

**OR328***Reinstatement in honeybees is context-dependent***Jenny Aino Plath, Johannes Felsenberg, Dorothea Eisenhardt**

During extinction animals experience that the previously learned association between a conditioned stimulus (CS) and an unconditioned stimulus (US) no longer holds true. Accordingly, the conditioned response (CR) to the CS decreases. This decrease of the CR can be reversed by presentation of the US alone following extinction, a phenomenon termed reinstatement. Reinstatement and two additional phenomena, spontaneous recovery and renewal, indicate that the original CS-US association is not lost through extinction but can be reactivated through different processes. In honeybees (*Apis mellifera*), spontaneous recovery, i.e., the time-dependent return of the CR, has been demonstrated, suggesting that also in these insects the original CS-US association is not lost during extinction. To support this notion, we ask whether honeybees show reinstatement after extinction. In vertebrates reinstatement is context-dependent. Thus we examined whether the same holds true for honeybees. We demonstrate reinstatement in restrained honeybees and show that reinstatement is context-dependent. In addition, we show that an alteration of the wavelength of light, i.e. its colour, illuminating the experimental setup suffices to indicate a contextual change. We conclude that in honeybees the initially formed CS-US memory is not lost after extinction. Rather, honeybees might learn about the context during extinction. This enables them to adequately retrieve one of the two opposing memories about the CS that have been formed after extinction.