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CHRONOBIOLOGICAL ISSUES OF SLEEP AND CIRCADIAN RHYTHMS

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Progress in unravelling the cellular and molecular basis of mammalian circadian regulation over the past decade has provided us with data that deteriorations in measurable circadian output parameters, such as sleep/wake deficits and dysregulation of circulating hormone levels, are common features of most central nervous system disorders.

At the core of the mammalian circadian system is a complex of molecular oscillations within the hypothalamic suprachiasmatic nucleus. These oscillations are modifiable by afferent signals from the environment, and integrated signals are subsequently conveyed to remote central neural circuits where specific output rhythms are regulated. Usually our sleep/wake cycle, temperature and melatonin rhythms are internally synchronized with a stable phase relationship. When there is a desynchrony between the sleep/wake cycle and circadian rhythm, sleep disorders such as advanced and delayed sleep phase syndrome can arise as well as transient chronobiologic disturbances, for example from jet lag and shift work.

Increasing evidence suggests that disrupted temporal organization of biological functions impairs behaviour, cognition, affect, and emotion. Furthermore, disruption of circadian clock genes impairs the sleep-wake cycle and social rhythms, which may be implicated in particular in mental disorders. An increasing number of journal publications point to a crucial role of circadian rhythm dysregulations in particular for affective disorders, which should be addressed specifically in modern psychiatry.