14. Role of membrane-bound lectins in the regulation of humoral immune responses

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CD22/Siglec2 and CD72 are inhibitory co-receptors that negatively regulate signaling through the B cell antigen receptor (BCR) by activating the SHP-1 phosphatase. CD22 is a member of the Siglec family that recognizes α2,6 sialic acid. CD72 contains a C-type lectin-like domain, but whether it recognizes a glycan ligand is not yet known. We demonstrated that these membrane-bound lectins function as a molecular switch that determines whether antigen-stimulated B cells undergo apoptosis or activation. Moreover, we demonstrated that CD22 does not negatively regulate BCR signaling in memory B cells, resulting in augmented BCR signaling. Augmented BCR signaling in memory B cells appears to be involved in rapid B cell activation and antibody production in memory responses, which is crucial for host defense by vaccination. Taken together, membrane-bound lectins and probably their glycan ligands play important roles in the regulation of humoral immune responses.