

Contents

<i>Dedication</i>	v
<i>Preface</i>	vii
<i>Acknowledgments</i>	ix
<i>Contributing Authors</i>	xi

Cardiovascular Adaptations

1. Prevention of hemorrhagic shock-induced disturbances with adaptation to stress or hypoxia <i>Y.V. Arkhipenko, A.G. Zhukova, N.V. Kizichenko and T.G. Sazontova</i>	1
2. Immediate cardiac preconditioning with mild oxidant stresses <i>F.R. Boucher, M.-C. Toufektsian, S. Tanguy, S. Morel and J.G. de Leiris</i>	11
3. Omega-3 fatty acids and resistance of the myocardium to ischemia-induced ventricular arrhythmias <i>M. de Lorgeril, P. Salen and F. Paillard</i>	27
4. Mechanism of action of dietary n-3 polyunsaturated fatty acid during myocardial stunning: Reference to mitochondrial energy metabolism <i>E. Sentex and L. Demaison</i>	32
5. Erythropoietin and vascular endothelial growth factor in humans under normobaric and hypobaric-hypoxic conditions <i>H.C. Gunga, K. Kirsch, L. Röcker, C. Behn, E. Koralewski, E.H. Davila, M.I. Estrada, B. Johannes, P. Wittels and W. Jelkmann</i>	46
6. Myocardial cell engineering <i>S. Tomita, T.M. Yau, D.A.G. Mickle, R.D. Weisel and R.-K. Li</i>	62
7. Saturated, n-3 and n-6 polyunsaturated fatty acids and cardiac arrhythmias <i>D. Moreau</i>	69
8. Cell-cell interactions in cardiomyopathy <i>S. Onishi, N. Kawaguchi, N. Tani, E. Oiki and N. Matsuura</i>	78
9. Mitochondrial membrane alterations by aging and diet: Impact on recovery of myocardial function after stress <i>S. Pepe, F.L. Rosenfeldt, E.G. Lakatta and S.J. Sollott</i>	83
10. Protective effects of cytoplasmic factors on the membrane system of Ca^{2+} transport of myocardial and skeletal muscle sarcoplasmic reticulum <i>T.G. Sazontova, A.A. Matskevich and Yu.V. Arkhipenko</i>	93

11. Oxidative stress and myocyte cell death in the failing human heart 101
D. Kumar, J. Narula, A. Kaushal and P.K. Singal
12. Effects of diabetes on cation contents and contraction in the isolated rat heart 111
F.C. Howarth, M.A. Qureshi, W. Winlow, J. Singh and N.K. Bracken
13. Adaptation of the isolated rat heart to osmotic shock 121
J. Singh, F.C. Howarth, N. Bracken, A.M. Qureshi and B.I. Hustler

Adaptations to Changes in Altitude and Microgravity

14. Nitrogen at raised pressure produces narcosis through an activation of the GABA_A, but not the GABA_B, receptor 131
J.H. Abraini and H.N. David
15. A potential adaptation strategy to enable the toothed whales to reach extreme depths 136
S. Daniels and M.L. Dunstan
16. Microgravity-induced orthostatic intolerance: An arterial microvascular mechanism 144
M.D. Delp
17. Dimensions of *Brachiosaurus brancai*, *Dicraeosaurus hansemani* and *Diplodocus carnegii* and their implications for gravitational physiology 156
H.-C. Gunga, K. Kirsch, J. Rittweger, A. Clarke, J. Albertz, A. Wiedemann, A. Wehr, W.-D. Heinrich and H.-P. Schultze
18. Microgravity-induced vascular hyporesponsiveness: Nitric oxide dependent-mechanisms identified in a ground-based simulation model 170
R.E. Purdy
19. Structural and functional adaptations of vessels to microgravity 179
L.-F. Zhang and L.-N. Zhang
20. Blood volume changes during altitude acclimatization: Implications for aerobic performance 191
A.J. Young and M.N. Sawka
21. Gravitational environment and bone tissue: Lessons from space studies 202
E. Zérath

Environmental Stresses

22. Heatstroke, susceptibility to heat and stress 211
L. Bourdon, F. Canini and A. Buguet
23. NO a cornerstone in sleeping sickness: Voltammetric assessment in animal and man 221
A. Buguet, S. Banzet, B. Bouteille, P. Vincendeau, P. Tapie, F. Doua, P. Boguì and R. Cespuglio

24. Brain nitric oxide in heatstroke <i>F. Canini, L. Bourdon, R. Cespuaglio and A. Buguet</i>	230
25. Brain excitotoxic networks in heatstroke <i>F. Canini and L. Bourdon</i>	239
26. Hypoxitherapy today and in the future <i>A.Ya. Chizhov and A.A. Bludov</i>	248
27. CNS regulation of BAT function and arousal from hibernation in hamsters <i>M. Hashimoto, A. Kuroshima and M. Shibata</i>	261
28. Human colorectal carcinoma is a direct target tissue for growth hormone: Evidence of receptor adaptation <i>D.T. Lincoln, L. Temmim, Mhd. A. Al-Jarallah, Habib T. Abul, F. Clarke and M.J. Waters</i>	267
29. Cellular mechanism responsible for beneficial effects of hypoxic therapy <i>L.D. Lukyanova</i>	289
30. Oxygen-dependent processes in tissues under adaptation to intermittent hypoxia and their clinical significance <i>I. Mankovskaya, Z. Serebrovskaya, R.J. Swanson, V. Nosar, T. Serebrovskaya and K. Lyabakh</i>	304
31. Role of nitric oxide in protective effects of adaptation <i>E.B. Manukhina and I.Yu. Malyshev</i>	312
32. An ultrastructural observation of lungs treated by the hypoxic therapy: An assessment of its therapeutic efficacy as one of the impulse therapy <i>K. Okuyama, J. Jiang and K. Aihara</i>	328
33. Comparison between neurochemical and behavioural effects of high pressure and inert narcotic gases: Is there any adaptive mechanism? <i>J.J. Risso, B. Lego, A. Saget, E. Carre, A. Moulins and O. Darbin</i>	337
34. Nervous system in hyperbaric conditions <i>J.-C. Rostain and R. Balon</i>	344
35. Effect of ageing on morphology and protein secretion and synthesis in the isolated rat lacrimal gland <i>E. Adeghate, J. Singh and C. Draper</i>	350
36. Mechanisms of fatigue during exercise-heat stress <i>A. Strachan and R. Maughan</i>	361
37. Cellular mechanisms of right ventricular hypertrophy in rats adapted to low pressure hypoxia <i>M. Moravec, Z. Turek and J. Moravec</i>	368