Saravanan Ramachandran
Senthilkumar Rajagopal

Zebrafish: A Model for Marine Peptide Based Drug Screening

Springer

Zebrafish: A Model for Marine Peptide Based Drug Screening

Saravanan Ramachandran
Senthilkumar Rajagopal

Zebrafish: A Model for Marine Peptide Based Drug Screening

Springer

Saravanan Ramachandran
Native Medicine and Marine Pharmacology Laboratory, Faculty of Allied Health Sciences
Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education (Deemed to be a University)
Kelambakkam, Tamil Nadu, India

Senthilkumar Rajagopal
Department of Biochemistry
Rayalaseema University
Kurnool, Andhra Pradesh, India

ISBN 978-981-13-7843-0 ISBN 978-981-13-7844-7 (eBook)
https://doi.org/10.1007/978-981-13-7844-7

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd.
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Foreword by Balasubramanian

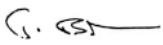
The field of marine peptide research is vast and evolving rapidly in both basic research and clinical therapeutics. When I was asked to write a foreword to this book, my immediate thought was that there are many monographs and comprehensive textbooks focusing on zebrafish model for utilizing drug discovery from marine peptides that cover a wide variety of topics at various levels of detail, so why the need for another book in this increasingly crowded field? Although quite a lot of information is available on the zebrafish model for drug discovery, the present monograph is different from the earlier as the authors provide a comprehensive information on the basic mechanisms of peptides/toxins and how these mechanisms are linked with the emergence of common, devastating pathological disorders. The authors build on current knowledge to detail the link between zebrafish models for discovery of more drugs. They explain these complex concepts with straightforward language that allows greater accessibility to a wide audience. The succinct text will assist the novice in understanding marine peptide complexity research, while the up-to-date information on the current state of this work and pathophysiology will be of interest to the experts in the field.

The authors provided all the relevant information in an update fashion in five different chapters. Chapter 1 highlights the introduction, classification, and biomedical importance of peptide, toxins, alkaloids, polysaccharides, and phenolic compounds of macro- and microorganisms and other marine organisms for various human diseases and disorders. Chapter 2 emphasizes the isolation, structural

characterization techniques, and de novo sequencing of peptide from ascidians and its teratogenic activity in the zebrafish embryo.

Chapter 3 accentuates the separation, purification, and sequencing techniques of toxin from the posterior salivary gland of cuttlefish—furthermore, the maximum tolerated dose and teratogenic activity of toxin by using the embryo of the zebrafish. Chapter 4 draws the attention to the anticancer properties of cuttlefish toxin and the development of xenotransplantation model of zebrafish for anticancer property marine drug screening. Chapter 5 represents the protective effect of marine peptides for cardiovascular diseases in zebrafish model; each chapter of this book contains an insight that will be useful to the scientists at all levels.

I congratulate the authors on producing a straightforward text that can be useful to the researchers with different levels of expertise. I hope that this work will essentially help to expand interest in the field of the marine peptide using drug discovery.



Vice Chancellor
Chettinad Academy of Research and Education
Kelambakkam, Tamil Nadu, India

T. Balasubramanian

Foreword by Madeswaran

It is a distinct honor to have been invited by my colleagues in marine peptide-based drug screening arena to write the foreword to this very articulate and scientifically state-of-the-art book entitled *Zebrafish: A Model for Marine Peptide-Based Drug Screening*. The book covers all the areas required to create a robust category and perform read-across. I am certain that the readers, including the faculties, researchers, and students, will find this book extremely informative, interesting, and inspiring. Hence, I hope that you will find this book possess sufficient disclosure and adequate utility. This book aims to simplify the revolution and to fortify the researcher with the information needed to use marine protein/peptides/toxins with complete confidence and the best compound that can be applied for therapy of the individual. The book explores in many ways and makes a good sense to investigate further on the isolation of these peptides from marine species. Moreover, this valuable text opens the doors for the progression that occurs when one discovers a fact, becomes interested, and then begins investigating and discovering the natural process.

I am a scientist G in the Ministry of Earth Sciences (MoES), who is presently working at the National Centre for Coastal Research (NCCR), Chennai. Since 1994, I have handled the following four major research and development programs, viz., (i) Development of Potential Drugs from Ocean (Drugs from Sea); (ii) Integrated Coastal and Marine Area Management (ICMAM); (iii) Marine Living Resources (MLR); and (iv) Coastal Ocean Monitoring and Prediction System (COMAPS). In

addition, I have handled two international programs, i.e., (i) Commission for Conservation of Antarctic Marine Living Resources (CCAMLR), Hobart, Australia, and (ii) South Asia Co-operative Environment Programme (SACEP), Colombo, Sri Lanka.

As a consequence, a large number of books, thick and thin, are being published continuously on various aspects of beneficial usage of marine peptides. The central theme of this monograph is giving fundamental mechanisms of marine peptides/toxins on physiological activities in our body. The authors have made an effort to unify all the content of scattered research literature in this area of research and tried to provide thorough information. By and large, this monograph is not just a collection of papers, but it is an essence of the diverse marine peptides-/toxins-based drugs screened using the zebrafish model. In all chapters, they have provided the basic information relevant to the topics, and at the same time, they have described the perspective knowledge about using the zebrafish model. I believe that this monograph could be an informative resource in the form of condensed handbook for both fundamental and advanced researchers.

Consequently, this monograph covers information on marine pharmacognosy. The authors, Saravanan Ramachandran and Senthilkumar Rajagopal, have brought through understanding the milieu of clinical research, experimental research, marine omics, and pharmacology which, collected revenue, focused on the most active areas of cancer research in the zebrafish model.

Best wishes to the authors.

Scientist G, National Centre for Coastal Research
Ministry of Earth Sciences, NIOT Campus
Chennai, Tamil Nadu, India

P. Madeswaran

Contents