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NSAIDs as a New Generation of Anti-tumoral Agents; 1.5.1.4 Other NO Donors with Anticancer Activity; 1.5.2 NO against Virus; 1.5.2.1 HIV-1 Induces NO Production; 1.5.2.2 Antiviral and Proviral Activity of NO; 1.5.3 Inhibition of Bone Resorption; 1.5.4 Treatment of Diabetes; 1.5.5 Thromboresistant Polymeric Films; 1.5.6 Inhibition of Cysteine Proteases; 1.6 Conclusion; References; 2 Organic Nitrates and Nitrites; 2.1 Organic Nitrates 2.1.1 Direct Chemical Reaction between Organic Nitrates and Thiols 2.1.2 Glutathione-S-transferase; 2.1.3 Cytochrome P-450-dependent Systems; 2.1.4 Membrane-bound Enzyme of Vascular Smooth Muscle Cells; 2.1.5 Xanthine Oxidoreductase; 2.1.6 Mitochondrial Aldehyde Dehydrogenase; 2.1.7 Tolerance; 2.2 Organic Nitrites; 2.3 Conclusions; References; 3 N-Nitroso Compounds; 3.1 Introduction; 3.2 N-Nitrosamines; 3.2.1 Synthesis of Nitrosamines; 3.2.2 Physical Properties and Reactions of N-Nitrosamines; 3.2.3 Structure-Activity Relationship of N-Nitrosamines; 3.2.4 Application of N-Nitrosamines 3.3 N-Hydroxy-N-nitrosoamines 3.3.1 Biologically Active N-Hydroxy-N-nitrosamine Compounds; 3.3.2 Synthesis of N-Hydroxy-N-nitrosamines; 3.3.3 Properties of N-Hydroxy-N-nitrosamines; 3.3.4 Reactivity of N-Hydroxy-N-nitrosamines; 3.4 N-Nitrosimines; 3.4.1 Mechanism of Thermal Reaction of N-Nitrosoimine; 3.4.2 Properties of N-Nitrosoimines; 3.4.3 Synthesis of N-Nitrosoimines; 3.5 N-Diazeniumdiolates; 3.5.1 Mechanism of NO Release; 3.5.2 Synthesis of N-Diazeniumdiolates; 3.5.2.1 Ionic Diazeniumdiolates; 3.5.2.2 O-derivatized Diazeniumdiolates; 3.5.3 Reactions of N-Diazeniumdiolates 3.5.4 Clinical Applications 3.5.4.1 Reversal of Cerebral Vasospasm; 3.5.4.2 Treatment of Impotency; 3.5.4.3 Nonthrombogenic Blood-contact Surfaces; 3.5.5 Future Directions; References; 4 The Role of S-Nitrosothiols in the Biological Milieu; 4.1 Structure and Cellular Reactivity of RSNOs; 4.1.1 RSNO Structure; 4.1.1.1 Enzymatic Consumption of RSNOs; 4.1.2 Formation of RSNOs in the Biological Milieu; 4.1.2.1 Nitrite Mediated; 4.1.2.2 NO Mediated; 4.1.2.3 NO Oxidation Products Mediated; 4.1.2.4 Metalloprotein Mediated; 4.1.2.5 Transnitrosation; 4.2 Postulated Physiological roles of RSNOs 4.2.1 Regulation of Blood Flow by HbSNO

## Sommario/riassunto

Nitric oxide is a highly potent regulatory molecule with great pharmaceutical potential. This handbook fills a real gap in combining the chemistry of nitric oxide releasing substances with their practical applications in biology and drug design. It covers all classes of nitric oxide donors, from organic nitrates to nitroso compounds, guanidines and metal-NO complexes. In addition to a detailed treatment of the chemistry of NO donors, numerous examples of successful diagnostic and pharmacological applications are discussed, as well as further therapeutic targets for these substances.