

Journal of Andrology, Vol 22, Issue 2 245-254, Copyright © 2001 by The American Society of Andrology

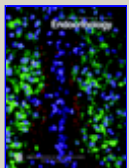
## JOURNAL ARTICLE

# Melatonin inhibits the expression of steroidogenic acute regulatory protein and steroidogenesis in MA-10 cells

C. S. Wu, S. F. Leu, H. Y. Yang and B. M. Huang  
Department of Biology, National Cheng Kung University, Tainan, Taiwan, Republic of China.

The effects of melatonin on steroidogenesis and steroidogenic acute regulatory (StAR) protein expression were investigated in MA-10 mouse Leydig tumor cells. MA-10 cells were treated with human chorionic gonadotropin/cyclic adenosine monophosphate (hCG/cAMP) analogue alone or with hCG/cAMP analogue plus melatonin in different dosages (0.1 nM to 10 µM). Steroid production and the expression of StAR protein were measured. Melatonin directly inhibited hCG- or dbcAMP-stimulated progesterone production in MA-10 cells within 3 hours. The inhibitory effects of melatonin on hCG- or dbcAMP-stimulated steroid production in MA-10 cells were abolished by a comparative melatonin receptor antagonist, luzindole. 22R-hydroxycholesterol reversed melatonin's inhibitory effects, which illustrated that melatonin did not suppress P450<sub>scc</sub> enzyme activity. Moreover, StAR protein expression stimulated by hCG and dbcAMP was maximally reduced by 10 nM of melatonin treatment for 3 hours. The effects of prolonged exposure (12 h) to melatonin with dbcAMP stimulation in MA-10 cells were also examined. The expression of StAR protein and steroid production were reduced by melatonin concentrations from 1 nM to 10 µM. However, melatonin at a dose of 1 nM had no effect in 3-hour treatment. Our results indicate that melatonin suppressed MA-10 mouse Leydig cell steroidogenesis through specific binding sites by blocking StAR protein expression without altering the activity of P450<sub>scc</sub> enzyme.

This article has been cited by other articles:



### Endocrinology

[HOME](#)

M. B. Frungieri, A. Mayerhofer, K. Zitta, O. P. Pignataro, R. S. Calandra, and S. I. Gonzalez-Calvar

Direct Effect of Melatonin on Syrian Hamster Testes: Melatonin Subtype 1a Receptors, Inhibition of Androgen Production, and Interaction with the Local Corticotropin-Releasing Hormone System  
Endocrinology, March 1, 2005; 146(3): 1541 - 1552.

[\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)

### This Article

- ▶ [Full Text \(PDF\)](#)
- ▶ [Alert me when this article is cited](#)
- ▶ [Alert me if a correction is posted](#)

### Services

- ▶ [Similar articles in this journal](#)
- ▶ [Similar articles in PubMed](#)
- ▶ [Alert me to new issues of the journal](#)
- ▶ [Download to citation manager](#)

### Citing Articles

- ▶ [Citing Articles via HighWire](#)
- ▶ [Citing Articles via Google Scholar](#)

### Google Scholar

- ▶ [Articles by Wu, C. S.](#)
- ▶ [Articles by Huang, B. M.](#)
- ▶ [Search for Related Content](#)

### PubMed

- ▶ [PubMed Citation](#)
- ▶ [Articles by Wu, C. S.](#)
- ▶ [Articles by Huang, B. M.](#)



C. Torres-Farfan, H. G. Richter, A. M. Germain, G. J. Valenzuela, C. Campino, P. Rojas-Garcia, M. L. Forcelledo, F. Torrealba, and M. Seron-Ferre

Maternal melatonin selectively inhibits cortisol production in the primate fetal adrenal gland

J. Physiol., February 1, 2004; 554(3): 841 - 856.

[\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)