Roles of Tribbles in Tumor Formation in Drosophila melanogaster

Allen, Alexis

The model organism, Drosophila melanogaster, is commonly used in research due to their similarities to humans, ability to rapidly reproduce, and the simplicity of their genetic code. Phosphatase and tension homolog (PTEN) is a tumor suppressant that can alter cell proliferation based on its expression. Tribbles, a recently found gene, is important in insulin signaling pathways as its activity helps regulate the cell cycle as well as contributes to insulin resistance. The wings of Drosophila show distinguished genetic expressions. This experiment misexpressed PTEN-RNAi, tribbles-RNAi, and other insulin signaling components (PI3Kinase and S6Kinase). RNAi (ribonucleic acid interference) is a double stranded RNA molecule that can inhibit/regulate gene expression. It's a gene silencer in Drosophila. The wings of Drosophila expressing multiple combinations of the genes listed above along with a control were collected to calculate the density of trichomes and the total area of specific regions within the wing. The ratio of the total area and density of trichomes between the areas were configured. There was not a significant difference when S6Kinase or PI3Kinase were misexpressed. Tissue size and cell proliferation increased dramatically when tribbles was silenced, creating symptoms of a tumor. At 30°C, the silencing of PTEN became lethal. Components of the insulin signaling pathway help contribute to tumor regulation.

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