

Sexual dimorphism in orexin receptor type two (*TcasOX2R*) expression in fat body and gonads of the storage beetle *Tribolium castaneum*



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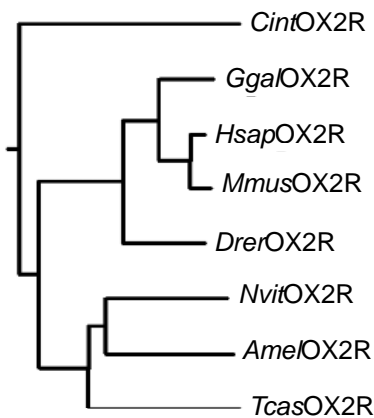
- 1 - Insect Physiology & Molecular Ethology
- 2 - Molecular Developmental Physiology & Signal Transduction
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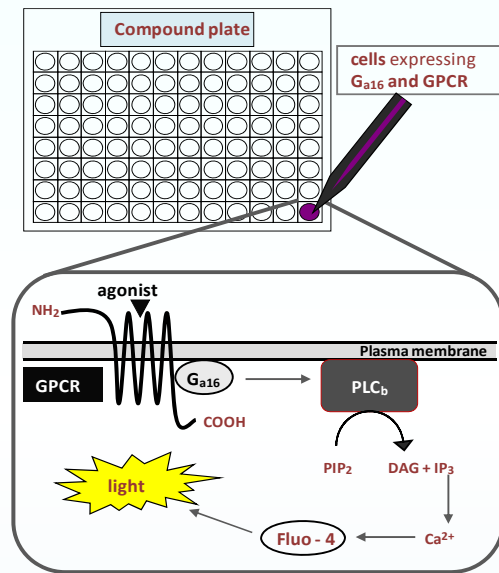
State of the art:

In most vertebrates the orexin pathway regulates feeding, sleeping, energy homeostasis and overall vigilance (1).



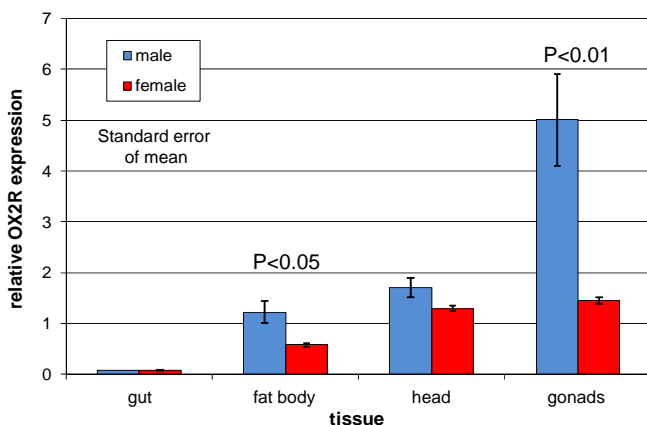
We cloned a homolog of G-protein coupled orexin receptor type two (*TcasOX2R*) from storage beetle head cDNA. This receptor has a 47.2 % identity score with the wasp *Nasonia vitripennis* counterpart and aligns well with mammalian homologs (>33 %).

GPCR reporter assay



A HPLC fraction of an acidic extract of *Tribolium* heads activates the *TcasOX2R* in an *in vitro* reporter assay. Further purification will enable us to identify the endogenous ligand.

tissue distribution OX2R in *Tribolium castaneum*



Tissue distribution

q-PCR gene expression profiling highlights significant expression in the CNS, fat body and highest in the gonads.

The testes express significantly higher amount of OX2R compared to ovaries. The high expression in the fat body, the liver equivalent, points to a role in energy homeostasis as predicted in vertebrates

Conclusion:

Our results confirm dimorphism in gonadal *TcasOXR* expression as described previously in rat and bird (2). Elucidating the endogenous ligand(s) will allow us to further elaborate this evolutionary relationship.

(1) Teske et al., 2010 Acta Physiol. 44, 133-138

(2) Ohkubo et al., 2003, J.Mol. Endocrinol. 31, 499-508