

**Technology**

Use of a viscous polymer solution for treatment of presbyopia

Inventor

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Key Features

- Non-toxic viscous polymer solution for use as an intraocular lens
- Capable of changing focal length within the eye
- Minimally invasive and easily deliverable
- Could be removed if necessary

Stage of Development

Reduced to practice with polymer solutions developed

Keywords

Medical device
- Ophthalmology
- Intraocular Lens

Patent Status

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Synthesis of an Artificial Human Lens that can Potentially Eliminate Bifocals (VA Reference No. 02-125)

Novel method of preparing a viscous polymer solution to be used as an intraocular lens for treatment of presbyopia

Technology

The Department of Veterans Affairs has developed a method of preparing a viscous polymer solution free of toxic monomers and other undesirable additives that can gel spontaneously within the lens capsular bag. The gel can be formulated to exhibit optical and mechanical properties similar to a youthful lens and thus has the potential to eliminate bifocals, glasses, or contact lenses.

Description

The VA has developed a material that consists of a viscous polymer gel which can change its shape within the eye and thereby its focal length. The polymer gel consists of individual chains of polymers linked by disulfide chemical bonds. The gel is thoroughly washed to remove any traces of impurities and then liquefied by breaking these disulfide bonds to form a honey-like viscous solution. This polymer solution can spontaneously solidify back into a soft gel within a body cavity under normal physiological conditions, such as ambient temperature, pH, and oxygen. When injected into the eye, it has the potential to be used as an intraocular lens implant during cataract surgery. Since the solid polymer is soft, pliable and transparent, it takes the shape of the lens capsule and is capable of changing focal length within the eye.

Competitive Advantage

This invention:

- Allow patients to see clearly at a range of distances, thus eliminating the need for reading glasses and lessening surgical trauma.
- Is minimally invasive, easily deliverable, and able to fill native or potential cavities while conforming to different shapes, which may be difficult to prefabricate.
- Possesses a chemical similarity to natural proteins
- Could be changed from a gel back into a liquid, if necessary, for easy removal and reinsertion.

Status

The Department of Veterans Affairs is looking for a partner for further development and commercialization of this technology through a license, and the VA inventors are available to collaborate with interested companies through a Cooperative Research and Development Agreement (CRADA).