

Book Title (ID 2024_08)

New Dimensions in Molecular Entomology

About the Book

In the realm of entomology, the microscopic world holds immense potential for unraveling mysteries and revolutionizing our understanding of insect behavior, genetics and resistance mechanisms. "New Dimensions in Molecular Entomology" delves into the forefront of scientific exploration, showcasing innovative approaches and groundbreaking discoveries that promise to reshape the landscape of insect research. It will serve as a gateway to the cutting-edge methodologies driving the field forward. From CRISPR/Cas9 gene editing to single-cell sequencing technologies, researchers are equipped with powerful tools to dissect the molecular intricacies of insect biology. The humble fruit fly, *Drosophila melanogaster*, emerges as a cornerstone of molecular entomology research. Beyond its role in classical genetics, modern advancements have elevated *Drosophila* to a premier model for studying neurobiology, behavior, and evolutionary genomics. Insects wield remarkable abilities to develop resistance to chemical interventions, posing significant challenges to pest management strategies. As we venture deeper into the molecular realm, the boundaries of our understanding continue to expand, offering new vistas for exploration and discovery in the captivating world of insects. We hope that students, scholars and professors interested in molecular entomology will find this book informative.

Chapters outlines but not limited to:

1. DNA, Gene Structure and DNA Replication
2. Transcription, Translation and Regulation of Eukaryotic DNA
3. Nuclear and Extranuclear DNA in Insects
4. Genetic Systems, Genome Evolution and Genetic Control of Embryonic Development in Insects
5. Some Basic Tools: How to Isolate, Cut, Paste, Copy, Measure, Visualize and Clone DNA
6. DNA Sequencing and the Evolution of the “-Omics”
7. DNA Amplification by the Polymerase Chain Reaction
8. Molecular Genetics of Insecticide Resistance
9. Transposable-Element Vectors and Other Methods to Genetically Modify *Drosophila* and Other Insects
10. CRISPR-Cas Genome Editing
11. Sex Determination in Insects
12. Molecular Genetics of Insect Behavior
13. Molecular Systematics and the Evolution of Arthropods
14. Insect Population Ecology and Molecular Genetics
15. Genetic Modification of Pest and Beneficial Insects for Pest Management Programs
16. Molecular Systematics and the Evolution of Arthropods
17. Candidates for Genetic Engineering: Naturally Occurring Insecticidal Molecules
18. Insect Control through Genetic Engineering
19. Insect Viruses
20. Molecular Methods for Insect Phylogenetics
21. *Drosophila melanogaster*: Molecular Population Genetics, Regulation of Cellular Pattern Formation in the Compound Eye, Molecular Genetics of Sex Determination, Biological Rhythms
22. Insect Meiosis and Sex Ratio Distortion
23. Gene Transfer Techniques in Insects

CHAPTER SUBMISSION PROCEDURE:

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