The circadian system evolved as an adaptation to cyclic changes in external conditions on Earth, mainly the alternation of light and dark with a period of solar day. The rhythmic signal is generated at the cellular level and it is controlled by rhythmic expression of clock genes and their protein products. In mammals, the hypothalamic suprachiasmatic nuclei (SCN) are the principal circadian oscillator coordinating daily cycles of physiology and behavior, while in peripheral tissues local oscillators operate. The peripheral oscillators are entrained to the daytime and also among each other, by neuroendocrine signals from the SCN. Mutual synchrony of all the circadian components is necessary for proper function of the organism. The main entraining cue of the circadian system with environment is light, which affect the SCN via retina. In a subgroup of blind people sensing the light in the retina is disturbed and their circadian system cannot be synchronized by light. The SCN controls rhythmic production of melatonin in the pineal gland. This hormone mediates the information about the daytime to other tissues in the body, which are not photosensitive. The circadian system temporally drives many processes, including the cell division cycle. It seems that disruption of the temporal regulation could contribute to incidence of some kind of cancer. In human population, variability in expression of clock genes and their polymorphisms have been detected. The increasing knowledge on the circadian system opens new options of therapy, i.e., chronotherapy, which is based on delivery of the drug at the daytime when its effect is the highest.