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The role of uracil-DNA in *Drosophila melanogaster*

During *Drosophila melanogaster* development, dUTPase expression is restricted to imaginal primordium tissues in larvae. Besides this, in tissues where there is no dUTPase expression the uracil content of the DNA is elevated. RNA silencing of dUTPase in the whole organism causes pupal lethality and elevated uracil content of the DNA in imaginal primordium. Our aim was to investigate alterations in the DNA of dUTPase silenced animals which could cause the lethality. We also wanted to perform experiments to rescue the lethal phenotype. In the imaginal wing discs of silenced animals we detected DNA strand breaks using two different methods (TUNEL assay, pH2AX immunostaining). We concluded that absence of dUTPase decreased DNA integrity. Partial silencing in the wing disc caused abnormal curled wings as well. Our experiments to rescue the lethality were successful with overexpression of *Drosophila*, human and *E. coli* dUTPases. Our theory is that Thd1 (TDG homologue in *Drosophila*) can be responsible for the DNA strand breaks in the silenced animals. We showed that absence of Thd1 causes increase in the uracil content of the DNA. In animals in which both dUTPase and Thd1 is silenced there was rescue at lower temperature (18°C). Thd1 silencing parallel with dUTPase silencing in the wing disc also causes partial rescue of the wing phenotype. In the future we would like to examine the DNA of double silenced animals (Uracil content measurement, TUNEL assay, pH2AX immunostaining.) Our plan is to perform more rescue experiments with different modified *Drosophila* dUTPases too.

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