SUMMARY

The present project refers to biomolecules immobilization on polymeric matrices for selective regognition and separation. Immobilization of microorganisms, is a technique of great biotechnological interest with a wide range of applications (food industry, biosensors, chemical labs).

The biomolecules of interest for immobilization, are transformed *E.coli* cells overexpressing pectin lyase gene. The latter is an enzyme which cleaves the a-1,4-glycosidic bond of galacturonic acids of pectin. Pectin lyase, is of great biotechnological interest and has already been used in food industry for juice clarification.

In the present work pectin lyase has been overexpressed as a fusion protein bearing at the C-terminal a 6-His tag and at the N-terminal a signal peptide of a-amylase from *B.subtilis*. *E.coli* cells, have been immobilized in alginate beads and their enzymic activity has been compared to the activity of the immobilized enzyme and of free cells.

Immobilized cells, perform succesfully for 10 cycles and their enzymic activity is 100% better from free cells. In addition, in comparison to the performance of immobilized enzyme, has been found that immobilized cells perform better and longer. Furthermore, the enzymic activity of immobilized *E.coli* can be enhanced by increasing membrane permeability through tolouene addition in the reaction mixture. Finally, pectin lyase can be partially regognised and separated by alginate beads containing pectin.