DOI 10.18699/SBB-2022-627

Role of Hsp70 chaperones in age-related changes in skeletal muscle proteome in *Drosophila melanogaster*

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Key words: *Drosophila melanogaster, Hsp70,* mitochondria

Motivation and Aim: Aging is associated with changes in many cellular functions, including a decrease in mitochondria function in skeletal muscles. Chaperones regulate proteostasis, controlling protein refolding and nonspecific aggregation. We aimed to investigate the role of chaperones of the Hsp70 family in age-related changes in skeletal muscle proteome in *D. melanogaster*.

Methods: Males of the *D. melanogaster Hsp70*-(Df(3R)Hsp70A,Df(3R)Hsp70B),strain with knockout of 6 genes from the *Hsp70* family, were used in the study, as well as males of the control parent strain *w1118*. General functional status of flies was assessed during the life by vertical climbing speed. Fly's legs were prepared to evaluate genotype- and age-related changes in the proteome of skeletal muscles using shotgun quantitative (with isobaric labeling) proteomic.

Results: There were no differences in survival between strains. Young *Hsp70*-flies show 2 times lower climbing speed compared to *w1118*. During aging only *w1118* showed a decrease in the climbing speed, while the climbing speed of *Hsp70*-flies remained at a constant (and substantially reduced) level compare to the control. We detected 725 highly abundant proteins in skeletal muscle: the content of 67 and 88 proteins was reduced and increased respectively, in old *Hsp70*-compared to the age-matched control.

Conclusion: Knockout of Hsp70 family genes does not affect lifespan, but reduces locomotor activity and down regulates proteins associates with carbohydrate metabolism and oxidation-reduction processes, in particular, with pentose phosphate pathway and cytochrome c oxidase.

Acknowledgements: The study was supported by the Russian Science Foundation (grant 21-15-00405).