

# Interplay between behavioural thermoregulation and immune response in mealworms

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Since the preferential body temperature should positively correlate with physiological performance, behavioural fever should enhance an organism's immune response under an immune challenge. Here we have studied the preferential body temperature ( $T_p$ ) and its consequences on immune response performance after an immune challenge in larvae of *Tenebrio molitor*. We evaluated  $T_p$  and immune responses of larvae following a challenge with various concentrations of lipopolysaccharide (LPS), and we studied the correlation between  $T_p$  and two immune traits, namely antibacterial and phenoloxidase (PO) activities. Larvae that were immune challenged with higher LPS concentrations (C50 and C100) preferred in average, warmer temperatures than did larvae challenged with lower concentrations (C0 and C25).  $T_p$  of C25-C100 (challenged)-mealworms was 2.3°C higher than of C0 (control) larvae. At lower LPS concentration immune challenge (C0 and C25) antibacterial activity correlated positively with  $T_p$ , but at C5