Contents

Novartis Foundation Symposium on New treatment strategies for dengue and other flaviviral
diseases, held at the Novartis Institute for Tropical Diseases in Singapore, 26–27
September 2005

Editors: Gregory Bock (Organizer) and Jamie Goode

This symposium is based on a proposal made by Shubash Vasudevan, Thomas Keller,
David Jans and Pad Padmanabhan

Participants viii

Charles Rice Chair’s introduction 1

Duane J. Gubler Dengue/dengue haemorrhagic fever: history and current
status 3
Discussion 16

Eva Harris, Katherine L. Holden, Dianna Edgil, Charlotta Polacek and
Karen Clyde Molecular biology of flaviviruses 23
Discussion 40

Chinmaya G. Patkar and Richard J. Kuhn Development of novel antivirals
against flaviviruses 41
Discussion 52

Karin Stiasny, Stefan Kiermayr and Franz X. Heinz Entry functions and
antigenic structure of flavivirus envelope proteins 57
Discussion 65

General discussion I 71

R. Padmanabhan, N. Mueller, E. Reichert, C. Yon, T. Teramoto,
Y. Kono, R. Takhampunya, S. Ubol, N. Pattabiraman, B. Falgout,
V. K. Ganesh and K. Murthy  Multiple enzyme activities of flavivirus proteins  74  
Discussion  84

Ting Xu, Aruna Sampath, Alex Chao, Daying Wen, Max Nanao, Dahai Luo, Patrick Chene, Subhash G. Vasudevan and Julien Lescar  Towards the design of flavivirus helicase/NTPase inhibitors: crystallographic and mutagenesis studies of the dengue virus NS3 helicase catalytic domain  87  
Discussion  97

Thomas H. Keller, Yen Liang Chen, John E. Knox, Siew Pheng Lim, Ngai Ling Ma, Sejal J. Patel, Aruna Sampath, Qing Yin Wang, Zheng Yin and Subhash G. Vasudevan  Finding new medicines for flaviviral targets  102  
Discussion  114

Diego Alvarez, Maria F. Lodeiro, Claudia Filomatori, Silvana Fucito, Juan Mondotte and Andrea Gamarnik  Structural and functional analysis of dengue virus RNA  120  
Discussion  132

Vijaya Satchidanandam, Pradeep Devappa Uchil and Priti Kumar  Organization of flaviviral replicase proteins in virus-induced membranes: a role for NS1’ in Japanese encephalitis virus RNA synthesis  136  
Discussion  145

Melinda J. Pryor, Stephen M. Rawlinson, Peter J. Wright and David A. Jans  CRM1 dependent nuclear export of dengue virus type-2 NS5  149  
Discussion  161

Gavin Screaton and Juthathip Mongkolsapaya  T cell responses and dengue haemorrhagic fever  164  
Discussion  171

Edward C. Holmes  The evolutionary biology of dengue virus  177  
Discussion  187

John R. Stephenson  Developing vaccines against flavivirus diseases: past success, present hopes and future challenges  193  
Discussion  201
Martin L. Hibberd, Ling Ling, Thomas Tolfvenstam, Wayne Mitchell, Chris Wong, Vladimir A. Kuznetsov, Joshy George, Swee-Hoe Ong, Yijun Ruan, Chia L Wei, Feng Gu, Joshua Fink, Andy Yip, Wei Liu, Mark Schreiber and Subhash G. Vasudevan  A genomics approach to understanding host response during dengue infection 206

Discussion  214

Nathalie Charlier, Pieter Leyssen, Erik De Clercq and Johan Neyts  Mouse and hamster models for the study of therapy against flavivirus infections 218

Discussion  229

S. Alcon-LePoder, P. Sivard, M.-T. Drouet, A. Talarmin, C. Rice and M. Flamand  Secretion of flaviviral non-structural protein NS1: from diagnosis to pathogenesis 233

Discussion  247

Final discussion  251

Contributor index  254

Subject index  256