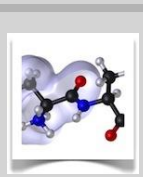

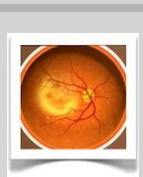
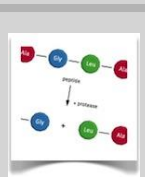
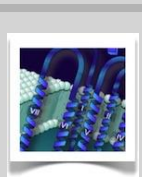

School of Pharmacy PhD Projects 2015

Project Title: **Multifunctional Loaded Thermo-sensitive Hydrogels for the Treatment of Bone Metastases**

Supervisors: Dr Helen McCarthy & Dr Nicholas Dunne
School of Pharmacy & School of Mechanical and Aerospace Engineering

Description:

Eligibility: Applicants should hold or expect to hold a 2.1 Hons (or equivalent) degree in a relevant discipline such as Pharmacy, Mechanical Engineering, Biomedical Engineering, Chemistry or Materials Science. It is essential that the candidate has an enthusiastic attitude towards undertaking research in the field of Healthcare Technology and is willing to travel for placements, training courses and dissemination activities.

Clinical UK data from 2011 indicates that the new incidences of breast, prostate, lung, kidney and ovarian cancers totalled 152,395 people. Of those diagnosed, 30-50% of cases will develop tumours in bone sites. In addition for those cancer patients that have treatment such as radiotherapy the chances of getting skeletal related events are around 60%. Given that the overall 10 year prevalence of the disease is approximately 1.5M in the UK this proposal has potential for a significant proportion of cancer patients. Within QUB, we have developed two exciting delivery technologies that include; a peptide delivery system that can wrap hydrophilic drugs and nucleic acids to form nanoparticles with improved delivery *in vitro* and *in vivo*, and thermo-sensitive alginate hydrogels that can be injected into bone sites as a liquid, gelate at body temperature before imbibing fluids to release the nanoparticle content over time. Therefore the overarching hypothesis of this novel PhD studentship is that we can develop an injectable thermo-sensitive alginate multifunctional hydrogel that incorporates both Peptide/BP (Bisphosphonates) and Peptide/miR (microRNA) releasing nanoparticles that will be functional to relieve bone pain and also therapeutic for bone metastases.

This 3-year project will provide the opportunity to gain technical expertise in medical device engineering, molecular biology, in addition to *in vitro* and *in vivo* technologies.

Further information on the project can be obtained by emailing Dr Helen McCarthy (h.mccarthy@qub.ac.uk).

Start Date: 1st October 2015

Keywords: Metastatic Cancer, Biomedical Engineering, Healthcare Technology, Delivery Systems

Contact Details
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How to Apply
Postgraduate applications should be made using Queen's Online:
http://go.qub.ac.uk/pgapply
Please note that there are two application processes: one for admission to the university and another for postgraduate awards.
Further Information
Additional information for prospective postgraduate students can be found on the School of Pharmacy website:
http://www.qub.ac.uk/pha
and the Queen's Postgraduate website:
http://www.qub.ac.uk/home/ProspectiveStudents/PostgraduateStudents/