

# Comparative Investigations of the Circadian Rhythm of Duodenum Mitotic Activity in ICR Mice by Using Different Lighting Conditions and Melatonin Treatment

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**Abstract:** The 24-hours changes of mitotic index (MI) in the epithelium of duodenum were studied by using ICR mice, exposed to constant light (LL) or constant dark (DD) for a long time (4 weeks) and daily injected with melatonin at the same time point (13:00 h local time) during the last week of the experiment. Using Cosinor analysis the rhythmical variations of MI were established in both experimental formulations. The periodicity of rhythmical variations was with duration of 25h at LL and 24h at DD conditions. The mean mitotic index (MMI) for the investigated 24-hous period was not significantly changed by daily melatonin injection ( $P>0,05$ ). However, the daily injection of mice with melatonin caused shifting effects on the acrophase and its earlier onset mainly in the case with LL. The magnitude of acrophase shifting was more expressed at LL. The acrophase advanced by 6 hours. In the case with DD and melatonin treatment the acrophase range becomes shorter. The obtained results suggest that in absence of photoperiodism daily application of melatonin can influence on the circadian clock as a timekeeper.

**Key words:** circadian rhythm, melatonin, MI, LL, DD, ICR mice, duodenum.