The Third Symposium of Japanese Consortium for Glycobiology and Glycotechnology
Integration from functional analyses of sugar chains to systems glycobiology
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18.   Strategic analysis of carbohydrate functions through gene knockouts

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The nematode *Caenorhabditis elegans* is an ideal model organism for functional genomics. Human genome and the nematode genome have many glycome-related genes in common. In this project, we select human glycome-related genes systematically and study functions of the genes by using the nematode. RNAi and deletion mutagenesis is systematically used for this purpose, aiming of the complete functional analysis of glycome-related genes and associated gene networks. For instance, we found 145 human glycosyltransferase orthologs in the nematode genome, and especially severe phenotypes were observed in 20% of their gene knockout experiments, confirming the importance of glycome-related genes in cell division, neural circuit formation and morphogenesis. In addition to DNA microarray analysis of mutant animals, proteome analysis is being used extensively in this study, and revealing the gene networks of carbohydrate related proteins will throw light on the hidden roles of sugar chains in multicellular organisms including ourselves.