

CLINICAL SPECIFICATIONS

SYNAPSIN

Function:

Synapsin I, also known as phosphosynapsin I, is a major immunoreactive protein found in most neurons of the central and peripheral nervous systems. It is a member of a group of neuronal phosphoproteins involved in the regulation of neurotransmitter release.

Synapsin I is present in the nerve terminal of axons, specifically in the membranes of synaptic vesicles.

Antibodies Appear:

Demyelinating Diseases²
 Inhibited Neurotransmitter Release⁴
 Lupus⁴
 Multiple Sclerosis²

Known Cross-Reactions: Gliadin^{1,5}

Clinical Significance:

Antibodies against Synapsin can contribute to neuronal damage^{2,4} as well as non-neuronal tissues.³ There is a similarity between Synapsin I and Gliadin (a protein of wheat) in that they both have high frequencies of proline and glutamine residues, thus, cross-reactivity occurs between Synapsin I and Gliadin.^{1,5} This molecular mimicry triggers autoimmunity resulting in neurological deficits often associated with gluten sensitivity and, in genetically susceptible patients, with Celiac Disease. Non-neuronal Synapsin I has also been identified in the liver and is thought to be associated with the trans-Golgi network-derived compartment.³ This placement suggests that Synapsin I plays a role in modulating post-trans-Golgi network trafficking pathways of secreted proteins.³

References:

1. Alaedini, et al. Immune cross-reactivity in Celiac disease: Anti-gliadin antibodies bind to neuronal synapsin I. J Immunol, 2007; 178:6590-6595.
2. Bitsch, et al. Autoantibody synthesis in primary progressive multiple sclerosis patients treated with interferon beta-1b. J Neurol, 2004; 251:1498-1501.
3. Bustos, et al. Synapsin I is expressed in epithelial cells: localization to a unique trans-Golgi compartment. J Cell Sci, 2001; 114:3695-3704.
4. Gitlits, et al. Synapsin I identified as a novel brain-specific autoantigen. J Invest Med, 2001; 49(3):276-283.
5. Vojdani and Tarash. Cross-reaction between gliadin and different food and tissue antigens, Food Nutri Sci, 2013; 4:20-32.