

# Evolution of the Pineal Gland: *Did Melatonin Start Out as Metabolic Garbage?*

by **David C. Klein**

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David Klein's group studies signal transduction in the pineal gland, with primary focus on the biochemistry and molecular biology of the first enzyme in the serotonin-melatonin conversion pathway, serotonin N-acetyltransferase (arylalkylamine N-acetyltransferase, AANAT). The production of melatonin is increased at night in all vertebrates due to a marked increase in AANAT activity in the pineal gland. As such, AANAT plays an essential role in vertebrate physiology in translating darkness into a circulating signal. Melatonin is also synthesized in the vertebrate retina, where it appears to enhance dark adaptation. Current research is focused on structure-function studies of AANAT, the group having determined the mechanisms of catalytic action, and the 3-D structure by X-ray crystallography. In addition, studies are underway on the regulation of its activity at the level of transcription and by controlled proteasomal proteolysis.

**Date:** 6 Dec 2003, Saturday  
**Time:** 10 am  
**Venue:** DBS Conference Room  
Blk S3 Level 5  
**Host:** Dr Philippa Melamed

All are welcome

