

# Current Issues in PHARMACY

Qamar Uddin Ahmad



IIUM PRESS  
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA



# Current Issues in Pharmacy

Editor

Qamar Uddin Ahmed, PhD

Kulliyah of Pharmacy, International Islamic University Malaysia



IIUM Press

Published by:  
IIUM Press  
International Islamic University Malaysia

First Edition, 2011  
©IIUM Press, IIUM

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without any prior written permission of the publisher.

Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Qamar Uddin Ahmed: Current Issues in Pharmacy

ISBN: 978-967-418-019-5

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM  
(Malaysian Scholarly Publishing Council)

Printed by :  
**IIUM PRINTING SDN. BHD.**  
No. 1, Jalan Industri Batu Caves 1/3  
Taman Perindustrian Batu Caves  
Batu Caves Centre Point  
68100 Batu Caves  
Selangor Darul Ehsan

<b>TABLE OF CONTENTS</b>	<b>Page</b>
<b>PREFACE</b>	<b>3</b>
<b>Chapter 1: Issues in Pharmacy Education</b>	
<i>Tariq Abdul Razak</i>	<b>5</b>
<b>Chapter 2: Direct-to-Consumer Advertising in Malaysia: Skirting the Regulations?</b>	
<i>Syahiera Farhana Zakaria; Noordin Othman</i>	<b>15</b>
<b>Chapter 3: Tobacco Control Education in Pharmacy: From Theory to Practice</b>	
<i>Mohamad Haniki Nik Mohamed; Saraswathi Simansalam</i>	<b>25</b>
<b>Chapter 4: Pharmaceutical Promotion: The Theoretical Framework of Regulation</b>	
<i>Noordin Othman; Agnes Vitry; Elizabeth E. Roughead</i>	<b>57</b>
<b>Chapter 5: The Challenge of Pharmaceutical Promotion Regulation in Malaysia</b>	
<i>Noordin Othman; Agnes Vitry; Elizabeth E. Roughead</i>	<b>70</b>
<b>Chapter 6: Innovations in the Delivery of Pharmaceutical Care</b>	
<i>Nurdiana Jamil; Syahiera Farhana Zakaria</i>	<b>88</b>
<b>Chapter 7: Microencapsulation of Gentamicin into PLGA-Chitosan Matrices</b>	
<i>Anas Abdullah Hazim; Ahmad Fahmi Harun Ismail; Mohamed Awang; Farahidah Mohamed</i>	<b>112</b>
<b>Chapter 8: Process Analytical Technology Based Monitoring and Control of Crystal Properties in Pharmaceutical Crystallisation Processes</b>	
<i>Mohd Rushdi Abu Bakar; Zoltan Karman Nagy</i>	<b>129</b>
<b>Chapter 9: Pharmaceutical Application of Solid Dispersion Technology in Improving Solubility of Poorly Soluble Drugs: A Review</b>	
<i>Uttam Kumar Mandal</i>	<b>156</b>

## Current Issues in Pharmacy

<b>Chapter 10:</b> Natural Surfactants for Pharmaceutical Emulsions	
<i>Hadi, J. N; Norazian M. Hassan; Kausar Ahmad</i>	<b>178</b>
<b>Chapter 11:</b> The Vascular Protective Effects of Polyphenols	
<i>Juliana Md Jaffri</i>	<b>196</b>
<b>Chapter 12:</b> The Stress and Free Radical towards Disease and Aging	
<i>May Khin Soe</i>	<b>215</b>
<b>Chapter 13:</b> Research and Development on Antidiabetic Herbs: Malaysia Perspective	
<i>Abdul Razak Kasmuri</i>	<b>227</b>
<b>Chapter 14:</b> <i>In Vitro</i> Activities of Malaysian Antidiabetic Plant Extracts on Adipocyte Cells	
<i>Muhammad Taher; Mohamed Zaffar Ali Mohamed Amiroudine; Deny Susanti</i>	<b>238</b>
<b>Chapter 15:</b> Herbs as Antimicrobial Remedies and the Scientific Evidences	
<i>Norazian M. Hassan; Qamar Uddin Ahmed</i>	<b>249</b>
<b>Chapter 16:</b> Phytochemical Screening Expedition 2009: Drug Discovery From Nature	
<i>Siti Zaiton, M. S; Norazian M. Hassan; Shamsul Khamis</i>	<b>274</b>
<b>Chapter 17:</b> Pharmacology, Phytochemistry, and Toxicity of <i>Rhazya Stricta</i> DECNE	
<i>Saifullah Khan; Farmanullah</i>	<b>285</b>
<b>Chapter 18:</b> Effect of Different Growth Regulators on Shoot Proliferation of Garlic ( <i>Allium sativum</i> L.)	
<i>Santi Rosana; Retno A. Budi Muljono; Ishak</i>	<b>305</b>
<b>Chapter 19:</b> Metals in Herbal Formulations	
<i>A. B. M. Helal Uddin</i>	<b>320</b>
<b>Chapter 20:</b> Flavonoids: Future Pharmaceutical Agents	
<i>Qamar Uddin Ahmed</i>	<b>333</b>

## CHAPTER 11

### **THE VASCULAR PROTECTIVE EFFECTS OF POLYPHENOLS**

*Juliana Md. Jaffri*

*Department of Pharmaceutical Technology, Kulliyyah of Pharmacy, International Islamic University Malaysia, Kuantan, Pahang DM, Malaysia*

Polyphenols have been proven, both in animal and human studies to be beneficial as vascular protective agents. The effect is claimed to be related to the compound antioxidative properties. This effectively blunts the vasoconstriction process, reported to be due to the excessive generation of reactive oxygen species, as observed in many *in vitro* studies using isolated arteries. The mechanism of the vasodilation process involved the endothelium, or it could also be endothelium-independent. In many studies the former seemed to be the main pathway. The role of nitric oxide in endothelium-dependent vasodilation activity of the polyphenols is attributed to its protective effect on the soluble gas from deterioration by ROS, as it is capable of neutralizing the radicals. Polyphenols has also been proven to stimulate endothelial nitric oxide synthase to produce more NO, and hence improve vasorelaxation. Another alternative pathway of the endothelium-dependent vasodilation that is also enhanced by polyphenols is endothelium-dependent hyperpolarizing factor. It was suggested by many authors that this pathway compensates for the failure in NO-dependent vasodilation, but many polyphenol entities have been proven to stimulate this pathway, involving inward rectifier K<sup>+</sup> channels and large conductance Ca<sup>2+</sup>-activated K<sup>+</sup> channels. The third type pf vasodilation is endothelium-