

# Virus Infection and Tumorigenesis

Xiaobo Zhang  
Editor

# Virus Infection and Tumorigenesis

Hints from Marine Hosts' Stress Responses

 Springer

*Editor*  
Xiaobo Zhang  
College of Life Sciences  
Zhejiang University  
Hangzhou, Zhejiang, China

ISBN 978-981-13-6197-5      ISBN 978-981-13-6198-2 (eBook)  
<https://doi.org/10.1007/978-981-13-6198-2>

Library of Congress Control Number: 2019930614

© Springer Nature Singapore Pte Ltd. 2019

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

<b>1 Overview of Virus Infection and Tumorigenesis</b> .....	1
Geng Yang and Xiaobo Zhang	
<b>2 Marine Viruses</b> .....	25
Tianliang He, Min Jin, and Xiaobo Zhang	
<b>3 Marine Invertebrate Stress Responses to Virus Infection</b> .....	63
Yaodong He, Yi Gong, and Xiaobo Zhang	
<b>4 The Roles of MicroRNAs in Antiviral Immunity of Marine Invertebrates</b> .....	105
Yalei Cui, Le Shu, and Xiaobo Zhang	
<b>5 Marine Microbe Stress Responses to Bacteriophage Infection</b> .....	141
Min Jin, Tianliang He, and Xiaobo Zhang	
<b>6 Roles of Microbial Metabolites in Bacteriophage-Microbe Interactions</b> .....	175
Chenxi Xu, Min Jin, and Xiaobo Zhang	
<b>7 Tumorigenesis and Metabolism Disorder</b> .....	209
Fan Yang, Le Shu, and Xiaobo Zhang	
<b>8 Effects of MicroRNAs from Marine Invertebrate Stress Responses to Virus Infection on Tumorigenesis</b> .....	251
Yi Gong, Yalei Cui, and Xiaobo Zhang	
<b>9 Antitumor Activities of Secondary Metabolites from Marine Microbe Stress Responses to Virus Infection</b> .....	285
Tianliang He, Chenxi Xu, and Xiaobo Zhang	