

## **Αγγλική Περίληψη**

Organic field-effect transistors including a functional bio-recognition interlayer, sandwiched between the dielectric and the organic semiconductor layers, have been recently proposed as ultrasensitive label-free biosensors capable to detect target molecule in the low pM concentration range. The morphology and the structure of the stacked bilayer formed by the protein bio-interlayer and the overlying organic semiconductor is here investigated for different protein deposition methods. The first part introduces a theoretical introduction listing all the theory that is needed for the issues addressed in this paper. The second part presents a presentation of the materials and the individual techniques and devices used as well as the basic principles governing their operating principle. In the 3rd part a new architecture for the construction of the transistors is proposed and all construction steps are presented with pictures and clarifications regarding conditions and difficulties that are considered important for labeling. In the 4th part presented are images and measurements taken from the experimental process and finally summarizing, conclusions, markings as well as suggestions for future expansion and work on the issues of work.