Position Title	PhD Studentship – A Smart Biosensing Cell Reservoir For Treatment of Diabetes
Project Abstract	The last decade has resulted in several medical advances that have dramatically improved treatment of Type 1 diabetes (T1D). A critical hurdle preventing the long-term use of implantable technologies for treatment of T1D is the foreign body response (FBR). Implantable glucose sensors are particularly vulnerable to the FBR, with disruption of the native tissue during implantation causing a local inflammatory response that leads to protein absorption to the sensor surface an immediate decrease in sensitivity of up to 80%. This can result in a substantial diffusion barrier leading to device failure of implantable sensors or drug delivery systems. In the case of islet cell encapsulation devices, which typically utilize a semipermeable membrane to allow for selective diffusion while preventing host immune cells from clearing donor cells, the FBR has also prevented this approach from providing a permanent cure for diabetes. Contribution of the FBR to device failure is only appreciated after device failure has occurred. Clearly, new methods for continuous monitoring of the FBR are needed to predict impending device failure. The **overall objective** of this research is to develop an implantable, replenishable cell encapsulation system with a **novel, multimodal biosensor membrane for continuous monitoring of the foreign body response *in vivo***.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Medicine/Biomedical Engineering. Candidates should also have a strong interest in Biomaterials, 2D Materials, Membrane Technology.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	NUIG
Closing Date	Friday 29th June 2018
For more information contact	garry.duffy@nuigalway.ie

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Position Title	PhD Studentship – Corrosion and Surface Properties of Medical Implant Devices
Project Abstract	DePuy Synthes' strong focus on patient safety, quality and innovation drives continuous research activities for product and manufacturing process development and optimization. Increasing demand from the market and rising regulatory requirements have recently brought corrosion resistance of surgical implants and instruments into focus. This project will involve an electrochemical study on the corrosion resistance of surgical instrument materials and products with the goal of gaining deeper insights into the influence of individual and combined manufacturing process parameters on the final performance of the product. Manufacturing processes of interest include heat treatment, bead blasting, electrochemical finishing, cleaning and laser etching. The candidate will carry out a well-structured research programme with exposure to multidisciplinary and international research teams across the several plants in Ireland and Switzerland.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Materials Science/Chemistry. Candidates should also have a strong interest in Electrochemistry, Corrosion, Surface Science, Physical Chemistry and Laser Technology. Fluency in English required with German or French an advantage.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	Trinity College Dublin. Some travel to industry and in Europe may be required.
Closing Date	Friday 29th June 2018
For more information contact	melyons@tcd.ie; Prof. MEG Lyons; +353 1 896 2051

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Position Title	PhD Studentship - Design and exploration of Immobilised Transition Metal Catalysts in Continuous Flow Processing for API synthesis
Project Abstract	Success in the discovery, development and marketing of new pharmaceuticals requires excellence at the outset in medicinal chemistry research to identify new compounds with desired activity, and minimal side effects, right through to outstandingly efficient, reproducible, safe, economic manufacturing processes where the chemical transformations are conducted at very large scale to produce active pharmaceutical ingredients to be formulated into medicines. Developing efficient green approaches for large scale API synthesis is a priority and use of continuous flow is a particularly valuable addition to the process chemistry toolkit. In this project development of immobilised heterogeneous catalyst ligand systems for synthetic applications will be undertaken, with a particular focus on using packed bed reactors as solid phase catalysts in continuous flow systems. The objective is to have a series of robust, well characterised materials which can be utilised in an exchangeable manner across a range of synthetic processes – a plug and play approach. The opportunity to investigate the solid state form of these materials within Amber opens exciting new opportunities to us.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Pharmacy/Chemistry.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	University College Cork
Closing Date	Friday 29th June 2018
For more information contact	a.maguire@ucc.ie; 021-490-1694

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Position Title	PhD Studentship - Design and synthesis of new biomimetic materials with tunable biodistribution profiles, as conjugates to RNAs in gene therapy
Project Abstract	Gene silencing using siRNA (small interfering RNA) provides the opportunity to design a new generation of therapeutics capable of treating a wide range of diseases with high unmet clinical needs. The major barrier to translation of this concept into the clinic, and the **rationale for this project,** is the lack of nontoxic, biocompatible materials capable of producing nano-complexes with nucleic acids which can be manufactured to consistent quality, ensure delivery to the diseased site and achieve the required duration of activity. Chemically modified cyclodextrins (CDs), are uniquely capable of assembly into nanoparticles and because of mesomolecular size can do so even as conjugates to large biomolecules including oligonucleotides. Of particular interest is the recent 'proof of concept' data showing; (i) CD.siRNA covalent conjugates retain the gene silencing efficacy of the unconjugated siRNA, and (ii) CD.siRNA nanoparticles can be tagged with antibody fragments (FAB) to achieve specific cell targeting. The **aim of this project** is to unite these 2 technologies to produce therapeutic conjugates of siRNA for the treatment of Leukaemia.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Phamacy, Chemistry, Bioengineering. Candidates should also have a strong interest in clinical translation of materials and Biomaterials.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	University College Cork
Closing Date	Friday 29th June 2018
For more information contact	Professor Caitriona O'Driscoll, Prof and Chair of Pharmaceutics, UCC, caitriona.odriscoll@ucc.ie

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Position Title	PhD Studentship - Design and Synthesis of Surface Immobilised Additives to Improve Engine Efficiency and Cleanliness
Project Abstract	The occurrence of engine knock has been frequently identified as the major barrier to increasing the efficiency of spark ignition (SI) engines. Engine knock is caused by sequential auto-ignitions within the cylinder which elevate the local pressure amplitude and form pressure waves. The knocking phenomenon is chemical in origin and is the consequence of a radical chain reaction. Depending on the operating condition of the engine, a differing mixture of O atom, H, OH, HO2 and CH3 radicals or molecular O2, are the dominant radical chain carriers. To prevent knock, the end-gas must be prevented from auto-igniting. Historically, this was achieved using tetraethyllead (TEL). Studies of the mechanism of action of TEL proposed that metallic lead was responsible for the interception of HO2 radicals *i.e.* termination of the radical chain and prevention of ignition. This work invents the concept of radical trapping by designing polymeric metallic and non-metallic materials to trap and retain the radical chain carriers of the combustion processes. This would transform the effectiveness of the additive in the application as it would relax the current high potency-low concentration requirement, to a more amenable low-potency-high concentration scenario. Work package 1 will focus on the immobilisation of additives on metallic and/or composite surfaces. Work package 2 will test the efficacy of these substrates using an ignition quality tester (IQT) at TCD.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Physics, Chemistry or Chemical Engineering. Candidates should also have a strong interest in Energy.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	Trinity College Dublin
Closing Date	Friday 29th June 2018
For more information contact	stdooley@tcd.ie, +353 1896 2030

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Position Title	PhD Studentship – Develop Novel Translational Imaging Methods to Transition AMBER-Developed Joint Repair Materials into Clinical Practice
Project Abstract	As tissue engineered solutions for joint repair become ever closer to mainstream clinical use, the ability to monitor their progress and performance also comes into sharper focus. There has been ground-breaking successes in clinical applications of tissue engineering (TE) therapies for osteochondral defects within TCD/AMBER in recent years. Current methods of non-invasive diagnostic imaging are not equipped to specifically determine therapeutic progress after implantation. We have recently developed ways to merge basic biological joint assessments with MRI imaging methods. This is an important new area in tissue engineering and musculoskeletal imaging. This PhD project will bring together expertise in bone/cartilage imaging and mechanobiology (Kennedy) and clinical perspectives on joint repair (Moran & Flanagan) as well as vast experience in generation and implementation of tissue engineered joint repair applications (Profs Danny Kelly and Fergal O'Brien). We propose a PhD project that will fully characterize the performance of tissue-engineered constructs, from a diagnostic imaging perspective (MRI and μCT) perspective, first in a pre-clinical animal model and then ultimately this will be translated to clinical setting, by incorporating with ongoing clinical trials which use novel implanted materials (such as Chondrocoll). This will allow us to bring our understanding of these processes to the next level and to fully control and monitor implant integration, pathological processes and tissue regeneration.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bioengineering/Biomedical Science/Medicine. Candidates should also have a strong interest in regenerative medicine.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD/RCSI
Closing Date	Friday 29th June 2018
For more information contact	Prof. Cathal Moran; moranc8@tcd.ie

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Position Title	PhD Studentship - Developing Innovative Injectable Collagen-Bioceramic Composites for Medical Devices
Project Abstract	It is proposed that an injectable composite product, which harnesses the advantageous properties of both collagen and ceramics, would be an innovative and novel biomaterial technology. As such, *this project aims to develop a novel range of shear thinning injectable collagen-bioceramic composites, capable of in situ hybridisation, for drug and cell delivery in tissue engineering and regenerative medicine applications.* Specifically, the objectives of this project will be two-fold: 1) Combine collagen with a variety of ceramics with bioactive properties (e.gthermoresponsive properties, collagen is as an attractive polymer for. hydroxyapatite, magnesium phosphate, strontium, calcium phosphate) and develop a series of shear thinning, thermoresponsive, injectable composite biomaterials 2) Functionalise the injectable composites with specific therapeutics to guide cell differentiation and tissue formation both in vitro and in vivo The outcome of this project will be a catalogue of novel shear thinning injectable composite biomaterials with a broad range of mechanical properties and biological functionalities to be used as medical devices in the treatment of diseased and damaged tissue.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bioengineering or Medicine. Candidates should also have a strong interest in regenerative medicine and materials.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	RCSI
Closing Date	Friday 29th June 2018
For more information contact	Dr. Ciara Murphy; ciaramurphy@rcsi.ie; +353 1 402 5053

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Position Title	PhD Studentship - Developing next generation lithium ion battery electrodes using nanoscience
Project Abstract	Society needs batteries with significantly enhanced energy storage capability. The simplest way to achieve this is to increase the electrode thickness and so enhance the area energy density. However, this simple idea raises a number of materials science challenges. Firstly, thick electrodes have high electrical resistance which leads to reduced performance, especially at high rate. In addition, even with polymeric binders, it is impossible to produce electrodes beyond a critical thickness without mechanical instabilities leading to immediate crack-induced failure. Thus, what is urgently needed is a new battery architecture which leads to electrodes which are extremely conductive in the out-of-plane direction to facilitate charge delivery but extremely tough (mechanically) in the in-plane direction to prohibit cracking. Here we will develop 3-phase composites consisting of mixtures of lithium storage material (e.g. silicon or metal oxide particles) with very small amounts of graphene and carbon nanotubes. We aim to use surface tension effects to bias the film formation to yield an in-plane aligned nanotube network leading to high in-plane mechanical toughness. In addition, we aim to use solution processing to coat the lithium storing particles with graphene. On film formation, the graphene will be trapped in the inter-particle interstices leading to an isotropic graphene network capable of rapidly delivering charge throughout the electrode. We estimate that by optimizing the electro-mechanics, such a system could yield >500 um thick electrodes, leading to capacities of >10 mAh/cm2 at rates up to 0.5C.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Physics/Chemistry/Materials. Candidates should also have a strong interest in 2D Materials/Energy.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
For more information contact	colemaj@tcd.ie; +353 (1) 896 3859

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Position Title	PhD Studentship - Development of a 3D scaffold-based cell culture platform for oncology drug design and screening
Project Abstract	3D scaffold-based *in vitro* cell culturing is a new innovative approach in cancer research to bridge the gap between conventional 2D culture and *in vivo* tumours. Importantly, such 3D cell models help to reduce and replace animals for pre-clinical research addressing the principles for the care and use of animals known as the 3Rs (Replace, Reduce & Refine). The purpose of the proposed study is to better understand the molecular nature of the tumour microenvironment (TME), its tissue biomechanics, architecture, and cellularity for both primary tumours and metastatic sites. This, in turn, will help us to identify important features representative of the evolving TME and facilitate its 'reconstruction' *in vitro* subsequently advancing the recently developed physiologically relevant 3D *in vitro* cell model to develop and test new drugs for neuroblastoma. The objectives of the study are (i) to deconstruct/dissect neuroblastoma primary and metastatic microenvironment through characterisation its extracellular and cellular compositions, (ii) to characterise their biomechanical properties and (iii) to provide a rationale to design scaffolds that accurately mimic primary and metastatic microenvironments.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bioengineering/Biomedical Science. Candidates should also have a strong interest in cancer research.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	RCSI
Closing Date	Friday 29th June 2018
For more information contact	olgapiskareva@rcsi.ie; 01 402 2123

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Position Title	PhD Studentship – Development of next generation transcutaneous heart valves with long-term durability and reduced risk of calcification
Project Abstract	Currently, the main method of replacing diseased heart valves is open heart surgery using mechanical or bioprosthetic heart valves (BHVs). With an aging population, however, BHVs will be increasingly adopted, as unlike traditional mechanical valves BHVs are suitable for key-hole surgery. The main aim of this project is to identify viable materials to increase the long-term durability of transcutaneous valves. This will be achieved by testing BP tissue which has been fixed using the traditional glutaraldehyde protocol and comparing it to suitable alternatives including (i) BP fixed using a novel photo crosslinking technique and (ii) a decellularized biological scaffold (porcine intestinal submucosa) fixed using the novel crosslinking technique. This project will explore the biomechanics of the tissue via uniaxial and biaxial tests along with longer term cyclic tests to ascertain damage accumulation in the tissues.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bioengineering/Biomedical Science. Candidates should also have a strong interest in biomaterials and tissue engineering.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD/
Closing Date	Friday 29th June 2018
For more information contact	Prof. C Lally; lallyca@tcd.ie; +353 1 896 3159

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Position Title	PhD Studentship - Electrocatalytic CO2 Reduction at Single Au and Cu Nanoparticles
Project Abstract	The burning of fossil fuels has resulted in the drastic increase in atmospheric CO2 concentrations and climate change. The capture and conversion of CO2 into economically useful products could reduce atmospheric CO2 levels at the same time as producing liquid fuels. One method for the capture and conversion of CO2 is electrochemical reduction. This requires electrical energy, which can be derived from renewable sources, and a highly efficient electrocatalyst. Both Au and Cu are potential electrocatalysts. We aim to investigate the relationship between nanoparticle morphology and electrocatalytic CO2 reduction activity on single isolated Au and Cu nanoparticles using a combination of Scanning Electrochemical Cell Microscopy and Atomic Force Microscopy. The ability to measure both electrocatalytic activity and precise morphology of each individual nanoparticle is unique and will provide an internationally distinct research effort that will produce the first morphology/activity relationship at a single nanoparticle level.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Chemistry/Materials. Candidates should also have a strong interest in Catalysis/Energy.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
For more information contact	Prof. Kim McKelvey; kim.mckelvey@tcd.ie; +353 1896 4215

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Position Title	PhD Studentship - Engineering the Bone-Cartilage Interface for Joint Repair
Project Abstract	As tissue engineered solutions for joint repair become more advanced, and closer to widespread clinical use, further knowledge of their interface regions is crucial for long-term success. Interface regions are a vital part of every tissue-engineered application and can refer to the region between construct and host tissue, or between different elements of a multi-phase construct. This proposal will address the latter, specifically the zone of calcified cartilage (ZCC) that joins articular cartilage with subchondral bone. There has been ground-breaking success in tissue engineering (TE) of bone and cartilage tissue within the AMBER centre since its inception. We will supervise a PhD project to accomplish the following 3 aims: (1) Establish a library of new tissue-specific candidate factors for regeneration of the joint interface using a combination of our high throughput LCM method and RNA seq/Nanostring technology. (2) Develop an *in vitro* model system to understand how candidate macromolecules affect cellular crosstalk at the bone-cartilage interface. (3) Test modified/optimized scaffold system in pre-clinical model of joint disease.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bioengineering/Biomedical Science. Candidates should also have a strong interest in biomaterials/regenerative medicine.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	RCSI
Closing Date	Friday 29th June 2018
For more information contact	Dr. Oran Kennedy; orankennedy@rcsi.ie; Tel +353 1 402 5041

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Position Title	PhD Studentship - Evaluation of Additive Manufacturing as a Novel Fabrication Route for High-performance Electron Microscopy
Project Abstract	Many disciplines are undergoing a design and fabrication revolution with the advent of additive manufacturing or AM (3d printing). This is causing much old wisdom to be re-evaluated. The aims of this project will be to asses how these new capabilities might affect the design and construction of atomic-resolution transmission electron microscopes and their associated accessories. Two inter-related areas will be explored in this regard; electron-lenses and sample-holders. Electron-lenses are at present made from simple geometries, usually machined on lathes allowing only limited cylindrical symmetry designs. These designs often then contain sharp corners, leading to regions of magnetic-field saturation, spillout, or concentrated mechanical stresses. Sample holders are again manufactured at present by (mostly) CNC machining. Prices for these holders range from $10k-400k depending on the complexity of manufacture. Part of the project will involve working with CAD drawing packages to replicate the existing state-of-the-art designs, analysing these both mechanically using FEA tools as well as magnetic field simulations, and hopefully identifying opportunities to exploit new manufacturing capabilities in their manufacture for improved performance. 3D printing facilities will be available to produce prototypes of any new designs proposed and, depending on the success of these, metal parts will be manufactured for testing.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Physics/Chemistry/Nanoscience. Candidates should also have a strong interest in Additive Manufacturing/Microscopy.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
For more information contact	Dr. Lewys Jones, Lewys.jones@tcd.ie

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Position Title	PhD Studentship – Finish machining of orthopaedic implants
Project Abstract	UHMWPE (ultra-high-molecular-weight-polyethylene) materials are used to manufacture bearing components for orthopaedic implant systems. These products are produced on 5 axis CNC machines from blocks/bar stock. The challenges with machining this material are the long lengths of swarf and burrs on the finished machined components. If the swarf wraps around the cutting tool or part it can result in process issues such as poor surface finish, illegible part marking or part transfer location issues. Burrs remaining on the part results in secondary manual operations to remove. Controlling machine parameters such as chilled air cooling, cutting tool geometries and CAM tool paths are known variables that can reduce continuous swarf or burrs on parts. There are other factors but the criticality of each and their interactions are not understood. A stable machining and reduced inspections will ultimately lead to automation opportunities and lights out manufacture possibilities.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Materials Science/Polymer Engineering/Biomedical Science. Candidates should also have a strong interest in Materials for Health.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	Athlone Institute of Technology
Closing Date	Friday 29th June 2018
For more information contact	Dr. Declan Devine; ddevine@ait.ie

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Position Title	PhD Studentship – Immune modulating biological scaffolds for functional tissue regeneration
Project Abstract	Despite decades of research, there have been relatively few examples of successful tissue and organ regeneration in humans using biomaterial scaffolds. This may be because such bioscaffolds are designed to modulate the later stages of the healing process such as stem cell differentiation, while less focus has been placed on the manner in which the host immune system responds to the particular intervention. As a result, efforts are being made to manipulate the interplay between the implant material itself and the host immune system, as recent evidence suggests that promoting specific interactions between the two can boost immune tolerance and positive healing outcomes. The goal of this project is to expand on these studies and to further explore how the composition of biomaterial scaffolds determines immune cell recruitment, macrophage polarization, vascularization, progenitor cell recruitment and differentiation and, ultimately, functional tissue regeneration within critically sized bone defects. Furthermore, we will determine if biomaterial - induced metabolic changes impact on the ultimate fate of MSCs and whether this can be manipulated to promote favourable chondrogenesis and osteogenesis. These questions will be addressed using established *in vivo* and *in vitro* models using both biomimetic scaffolds (produced from the bottom up by combining specific organic and inorganic matrix components) and extracellular matrix (ECM) derived scaffolds (produced from decellularized porcine tissue).
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bioengineering/Immunology/Biomedical Science. Candidates should also have a strong interest in regenerative medicine.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
For more information contact	Dr. Aisling Dunne; + 353-1-8962437; aidunne@tcd.ie

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Position Title	PhD Studentship - Industrial Mineral Ore Sorting by Selective Microwave Heating
Project Abstract	The proposed PhD research project is part of SortOre, a research and development project currently underway in the Applied Physics Research Group in the TCD School of Physics and AMBER, PI Prof. Igor Shvets. SortOre aims to develop a commercial ore sorting solution as a mineral pre-concentration stage to be installed in production chains of various mineral ores in the mining industry. This is intended to address the perennial problem faced by mines that usable materials have to be extracted from orebodies of continually dropping grades and quality. In a stream of run-of-mine material, the SortOre solution identifies rocks of sufficient mineral content by way of an array of sensors that perform automated physical measurements. One such sensor, to be developed in the proposed project, subjects the stream of rocks to a high-power microwave field (of a frequency in one of the ISM bands). In this field, rocks will heat at different rates according to the dielectric parameters of the materials in each rock matrix. A thermal imaging system extracts the heating rates of each rock, on the basis of which a machine learning algorithm then performs an estimation of the mineral content.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Physics/Engineering. Candidates should also have a strong interest in Energy & Sustainability.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
For more information contact	Prof. Igor Shvets; igor.chvets@tcd.ie

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Position Title	PhD Studentship - Infrared Plasmonic Behavior of 2D and 3D Patterned Conducting Polymer Metamaterials
Project Abstract	The objective of this project is to experimentally determine if traditional plasmonic responses associated with patterned metallic micro and nano structures, such as surface plasmon polaritons and localized surface plasmon resonances can occur in highly doped 2D and 3D patterned conjugated polymer materials at mid-infrared wavelengths (i.e., in the 3 µm to 25 µm wavelength range). The main hypothesis is that by forming patterned nano- and micro-structures of highly-doped conjugated polymers, similar resonant optical properties to those observed in metallic nanostructures at visible wavelengths (i.e., surface plasmon resonances) will be apparent in the mid - infrared. Surface plasmon resonances have found unique applications in surface sensing as well as in sub-wavelength optics at visible and near-infrared electromagnetic wavelengths.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Physics or Nanoscience. Candidates should also have a strong interest in Additive Manufacturing and Photonics.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
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Position Title	PhD Studentship - Additive manufacturing approach to particle engineering for drug delivery
Project Abstract	Making patients breathe easier: an additive manufacturing approach to particle engineering for inhaled drug delivery applications. With the FDA approval of Spritam® in 2015, the first 3D printed tablet, a new era for pharmaceutical manufacturing is emerging. The utility of 3D PRINT/additive manufacturing approaches in tissue engineering is well established and its potential to revolutionise pharmaceutical product manufacturing is now emerging. 3D PRINT offers pharmaceutical developers and manufacturers a range of potential benefits including; i) the ability to create complex pharmaceutical products ii) personalised patient dosing e.g. paediatric & geriatric populations, iii) creation of combination drug products iv) manufacturing at the point-of-care and v) rapid prototyping of new drug products. This project seeks to build on the expertise of Prof. Cryan's DRug Delivery and Advanced Materials (DReAM) team within RCSI TERG in drug product development and combines this with AMBER's state-of-the-art Additive Research Laboratory to develop innovative drug product prototypes. Specifically in this PhD project the focus will be on the development of additive manufacturing approaches to particle engineering for inhaled products. Respiratory diseases are among the leading causes of morbidity and mortality worldwide.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Pharmacy/Biomedical Science. Candidates should also have a strong interest in additive manufacture/polymers/drug delivery.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	RCSI
Closing Date	Friday 29th June 2018
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Position Title	PhD Studentship – Mechanotransducing Magnetic Biomaterials
Project Abstract	By directly targeting cell-surface mechanosensors and transducing forces from an external magnetic field to remotely control mechanotransduction, the study will assess the ability of these magnetic biomaterials to facilitate bone regeneration following osteoporotic bone loss or to heal a critical sized defect. This exciting technique offers a potential non-invasive, anabolic therapy, however, the technology has clinical applications far beyond the skeletal system proposed here. Magnetic nanoparticles offer an innovative way of mechanically stimulating cells both in-vitro and in-vivo. Superparamagnetic iron oxide nanoparticles (SPIONs) have a magnetic particle core which is surrounded by a biocompatible polymer. In this study, SPIONs will be functionalised to attach to a number of cell receptors which have been identified for their role in bone turnover and where mechanical loading is a requirement for initiating the signalling pathway.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Biomedical Science/Physics. Candidates should also have a strong interest in magnetism and regenerative medicine.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	RCSI
Closing Date	Friday 29th June 2018
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Position Title	PhD Studentship - Novel polypeptide bioinks for 3D printing of bioactive scaffolds for tissue engineering applications
Project Abstract	The development of defined three-dimensional (3D) architecture fabrication for tissue engineering has been a recent emergence within the field tissue engineering. In particular, 3D printing represents a promising rapid prototyping technology for the production of intricate bio-inspired scaffolds/constructs. Recent work on 3D rapid prototyping with hydrogels has mainly focused on the use of natural polymers such as chitosan, alginate as well as modified bio-native gelatin and hyaluronic acid hydrogels. Notably, the development of printer technology has significantly outpaced the development of new advanced inks and the limited number of suitable bio inks has been identified as the major barrier to progress for the development of tissue engineering applications. It is envisaged that a possible solution lies in the synthesis of hydrogel polymers but application demands are high. We will synthesize polypeptide bioinks; perform rheology and mechanical analysis; 3D print, and perform biocompatibility assessments.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Chemistry/Biomedical Science. Candidates should also have a strong interest in additive manufacturing, polymers or regenerative medicine.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	RCSI
Closing Date	Friday 29th June 2018
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Position Title	PhD Studentship - Novel Porphyrin Functionalised Nanoribbon Devices: Towards Integrated Functional Nanoribbon Electronics
Project Abstract	The idea of this project is simple even though using complex physical, chemical and surface science methods and techniques. Electronically and chemically versatile functional molecules known as **porphyrins**, are to be integrated into **self-assembled graphene nanoribbons (GNR)**, where this on–surface bottom-up assembly occurs due to thermally driven chemical dissociation, diffusion and reaction mechanisms. Consider this as "wiring up" functional porphyrin molecules with semiconducting nanowires to either side, integrating porphyrin molecules as part of a conductive pathway, or circuit element in future nanoelectronic devices which could employ such self-assembled nanostructures. We term these nanostructures **porphyrin functionalised graphene nanoribbons (Por-fGNR)**. Constructing a **Field Effect Transistor (FET)** device based on this concept is appropriate to AMBERs research mission.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Physics/Chemistry/Materials Science. Candidates should also have a strong interest in 2D Materials
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
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Position Title	PhD Studentship – Printable soft matter with self-healable and tuneable properties through supramolecular engineering
Project Abstract	Supramolecular polymers are emerging as alternative means to developing functional, responsive and engineered hierarchical materials. Unlike classical polymeric synthesis, their application as materials in additive manufacturing (AM) is, however, rather unexplored, but fast growing such as in the formation of novel and targeted biomaterials. Supramolecular building blocks provide the platform for non-covalent interactions, that can be capitalized on in the engineering of physical and mechanical properties, that are expressed in such bulk material. These non-covalent interactions, arising from hydrogen bonding and π- π forces, to strong metal coordination, can be tuned by ligand design, adding unique and controllable properties, through such 2D and 3D interactions. This PhD project will involve the development of such structures with a focus towards biopolymers such as Chitin and Chitosan. We will develop suitable formulations that allow for the 3D printing of functional structures.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Chemistry/Materials Science. Candidates should also have a strong interest in Additive Manufacturing/Sustainable Materials.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
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Position Title	PhD Studentship - Simulation of switching mechanism of 2-D materials for flexible electronics
Project Abstract	Two-dimensional (2-D) semiconductors such as molybdenum disulphide have commercial potential as transistor components and light emitting agents in novel large scale, inexpensive, non-toxic displays and optoelectronics. They can be deposited using inkjet-printing techniques, which result in 'flexible' electronics. When 2-D semiconductors are immersed in an ionic liquid, application of a gate voltage can switch them on or off so that they display transistor behaviour. The 2-D character of these materials means that electronic circuits can be created from liquid-exfoliated nanosheets [1] using inkjet printing technology [2]. These are immersed in an ionic liquid (IL), and a small gate voltage (2 V) is applied between an electrode in the liquid and a back-electrode underneath the nanosheet network. The resulting transistor is gated by the potential of the electric double layer (EDL) formed when the gate potential is applied. Displacement of ions in an IL in a potential gradient generates an EDL at the semiconductor/IL interface. The resulting electrostatic potential in the semiconductor generates charge carriers in the semiconductor. The Coleman group in AMBER is developing this technology in the laboratory. ***The aims of this project are to advance understanding of switching mechanisms of IL gated 2-D semiconductors using molecular dynamics (MD) and density functional theory (DFT) and to increase the innovation rate in IL gated 2-D semiconductors in the Coleman group.***
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Physics/Materials. Candidates should also have a strong interest in 2D Materials.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
For more information contact	Prof. Charles Patterson; Charles.Patterson@tcd.ie; + 353 1 896 1675

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Position Title	PhD Studentship - Simultaneous Exfoliation and Functionalization of Graphene in *Water: Towards Bio-Useful Graphene*
Project Abstract	In recently published work, we have devised a two component system that orchestrates a **directed self-assembly** (DSA) of fluorophore containing nanocapsules, which can self-report on dynamic changes within their local aqueous environment. Herein we propose that that the ability of these DSA polymeric particles to **dynamically modulate emission intensity upon surface adsorption** can be exploited for selective labelling graphene surfaces and that this could be achieved in conjunction with the production of graphene in water. Once NIR fluorescently functionalized, this would allow the real-time imaging of graphene bio-interactions and would serve as a model system for the adsorption of other hydrophobic entities. Our collaborators in the University of Manchester have extensive expertise in graphene surface analysis and will assist in performing extensive Raman and electrochemical characterisation of our exfoliated hybrid materials. SEM, TEM imaging and helium-ion microscopy to be carried out in collaboration with Prof. Gunnlaugsson. Once optimised the procedural knowledge gained to produce hybrid graphene materials in water would be applicable to a wide range of potential uses from hydrophobic drug to metal complex adsorption.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Chemistry; Materials Science; Organic Chemistry; Chemical Biology. Candidates should have an interest in 2D materials/drug delivery.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	RCSI.
Closing Date	Friday 29th June 2018
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Position Title	PhD Studentship - Smart Inverse Piezoelectric Biomaterials for Cardiac Organoid Engineering
Project Abstract	Electro-conductive biomaterials are an emerging topic in the field of tissue engineering with current solutions today in biosensors, neural implants, drug delivery devices, and tissue engineered scaffolds. The Monaghan Lab have developed a number hybrid polymeric materials based on poly(3,4-ethylenedioxythiophene:poly(styrenesulfonate) (PEDOT:PSS), polypyrolle (PPy), among others, that are biocompatible, exhibit tunable electrical and mechanical properties and are relatively straightforward to produce. These materials have been shaped in 2D, and in 3D through a number of additive manufacturing processes (lyophilisation, melt electrospinning writing) with novel crosslinking agents to attain aqueous stable 3D porous structures. The overall objective of this project is to investigate, modify and employ electroconductive materials to achieve inverse piezoelectric transduction for tissue engineering applications.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bioengineering/Physics/Bioscience.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
For more information contact	Dr. Michael Monaghan; monaghmi@tcd.ie; +353 1896 8582; www.monaghanlab.com

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Position Title	PhD Studentship in SoDHA (solution deposit of Hydroxyapatite)
Project Abstract	This proposal details the investigation of the incorporation of additives to solution deposited hydroxyapatite (SoDHA) coatings for orthopaedic implants, to promote appositional bone growth and to discourage bacterial growth. The main reason for the failure of orthopaedic implants are poor fixation and infection. By increasing the appositional bone growth, the fixation of implants will be improved. By discouraging bacterial growth the levels of infection will be reduced. The research will include the incorporation of anti-microbial ions and/or drugs that promote bone growth within and on the SoDHA coating. Characterisation of the coating will include morphological and chemical analysis, plus measurements of surface energy and bio-activity. The potential impact of success in this project would be the identification of a technology that would provide a clear improvement in joint replacement surgical outcomes. Patient lives would be improved by a reduction in revision surgeries and a longer lifetime of the orthopaedic implants.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Chemistry/Materials Science/Engineering. Candidates should also have a strong interest in Biomaterials.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
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Position Title	PhD Studentship - Soft Bio-inspired Micro-robotics
Project Abstract	Scientists have endeavoured for decades to synthetically imitate the movement and functionalities exhibited by living organisms, in a bid to develop vehicles capable of movement at the micro-scale. Approaches to date lack mechanical compliance, resulting in a mismatch between the synthetic and the biological. In this regard, the field of robotics requires an immediate and drastic rethink, moving from engineering to bio-inspired concepts. This project will address such a need, through the development of artificial micro- "vehicles" which possess life-like behaviours such as movement, sensing, signalling and reporting. Generating life-like micro-vehicles which have the potential to transport chemicals and act as chemical messengers, could offer a viable route towards the creation of effective platforms for personalised drug delivery and regenerative medicine within the body. In this project, advanced micro-vehicles will be fabricated using recently developed high resolution three-dimensional (3D) printing technologies, namely **Direct Laser Writing Fabrication (DLW)**. Furthermore, these biomimetic structures will incorporate stimuli-responsive materials into the pre-designed 3D polymeric networks.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Chemistry/Materials Science/Physics. Candidates should also have a strong interest in Additive Manufacture.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	DCU
Closing Date	Friday 29th June 2018
For more information contact	Larisa.Florea@dcu.ie

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Position Title	PhD Studentship – Optically active artificial chiral structures for chirality sensing
Project Abstract	The aim of this proposal is to develop and exploit optically active artificial chiral nanostructures for high sensitivity sensing platforms targeted at the needs of the pharmaceutical industry. It is envisaged that such structures could more generally also be used for sensing applications in chemistry and the environment. Production of artificial optically active chiral nanostructures with controlled properties tailored for sensing applications is still in its infancy. Bottom-up approaches include a limited number of reports on successful synthesis of such structures, based on plasmonic gold nanoparticles helically arranged on a DNA-origami scaffold, ligand or defect based optical chirality in semiconductor quantum dots/rods. Top-down approaches include lithographically patterned plasmonic surfaces. The project will investigate the optical dichroism, the emission properties (such as circularly polarised excitation and emission), the energy transfer properties in the presence of the chiral structures and chiral tweezing.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Physics, Chemistry, or Nanoscience. Candidates should also have a strong interest in ICT/Biophotonics.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
For more information contact	Dr. Louise Bradley, bradlel@tcd.ie, 01-896-3595

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Position Title	PhD Studentship - Targeted Nanotherapy for Pancreatic Cancer Treatment
Project Abstract	**Pancreatic cancer (PanCa) is a devastating disease with almost the same number of diagnoses as deaths**, reflecting an urgent need for the development of novel and effective treatment modalities. The delay of clinical manifestation and lack of criteria to identify susceptible individuals results in extensive metastasis by the time of diagnosis and typically tumours are both radio- and chemo- resistant. Consequently, this PhD proposal aims to **develop a dual-functional NP (nanoparticle) system composed of chemotherapy (GTP) and gene-therapy (miR-143), to perform a sustained synergistic therapeutic effect for PanCa treatment, which will be delivered in a controlled and sustained manner using a thermo-responsive hydrogel system**. An interdisciplinary team based approach is essential to the successful delivery of this project. Prof Dunne (TCD/DCU) will provide expertise on fabrication and characterisation of the NP systems and thermo-responsive hydrogel, and Dr Levingstone (DCU) & Prof McCarthy (QUB) will provide expertise on *in vitro* and *in vivo* assessment. A number of strategic industrial and academic stakeholders have expressed unreserved support for the PhD proposal in terms of technical advice and clinical support.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bioengineering/Biomaterials/Nanotechnology/Medicine. Candidates should also have a strong interest in Drug Delivery/Oncology.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	DCU/TCD
Closing Date	Friday 29th June 2018
For more information contact	Prof. Nicholas Dunne, nicholas.dunne@dcu.ie

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Position Title	PhD Studentship - Development of an Implantable Bioengineered Tracheal Scaffold for Respiratory Tissue Regeneration
Project Abstract	The central research question of this project is whether it is possible to manufacture a tracheal medical device containing a composite of natural and synthetic biomaterials that can both enhance healing and restoration of the native biological tissue, in addition to exhibiting the mechanical strength necessary to maintain a patent airway. Today, there is still an unmet clinical need for treatment of long-segment tracheal damage. The trachea is essential to facilitate the transit of air to the distal regions of the lungs for oxygen and carbon dioxide exchange. Tracheal damage due to cancer, stenosis, infection, or congenital abnormalities can have devastating consequences. Accordingly, the major objective of this project is to design a novel composite scaffold with suitable biocompatible and mechanical properties for tracheal tissue regeneration. Our central hypothesis is that the incorporation of a synthetic polymer fabricated with 3D printing technology can be used to create an engineered implant that combines the advantages of the CHyA-B scaffold with the robust strength of a biocompatible, synthetic polymer, providing an implantable device that will maximize tracheal tissue regeneration by the promotion of epithelialisation, airway patency, and vascularisation.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bio-Engineering/Pharmacy. Candidates should also have a strong interest in 3-D Printing/Regenerative Medicine.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	RCSI
Closing Date	Friday 29th June 2018
For more information contact	Dr. Cian O'Leary, cianoleary@rcsi.com; Tel: +353 1 402 8521

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Position Title	PhD Studentship - The development of smart 4-D materials utilising melt processed stimuli sensitive polymers
Project Abstract	Imagine a world where current diseases could be easily treated, where patients underwent short treatment periods and recovered quickly with limited side effects. We are now entering a generation of smart medicine which will do just that. The proposed study represents unchartered territory for smart temperature sensitive polymers. The main aim of this study is to develop novel smart 4-D materials and analyse their behaviour and potential applications. There is more that can be done with 3-D printed materials to make them more flexible and more useful: by utilising structures (Smart Polymers) that can transform in a pre-programmed way in response to a stimulus. Very recently given the popular science name of "4-Dprinting", it refers to 3-D printed objects that can transform their shape over time, thus giving them an extra dimension. While the use of smart materials is not new, the 3-D printing of smart polymers is very new, and 3-D printing of smart negative temperature sensitive polymers using Fused Deposition Modelling has not been reported in literature. Thus it marks an exciting new chapter in the evolution of smart thermosensitive polymer materials. When one thinks of the revolutionising materials properties brought about by melt processing conventional polymers, which have been used in many lifesaving applications in the biomedical field, the potential of this research is very far reaching indeed.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Polymer Science/Materials/Bioengineering. Candidates should also have a strong interest in 3-D Printing/Additive Manufacture.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	AIT
Closing Date	Friday 29th June 2018
For more information contact	Dr. Luke Geever, lgeever@ait.ie

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Position Title	PhD Studentship - Timed to Perfection: Development of a novel circadian drug delivery platform and its application in osteoarthritis
Project Abstract	There is a growing body of evidence that multiple biological processes demonstrate 24-hour rhythms, also known as circadian rhythms; however, to our knowledge, no local drug delivery system has been developed to align to these biological oscillations. To this end, this PhD project brings together expertise in Immunology and Clock Biology (Curtis Lab) and in timed and on-demand drug delivery (Kearney Lab) to develop a novel platform for circadian-mimicking drug delivery. 56 of the top 100 selling drugs target the product of a circadian gene but most do not consider time-of-day dosing. Therefore, demonstration of a circadian drug delivery device –as is the objective of this project– will provide a platform that can be applicable across a wide range of marketed drugs. As an initial test, we will apply this circadian drug delivery device to osteoarthritis by examining delivery of a molecule, adenosine, which is known to play key roles in cartilage cell (chondrocyte) health and displays a strong circadian profile. To ensure that the outputs of this work are ready for translation, we will perform proof-of-concept trials in animals.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Bioengineering/Medicine/Immunology. Candidates should also have a strong interest in Regenerative Medicine/Drug Delivery
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	RCSI
Closing Date	Friday 29th June 2018
For more information contact	Dr. Annie Curtis, anniecurtis@rcsi.ie, 353-1-4025018

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Position Title	PhD Studentship – 3D Printing – Understanding microstructural effects due to changes in process parameters
Project Abstract	The ultimate goal for material properties created in a 3D printer would be to meet required material specifications directly out of the 3D printer. Unfortunately, currently further post processing and thermal treatments are often required. The intent of this project is to understand the possibilities of changing process parameters in the printing cycle to achieve desired microstructural effects and as a result material properties. For example: what process parameters can be dialled in to eliminate porosity, increase ductility, improve fatigue strength, improve lattice structure properties or surface finish etc. The intent is to really understand the impact of all process parameters and how they could be dialled in to improve design and quality of component. Potential Impact of Success: Elimination of thermal treatments would reduce COGS and Lead Time; Control of material properties would open up opportunities for design freedom; Understanding of material properties will facilitate problem solving.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Chemistry/Physics/Materials. Candidates should also have a strong interest in Microscopy/Additive Manufacturing.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	TCD
Closing Date	Friday 29th June 2018
For more information contact	Prof. Mick Morris, morrism2@tcd.ie; +353 (0)1 896 3089

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Ireland's European Structural and Investment Funds Programmes 2014-2020 Co-funded by the Irish Government and the European Union
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Position Title	PhD Studentship – Utilising block copolymer derived metal nanowire structures to create surface topography effects for cell attachment in biomedical applications
Project Abstract	Interaction between biomaterials and cells is a critical aspect for successful application of tissue engineering research. Cells in their native environment are surrounded by chemical and physical factors spanning a range of length scales from nanometers to hundreds of microns. Hence, cells that adhere to the extracellular matrix (ECM) can sense and respond to a wide variety of chemical and physical features of the adhesive surface, including the molecular nature of adhesive ligands and their local densities, as well as surface topography and rigidity. Recent advances where block copolymers have one block preferentially dissolved and infilled with metals to produce nanowires could prove a valuable method in this field. These nanowires structures can be used as an insert in an injection mould to create a nanotopography on the surface of a range of thermoplastic resins. Utilising block copolymer derived nanowires in moulds will allow polymers to be produced with nanotopography. These components will be assessed to determine how the polymer chemistry and surface topography effects cell attachment and if this nanostructure can be utilised to control cell attachment.
Experience	The PhD position is funded for 4 years, including a monthly stipend and materials and travel budget. Applicants should hold a minimum of an honours bachelor's degree at 2:1 level or equivalent in a relevant subject such as Materials Science/Polymer Engineering/Biomedical Science. Candidates should also have a strong interest in Materials for Health.
Funding	The studentship will cover fees up to €5,500 pa and a stipend of €18,500 pa
Location	Athlone Institute of Technology
Closing Date	Friday 29th June 2018
For more information contact	Dr. Declan Devine; ddevine@ait.ie

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