6. Crystal structure of pp-GalNAc-T10

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pp-GalNAc-Ts are initiation enzymes to synthesize mucin type *O*-glycans, which transfer GalNAc from UDP-GalNAc to Ser or Thr residues of substrate proteins. To the present, 18 human isozymes have been identified. They are classified into some types according to catalytic specificities. The combination of expression pattern of all enzymes in tissues/cells and their substrate preferences will produce a large variety of *O*-glycosylated proteins. T10 is a unique isozyme, which has strong activity toward glyco-peptides, while it has little activity toward naked peptides. We crystallized a soluble truncated form of the enzyme expressed by *Pichia pastoris*. The crystal diffracted X-rays up to 2.5 Å resolution with PF-AR-NW12 beam line. The crystal structure was solved by molecular replacement method using the catalytic domain of T1 as a search model. The relative position of the lectin domain to the catalytic domain in T10 was significantly different from that in T1. From electron density map, UDP, GalNAc and Mn^{2+} were clearly identified, which indicated the breakage of glycoside bond between UDP and GalNAc. By comparing with the crystal structure of T1 which did not contain any substrates, it was suggested that two flexible loops undergo conformational changes concomitantly with the substrate binding.