Abstract

Lívia Boboňková: ***Lectins-biological activity,*** Diploma Thesis, Charles University, 2007

Lectins bind mono- and oligosaccharides reversibly and with high specifity, but are devoid of catalytic activity, and in contrast to antibodies, are not products of immune response. Each lectin molecule contains typically two or more carbohydrate-combining sites, lectins are di- or polyvalent. Therefore, when they react with cells, for example erythrocytes, they will not only combine with the sugars on their surfaces, but will also cause cross-linking of the cells. Lectins agglutinate erythrocytes and precipitate polysaccharides. Both reactions are inhibited by the sugar ligands for which the lectins are specific. Lectins can be found in all kingdoms of life ranging from viruses through bacteria and plants to animals. The largest and most thoroughly studied family of the simple lectins is that of Fabaceae, of which close to 100 members have been characterized, almost all isolated from seeds of the plants. Despite their abundance in plants, their true physiological functions are not clearly defined. Some of them are highly toxic, especially type II ribosome inactivating proteins (RIPs II). Abrin, ricin, viscumin, modeccin and volkensin belong to this group. Lectins are widely employed in research for diverse purposes, primarily those in which detection, identification and functional evaluation of carbohydrate is needed. In contrast to the wide range of lectin applications in research, their routine use for clinical purposes is limited. They are employed for blood typing, for assessing the immune state of patients, for karyotyping, and for purging of bone marrow for transplantation. Much effort is being invested in screening lectins for their potential as diagnostic reagents in clinical situations. The presented work is primarily focused on the biological activity and mapping of the lectins in plant kingdom.