Gene *dilp6* Regulates Octopamine Metabolism in *Drosophila melanogaster*

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Abstract—The effect of strong hypomorphic mutation of the insulin-like protein gene (*dilp6*) on metabolism of octopamine (one of the main biogenic amines in insects) was studied in *Drosophila melanogaster* males and females. The activity of tyrosine decarboxylase (the key enzyme of octopamine synthesis) and the activity of octopamine-dependent N-acetyltransferase (the enzyme of its degradation) were measured. It was demonstrated that the activity of both studied enzymes is decreased under normal conditions in the $dilp6^{41}$ mutants (as we previously demonstrated, this is correlated with an increased level of octopamine). It was also found that hypomorphic mutation of the *dilp6* gene decreases the intensity of tyrosine decarboxylase response to heat stress. Thus, it was demonstrated for the first time that insulin-like DILP6 protein in drosophila influences the level of octopamine (regulating the activity of the enzyme degrading octopamine).

Keywords: octopamine, insulin signaling pathway, *Drosophila*, stress

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