

Fig. S1: Survival curves from whole-body heating

As a supplement to the experiments with ventral whole-body heating (main manuscript) we performed a set of experiments with dorsal heating. Here, the fly in a pipette tip was placed on its back on the heating stage, such that heat could be applied dorsally, and temperature was measured on the ventral side. The transverse temperature gradient with dorsal heating was not different from the gradient that arose from ventral heating (2.58 ± 0.17 °C, two sample t-test, $t=-0.204$, $df=13.56$, $p=0.842$). Pairwise comparisons of 95% confidence intervals within body parts between ventral and dorsal heating showed no differences between the two heating methods (overlapping 95% confidence intervals). The temperature of the head seemed to be most influenced by heating method, which could be because the head is connected with the thorax more towards the ventral side. This means that a fly placed on its back “holds its head high”. During ventral heating there was a small difference in temperature between the head and the abdomen (red curves, non-overlapping 95% confidence intervals).

Comparison of survival curves for ventrally and dorsally whole-fly heated *D. mojavensis*. Shaded rectangles represent 95% confidence interval around the LT_{50} estimates, the LT_{50} estimates are also shown near the temperature axis (dorsal heating; diamonds, ventral heating; triangles). Sample size was $n=24$ (ventral heating) and $n=12$ (dorsal heating).

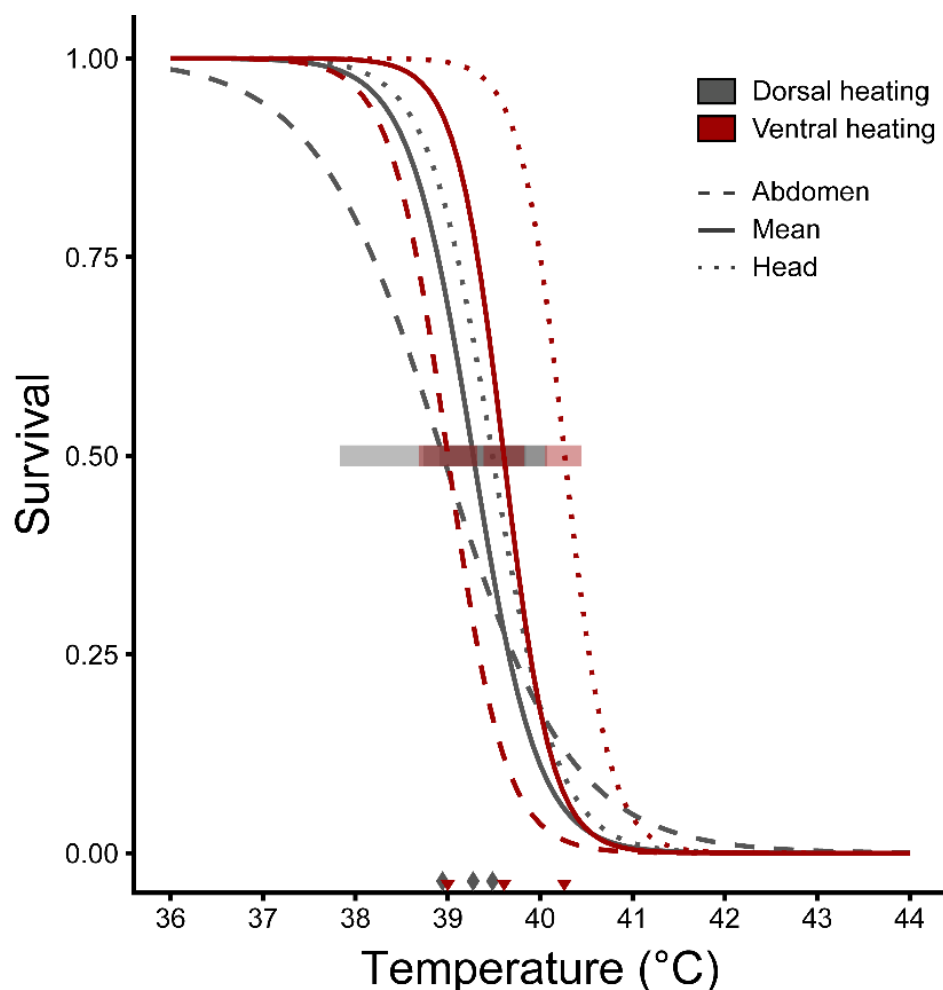


Fig. S2: Prevalence of single SD events

Occurrence of single SD events was more prevalent in ramp experiments than during static heat exposure, even when the ramp was preceded by a 1-hour constant heat exposure. Total bar height corresponds to the percent of single SD events within experiment type (listed as proportion of n), while coloured parts are proportional to the species distribution of single events within experiment type. For the group 'static+ramp', only *D. melanogaster* and *D. mojavensis* were tested, and here all the single SDs occurred during the ramp.

