ABSTRACT

The cell which is the basic structural and functional unit exhibits the phenomenon of life. Surrounded by a lipid bilayer, the cell membrane, aims to separate the cellular components of the environment. For communication with the surrounding environment and the cell's proper function, inflow and outflow of ions, whose complexity varies from small ions to organic macromolecules is required, through the cellular membrane. The base of the conductive polymeric material is also formed of organic macromolecules, and like biological systems, conductive polymers have intrinsic electronic and ionic conducting properties. This ability establishes conductive polymeric materials as promising materials in the field of nanobiotechnology, with applications in areas such as tissue regeneration and bioelectronics.The purpose of this thesis is to study the conductive polymer PEDOT: PSS (PH1000 and PVPAI4083) as a candidate material for the proper cellular attachment and growth. The cell viability was studied for the early 18 and 24 hours in contact with film samples, produced by the spin coating technique. Furthermore, an attempt was managed in order to study the material's fibers form, adding the PVA polymeric, in two different proportions. The technique used for the creation of the conductive fibers was the electrostatic deposition process. The prepared samples were studied by AFM, SEM, optical microscope technique as well as contact angle measurements were performed. The samples' cytotoxicity was tested by MTT assay, measuring the active metabolic activity of living cells.