ABOUT THE BOOK

This book describes how biological networks can be used to represent and describe the interactions between biological entities. Various methods for visualizing and analyzing complex biological activities, such as protein-protein interactions have been discussed in a concise manner. It will give a brief idea about theoretical and practical knowledge required for the analysis of biological networks at the interface of biology and computer science. Dedicated chapters on gene ontology, its resources and analytical methods are also included in this book. Readers are introduced with the popular bioinformatics web-based resource system viz. DAVID, commonly employed for functional annotation and enrichment analyses of gene lists into a manageable number of biological modules for efficient interpretation in a network context. Written in a very simple, easy to understand language, this edited book will be useful as a textbook for students doing graduate and post-graduate studies in Life Sciences, Bioinformatics and Computational Biology. It will be also helpful to the educators and to candidates preparing for various competitive examinations in this field.

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Editors:
Sonal M. Manohar
Pramodkumar P. Gupta

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PREFACE

Biological networks comprise of graphical modelling of interactions or relationships among different biomolecular entities. Gene Ontology provides a framework designed for computational representation of biological systems such as the function of gene products from every organisms.

Analysis of networks and gene ontology has numerous applications in biological and biomedical science. It facilitates a better understanding between genes and proteins, interactions between different drug targets, disease gene prioritization and genome-wide association studies.

Written in a very simple, easy to understand language, this edited book is not a mere compilation of facts and figures but has a potential to act as a compass that can guide you through the intricate landscapes of genes, cells, proteins like biomolecules and the fascinating interplay occurring between them.

By including chapters on topics on biological networks, biological databases, gene ontology resources, various tools for network analysis and so on, a sincere attempt has been made to make the readers familiar with the basics of this area of bioinformatics in a lucid style.

All the chapters have been peer reviewed and thoroughly checked for the text similarity using Turnitin software to avoid any plagiarism.

The book will be useful as a textbook for students of graduate and post-graduate level courses in Life Sciences, Bioinformatics, and Computational Biology.

We sincerely hope that this book will stand out as a testament to the ceaseless pursuit of knowledge in the areas of biological networks and gene ontology. So, as you turn the pages allowing the words to unfold, may your understanding of the biological world be enriched forever! We wish that this book will inspire further research, fostering inter-disciplinary collaborations, ultimately contributing to an improved human health and our environment!

Editors

Dr. Sonal M. Manohar

Dr. Pramodkumar P. Gupta

15th February, 2024

ABOUT THE EDITORS

Dr. Sonal M. Manohar is currently working as an Assistant Professor (senior scale) and a recognized Ph.D. supervisor at the Department of Biological Sciences, Sunandan Divatia School of Science, SVKM's NMIMS (Deemed-to-be) University, Vile Parle, Mumbai.

She has done her graduation and post-graduation in Life Sciences at University of Mumbai. She then worked in the Pharmacology (Oncology) Department of Piramal Life Sciences Ltd. for 8 years as a research scientist where she also completed her Ph.D. in Applied Biology. This was followed by a post-doctoral research stint at IIT Bombay for 3 years.

She has published more than 30 research and review articles in reputed peer reviewed journals and has an h-index of 13. She has 3 international (USA) patents and 4 book chapters to her credit. She is also serving as an honorary reviewer for several reputed international journals published by Elsevier, Taylor and Francis, Bentham Science Publishers, MDPI etc. She has attended several conferences, workshops, and seminars to present her research work in India, as well as abroad and has also been awarded for best poster and best oral presentations at various international conferences.

Her research areas include anticancer drug discovery, cell signaling, single cell analysis using flow cytometry, phytochemistry and biological network analysis. She has been awarded with a Start-up Research Grant by the UGC. She is a Life member of Cytometry Society of India.

Dr. Pramodkumar P. Gupta is working with School of Biotechnology and Bioinformatics, D Y Patil Deemed to be University, Navi Mumbai, Maharashtra, India in a position as an Assistant Professor and Bioinformatics Lab In-charge, Academic Editor to PLOS ONE Journal, Affiliate member to Royal Society of Chemistry (2022-2023), having more than 14 years of research and teaching experience in various Bioinformatics and Cheminformatics subjects at undergraduate and post graduate level.

He is a Visiting Professor in Bioinformatics subject, to numerous premier institutes of India and a registered Ph.D. guide in the field of Bioinformatics. He holds a Ph.D. in Bioinformatics, he is a recipient of Erasmus Mundus Doctoral Fellowship year (2016 – 2017) under Erasmus Mundus Euphrates Program, by European Union Commission, has completed his work at the Proteomic Center, Vilnius University, Lithuania, Europe.

His area of work includes Protein kinase and drug discovery, Metabolic pathway mapping, Modelling analysis, Protein 2D and 3D structure modelling, Data annotation, Drug target mining and Biomarker identification using in-silico techniques, Network Pharmacology, MD simulations and related.

He has contributed to numerous book chapters and research articles in national, international journals and has chaired organizing committee member, national advisory board member, consultant to national and international scientific events and industry.

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Editors would like to recognize and appreciate the collective efforts of brilliant minds involved in writing this book whose tireless curiosity and urge to share their knowledge with the readers has been instrumental in shaping up this informative piece of work.

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Editors

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