UNIVERSITY OF LIVERPOOL

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Therapeutic Tamponades

A new approach for ocular drug delivery which can alter drug release rates into aqueous environments, including the eye.

Please note, header image is purely illustrative. Source: skitterphoto, Pixabay, CC0

IP Status

Patent application submitted

Seeking

Commercial partner, Development partner, Licensing

About **University of Liverpool**

By facilitating access to our expertise, facilities and networks, the University of Liverpool offers the means to transform ideas into creative solutions, improved performance, new technologies, strategies, applications, products or skills.

Background

There is difficulty in achieving therapeutic drug levels in the vitreous space and retina through conventional routes of administration. It is possible to administer drugs intravitreally or subconjunctivally, but many conditions (e.g. proliferative vitreoretinopathy) require treatment over a period of several weeks. The half-life of most drugs in the vitreous space is short, requiring repeated dosing.

Repeated injections can cause complications, such as infections, inflammation and elevated intraocular pressure and/or a build-up of drug to toxic levels.

Tech Overview

A team of researchers at the University of Liverpool has developed a method of extending drug release in conjunction with modified oils thereby safely and effectively delivering drugs over a prolonged period. The amounts delivered over a prolonged period of time are non-toxic.

Studies of drug release using radiochemical approaches have showed that this copolymer could extend ibuprofen release over three-fold (from 3 days to > 9 days) whilst the release of all-trans retinoic from the silicone oil phase was extended to > 72 days (Figure 1). These timescales are highly clinically relevant showing the potential to tune drug delivery during the healing process and offer an efficient means to improve patient outcomes.

Publications:

Journal of Controlled Release, Volume 244, Part A, 28 December 2016, Pages 41-51

Journal of Polymer Science. Part A, Polymer Chemistry. 2018 Apr 15; 56(8): 938–946.

Applications

The University team has *ex vivo* proof of concept data demonstrating extended release of retinoic acid and ibuprofen.

The model has the potential to be used across a range of drugs, and the team will be generating in vivo proof of concept and are considering a number of medicants to be included in future studies to show drug loading and drug variety.

Opportunity

The team have recently secured £1Million in funding from EPSRC to continue development of the technology and are currently looking for commercial partners who could help the University take the technology to market.

Patents

- Two Patents have been filed WO/2018/029476 and WO 2018/029477 A1

Appendix 1

Figure 1