

**Mannan-binding lectin of the sea cucumbers *Stichopus japonicus* has common antigenic determinants with human serum mannan-binding lectin**

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**Abstract**

The host defense system or immune system of all modern animals has their roots in very ancient organisms. After analyzing literature data concerning properties of invertebrates and vertebrates lectins we suggest that mechanism of mannans recognition may exist in marine invertebrates, as a universal mechanism for homeostasis maintenance and host defense, and mannan-binding lectins family of vertebrates has ancient precursor, as was shown for another S-type lectins family. We carried out the screening of mannan-binding type lectin among different species of echinoderms inhabiting in Piter the Grate Bay, the sea of Japan. As a result, the C-type lectins (SJL-32) specific for high mannose glycans was isolated from the coelomic plasma of the sea cucumbers *Stichopus japonicus* by ion-exchange chromatography on a DEAE-Toyopearl 650M, affinity chromatography on a mannan-Sepharose 6B and gel filtration on a Sephacryl S-200. SJL-32 is homodimer with molecular mass about 32 kDa on SDS-PAGE under non-reducing conditions. Protein part of the lectin has high contents Asn, Glu, Ser. Hemagglutination of trypsin-treated O blood group human erythrocytes by SJL-32 was competitively inhibited by high-branched -D-mannan composed of -1,2 and -1,6 linked D-mannopyranose residues. In contrast, a variety of mono-, oligo-, and polysaccharides composed of residues of galactose and fucose showed absence or little inhibitory activities. The lectin activity strong depends on Ca<sup>2+</sup> concentration, temperature and pH. Monospecific polyclonal antibodies were obtained to the lectin. As was shown by ELISA assay, antibodies to SJL-32 cross-reacted with human serum mannan-binding lectin. This data allows making conclusion about common antigenic determinants and structural homology of both lectins. In our opinion, SJL-32 belongs to evolutionary high conservative mannan-binding lectins (MBLs) family and takes part in the host defense against pathogenic microorganisms.