It therefore would be desirable to provide better, safer, more effective techniques for the direct delivery of therapeutic agents to eye tissues. It also would be desirable to provide devices useful in such techniques which can be relatively inexpensive to produce and use. It further would be desirable to provide methods for pinpoint delivery of drug to sclera, choroidal, uveal, macular, ciliary, vitreous and retinal tissues.

SUMMARY OF THE DISCLOSURE~~INVENTION~~

Methods and devices are provided for administering a drug to an eye of a patient. The methods may be used, for example, in the treatment of uveitis, glaucoma, diabetic macular edema, age-related macular degeneration, or cytomegalovirus retinitis. In one aspect, the method includes inserting a hollow microneedle into the sclera of the eye at an insertion site, the microneedle having a tip end with an opening; and infusing over a period of time a fluid drug formulation, which comprises a drug, through the inserted microneedle and into the suprachoroidal space of the eye, wherein during the period the infused drug formulation flows within the suprachoroidal space away from the insertion site.

In one aspect, there is provided the use of a fluid drug formulation in the manufacture of a medicament for the treatment of an ocular disorder, wherein the medicament is adapted to be delivered via a hollow microneedle inserted into the sclera, the microneedle having a tip end with an opening, the medicament is adapted for being infused over a period of time through the inserted microneedle and into the suprachoroidal space of the eye, wherein during the period the infused medicament is adapted to flow within the suprachoroidal space away from the insertion site.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1A, 1B, 1C, and 1D are cross-sectional illustrations of the tissue structures of a human eye. The eye as a whole (**1A**), a close-up of the cornea (**1B**), and a close-up of the sclera and associated tissues in an eye without fluid in the suprachoroidal space (**1C**) or with fluid in the suprachoroidal space (**1D**).

FIG. 2 is a cross-sectional view of a microneedle device comprising a hollow microneedle disposed in an elongated body according to one embodiment.

FIG. 3 is a cross-sectional view of the elongated body of the microneedle devices shown in **FIG. 2**.

FIG. 4 is an illustration of a microneedle device according to one embodiment.

FIG. 5 is an illustration of a microneedle device according to one embodiment.

FIGS. 6A and **6B** illustrate an embodiment of a process for using a hollow microneedle to deliver drug into the suprachoroidal space of an eye, where the process includes inserting the hollow microneedle into the sclera and infusion of a fluid drug formulation into the suprachoroidal space.

FIG. 7A shows a comparison of a hollow microneedle according to one embodiment as compared to the tip of a conventional 30 gauge hypodermic needle. **FIG. 7B** shows a schematic illustration of a custom acrylic mold shaped to fit a whole eye.