Novel Psychoactive Substances: Classification, Pharmacology and Toxicology

Edited by

PAUL I. DARGAN MB, BS, FRCPE, FACMT, FRCP, FAACT
Consultant Physician and Clinical Toxicologist, Clinical Director and Reader in Toxicology
London, UK

DAVID M. WOOD MD, FRCP, FACMT, FBPharmacolS
Consultant Physician and Clinical Toxicologist, Senior Lecturer
London, UK
Contents

Forewords ix
List of contributors xiii

Section 1
BACKGROUND

1. Legal Classification of Novel Psychoactive Substances: An International Comparison
LESLIE A. KING
Introduction 3
Traditional Control Mechanisms 8
Recent Developments 16
References 23

ROUMEN SEDEFOV, ANA GALLEGOS, JANE MOUNTENY AND PADRAIG KENNY
Introduction 29
Definitions 31
The Identification, Risk Assessment and Monitoring of Novel Psychoactive Substances 31
The EU Ews Information Exchange 33
International, Regional and National Drug Monitoring Systems 38
Sources for Detecting and Monitoring Novel Psychoactive Substances 42
Conclusions 49
References 49

3. Availability and Supply of Novel Psychoactive Substances
SILAS W. SMITH AND FIONA M. GARLICH
Background 55
Novel Psychoactive Substance Market 57
NPS Origins and Market Entry 58
NPS Market Structure 60
Product 65
Conclusions 71
References 71

4. Epidemiology of Use of Novel Psychoactive Substances
HARRY SUMNALL, JAMES McVEIGH AND MICHAEL J. EVANS-BROWN
Introduction 79
General Population Surveys 80
Summary and Conclusions 98
References 99

5. Social Issues in the Use of Novel Psychoactive Substances: Differentiated Demand and Ideological Supply
FIONA MEASHAM
Introduction 105
Availability 105
Prevalence in Context: Differentiated Demand in Different Leisure Venues 109
Understanding Motivations: The Displacement Question 113
Exploring Social Harms: Legislative Control and the Supply of NPS 116
CONTENTS

Policy Options in a Changing World 119
The NPS Debate: Historical Stagnation and Vested Interests (A UK Perspective) 123
Conclusion 124
References 124

Section 2
ANALYTICAL TECHNIQUES

6. Analytical Techniques for the Detection of Novel Psychoactive Substances and Their Metabolites
FRANK T. PETERS AND MARKUS R. MEYER
Introduction 131
Analytical Methods Covering Several Classes of Novel Psychoactive Substances 137
Methods for Screening and/or Quantification of Novel Psychoactive Substances from Specific Drug Classes 143
Recommendations for Setting up Analytical Methods for Analysis of Novel Psychoactive Substances 149
References 150

Section 3
INDIVIDUAL NOVEL PSYCHOACTIVE SUBSTANCES

7. Synthetic Amphetamine Derivatives
JEFF LAPOINT, PAUL I. DARGAN AND ROBERT S. HOFFMAN
Pharmacology 161
Monomethoxy Derivatives 163
Dimethoxy Derivatives 166
Trimethoxy Derivatives 168
Thiol-Derivatives 169
4-Fluoroamphetamine 170
Monomethyl Derivatives 172
Summary 175
References 175

8. 1-Benzylpiperazine and other Piperazine-based Derivatives
PAUL GEE AND LEO SCHEP
Introduction 179
Pharmacology 180
Toxicology 189
Treatment 197
Chronic Toxicity 201
Dependence and Abuse Potential 201
Conclusion 202
Acknowledgment 203
References 203

9. Mephedrone
DAVID M. WOOD AND PAUL I. DARGAN
Introduction 211
Pharmacology 211
Prevalence of Use 219
Acute Toxicity 221
Mephedrone-Related Deaths 225
Chronic Toxicity 226
Dependence and Abuse Potential 227
References 228

10. Pipradrol and Pipradrol Derivatives
MICHAEL W. WHITE AND JOHN R.H. ARCHER
Pharmacology 233
Prevalence of Use 243
Acute Toxicity 245
Chronic Toxicity 251
Dependence and Abuse Potential 252
Conclusions 253
References 254

11. Aminoindane Analogues
SIMON D. BRANDT, ROBIN A. BRAITHWAITE, MICHAEL EVANS-BROWN AND ANDREW T. KICMAN
Introduction 261
Pharmacology 261
Prevalence of Use 276
Regulation of the Aminoindanes 277
Acute and Chronic Toxicity 278
# CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Authors</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>Synthetic Cannabinoid Receptor Agonists</td>
<td>VOLKER AUWÄRTER, PAUL I. DARGAN AND DAVID M. WOOD</td>
<td>317-338</td>
</tr>
<tr>
<td>14.</td>
<td>Natural Product (Fungal and Herbal) Novel Psychoactive Substances</td>
<td>SIMON GIBBONS AND WARUNYA ARUNOTAYANUN</td>
<td>345-364</td>
</tr>
<tr>
<td>15.</td>
<td>Tryptamines</td>
<td>SHAUN L. GREENE</td>
<td>363-378</td>
</tr>
<tr>
<td>16.</td>
<td>Benzofurans and Benzodifurans</td>
<td>SHAUN L. GREENE</td>
<td>383-390</td>
</tr>
<tr>
<td>17.</td>
<td>Miscellaneous Compounds</td>
<td>SHAUN L. GREENE</td>
<td>393-407</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conclusion</th>
<th>Acknowledgments</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>358</td>
<td>358</td>
<td>359</td>
</tr>
<tr>
<td>378</td>
<td></td>
<td>378</td>
</tr>
<tr>
<td>378</td>
<td></td>
<td>378</td>
</tr>
<tr>
<td>378</td>
<td></td>
<td>378</td>
</tr>
</tbody>
</table>

| Index | 411 |