New Materials with Micron Network Membrane Morphology: The Research of Their Potential Usage in Proteomic Studies

Eskin, Roza (School: Gaziemir Ozel Rota Fen Lisesi)
Ozgur, Halil (School: Gaziemir Ozel Rota Fen Lisesi)

Serum proteins can generally be a rich resource for the illness' indication. They are invaluable resources to detect illnesses such as inflammation, cancer, diabetes, malnutrition, cardiovascular diseases, Alzheimer's, other autoimmune diseases and infections and to follow physiological conditions. Albumin and Immunoglobulin (IgG) constitute 80% of total serum protein. Since there is a high amount of these proteins in the plasma, it becomes difficult to use marker proteins for proteome studies. A new micron network structured reactive dye immobilized p(HEMA) membrane which is based on dye-ligand affinity technique has been developed in this study. By using two HEMA monomers as the support material, the synthesis was carried out with UV photo-polymerization method. The micron network structured p(HEMA) membranes were derivated with Reactive Red 241 dye and the density of dye-ligand was calculated. FTIR-ATR spectroscopy, SEM/ESEM and contact angle goniometer were used for characterizations of micron-network structured p(HEMA) and p(HEMA)-RR241 membranes. The water adsorption capacities were determined by using the swelling tests. The optimum conditions were defined as pH 6,5, 25oC, the ionic strength as 0,05 M NaCI and the IgG initial concentration was 1 mg/mL. Adsorption-desorption cycles were performed to show that the recommended materials can be reusable. This novel method removes the IgG from serum and reduces the proteome pre-step studies and increases the biomarker proteins in the serum for proteom studies. Key Words: Proteomic, IgG depletion, micron network structured membrane, reactive red 241.

Awards Won: