

17. Elucidation of the Roles of Glycans using RNAi Technology

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Glycans on proteins and lipids are developmentally regulated and play an important role for cell-cell recognition. The glycosylation is performed in the Golgi apparatus by glycosyltransferases, which transfer various sugars from sugar-nucleotides to acceptor substrates. Our molecular evolutionary study showed that a prototype of glycosyltransferases was conserved between mammals and *Drosophila*, which is well established as a model for genetic analysis. RNA interference (RNAi) is becoming an efficient reverse genetic tool for studying gene function in model organisms. To clarify the basic physiological functions of glycans, we established *Drosophila* inducible RNAi system and applied it to glycosyltransferases.

If the silencing of each gene was induced ubiquitously in the fly, many RNAi mutant flies showed lethality to prove essential roles of glycans in development. Tissue-specific silencing induced various malformed phenotypes in the flies, by which genes were classified into some groups. These clusters might reflect the biosynthetic pathways and distinct functions of the various glycans. We will present a new approach to the comprehensive analysis of glycan function in development.