
STRUCTURAL CHARACTERIZATION OF A RECOMBINANT TN ANTIGEN-BINDING LECTIN FROM VATAIREA MACROCARPA

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Legume lectins represent the largest and most thoroughly studied lectin family, comprising a large group of homologous carbohydrate-binding proteins (Sharon & Lis, 1990). A few galactose/N-acetylgalactosamine (Gal/GalNAc) binding lectins isolated from legume plants have proven to be useful as markers in cancer histochemistry. Structural analysis of Tn-binding lectins is of considerable interest for elucidating the mechanism of specific protein-carbohydrate recognition as well as for engineering novel binding activities in legume lectins. Here we present the crystal structures of a single-chain recombinant legume lectin from *Vatairea macrocarpa* (VML), recombinantly expressed in *Escherichia coli*, in complex with lactose, N-acetyl-galactosamine and Tn antigen, respectively. The structural data is supported by isothermal titration calorimetry (ITC) and small-angle X-ray scattering assays. Molecular docking simulations were also performed to analyze the binding of this lectin to O-mucins. These findings provide a complete structural characterization of this new Tn-binding protein and strongly suggest recombinant VML as a new tool for cancer research.