

## Αγγλική Περίληψη

The aim of the present thesis is the development, characterization and drug release study of one and two layers thin films based on organic polymers (PLGA 65: 35, PLGA 75: 25, PCL) and dexamethasone in order to examine their applicability on intraocular lenses, and their function as intraocular drug delivery systems. Four groups of thin films were prepared by the method of spin coating on silicon substrate: group A, consisting of two layers (lower: PLGA 75:25 upper: PLGA 65:35 in a 2:1 ratio with dexamethasone), group B with two layers (lower: PLGA 75:25 upper: PLGA 65:35 in ratio 3:1 with dexamethasone), group C with one layer (blend PLGA: PCL 90:10 with a 2:1 ratio with dexamethasone) and group D with one layer (blend PLGA: PCL 90:10 with a 3:1 ratio with dexamethasone). The films were studied with the use of AFM and ellipsometry. Release rate of dexamethasone was studied for a period of ten weeks. Conclusions have been reached in relevance to the surface structure and roughness of the films. Groups A and C demonstrated the formation of large aggregates of dexamethasone, while groups B and D demonstrated the formation of smaller ones. The monolayer films of groups C and D formed pores, in agreement with previous findings. The ellipsometry study showed transparent samples. The study of drug release demonstrated a release for the first 6 weeks and allowed the drawing of the curves. The films exhibited properties (transparency, release duration, release curve) that serve the purpose of using them as systems intraocular drug delivery. It is necessary to further study the films and investigate the possibility to develop them directly on the surface of the IOL.