



**Figure S5** Sleep analyses of *yar* mutants. A. Analysis of circadian rhythm. Shown is the locomotor activity of females from the reference *yar*<sup>+/+</sup> (*y1 yar*<sup>+</sup> *w67c23*, white bar) and the *yar* mutant (*y1 yar*<sup>ΔHR2</sup> *w67c23*) line kept in constant dark for ten days, after being reared for three days under twelve hr light/ twelve hr dark conditions. Circadian periodicity was calculated using the autocorrelation function of ClockLab software (Actimetrics at <http://www.actimetrics.com/>). The autocorrelation analysis shows that both strains maintain normal circadian rhythmicity under this free running condition. The average periods for reference and *yar*<sup>ΔHR2</sup> were 23.72 and 23.99 hrs, respectively. B. Analysis of waking activity. Waking activity index in the reference *yar*<sup>+/+</sup> (*y1 yar*<sup>+</sup> *w67c23*, white bar) line and *yar* mutant lines (black bars) is calculated as a ratio of activity counts per waking time. Introduction of P[*yar w*] does not reduce the waking activity in rescued *yar* mutants. Kruskal-Wallis one way ANOVA, \*, *P*<0.005.