in universities. Both students and university lecturers will find the book useful for teaching and research. Researchers in different Institutes and Industry will also find the book very useful. In addition; while the book will be useful in providing vital information for Entrepreneurs in business set-up; the book will be of immense benefit for farmers in the area of bio-herbicide production.

Although the book is a compilation of defended projects of five prior students, conscious effort has been taken to integrate the content so that it flows together logically as follows:

a) In chapter one, emphasis is on the use of cross-breeding and mutagenesis to produce better strains of Pleurotus (oyster mushroom) with enhanced spawn production, sporophore production, enzyme and protein production. Since Pleurotus are known to contain different antioxidants, this chapter

demonstrates an efficient means of producing immunomodulators. The chapter ends by concluding that Pleurotus may be a cheap source of immunotherapy.

b) Tyrosinase is one of the major enzymes produced by Pleurotus (oyster mushroom). In chapter two, enhanced production of tyrosinase and its immobilization is discussed. After reading chapter one; one will like to understand how tyrosinase can be immobilized using efficient cheaply available polymers.

c) In addition to Pleurotus been a cheap source of immunomodulators, in chapter three, Protein A from *Staphylococcus aureus* is exhibited as a possible candidate of immunotherapy.

d) In chapter four, the challenges of Arcobacter as an emerging food-borne and zoonotic opportunistic pathogen is discussed. The chapter is concluded by mentioning that immunotherapy is an efficient way of combating the emerging challenges of Arcobacter.

e) In chapter five, discussion is made of the effectiveness of different formulations of bio-herbicide containing mutant strains of *Pseudomonas aeruginosa* and *Lasiodiplodia pseudotheobroma* in the control of target weed with no effect on non-target crop. This is no disconnect from the first four chapters as effective strains of microorganisms are developed for biotechnology processes.

I gratefully acknowledge the thoughtful contributions of my prior doctoral students viz: Dr Adebayo Elijah, Dr Iyabo Ola, Dr Oke A J, Dr Yemisi Adesiji and Dr Adetunji Charles. I am indebted to the management of Ladoke Akintola University of Technology, Ogbomoso, Nigeria for allowing to utilize my accumulated leave at All Saints University during the time materials in this book

were compiled. The financial support provided by the management of All Saints University for the publication of this book is highly appreciated.

The invaluable assistance of my wife and children in making this book a reality is also gratefully acknowledged.

Oloke Julius Kola (PhD)
Professor of Microbiology and Biotechnology
June 2015

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