Docket #: S02-099

Bucky Paper for Retinal Cell Transplantation

The transplantation of retinal pigment epithelial cells (RPEs) or iris pigment epithelial cells (IPEs) to rescue diseased photoreceptors in the subretinal space is one of the leading experimental therapies for Age-Related Macular Degeneration, the most common form of blindness in people over 65 in Western nations. Currently this treatment is ineffective, possibly because of the inability of transplanted cells to spontaneously form an organized monolayer, and because they attach poorly to the damaged Bruch's Membrane.

This technology, known as Bucky paper, is a mesh of carbon nanotubes (CNTs) made entirely of carbon. Additionally, since it is a mesh of CNTs, bucky paper is very pourous and will allow nutrients, waste, oxygen, and carbon dioxide to easily diffuse through, regardless of the thickness. This invention proposes that RPEs and IPEs be grown on, and transplanted with, bucky paper. The presense of bucky paper as a support material will allow for the transplantation of large sheets/monolayers of RPE/IPEs for the effective treatment of Age-Related Macular Degeneration.

Applications

- Improving the effectiveness of the transplanting RPEs and IPEs in patients suffering from Age-Related Macular Degeneration.

Advantages

- Bucky paper does not curl up during surgery
- Bucky paper is porous and allows diffusion to occur
- Bucky paper is rigid and will allow for precision during surgical handling
- Carbon nanotubes have been shown to be biocompatible

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