

The two types of glycosylation of Art v 1 and their contribution to antibody binding

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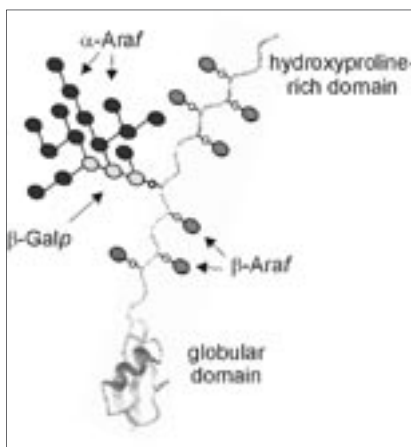
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The major allergen of mugwort pollen, Art v 1, consists of a globular, defensin-like domain and a (hydroxy-)proline-rich rod-shaped domain (Himly et al. 2003, FASEB J. 17). Art v 1 bears a large hydroxyproline-linked oligosaccharide consisting of a short galactan backbone with arabinan branches. This new type of O-glycan shall be termed type III arabinogalactan. However, experiments with isolated glycopeptide and a rabbit antibody fraction that reacts with natural Art v 1 only did not point to antibody binding by this oligosaccharide. Likewise, enzymatic digestion of the alpha-arabinan chains of this large O-glycan did not result in loss of binding of the "carbohydrate-specific" antiserum. The digestion product as seen by MALDI still had a much larger size than attributable to the polypeptide chain alone. NMR analysis revealed the presence of several single beta-arabinoses linked to hydroxyprolyl residues. We suppose that these hydroxyproline-linked arabinosyl residues are responsible for the difference in antibody binding between recombinant and natural Art v 1. Owing to the rod like peptide structure and the ARABINOSYL residues, this new IgE binding element could be termed "Alibaba stick".

Keywords: mugwort, glycoprotein

Figure: Schematic model of Art v 1.

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