Scientists discover group of genes connected to longer life in fruit flies

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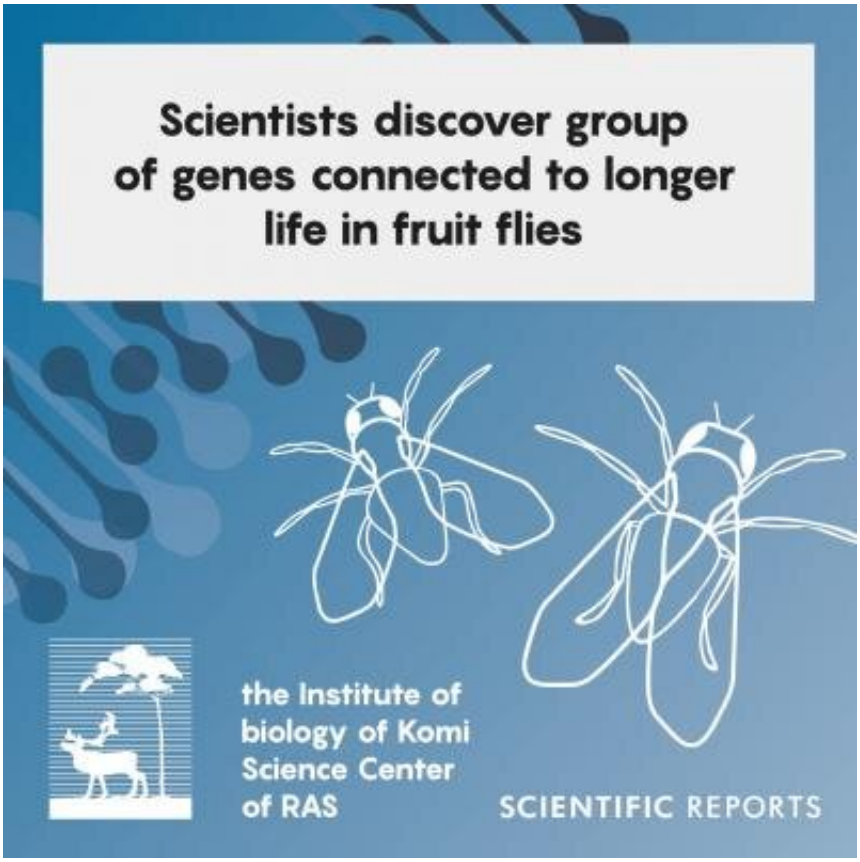

E(z) longer life - New insights on genes linked to longer life. Credit: Insilico Medicine

Alexey Moskalev, Ph.D., Head of the Laboratory of Geroprotective and Radioprotective technologies and co-authors from the Institute of biology of Komi Science Center of RAS, the Engelgard's Institute of

molecular biology of RAS and Moscow Institute of Physics and Technology published an article titled "Transcriptome Analysis of Long-lived Drosophila melanogaster E(z) Mutants Sheds Light on the Molecular Mechanisms of Longevity" in *Nature Scientific Reports*.

The study sheds light on a genetic mutation found in a fruit flies that may result in longer lifespans. Using genome-wide transcriptome analysis, the team noted that lifespan extension and stress resistance in fruit flies—Drosophila—carrying the E(z) histone methyltransferase heterozygous mutation (E(z)), were correlated with changes in the expression levels of 239 genes. The expression levels of some of the genes were doubled in flies with the E(z) mutation.

According to the results of the study, the mutant flies had a 22 to 23 percent lifespan extension compared to the control group. In addition, these flies were more resistant to hyperthermia, oxidative stress and endoplasmic reticulum stress, which can disrupt processes designed to help cells stay healthy. The mutant flies were also more fertile, the researchers added.

E(z) genes appear connected with gene expression that affects metabolism, such as carbohydrate metabolism, lipid metabolism, drug metabolism and nucleotide metabolism. The expressions that related to aging were involved in pathways related to the immune response, cell cycle and ribosome biogenesis.

"The findings may be a step toward investigating whether the E(z) mutation could play a role in human longevity and have implications for understanding the role of global de-repression of chromatin in aging," said Dr. Alexey Moskalev, Ph.D., head of the Laboratory of Geroprotective and Radioprotective technologies.

The Laboratory of Geroprotector and Radioprotector Technologies

studies the molecular and genetic mechanisms of lifespan regulation, the aging process, stress resistance and radioresistance. The scientific team succeeded in identifying several dozen genes with pro-longevity action. Geroprotective effects of various pharmacological agents, natural compounds and plant extracts on aging-related signaling pathways, lifespan and physiological functions are being actively studied. Members of the laboratory team contributed to the data libraries DrugAge and Geroprotectors.org in collaboration with leading institutions around the world.

More information: Alexey A. Moskalev et al. Transcriptome Analysis of Long-lived Drosophila melanogaster E(z) Mutants Sheds Light on the Molecular Mechanisms of Longevity, *Scientific Reports* (2019). DOI: 10.1038/s41598-019-45714-x

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