

Translational Bioinformatics

Volume 16

Series editor

Xiangdong Wang, MD, Ph.D.

Zhongshan Hospital Institute of Clinical Science, Fudan University Shanghai
Medical College, Shang Hai, China

Aims and Scope

The Book Series in Translational Bioinformatics is a powerful and integrative resource for understanding and translating discoveries and advances of genomic, transcriptomic, proteomic and bioinformatic technologies into the study of human diseases. The Series represents leading global opinions on the translation of bioinformatics sciences into both the clinical setting and descriptions to medical informatics. It presents the critical evidence to further understand the molecular mechanisms underlying organ or cell dysfunctions in human diseases, the results of genomic, transcriptomic, proteomic and bioinformatic studies from human tissues dedicated to the discovery and validation of diagnostic and prognostic disease biomarkers, essential information on the identification and validation of novel drug targets and the application of tissue genomics, transcriptomics, proteomics and bioinformatics in drug efficacy and toxicity in clinical research.

The Book Series in Translational Bioinformatics focuses on outstanding articles/chapters presenting significant recent works in genomic, transcriptomic, proteomic and bioinformatic profiles related to human organ or cell dysfunctions and clinical findings. The Series includes bioinformatics-driven molecular and cellular disease mechanisms, the understanding of human diseases and the improvement of patient prognoses. Additionally, it provides practical and useful study insights into and protocols of design and methodology.

Series Description

Translational bioinformatics is defined as the development of storage-related, analytic, and interpretive methods to optimize the transformation of increasingly voluminous biomedical data, and genomic data in particular, into proactive, predictive, preventive, and participatory health. Translational bioinformatics includes research on the development of novel techniques for the integration of biological and clinical data and the evolution of clinical informatics methodology to encompass biological observations. The end product of translational bioinformatics is the newly found knowledge from these integrative efforts that can be disseminated to a variety of stakeholders including biomedical scientists, clinicians, and patients. Issues related to database management, administration, or policy will be coordinated through the clinical research informatics domain. Analytic, storage-related, and interpretive methods should be used to improve predictions, early diagnostics, severity monitoring, therapeutic effects, and the prognosis of human diseases.

Recently Published and Forthcoming Volumes

Transcriptomics and Gene Regulation

Editor: Jiaqian Wu
Volume 9

Application of Clinical Bioinformatics

Editors: Xiangdong Wang, Christian Baumgartner, Denis C. Shields, Hong-Wen Deng, Jacques S Beckmann
Volume 11

Pediatric Biomedical Informatics Computer Applications in Pediatric Research

Editor: John J. Hutton
Volume 10

Genomic Approach to Asthma

Editors: Xiangdong Wang, Zhihong Chen
Volume 12

More information about this series at <http://www.springer.com/series/11057>

Hong Jiang • Ming Liu
Editors

Heart Genomics

 Springer

Editors

Hong Jiang
Zhongshan Hospital
Fudan University
Shanghai, China

Ming Liu
Zhongshan Hospital
Fudan University
Shanghai, China

ISSN 2213-2775

Translational Bioinformatics

ISBN 978-981-13-1428-5

<https://doi.org/10.1007/978-981-13-1429-2>

ISSN 2213-2783 (electronic)

ISBN 978-981-13-1429-2 (eBook)

Library of Congress Control Number: 2018956134

© Springer Nature Singapore Pte Ltd. 2018

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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

Contents

1	Genome-Wide Association Studies of Hypertension and Several Other Cardiovascular Diseases	1
	Yan Wang and Ji-Guang Wang	
2	Cardiac Transcriptome Profile in Heart Diseases	31
	Lili Hao, Shiyu Chen, Jing Ma, Deyong Xiao, and Duan Ma	
3	The Emerging Role of Epigenetics	65
	Lu Qian Wang, Kailash Singh, Aung Moe Zaw, and Billy Kwok Chong Chow	
4	Mitochondria Genome Mutations and Cardiovascular Diseases	103
	Hui Shi, Ying Yu, Minghui Li, and Ruizhen Chen	
5	GATA Transcription Factors and Cardiovascular Disease	127
	Bohao Chen	
6	The Genetic Paradigm of WT1 Gene in Heart Development and Cardiac Repair	153
	Xueqing Liu, Min Chen, Xiaoming Deng, and Zhaoping Ding	
7	Progress of Genomics in Hypertension–Cardiac Hypertrophy	179
	Xiaoyan Wang and Yunzeng Zou	
8	Progress of Genomics in Atherosclerosis–Coronary Heart Disease and Myocardial Infarction	219
	Jinqing Yuan and Yue Liu	
9	Progress of Genomics in Cardiac Conduction and Rhythm Disorders	241
	Zhenyan Xu, Qinmei Xiong, Yang Shen, Jinzhu Hu, and Kui Hong	
10	Progress of Epigenetic Changes in Heart Failure	281
	Peng Yu, Ming Liu, and Hong Jiang	

11 Progress of Genetics in Inherited Cardiomyopathies-Induced Heart Failure	293
Baoli Zhang, Xue Yang, Ning Feng, and Hong Jiang	
12 Warfarin and Its Pharmacogenomic Study	333
Shuiping Dai	
13 Gene Therapy and Genomic Application in Heart Disease	337
Feng Zhu and Kai Huang	