

## DESCRIPTION FOR THE GENERAL PUBLIC

Ambient temperature perception is essential for ectotherms. It allows the organisms to stay in the temperature range that enables optimal functioning of the fundamental biochemical and physiological processes. The effectiveness of ambient temperature perception, and in consequence, behavior in regulating body temperature, is especially important in variable environments and under changing climatic conditions. Perception of ambient temperatures allows insects to regulate their body temperature behaviorally, and therefore enable an ectotherm to defend against variable temperatures.

Receptors belonging to TRP family are responsible for perception of thermal stimuli. They are named thermo-TRP. Some natural substances are known to modulate thermoregulatory processes by affecting thermoreceptors belonging to TRP channel family. This phenomenon is often used in medicine, for example capsaicin is used in warming topical ointments or dermal patches (capsaicin is also used to relieve pain), while menthol is a component of many drugs and cosmetics that provides a cooling sensation (for example to treat sunburns, or in toothpaste). For this reason mammalian reactions to agonists and antagonists of thermo-TRP are relatively well studied. Recently it is known that TRP channels plays an important role in perception of temperatures in insects. However, little is known about their actual role in insect thermoregulation.

The aim of our proposal is to evaluate the effect of thermal environment changes on the activity of thermo-TRP in insects. It is known that changes in lipid composition is a common response of ectotherms to temperature variation and occurs with temperature acclimation or seasonal acclimatization. Lipid restructuring affects also the function of membrane proteins, such as TRP receptors. In our experiments we want to assess how the activity of thermo-TRP will change during acclimation. The results obtained will show how temperature variation (associated for example with seasonal acclimatization) may change the activity of insects' thermoreceptors, therefore modifying insects perception of ambient temperatures.