PREFACE

In the new century, with rapid population growth, large-scale urbanization, global warming and many other factors, we are facing unprecedented ecological, health, social, and other challenges and issues. These include biological invasion, environmental degradation, sharp increase in cancer morbidity, high frequency of emerging and re-emerging infectious diseases, which pose a grave threat to biological diversity, public health, economic development and so on. Based on the solid research in population dynamics and disease dynamics, mathematical modeling, analysis and simulation have been widely used over the past decades to study various problems in life sciences and medicine, from the expression of gene sequence to the pathogenesis of cancer, from the control of molecular organisms to the resistance of bacteria and viruses, from immune response to diseases to the design and evaluation of treatments, and so on. To provide a platform for researchers in mathematical biology and related fields to present latest findings and research trends, to exchange ideas and approaches, and to enhance communication and cooperation, we organized a workshop entitled "Current Topics in Mathematical Biology (CTMB)" at Shanghai Normal University, December 18-20, 2015. We acknowledge the support from the Mathematics and Science College at Shanghai Normal University and Shanghai Gaofeng Project for University Academic Development Program.

This special issue of Mathematical Biosciences and Engineering is based on the successful workshop. Many of the authors were speakers or attendees of the workshop. This issue comprises 27 peer reviewed papers contributed by 78 authors from 38 academic institutions. It covers a wide spectrum of topics, from theoretical studies in differential equations and dynamical systems to practical applications to epidemiology, ecology, and life sciences.

Some authors investigate the transmission dynamics of some specific diseases such as Schistosomiasis (Li et al.), Lyme disease and human babesiosis (Lou et al.), Tuberculosis (Ren), Echinococcosis (Wang et al.), and visceral leishmaniosis (Zou et al.). Some study epidemic models incorporated disease control strategies such as isolation and slaughter (Cui and Chen), media campaign (Lu et al. and Cai et al.), and vaccination (Cui et al.). Some treat ecological models such as nutrient-phytoplankton interacting models (Chen et al.), monostable time periodic Lotka-Volterra competition-diffusion systems (Du et al.), facilitation-competition systems of two species (Wang and Wu), and delayed logistic models with both impulsive and stochastic perturbations (Yuan and Ji). Some are concerned with reaction-diffusion equation models with nonlocal delay (Zhang et al.), with distributed delay (Zhao et al.), and with free boundary (Zhu et al.). Some deal with models arising in fields of circadian clock (Jiang et al. and Wang et al.), gene expression (Li et al.), bacteriophage (Shu et al.), stem cell regeneration (Situ and Lei), and enzyme-catalyzed reaction (Zhang et al.). The remaining papers treat vector-host models with age of infection (Dang et al.), network models (Jia and Jin), delayed virus models (Jiang et al.), impulsive semi-dynamical systems (Tang and Pang), and epidemic models with asymptomatic infection and seasonality (Tang et al.).The

rich content of this issue reflects the growing importance and rapid development of mathematical biology in recent years.

With the variety of mathematical and biological results we hope that the readers of the Mathematical Biosciences and Engineering will find helpful and even inspirational information for their own research. We would like to express our deepest gratitude to all authors for their contributions. We are also grateful to all referees for their great efforts and valuable comments. Finally, we thank the Editor-in-Chief of MBE, Professor Yang Kuang, for his invitation, coordination and encouragement.

FIGURE 1. Group photo of the Workshop on Current Topics in Mathematical Biology, Shanghai Normal University, Shanghai, China, December 18-20, 2015.

Guest Editors:
Daozhou Gao
Shanghai Normal University
dzgao@shnu.edu.cn

Shigui Ruan
University of Miami
ruan@math.miami.edu

Jifa Jiang
Shanghai Normal University
jiangjf@shnu.edu.cn