



## **Structural Characterization of the Oligomer-forming Parts of the MUC2 Mucin by X-ray Crystallography**

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**Project Description:** Mucins are the major protein components of the mucous layers covering the epithelial surfaces of our body and providing protection from infections, injuries and dehydration. A mucin contains at least one mucin-domain that is heavily glycosylated by O-linked glycans responsible for up to 90% of the mucin mass. Mucins exist both as membrane-bound and secreted proteins and MUC2 is the dominant secreted mucin found in the human intestine. The MUC2 protein is made up of 5179 amino acids and when fully glycosylated the mass reaches 3 MDa. The N- and C-terminal parts flanking the mucin-domain are rich in cysteins and contain several von Willebrand D domains, also present in the blood-clotting protein von Willebrand factor and several other oligomer-forming proteins. MUC2 is believed to form dimers via its C-terminal part and trimers via the N-terminal part, thus building up a protein network that gives the mucus its gel-like properties.

The aim of the project is to determine the high-resolution three-dimensional structure of fragments of the MUC2 mucin using X-ray crystallography. So far, no structural information is published for any mucin or any other related protein. Of especially high interest are the oligomer-forming fragments and the von Willebrand D domain. We have cloned and recombinantly expressed the N-terminal part (first 1399 amino acids) and the C-terminal part (last 845 amino acids) of MUC2 as separate constructs in CHO-cells. These will be studied separately thus giving trimers and dimers instead of protein networks. Also smaller MUC2 fragments will be used in crystallization experiments.

Other Information: <http://www.medkem.gu.se/mucinbiology/general.html>