Effects of Deubiquitinase Scrawny on Histone Modifications and Drosophila oogenesis

Shih, Kuan-Yu (School: The Affiliated Senior High School of National Taiwan Normal University)

During cell development, gene expression is regulated by both external stimuli and internal chromatin states, and proper regulation is essential for normal cellular development. This study uses a common model organism: Drosophila melanogaster, to investigate the role of the gene Scrawny (Scny) on the development of ovarian follicle cell development and histone modifications, and to explore its potential relevance to human biology. Using RNA interference (RNAi) driven by a cell-specific promoter, we investigated the functions of Scrawny. The results show that Scrawny-depleted follicle cells display hyper-polyploidization, multinucleation, and a premature entry into the mitotic-endocycle transition (M-E transition), alongside changes in normal histone modification levels. Besides the value in basic biology, the phenotypes observed directly mirror the formation of polyploid giant cancer cells (PGCCs), primarily linked with tumor recurrence and metastasis. This mechanistic phenocopy proves the viability of using Scrawny silenced cells as an in vivo model for human PGCC research.

Awards Won: