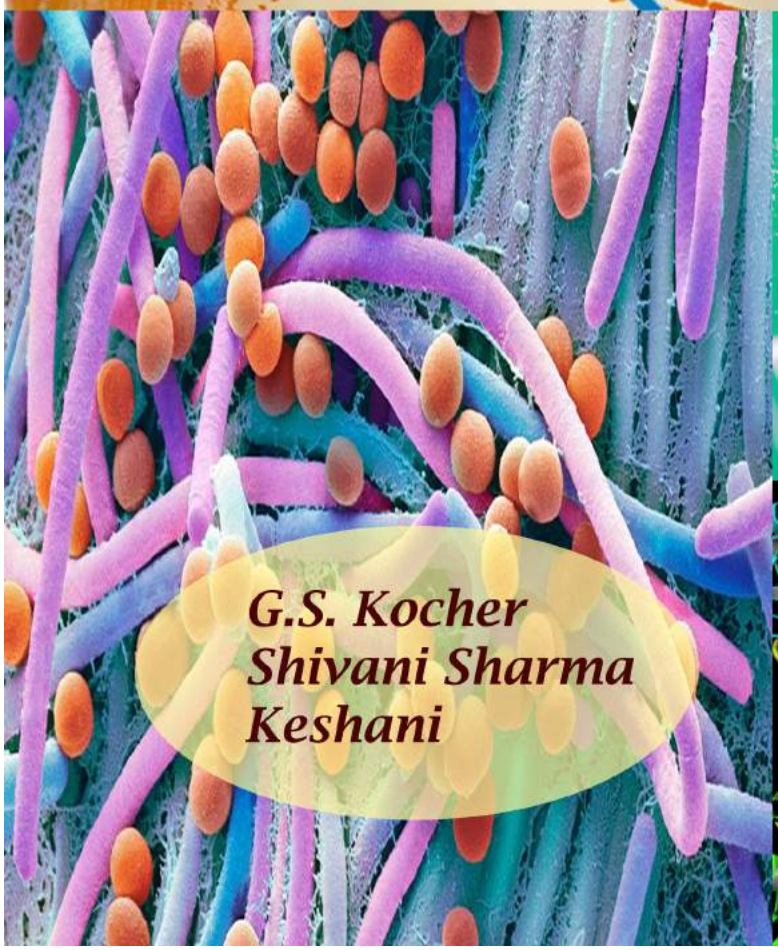
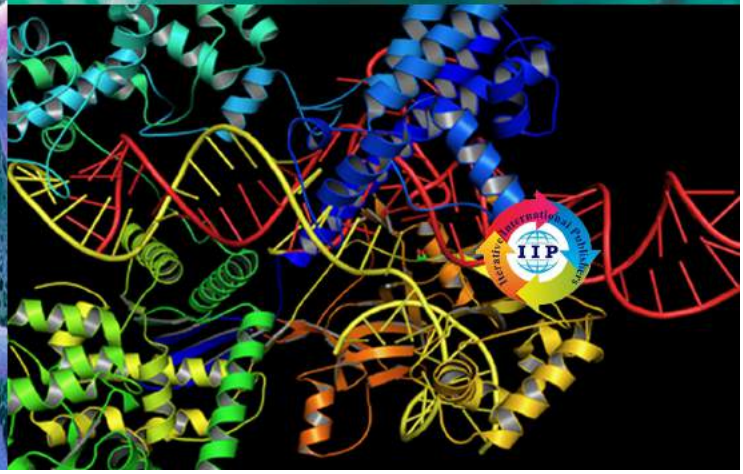
Current Molecular Techniques and their Applications in Microbiology





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First Volume

Editors

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Preface

Microbiology is an interesting branch of applied sciences and forms an indispensable part of a plethora of other sciences such as biochemistry, genetics, biotechnology, molecular biology etc. This is because our environment is full of microorganisms and the latter maintain a balance of the environmental characteristics. With the advancement in sciences different techniques have been emerged with time to study more detailed processes and more specific microorganisms which in turn were not possible to study with traditional methods. It is a known fact among microbiologist that the culture-dependent methods significantly underestimate the biocomplexity and misrepresent the true composition of microbial communities in the original environment. Hence, may culture-independent molecular microbiology techniques have been developed in the past decades that involve direct extraction of nucleic acids from environmental samples, thus overcoming the difficulties associated with the laboratory cultivation of microorganisms and providing a direct analysis of samples and insight into gene functions. The present proceedings describe current molecular microbiology techniques employed in microbiology and their diverse applications in agriculture, food, clinical and fermentation based industry.

The authors' intention in preparing this seminar edited book has been to encourage the PG students and enhance their writing skills as it is primarily based on the topics given to them for their seminar series on different molecular techniques and their applications and each chapter covers the complete aspect of the topic. This information is supplemented with illustrations, wherever these are appropriate and helpful. The editors feel that this book being a reasonably comprehensive guide regarding different molecular techniques and their applications in Microbiology, will tailor to the need of the faculty and students of different colleges and universities offering microbiology as a course for their undergraduate or postgraduate degrees.

In a work of this nature, errors of omission and commission are inevitable. Therefore, constructive suggestions, if any, from the readers will be highly appreciated to incorporate in the succeeding edition of this seminar series.

Editors

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About the Author

Dr. Gurvinder Singh Kocher did (B.Sc from Arya College, Ludhiana, Punjab, M.Sc and Ph.D from Punjab Agricultural University Ludhiana, India. He has carried out research projects and consultancy work in the areas of Value addition of agricultural produce into wines and vinegars, Fermentation of agricultural wastes into ethanol, Bioconversion of industrial wastes and by products into enzymes. Dr. Gurvinder Singh Kocher is an academic andenzymes. Dr. Gurvinder Singh Kocher is an academic and researcher with more than 26 years of experience in biotech research and development. Presently he is working as Principal Microbiologist-cum-Head at Punjab Agricultural University Ludhiana, Punjab. He has got various awards like "International Training in Fermentation Technology", awarded by Indian Council of Agricultural Research at Department of Viticulture and Enology, University of California, Davis, California, USA ((April 1 to June 29, 2010). "Normon E Borlaug Fellowship" awarded by USDA under "biofuels" at OARDC Wooster, Ohio, USA. (April 9 to May 11, 2007)". "International Training program in Biotechnology-13th course" at GBF, Braunschweig, Germany (Sept 6 to Oct 8, 1999). "Young Scientist ward in Environment Microbiology" in 1997 by Assoc. of Microbiologists of India. He has done various project namely Development of technology for efficient conversion of rice straw into ethanol employing thermostable microbial cellulases (Department of Atomic Energy, 2014-2017). Demonstration & promotion of techno-economically viable options for sustainable livelihood generation in kandi area of Punjab (Department of Science and Technology, 2015-2018). Bioprocess development for production of debittered kinnow juice for preparing low alcoholic naturally carbonated beverage and kinnow-wine (Department of Science and Technology, 2015- 2018). Dr. Gurvinder Singh Kocher has published more than 90 research papers in various national and international journals and has 2 patents to his credit.

Dr Shivani Sharma is presently working as Mycologist (Mushrooms) in the Department of Microbiology, Punjab Agricultural University, Ludhiana, India. She holds a PhD in Microbiology from PAU, Ludhiana. She has worked on "Production, purification and characterization of lentinan from Lentinus edodes" which was funded by Bharti Field Fresh, Laddowal. Her research interests include nutritional and medicinal properties of mushrooms, lignocellulosic degrdation of agricultural wastes by white rot fungi. For her noteworthy contribution in education and research, she has been conferred with Yadavindra Young Scientist Award from Mushroom Society of India. She also got FABS, Devolved fellowship from University of Saskatchewan, Canada. She has published number of articles in national and international peer-reviewed journals and attended various seminars and conferences. She is actively involved in spawn production and compost preparation in order to cater the needs of mushroom growers in Punjab. She is actively involved in the field of extension by delivering lectures and organizing mushroom trainings for the stakeholders. She is a member of various societies working in life sciences including AMI, MSI, PSC and ISC etc.

Dr. Keshani is working as Extension Scientist (Microbiology) at College of Basic Sciences and Humanities, Punjab Agricultural University, Ludhiana. She received her graduation, post-graduation and doctorate degree from CSK HPKV, Palampur. She is a gold medalist in her bachelors and masters programme and a DST-INSPIRE fellow in her doctorate. She qualified ARS-NET in Agricultural Microbiology. She has more than five years teaching and research experience and has guided and trained many undergraduate and postgraduate students in the field of microbiology. She has authored more than 25 papers in national, international journals, magazines, books, and attended number of seminars and conferences. She has handled one Bio-CARe DBT project as PI and twelve, industry sponsored testing projects. For her noteworthy contribution in education and research, she has been conferred Young Microbiologist Award by AEDS and Young Scientist Award by MSI. She is a member of various societies working in life sciences including AMI, MSI, AEDS and ISC etc.

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