

### **3. Structural studies on protein glycosylation and protein-carbohydrate interactions in the Protein 3000 project**

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Our Structural Biology Research Center in KEK-PF serves as one of the nine consortia of Protein 3000 (a national project of Japan) pursuing structural and functional analyses of post-translational modification (mainly glycosylation) and transport. The consortium consists of nine universities and five research institutes including structural biologists (X-ray crystallography, NMR and Small Angle X-ray Scattering), bioinformaticians, biochemists and cell biologists. We founded a core facility at KEK-PF, where a major part of our work, such as manipulation of recombinant DNA for gene expression, protein purification, crystallization and structure determination, is carried out. For example, we determined X-ray structures of novel glycotransferases, GlcAT-P and GlcAT-S, with and without substrates which are important for HNK-1 glyco carbohydrate. We also determined structures of the mammalian sialidase Neu2. Structural comparison between human Neu2 and influenza virus sialidases may help development of a new anti-influenza virus drug without side effect. In addition, there are many other structural and functional research projects, such as glycotransferases, glycolytic enzymes and lectins, are in progress.