

# Table of Contents

## Preface

## Chapter 1: Materials in Pharmacology and Biomedical Practice

### **Effect of Modified Hydroxypropyl Tapioca Starch and Percentage of Drug Loading on Physical Property of Paracetamol Tablet**

V. Patomchaiviwat, S. Limmatvapirat, C. Sirisapaya, R. Kolae, K. Anantakul and S. Piriyaprasarth

3

### **Physicochemical and Mechanical Properties of Rice Bran Protein Hydrolysate-Loaded Films**

T. Wunnakup, C. Monton, L. Charoenchai and D. Meksuriyen

9

### **A Comparative Study on the Effect of Hydroxypropyl Methylcellulose F4M and Eudragit® E PO on the Physicochemical Properties of Taste-Masking Microparticles**

K. Burapapadhd, N. Wattanakhejorn, P. Sukpipat, S. Promchuay, T. Phengpinit and P. Saokham

15

### **Phase Behavior of Doxycycline Hydyclate-Incorporated Bleached Shellac *In Situ* Forming Gel/Microparticle after Solvent Movement**

S. Senarat, J. Charoenteeraboon, P. Praphanwittaya and T. Phaechamud

21

### **Combination Effects of Gambogic Acid on Imatinib Mesylate Cytotoxicity in Colon Cancer Cells**

E.M. Khaing, T. Saenpunya, P. Kerdklai, S. Pangpongma, S. Vongvijit, T. Phaechamud and T. Intaraphairot

27

### **Low Protein Natural Rubber Latex - Based Polymer Blends for Transdermal Patches of Mefenamic Acid**

J. Suksaeree, W. Pichayakorn, P. Siripornpinyo, S. Chaiprasit and P. Maneewattanapinyo

34

### **Fabrication and Evaluation of Thermally Crosslinked Gantrez S-97 Microneedle Arrays**

Y.Y. Myat, N.N. Aung, T. Ngawhirunpat, T. Rojanarata, P. Opanasopit and P. Patrojanasophon

39

### ***In Vitro* and *In Vivo* Evaluation of Amphiphilic Chitosan Derivatives for Inhibition of Organic Cation Transport Function**

S. Soodvilai, S. Soodvila, W. Sajomsang, T. Rojanarata, P. Patrojanasophon and P. Opanasopit

45

### **Simultaneous Determination of Gallic Acid and Quercetin in Leaf Extract of *Madhuca longifolia* from Myanmar by HPLC-DAD: Method Development and Validation**

A. Thida, O. Toyama and M. Satiraphan

51

### **Development of Clove Oil *In Situ* Gels for Buccal Mucoadhesive**

S. Panomsuk, K. Keawsri, C. Limsatjapanit, N. Asaneesantiwong, P. Chomto and M. Satiraphan

57

### **Development and Physico-Chemical Evaluations of Clove Oil Microemulsions**

S. Panomsuk, N. Porkar, P. Meerasen, N. Kunrattanaporn and M. Satiraphan

62

### **Xanthan Gum-Incorporated Natural Rubber Film Casted with Solvent Evaporation**

N. Puyathorn and T. Phaechamud

68

### **Surface Tension/Contact Angle Characters of Aprotic Binary Borneol-Dimethyl Sulphoxide Mixture**

N. Lertsuphotvanit, S. Tuntarawongsa, J. Mahadlek and T. Phaechamud

74

### **Characterization of Rheological Property of Mucoadhesive Polymeric Sol-Gel in the Presence of Black Ginger *Kaempferia parviflora* Extract**

S. Taokaew, N. Wattanaphraya and W. Kriangkrai

81

### **Synthesis and Characterization of Polyethylene Glycol Modified Chitosan**

P. Prompanya and S. Khondee

87

### **Quantitative Phytochemicals Determination of the Extracts from the Flowers of *Alstonia scholaris* and their Anti-Lipoxygenase Activities**

K. Kamonlakorn, C. Supon, A. Riankrasin, D. Pekthong and S. Parhira

94

### **Enhancement of Antioxidant Activity by the Combination of *Moringa oleifera* and *Perilla frutescens* Seed Oils in Microemulsion**

P. Tunit, S. Kietinun, K. Sriyakul, P. Tungsukruthai and C. Chittasupho

100

### **Antibacterial Agent-Incorporated Cholesterol Phase Inversion-Based *In Situ* Forming Matrix for Crevicular Pocket Delivery**

O. Sethajindalert, K.S. Aung, J. Charoenteeraboon, A. Sirinamaratana and T. Phaechamud

107

<b>The Effect of Spermidine and Spermine on Chitosan-Mediated Gene Delivery</b>	
A. Apirakaramwong, S. Sunthornphan, N. Pasuthawong, T. Intaravicha, N. Ruangthai, T. Rojanarata and P. Opanasopit	113
<b>Comparison of Doxycycline Hyclate Release from Beta-Cyclodextrin Based <i>In Situ</i> Forming Systems for Periodontal Pocket Targeting</b>	
S. Tuntarawongsa, J. Mahadlek, N. Lertsuphotvanit and T. Phaechamud	120
<b>Development and Characterization of Gantrez® S-97 and Hyaluronic Acid Microneedles for Transdermal Fluorescein Sodium Delivery</b>	
P. Suriyaamporn, W. Rangsimawong, P. Opanasopit and T. Ngawhirunpat	125
<b>Role of Citrus Limonoid as a Possible Bioavailability Enhancer</b>	
N. Piyapolrungroj, P. Phattanawasin, U. Sotanaphun and M.P.T. Maw	132
<b>The Solution Improvement of Quercetin Using Spontaneous Emulsification Systems</b>	
Y. Weerapol and S. Tubtimsri	139
<b>Physical, Chemical, and Microbiological Stability of <i>Mucuna pruriens</i> Effervescent Powders and Suspension</b>	
C. Chittasupho, S. Tadtong, S. Vorarat and N. Kamkaen	145

## Chapter 2: Cosmeceuticals and Cosmetic Ingredients

<b>Effects of the Combination of Organic Filter and Inorganic Metal Oxides and the Matrix Formulations on UV and Blue Light Protection Efficiencies</b>	
O. Chunnavong and T. Pitaksuteepong	153
<b>Development of Sunscreen Products Containing Titanium Dioxide and <i>Aloe vera</i> Gel</b>	
T. Kanthik, S. Lokham and S. Sungthongjeen	159
<b>Inhibitory Effect of <i>Perilla frutescens</i> L. Leaves Extract on Melanogenesis and Skin Whitening Efficacy in the Underarm Whitening Product Application</b>	
W. Preedalikit, K. Pintha, P. Tantipaiboonwong, N. Aunsri, P. Vivattanaseth and L. Mungmai	166
<b>Application of Plant Extracts as a Preservative in an Aqueous Gel Formulation</b>	
P. Bupphatanarat, W. Powtongsook, C. Asawahame and P. Wongtrakul	172
<b>Formulation Development of Canine Antifungal Shampoo Containing <i>Senna tora</i> (L.) Roxb. Seed Extract</b>	
L. Charoenchai, N. Chankana, O. Theanhong, S. Jongrungruangchok, D. Meksuriyen and V. Lipipun	181
<b>Optimization of <i>Maclura cochinchinensis</i> Extract as a Cosmeceutical Component for Antioxidant and Anti-Tyrosinase Activities</b>	
B. Vongsak, S. Jaisamut, K. Gonsap and P. Parmontree	188

## Chapter 3: Nanomaterials in Pharmacology

<b>Effect of Emulsifiers on Physical Properties and Stability of Oral Rice Bran Oil Nanoemulsions</b>	
P. Nongnuan and D. Charnvanich	197
<b>Types of Solid Lipids on Physical Stability of Resveratrol-Loaded Nanostructured Lipid Carriers</b>	
B. Chamsai, W. Samprasit, P. Opanasopit, P. Benjasirimongkol and P. Sriamornsak	203
<b>Development and Evaluation of Thermally-Crosslinked Mucoadhesive Gantrez™ S-97/Polyvinyl Alcohol/ Hyaluronic Acid-Catechol Nanofibers</b>	
C. Pornpitchanarong, T. Rojanarata, P. Opanasopit, T. Ngawhirunpat and P. Patrojanasophon	208
<b>Preparation and Evaluation of 6-Maleimidohexanoic Acid Grafted Chitosan Nanoparticles as a Novel Carrier for Intranasal Protein Delivery</b>	
E. Dumkliang, T. Ngawhirunpat, T. Rojanarata, P. Patrojanasophon, B. Pamornpathomkul and P. Opanasopit	214
<b>Electrospinning of Eudragit RS100 for Nerve Tissue Engineering Scaffold</b>	
N. Charernsriwilaiwat, T. Chareonying and P. Opanasopit	220
<b>Development of Antimicrobial Nanoemulsions Containing <i>Nelumbo nucifera</i> Extract</b>	
S. Pengon, N. Chinatangkul, C. Limmatvapirat and S. Limmatvapirat	226
<b>Niosomes Encapsulated Anthocyanins Complex Loaded in a Topical Oral Gel</b>	
S. Limsithichaikoon, A. Priprem and T. Damrongrungruang	232

**Development of Electrospun Shellac and Hydroxypropyl Cellulose Blended Nanofibers for Drug Carrier Application**

N. Chinatangkul, S. Pengon, S. Piriayaprasarth, C. Limmatvapirat and S. Limmatvapirat

239

**Chapter 4: Technologies and Processing Parameters in Pharmacology Production**

**Fabrication of Indomethacin-Loaded Polyvinyl Alcohol Filaments through Hot-Melt Extrusion**

K. Thanawuth and P. Sriamornsak

247

**Shelf-Life Extension of Dried *Kaempferia parviflora* Rhizomes by Gamma Irradiation**

W. Krongrawa, S. Limmatvapirat and C. Limmatvapirat

252

**Effects of Thermal Crosslinking on the Properties and Release Profiles of Three-Dimensional (3D)-Printed Poly Vinyl Alcohol (PVA) Tablets**

T. Chareonying, P. Opanasopit, T. Rojanarata, P. Akkaramongkolporn and P. Patrojanasophon

258

**Optimization of Microencapsulated *Lactobacillus rhamnosus* GG from Whey Protein and Glutinous Rice Starch by Spray Drying**

T. Thamacharoensuk, T. Boonsom, S. Tanasupawat and E. Dumkliang

265

**Response Surface Optimization on Microencapsulation of Lemongrass Essential Oil Using Spray Drying**

T. Boonsom and E. Dumkliang

271

**Validation of UV-Vis Spectrophotometric Method for Stability Evaluation of 5% Extemporaneous Vancomycin Eye Drops in Various Vehicles**

D. Panchapornpon, S. Pengon, N. Chinatangkul and T. Chevadisaikul

277

**Effect of Processing Parameters on Release Profiles of Donepezil Hydrochloride-Loaded Microparticles**

L. Sutthapitaksakul and P. Sriamornsak

283

**Fabrication of a Floating Device of Domperidone Tablets Using 3D-Printing Technologies**

K. Singpanna, T. Chareonying, P. Patrojanasophon, T. Rojanarata, M. Sukma and P. Opanasopit

289

**Development and Evaluation of Astaxanthin Orally Disintegrating Tablets Prepared from Coprocessed Excipients for Use in the Elderly**

T. Sangnim and K. Huanbutta

295

**Optimization for Powder Yield of Spray-Dried Garlic Extract Powder Using Box-Behnken Experimental Design**

N. Khumpirapang, S. Srituptim and W. Kriangkrai

301

**Differential Scanning Calorimetric Analysis for Incompatibility: Sodium Stearate/Magnesium Stearate and Acidic Compounds**

P. Chaiya and T. Phaechamud

307