Phytochemicals, Signal Transduction, and Neurological Disorders
6 Beneficial Effects of Curcumin on Neurological Disorders
6.1 Introduction
6.2 Bioavailability of Curcumin in the Brain
6.3 Molecular Targets of Curcumin
   6.3.1 Transcription Factors as a Target for Curcumin
   6.3.2 Effect of Curcumin on Enzyme Activities and Neurochemical Processes
   6.3.3 Effect of Curcumin on Biochemical Processes in the Brain
6.4 Therapeutic Importance of Curcumin in Neurological Disorders
   6.4.1 Curcumin and Alzheimer Disease
   6.4.2 Curcumin and Dementia
   6.4.3 Curcumin and Parkinson Disease
   6.4.4 Curcumin and Prion Diseases
   6.4.5 Curcumin and Multiple Sclerosis
   6.4.6 Curcumin and Ischemic Injury
   6.4.7 Curcumin and Traumatic Brain Injury
   6.4.8 Curcumin and Spinal Cord Injury
   6.4.9 Curcumin and Epilepsy
   6.4.10 Curcumin and Depression
   6.4.11 Curcumin and Tardive Dyskinesia
   6.4.12 Curcumin and Kainic Acid Neurotoxicity
6.5 Side Effects of Curcumin
6.6 Conclusion
References

7 Beneficial Effects of Resveratrol on Neurological Disorders
7.1 Introduction
7.2 Metabolism and Bioavailability of Resveratrol in the Brain
7.3 Biological Activities of Resveratrol
   7.3.1 Effect of Resveratrol on Transcription Factors
   7.3.2 Regulation of Neuroinflammation by Resveratrol
   7.3.3 Regulation of Oxidative Stress by Resveratrol
   7.3.4 Effect of Resveratrol and Other Wine Polyphenols on Angiogenesis
   7.3.5 Effect of Resveratrol on Silent Information Regulator
   7.3.6 Regulation of Cell Cycle Progression by Resveratrol
7.4 Beneficial Effects of Resveratrol on Neurological Disorders
   7.4.1 Beneficial Effects of Resveratrol on Ischemia/Reperfusion Injury
   7.4.2 Beneficial Effects of Resveratrol on Traumatic Brain Injury
   7.4.3 Beneficial Effects of Resveratrol on Spinal Cord Injury
7.4.4 Beneficial Effects of Resveratrol on Epilepsy
7.4.5 Beneficial Effects of Resveratrol on Alzheimer Disease
7.4.6 Beneficial Effects of Resveratrol on Parkinson Disease
7.4.7 Beneficial Effects of Resveratrol on Other Neurodegenerative Diseases
7.4.8 Beneficial Effects of Resveratrol in Kainic Acid Neurotoxicity
7.5 Conclusion
References

8 Beneficial Effects of Ginkgo biloba in Neurological Disorders
8.1 Introduction
8.2 Bioavailability of Ginkgo biloba in the Brain
8.3 Neurochemical Effects of EGB 761
  8.3.1 EGB 761 and Lipid Peroxidation
  8.3.2 EGB 761 and Transcription Factors
  8.3.3 EGB 761 and Gene Expression
  8.3.4 EGB 761 and Mitochondrial Dysfunction
  8.3.5 EGB 761 and Memory Formation and Consolidation
  8.3.6 EGB 761 and Antiapoptotic Effects
  8.3.7 EGB 761 and Thickening of Aorta
8.4 EGB 761 and Neurological Disorders
  8.4.1 EGB 761 and Stroke
  8.4.2 EGB 761 and Alzheimer Disease
  8.4.3 EGB 761 and Parkinson Disease
  8.4.4 EGB 761 and Huntington Disease
  8.4.5 EGB 761 and Prion Diseases
  8.4.6 EGB 761 and Dementia
  8.4.7 EGB 761 and Depression
  8.4.8 EGB 761 and Attention-Deficit Disorder/Attention-Deficit/Hyperactivity Disorder
  8.4.9 EGB 761 and Autism
  8.4.10 EGB 761 and Migraine Headache
8.5 Side Effects of EGB 761
8.6 Conclusion
References

9 Beneficial Effects of Garlic Components on Neurological Disorders
9.1 Introduction
9.2 Bioavailability of Garlic Constituents in the Brain
9.3 Biological Effects of Garlic Components
  9.3.1 Antioxidant Effects of Garlic Constituents
  9.3.2 Antiinflammatory Effects of Garlic Constituents
9.3.3 Antitumor Effects of Garlic Constituents ................................. 279
9.3.4 Antifungal Effects of Garlic Constituents ................................. 279
9.3.5 Immune System Enhancing Effects of Garlic Constituents ................. 280
9.3.6 Cholesterol Lowering Properties of Garlic Constituents .................. 280
9.3.7 Memory Retention and Garlic Constituents ................................. 281

9.4 Hydrogen Sulfide and Garlic .................................................. 281

9.5 Adverse Effects of Garlic ....................................................... 284

9.6 Effects of Garlic Constituents and Neurological Disorders .................. 286
9.6.1 Garlic Constituents and Ischemic Injury ................................... 287
9.6.2 Garlic Constituents and Alzheimer Disease ................................ 288
9.6.3 Garlic Constituents and Parkinson Disease ................................ 291
9.6.4 Effect of Garlic Constituents in Animal Model of Huntington Disease ... 292
9.6.5 Effect of Garlic Constituents on Depression ............................... 292

9.7 Conclusion .................................................................. 293

References .................................................................. 294

10 Beneficial Effects of Propolis on Neurological Disorders ....................... 301
10.1 Introduction ................................................................ 301
10.2 Chemical Composition and Biological Activities of Propolis ................ 302
10.3 Bioavailability of Propolis Components in the Brain ......................... 307
10.4 Beneficial Effects of Propolis Components on Neurological Disorders .... 309
10.4.1 Beneficial Effects of Propolis Components in Ischemic Injury ............. 311
10.4.2 Beneficial Effects of Propolis Components in Spinal Cord Injury ........ 312
10.4.3 Beneficial Effects of Propolis Components in Epilepsy ..................... 313
10.4.4 Beneficial Effects of Propolis Components in Parkinson Disease ........ 313
10.4.5 Beneficial Effects of Propolis Components in Alzheimer Disease ........ 314
10.4.6 Beneficial Effects of Propolis Components on Experimental Allergic Encephalomyelitis 315
10.4.7 Beneficial Effects of Propolis Components in Anxiety ..................... 315

10.5 Challenges and Side Effects of Propolis ..................................... 316
10.6 Conclusion .................................................................. 316

References .................................................................. 317
11 Perspective and Direction for Future Research on Phytochemicals in Neurological Disorders

11.1 Introduction

11.2 Problems Associated with the Use of Phytochemicals for Human Heath

11.3 Molecular Mechanisms Associated with Beneficial Effects of Phytochemicals

11.4 Unresolved Issues Associated with Therapeutic Use of Phytochemicals

11.5 Challenges for Studies on Therapeutic Use of Phytochemicals in Neurological Disorders

11.6 Conclusion

References

Index