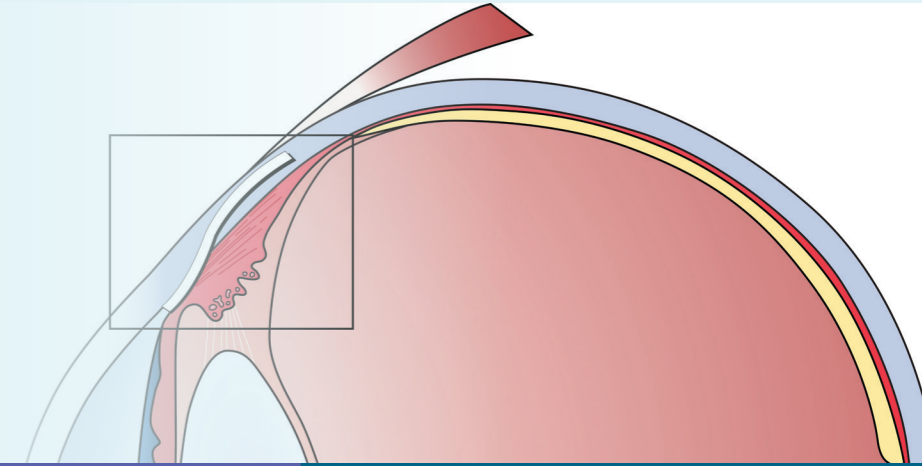




Better treatment for glaucoma

Glaucoma is the leading cause of irreversible blindness worldwide, with an estimated 80 million people affected including more than 200,000 Australians. NHMRC-funded researchers at the University of Western Australia (UWA) and the Lions Eye Institute (LEI) developed a new approach that has revolutionised glaucoma treatment leading to safer surgery and improved vision outcomes. With later support from an international industry team, this new glaucoma surgery is now in use worldwide.



Origin

Glaucoma occurs when fluid drainage from the eye is impeded and intraocular pressure increases. This can lead to damage to the optic nerve, continuous deterioration of vision and eventual blindness.

Treatment options for glaucoma include eye drops, laser treatment and surgery, when other options have been ineffective. However, surgery can cause scarring, there is usually a slow recovery of vision after surgery and there can be major complications.

Investment

NHMRC provided long-term funding to UWA/LEI researchers to support research into the development of a new treatment approach: the gel stent.

Funded researchers were Dao-Yi Yu and his team, which included Bill Morgan, Steve Cringle, Er-Ning Su, Dean Darcey and Paula Yu. Grants were also provided to Ian Constable.

In addition, Yu worked with industry partners to raise US\$100 million in venture capital funding to support clinical trials and commercialise the technology.

Research

The LEI/UWA team developed a tiny, nearly transparent tube to create a stent. The tube is thinner than a human hair and about the length of an eyelash. It is made from cross-linked gelatine, a material that possesses biocompatibility with the surrounding eye tissue so as to induce minimal inflammation.

The tube is semi-rigid during the implantation process, to allow quick, safe and accurate implantation, but then swells and becomes flexible after implantation to lock it into place and allow it to move with the eye.

Translation

Along with the stent, the team developed a special one-needle implanter and associated implantation procedure. These were patented in the United States in 2003 and then licensed to Aquesys, a US-based start-up, in 2006.

Aquesys was later purchased by Allergan (now part of AbbVie), which now markets the technology under the commercial name XEN® Gel Stent.

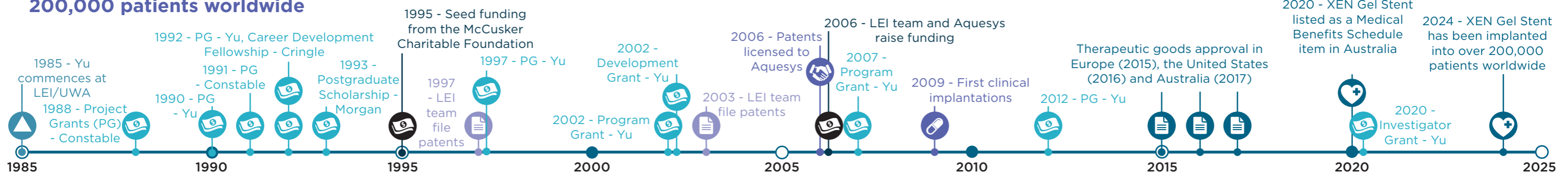
In 2009, and with the assistance of Morgan, Yu performed the first clinical implantations of the stent in Australia.

Impact

Implantation of the XEN® Gel Stent has become one of the most common glaucoma surgeries performed globally. The stent has now been implanted into over 200,000 patients worldwide (including approximately 3,000 in Australia). It is globally recognised as one of the safest and most effective treatments for glaucoma.

Numerous publications and surgeons have confirmed satisfaction with the effectiveness and safety of this invention. The incidence of vision threatening complications is low at <1%.

By 2024, the XEN Gel Stent had been implanted in over 200,000 patients worldwide



Researchers

Professor Dao-Yi Yu AM
Professor Bill Morgan
Professor Steve Cringle

Professor Er-Ning Su
Mr Dean Darcey
Associate Professor Paula Yu

Professor Ian Constable AO

Pressure buildup

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