Desynchronizing plasmodium cell cycle by a melatonin antagonist: a potential therapeutic target in malaria?

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We have previously shown, *in vivo* and *in vitro,* that the hormone melatonin is responsible for the synchronous development of Plasmodia. Melatonin can also mobilize calcium from internal stores in these parasites and this response is abolished by luzindole, a melatonin-receptor antagonist (Hotta *et al*., 2000). Here we investigate the role of the synchronicity of *Plasmodium* life cycle in the survival of infected mice, and the role of melatonin in *P. berghei,* that display an asynchronous development *in vitro* and *in vivo*.
In vivo alteration of parasite synchronous development, using luzindole (15 mg/Kg), dramatically increases the antimalaria activity of chloroquine (1.5 mg/Kg), with a 3-fold increase in survival rate at the end of the 10-day experiment. We also show that *in vitro* melatonin is unable either to modulate cell cycle, or to elicit an elevation in intracellular calcium concentration in *P. berghei*.
This data provides novel evidence suggesting that the malaria parasite uses the cell cycle synchrony as one of the strategies to evade the host immune system and the lack of synchrony observed in *P. berghei* may be due to the absence of response to melatonin.

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