



## The GPCR membrane receptor, DopEcR, mediates the actions of both dopamine and ecdysone to control sex pheromone perception in an insect

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Olfactory information mediating sexual behavior is crucial for reproduction in many animals, including insects. In male moths, the macroglomerular complex (MGC) of the primary olfactory center, the antennal lobe (AL) is specialized in the treatment of information on the female-emitted sex pheromone. Evidence is accumulating that modulation of behavioral pheromone responses occurs through neuronal plasticity via the action of hormones and/or catecholamines. We recently showed that a G-protein-coupled receptor (GPCR), AipsDopEcR, with its homologue known in *Drosophila* for its double affinity to the main insect steroid hormone 20-hydroxyecdysone (20E), and dopamine (DA), present in the ALs, is involved in the behavioral response to pheromone in the moth, *Agrotis ipsilon*. Here we tested the role of AipsDopEcR as compared to nuclear 20E receptors in central pheromone processing combining receptor inhibition with intracellular recordings of AL neurons. We show that the sensitivity of AL neurons for the pheromone in males decreases strongly after AipsDopEcR-dsRNA injection but also after inhibition of nuclear 20E receptors. Moreover we tested the involvement of 20E and DA in the receptor-mediated behavioral modulation in wind tunnel experiments, using ligand applications and receptor inhibition treatments. We show that both ligands are necessary and act on AipsDopEcR-mediated behavior. Altogether these results indicate that the GPCR membrane receptor, AipsDopEcR, controls sex pheromone perception through the action of both 20E and DA in the central nervous system, probably in concert with 20E action through nuclear receptors.

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### **Liens**

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