CONTENTS

1. Melatonin—Without the Hype 1
Aaron B. Lerner

2. Serotonin *N*-Acetyltransferase: A Personal Historical Perspective 5
D. C. Klein

3. Evolution of Melatonin-Producing Pinealocytes 17
Horst-W. Korf

4. Melatonin Biosynthesis in Chicken Retina: Regulation of Tryptophan Hydroxylase and Arylalkylamine *N*-Acetyltransferase 31
P. M. Iuvone, N. W. Chong, M. Bernard, A. D. Brown, K. B. Thomas, and D. C. Klein

5. Ultraviolet Light Suppresses Melatonin Biosynthesis in Chick Pineal Gland 43
Jolanta B. Zawilska, Jolanta Rosiak, and Jerzy Z. Nowak

6. Effects of Vasoactive Intestinal Peptide and Histamine on Melatonin and cAMP Production in Chick Embryo Pineal Cells 47
Martina Macková and Dalma Lamošová

7. Ceramide Inhibits L-Type Calcium Channel Currents in Rat Pinealocytes 51
C. L. Chik, B. Li, T. Negishi, E. Karpinski, and A. K. Ho

8. Expression of Melatonin Receptors and 2-[^{125}I]Iodomelatonin Binding Sites in the Pituitary of a Teleost Fish 61
Pascaline Gaildrat and Jack Falcon

9. Melatonin Release from the Pineals of Two Sparids: *Sparus aurata* and *Acanthopagrus bifasciatus* 73
Benny Ron and Darren K. Okimoto

10. Photoendocrine Signal Transduction in Pineal Photoreceptors of the Trout: Role of cGMP and Nitric Oxide 79
B. Zipfel, H. A. Schmid, and H. Meissl

11. Intrinsic Glutaminergic System Negatively Regulates Melatonin Synthesis in Mammalian Pineal Gland 83
Yoshinori Moriyama, Hiroshi Yamada, Mitsuko Hayashi, and Shouki Yatsushiro

12. Synaptic Vesicle Protein SV2B, but Not SV2A, is Predominantly Expressed and Associated with Microvesicles in Rat Pinealocytes 91
Mitsuko Hayashi, Shouki Yatsushiro, Hiroshi Yamada, Akitsugu Yamamoto, Masamitsu Futai, Akihito Yamaguchi, and Yoshinori Moriyama

13. Neuropeptide Y (NPY) and NPY Receptors in the Rat Pineal Gland . . . 95
Jens D. Mikkelsen, Frank Hauser, and James Olcese

14. Signal Transduction in the Rodent Pineal Organ: From the Membrane to the Nucleus 109
Erik Maronde, Martina Pfeffer, Charlotte von Gall, Faramarz Dehghani, Christof Schomerus, Helmut Wicht, Susanne Kroeber, James Olcese, Jorg H. Stehle, and Horst-Werner Korf

15. Regulation of Melatonin Synthesis in the Ovine Pineal Gland: An *in Vivo* and *in Vitro* Study 133
Karen Privat, Michelle Fevre-Montange, Christine Brisson, Didier Chesneau, and Jean-Paul Ravault

16. Melatonin Modulation of Prolactin and Gonadotrophin Secretion: Systems Ancient and Modern 137
Gerald Lincoln

17. The Siberian Hamster as a Model for Study of the Mammalian Photoperiodic Mechanism 155
Bruce D. Goldman

18. How Does the Melatonin Receptor Decode a Photoperiodic Signal in the Pars Tuberalis? 165
Peter J. Morgan, Sophie Messager, Catriona Webster, Perry Barrett, and Alexander Ross

19. Daily and Circadian Expression Patterns of mt1 Melatonin Receptor mRNA in the Rat Pars Tuberalis 175
H. Y. Guerrero, F. Gauer, P. Pevet, and M. Masson-Pevet

20. Molecular Pharmacology and Function of Melatonin Receptor Subtypes 181
Margarita L. Dubocovich, Monica I. Masana, and Susan Benloucif

21. Mechanisms of Melatonin Action in the Pituitary and SCN 191
Jiri Vanecek and Kazuto Watanabe

22. The Roles of Melatonin in Development 199
David R. Weaver

23. Investigation of the Human Mel la Melatonin Receptor Using Anti-Receptor Antibodies 215
Lena Brydon, Perry Barrett, Peter J. Morgan, A. Donny Strosberg, and Ralf Jockers

24. A Pharmacological Interaction between Melatonin and the α_2-Adrenoceptor in Cuckoo Wrasse Melanophores 221
Lena G. E. Mårtensson and Rolf G. G. Andersson

25. SCN Cells Expressing mt_1 Receptor mRNA Coexpress AVP mRNA in Syrian and Siberian Hamsters 229
C. K. Song,T. J. Bartness, S. L. Petersen, and E. L. Bittman

26. Suprachiasmatic Nuclei, Intergeniculate Leaflet, and Photoperiod 233
P. Pevet, N. Jacob, and P. Vuillez

27. Comparison of the Pineal and SCN Rhythmicity: Effect of Photic and Non-Photic Stimuli, Photoperiod, and Age 247
Helena Illnerová, Zdeňka Trávnicková, Martin Jáč, and Alena Sumová

28. Melatonin Normalizes the Re-Entrainment of Senescence Accelerated Mice (SAM) to a New Light-Dark Cycle 261
Shigenobu Shibata, Makoto Asai, Itsuki Oshima, Masayuki Ikeda, and Toru Yoshioka

29. Developmental Expression of Both Melatonin Receptor mt1 mRNA and Melatonin Binding Sites in Syrian Hamster Suprachiasmatic Nuclei 271
François Gauer, Carole Schuster, Vincent-Joseph Poirel, Paul Pevet, and Mireille Masson-Pevet

30. Entrainment of Rat Circadian Rhythms by Daily Administration of Melatonin: Influence of the Mode of Administration 279
H. Slotten, B. Pitrosky, and P. Pévet

31. Melatonin as a Chronobiotic for Circadian Insomnia: Clinical Observations and Animal Models 283
Stuart Maxwell Armstrong

32. Melatonin and Cardiovascular Function 299
Diana N. Krause, Greg G. Geary, Suzanne Doolen, and Sue P. Duckles

33. The Effect of Melatonin on Vasopressin Release under Stress Conditions in Pinealectomized Male Rats 311
Marlena Juszczak, Ewa Bojanowska, Jan W. Guzek, Bozena Stempniak, and Ryszard Dabrowski

34. Motility and Passive Avoidance Modulation by Septal Vasopressin is Dependent on the Pineal Gland 317
Helmut Schwarzberg and Edgar Appenrodt

35. Effects of Melatonin and Its Relation to the Hypothalamic-Hypophyseal-Gonadal Axis 321
Olga Ianăş, Dana Manda, D. Câmpean, Mariana Ionescu, and Gh. Soare

36. Melatonin Influence upon Ovary during Ageing: A Morphometric Study 329
B. E. Fernández, E. Diaz, C. Fernández, and B. Díaz

37. Melatonin Effect during Aging on Reproductive Hormones of Female Rats through the Estrous Cycle 333
B. Díaz, E. Díaz, C. Fernández, P. O. Castrillón, A. I. Esquifino, and B. Marín

38. New Insights into Melatonin Regulation of Cancer Growth 337
David E. Blask, Leonard A. Sauer, Robert T. Dauchy, Eugene W. Holowachuk, and Mary S. Ruhoff

39. Melatonin Synergizes with Retinoic Acid in the Prevention and Regression of Breast Cancer 345
Steven M. Hill, Stephenie Teplitzky, Prahlad T. Ram, Todd Kiefer, David E. Blask, Louaine L. Spriggs, and Kristin M. Eck

40. Melatonin and 9-*cis*-Retinoic Acid in the Chemoprevention of NMU-Induced Rat Mammary Carcinoma 363
S. R. Teplitzky, D. E. Blask, Q. Cheng, L. Myers, and S. M. Hill

41. The Antiproliferative Effects of Melatonin on Experimental Pituitary and Colonic Tumors: Possible Involvement of the Putative Nuclear Binding Site? 369
Marek Pawlikowski, Jolanta Kunert-Radek, Katarzyna Winczyk, Gabriela Melen-Mucha, Anna Gruszka, and Michal Karasek

42. Cytochalasin B Influence on Megakaryocyte Patch-Clamp 373
L. Di Bella, L. Gualano, C. Bruschi, S. Minuscoli, and G. Tarozzi

43. Relationships between Melatonin, Glutathione Peroxidase, Glutathione Reductase, and Catalase: Endogenous Rhythms on Cerebral Cortex in *Gallus domesticus* 377
M. T. Agapito, I. Redondo, R. Plaza, S. Lopez-Burillo, J. M. Recio, and M. I. Pablos

44. Effect of Pinealectomy on Melatonin Levels in the Gastrointestinal Tract of Birds 383
Iveta Herichová and Michal Zeman

45. Melatonin and 5-Methoxytryptamine in the Bioluminescent Dinoflagellate *Gonyaulax polyedra:* Restoration of the Circadian Glow Peak after Suppression of Indoleamine Biosynthesis or Oxidative Stress 387
R. Hardeland, S. Burkhardt, I. Antolín, B. Fuhrberg, and A. Coto-Montes

46. Presence and Possible Role of Melatonin in a Short-Day Flowering Plant, *Chenopodium rubrum* 391
Jan Kolář, Carl H. Johnson, and Ivana Macháčková

47. MLT and the Immune-Hematopoietic System 395
Georges J. M. Maestroni

48. The Use of Melatonin and Co-Treatment with Autologous or Allogeneic Cells as a Model for Control of Malignant β-Cell Leukemia 407
I. Nir, L. Weiss, and S. Slavin

49. Autoradiographic Detection of 2-(^{125}I)-Iodomelatonin Binding Sites in Immune Tissue of Rats 411
R. Konakchieva, S. Manchev, P. Pevét, and M. Masson-Pevét

50. Is Melatonin a Photoperiodic Signal in Humans? 417
Josephine Arendt

51. Melatonin as a Marker and Phase-Resetter of Circadian Rhythms in Humans 425
A. J. Lewy

52. Melatonin and Aging 435
Fred W. Turek, Phyllis Zee, and Olivier Van Reeth

53. Phase of Melatonin Rhythm in Winter Depression 441
Arcady A. Putilov, Galena S. Russkikh, and Konstantin V. Danilenko

54. Influence of Low-Frequency Magnetic Field of Different Characteristics on Serum Melatonin Concentrations in Humans 459
Michal Karasek, Marta Woldanska-Okonska, Jan Czernicki, Krystyna Zylinska, and Jacek Swietoslawski

55. Circadian Serum Melatonin Profiles in Patients with Very Large Goitre Before and After Surgery — Preliminary Report 463
Aleksander Stankiewicz, Krzysztof Kuzdak, Krystyna Zylinska, Elżbieta Bandurska-Stankiewicz, Jacek Swietoslawski, and Michal Karasek

56. Advanced Immunoassays for the Direct Determination of Melatonin in Human Serum and Culture Media 467
Matthias Schumacher, Anita Nanninga, Richard Werner, and James Olcese

Index 473