

## Abstract

# Investigations on cell adherent coatings on electrospun membranes for RPE implants

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One of the most common reasons for irreversible blindness of people in the Western World is age-related macular degeneration (AMD). As life expectancy rises the number of patients suffering from this degenerative disease will increase rapidly. The progression of AMD can only be retarded by a small amount of patients using a cost intensive therapy, where injections will be given regularly directly into the eyeball. In the past year, the potential of regenerative techniques based on stem cells have received increasing interest [1]. Especially, when human induced pluripotent stem cells (hiPS cells) can be used, no ethical concerns have to be overcome. One of the current most promising approach is the implantation of healthy hiPS cell-based retinal-pigmented epithelial layers (RPE) on physiologically compatible membranes directly behind the actual retina. Long-term function will be ensured, as these artificial RPEs take over the supply of the retina in place of the dead epithelium. Some of these experimental therapies have been successfully validated in animal studies, yet [1-5].

Here, the authors present a new approach to use form stable submicron structured membranes as a biocompatible implant. To achieve the necessary adhesion of RPE layer, film deposition by a cold gas plasma technology was used. The deposition and surface analysis of this amine-rich coatings will be discussed. Samples were analyzed by scanning electron microscopy (SEM) and fluorescence labeling of the primary amine groups. Improved adhesion of hiPS-derived RPE layers were demonstrated by in-vitro studies.

## AUTHOR'S STATEMENT

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