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優勝作品專輯

作品編號 **080007**

參展科別 生物化學

作品名稱 **Novel Biotechnological Approach for Recognition and Purification of Antibody: Lectin Affinity Membranes**

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Abstract

Immunoglobulin G is a glycoprotein structured molecule that is produced by the immune system and protects organism from harmful effects of antigens. Ig G amount in the blood plasma is an appropriate indicator of; infection, cancer, diabetes, cardiovascular diseases, Alzheimer and other autoimmune diseases. Besides, purification of Ig G used in the treatment of these diseases from naturel sources is carried out at high costs on the World market. It is hard to obtain Ig G in high amounts and without any decomposes, that's why it is important to develop new systems that will help to recognize and purify Ig G antibody.

In this project, my purpose was; recognizing Ig G antibody with efficient, high amounted, fast, easily, with less toxicity, economically and purifying Ig G in high ratios from its natural sources. For this purpose p(HEMA-EDMA) membranes are synthesized with free radical photo polymerization method and characterized according to SEM images, swelling behaviors FTIR analysis and elemental analysis. In order to adsorb Ig G to polymeric membranes; polymeric membranes are activated with silanization agent (IMEO) and derivatized with Con A which is a lectin affinity ligand. In the SEM results it is examined that membranes are in spherical structures. Highest swelling value is determined as 224.8%.Binding of IMEO was demonstrated with FTIR and Elemental Analysis. Optimum conditions for Ig G adsorption to membranes are; 1.5 mg/ml initial Ig G concentration, 30 minutes of adsorption time, pH 4 citrate buffer 37 0C and without any different ion strength. Optimum adsorption capacity is determined as 253.8 mg/cm2 and it is also determined that this value is 7 times higher than nonspecific Ig G adsorption to p(HEMA-EDMA) membranes. Ig G adsorption-desorption cycles (5 times) proved that product is reusable without losing its adsorption capacity. According to the electrophoresis, Ig G could be desorbed in pure form without any denaturation to its structure.

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The author immobilized Con A on the polymeric membrane, Con A can specifically associate with D-glucose. D-mannose or D-fructose. IgG is a glycoprotein. Thus, Con A can associate with IgG with a high affinity. The author created a Con A conjugated polymeric membrane and used this lectin-affinity membrane to purify IgG. However, the shortage of this metod is that Con A cannot specifically purify IgG from a pool of glycoproteins.