

Reduced light-induced per2 mRNA in NPY knockout mice.

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Neuropeptide Y (NPY) plays an important role in regulating biological rhythms, specifically by blocking the effects of light on circadian phase. Previous research has shown that light-induced phase delays are reduced in NPY knockout mice (1). In hamsters, per2 mRNA expression in response to light is reduced by NPY pretreatment (2). Based on these observations, this study aims to investigate levels of light-induced per2 mRNA in wild type and NPY knockout mice. NPY knockout mice were bred in our colony from founder animals generously provided by Dr. R. Palmiter (University of Washington; 3). Mice (n=20) were housed under a 12:12 LD cycle, after which half of them were exposed to a 15 minute light pulse (200 lux) at ZT 16 and half of the mice remained in darkness. The mice were overdosed with halothane and sacrificed 1.5 h after light exposure. Brains were stored at -80°C and cryostat-sectioned. Sections containing the suprachiasmatic nucleus (SCN) were then evaluated by in situ hybridization with [³⁵S]-labeled cRNA probes for per2 mRNA (480 bp). A difference between levels of mRNA expression in the mice exposed to light versus those kept in the dark was evident (F(3,13)=7.96, p=0.003). Further analysis showed a statistically significant reduction in per2 mRNA levels in light-exposed NPY knockout mice (t(8)=2.63, p=0.03). These results are consistent with our previous studies showing decreased phase shifts to light in these NPY knockout mice.

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