

Function and central projections of gustatory receptor neurons on the antenna of the noctuid moth *Spodoptera littoralis*

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Résumé en
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Chemosensory information is crucial for most insects to feed and reproduce. Olfactory signals are mainly used at a distance, whereas gustatory stimuli play an important role when insects directly contact chemical substrates. In noctuid moths, although the antennae are the main olfactory organ, they also bear taste sensilla. These taste sensilla detect sugars and hence are involved in appetitive learning but could also play an important role in food evaluation by detecting salts and bitter substances. To investigate this, we measured the responses of individual taste sensilla on the antennae of *Spodoptera littoralis* to sugars and salts using tip recordings. We also traced the projections of their neuronal axons into the brain. In each sensillum, we found one or two neurons responding to sugars: one NaCl-responsive and one water-sensitive neuron. Responses of these neurons were dose-dependent and similar across different locations on the antenna. Responses were dependent on the sex for sucrose and on both sex and location for glucose and fructose. We did not observe a spatial map for the projections from specific regions of the antennae to the deutocerebrum or the tritocerebrum/suboesophageal ganglion complex. In accordance with physiological recordings, back-fills from individual sensilla revealed up to four axons, in most cases targeting different projection zones.

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