maximum life span, lowering of body temperature and inhibition of spontaneous tumor incidence by 1.5-fold as compared to the control animals. The obtained results prove the safety of chronic administration of Vilon and suggest that its geroprotective properties could be used for prevention of age-related pathologies.[42,43]

The tetrapeptide Ala-Glu-Asp-Gly (molecular weight 390 Da) was synthesized based on the amino acid analysis of Epithalamin. The tetrapeptide obtained was named Epitalon.[44] It showed properties similar to those of Epithalamin: suppression of spontaneous carcinogenesis (Table 20.1) and increase of the life span in experimental animals (Table 20.2).[14] It is important to note that both peptides inhibited aging rate (as per Gompertz equation):[45] Epitalhamin in rats[38] and in C3H/Sn mice,[31] and Epitalon in SHR and CBA mice[14] as compared to the controls.

Epitalon and Epithalamin appeared to be safe alternatives to melatonin in regard to the correction of pineal gland functional insufficiency.[46] Aging leads to decreased production of melatonin, which performs many vital functions.[14,47] Melatonin is involved in the regulation of functions of the central and peripheral nervous systems, endocrine organs and immune system. Decreased melatonin levels caused by the violation of circadian rhythms is considered to be an important factor in reducing life span and causing premature aging and age-related diseases, including cancer.[48,49] Administration of melatonin to experimental animals revealed its geroprotective properties.[14] Melatonin suppressed tumor incidence in chemically or genetically modified animals.[14] Long-term administration of melatonin to CBA mice in spontaneous carcinogenesis models caused the increase of melatonin-mediated malignant tumors (lymphomas) incidence.[50]

Epitalon- and Epithalamin-mediated increases of melatonin levels were recorded in the blood, and also in the pineal gland of old *Macaca mulatta*.[46] Administration of Epitalon to male and female rats stimulated melatonin production during night time, normalized hormonal and metabolic markers and prevented premature aging and tumor development in animals.[51,52]

Thus, administration of short peptides resulted in a number of beneficial effects in different organs and tissues under normal and pathological conditions in experimental studies. However, the mechanisms of their geroprotective and anti-carcinogenic actions are not completely elucidated and require further research.

20.4 Influence of Short Peptides on Immune and Antioxidant Systems

Short peptides of the thymus may produce a specific effect on immunologic responsiveness, homeostasis and metabolism in case of secondary immunodeficiency. Experimental animals administered with Thymogen for 30 days manifested lymphocyte count increase. Remarkably, Thymogen administration resulted in the increase of T-cell count in thymectomy, with its dose 1000