152 Formation and Design of Artificial Cell Membrane over Silicon substrate and their Ellipsometric Characterization

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The design, formation and characterization of a stable artificial cell membrane have been the focus of our research group during the last years [1]. Support system for phospholipids bilayers seems to be the solution to keep the membrane at a moist environment during extended periods of time. This attribute could be used in different applications into the biotechnological field like drug delivery, tissue engineering and biosensing [2].

Previous research were developed by our research group, 60 Å film Dipalmitoylphosphatidylcholine (DPPC) was deposited over hydrogel films, using the Physical Vapour Deposition (PVD) technique. However this method produces non-homogeneous films. In Fig.1 is possible to visualize surface defects due to agglomerations of the DPPC.

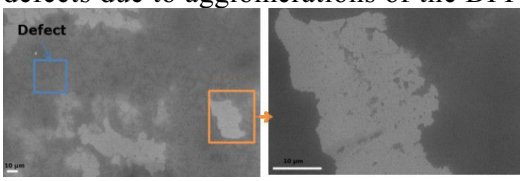

Fig. 1 *SEM of DPPC/ HEMA-PEGDA films /substrate*

Today, we are forming DPPC membranes using Langmuir Blodgett method. According to this, DPPC bilayers were deposited over photopolymerized hydrogel scaffold (for maintaining the system humectation) (Fig.2).

HEMA, two types of PEGDA with different weight molecular (crosslinkg agents) and Irgacure 2959 (photoinitiator) were utilized for the hydrogel formation [3].

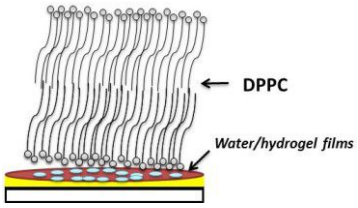

Fig. 2 *Artificial membranes DPPC/ HEMA-PEGDA films /substrate*

These hydrogel films were deposited via Spin Coating at 6000 rpm for 1 min., over the silicon wafer substrate, which was cleaned with the Tidwell methods. High resolution ellipsometry, with two different incidence angles (45 and 60°), was used to determine DPPC thickness variation against temperature changes. Finally, SEM micrographs were taken with the finality to observe sample surface behaviour.

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