

# Identification of Pipsqueak interacting proteins in *Drosophila melanogaster*

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Combinatorial expression of the genes in multicellular organisms leads to the development of different cell types. The important epigenetic regulators of higher eukaryotes are the Polycomb group (PcG) and Trithorax group (TrxG) proteins. PcG and TrxG proteins act antagonistically: PcG proteins repress, while TrxG proteins activate gene transcription. These factors control the transcription of a large number of genes involved in various cellular processes. Dysregulation of PcG and TrxG systems leads to developmental abnormalities and cancer. It was demonstrated that, in *Drosophila*, PcG and TrxG proteins communicate with specialized DNA elements termed PREs (Polycomb Response Elements). PREs are bifunctional elements that can act as repressors as well as activators of transcription. The number of DNA-binding proteins involved in recruitment of PcG/TrxG complexes to chromatin were identified. One of the is the Pipsqueak (Psq) protein that interacts with (GA)<sub>n</sub> sequences. In current study, we have affinity purified Psq complex and analyzed it by a highly sensitive mass spectrometric analysis. As a result, we have identified a number of known PcG and Trx group proteins, including PRE DNA-binding factors and ATP-dependent chromatin remodelers. A number of previously unknown and not related to PcG/TrxG group Psq partners were identified suggesting that they together with Psq can participate in regulation of transcription. This work is supported by the Russian Science Foundation (project 18-74-10091).