

Project proposal template – Faculty studentships Summer 2014

<i>Project title</i>	Ultrasound responsive contact lenses for treatment of ocular surface diseases	<i>Director of Study</i>	Raid Alany
<i>Second Supervisor</i>	Amr ElShaer	<i>School</i>	Pharmacy and Chem <input type="button" value="v"/>
<i>Other members of supervisory team</i>		<i>Any requirements from applicant (eg degree in specific subject area)</i>	BSc or MSc in pharmaceutical sciences, drug delivery, <input type="button" value="v"/>

Project summary
(max 1,000 characters)

Despite the popularity of conventional eye drops and ointments in treatment of eye diseases, they have some limitations. Soft contact lenses offer a viable alternative because of their ability to act as an effective drug reservoir as well as a geometric barrier to uncontrolled drug diffusion into the tear fluid. The drug release across contact lenses can be triggered by either chemical or physical stimuli. Chemical stimuli such as pH and oxidation/reduction potential may change polymer structure resulting in unwanted deformation resulting in drug burst release. Physical stimuli such as controlled temperature, light, pulse electrical field have been clinically exploited and have less biohazardous effects where minimal by-products are generated throughout the response process. Ultrasound has high penetration abilities, is cheap, easily accessible, controllable, and believed to be advantageous over other physical stimuli with promising success in molecular imaging and diagnosis. The aim of the proposed study is to investigate the use of ultrasound as a physical stimulus to trigger and modulate drug release from soft contact lenses.

Keywords:- Ocular surface, contact lenses, physical stimuli, ultrasound, polymers.