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Biotechnology and Bioforensics

New Trends

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Foreword

DNA technology has engraved its name in improving the nutritional quality of food by producing GM foods, personalized medicine based on DNA screening techniques, forensic DNA testing, genetic testing, and many other domains. New inventions and outbreaks in the era of science can be best exemplified with the progress in the implementation of DNA-based technologies and methodologies. This series presents the information on genetic predisposition, conventional communized medicine, and the individual specific problems with a focus on the therapy, often a random one rather than being specific as in the case of personalized medicine based on DNA screening techniques. The literature in this series describes the problems posed by the loss of victim identity in mass disaster cases that can be better solved by the DNA profiling technology today. It is also a well-accepted fact that Bioinformatics now plays a key role in modern drug discovery and it cuts enormous time frame and funding required in the processes of drugs reaching the market. Modern tools in bioinformatics and structure-based drug discovery have now enabled Insilco studies of crucial steps like weeding out the bad leads early in the process, positive lead screening, stability, toxicity prediction, bioavailability studies, etc. The chapters in this series comprise research insights from bioinformaticians, pharma professionals, and computational biology and discusses the emerging challenges, problems, and achievements in this field of developing algorithms and softwares, databases, target identification, Protein modeling, Protein function prediction, Binding site analysis, Protein drug complexes, Biomarkers Research Docking, etc.

Preface

The current era of incredible innovations toward the zeal to chase the heights of development has made science and technology one of the most powerful tools to accomplish the tasks of incremental prosperity for human welfare and sustainable development. It has been rightly said that science, technology, and innovation work together for growth and development. With the multifarious aspects of science there is a need for thought-provoking ideas and cumulative efforts which can strengthen the scientific capacity to produce successful innovation systems. This series has come up with its horizons widened. It aims to bring out all the advancements and innovations in the field of Biology, not restricting itself only to DNA technologies. The chapters in the book have brought together interdisciplinary domains of Life Science to implement the developments in one discipline so as to foster the standards of the other. I hope this series would be both knowledgeable and memorable to you all. We can expect more automation; it is already happening. There will be more integration of computerized analysis with laboratory tests. Capillary electrophoresis will require less material and produce faster results, DNA chips are in the pipeline too. We can also expect miniaturization with attendant portability. I recently read of a hand-held chip that can analyze 8 STRs in a few minutes. We can foresee the time when analysis can take place at the crime scene. If immediate results are produced, this can provide prompt clearance of erroneously identified suspects, avoiding much needless apprehension. I would emphasize, however, that what can be done in pilot experiments will usually not be good enough for forensic use, for which a system must be thoroughly tested and validated. While the appropriate use of DNA can be helpful in reducing and reversing wrongful convictions, inappropriate use of it and the sway of it, over other evidence on juries and judges can create a system of wrongful convictions. I offer my sincere gratitude toward the authors of the book chapters, acknowledging the support and cooperation received from the scientists from BioAxis DNA Research Centre Private Limited, CRRao AIMSCS, Andhra Pradesh Forensic Science Laboratories, Hyderabad from where most of the reviewers contributed toward review of papers.

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