University of HUDDERSFIELD

PhD Studentships in Biology, Chemistry, Pharmacy

Twelve new fully funded PhD research studentships are offered in the School of Applied Sciences for an 18 September 2017 start. The School is made up of the Departments of Biological Sciences, Chemical Sciences and Pharmaceutical Sciences.

There is competition funding for 12 of the 15 research projects outlined below. Usually the projects which receive the best applicants are funded.

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Biology

Chemistry

Pharmacy

If you are interested in any of these projects please contact the relevant supervisor for an informal discussion. To apply, please send an email outlining your motivation and experience to the supervisor, including a CV and the names of two referees by 28 February 2018 (copy to sasresearchadmin@hud.ac.uk). You should also complete an on-line application.

Interviews will be held on 20 March 2018 and will include a 10-minute presentation of each candidate's recent research.

Candidates may direct general enquiries to Dr Dougie Clarke, Director of Graduate Education in the School of Applied Sciences d.j.clarke@hud.ac.uk 01484 473142. General information about the School and research at the University is available on our website.

The studentships are open to citizens of the UK or EU only, and cover the full cost of tuition fees and an annual tax-free bursary of £14,764 for three years (RCUK rates). Successful applicants will have a very good first or upper second degree or Masters degree in a relevant subject.



Biology

The VDAC Channel/kinesin-like Protein Interactions In Programmed Cell Death and Autophagy

Voltage-dependent anion channels (VDACs) are the most abundant channels in the outer mitochondrial membrane. Throughout the life of the cell, different cytoplasmic proteins can interact with VDACs, regulating their open-to-closed state transitions and instructing the mitochondrion towards or against death processes. In addition to triggering death cascades, VDACs contribute to healthy fertilisation and embryo development.

We have recently identified a plant kinesin-like protein, possessing E3 ligase activity, and interacting with plant VDAC1. Similar interactions in mammalian cells are pivotal for the autophagy of defective mitochondria and the control of cancer and Parkinson's disease. The project will explore the biochemical and electrophysiological implications of this interaction *in vitro* and *in vivo*. It will further aim to define the molecular basis of these interactions structurally.

The candidate will undertake training in an interdisciplinary collaborative research environment. Applicants should have at least a 2.1 honours degree (or its international equivalent) in a relevant subject. Previous research experience and developed skills in molecular biology and protein handling are desirable.

Contact Dr Georgios Psakis g.psakis@hud.ac.uk 01484 473934

Prostanoid transporters as therapeutic targets for human hair disorders

Prostanoids have prominent roles, including the regulation of skin inflammation and cutaneous immune function, in addition to control of hair follicle biology. Indeed, the PGF2α analogue bimatoprost stimulates hair growth, whereas PGD2 facilitates hair follicle regression. We recently identified the presence of a host of transporters capable of prostanoid movement in human hair follicles. This clinically-relevant project builds on such exciting recent evidence to examine the functional significance of prostanoid transport on hair growth and cycling, with the goal of identifying new targets for the treatment of hair disorders. This work will take place in an interdisciplinary collaborative research environment. Full training will be given in all techniques and no previous experience of hair biology is necessary.

Contact Dr Iain Haslam i.haslam@hud.ac.uk 01484 471734

Identifying Targets for Treatment of Alcohol Dependence using Electroencephalography

Developing new treatments for alcohol dependence is a priority amongst health professionals and researchers. The first step for developing successful treatments is to establish a reliable, sensitive and cost effective testing platform to be used for screening potentially efficacious treatments.
This project aims to develop and validate an electroencephalography (EEG) testing platform for assessing reward disturbances in alcohol dependence using both event related potential and single trial EEG techniques. It is expected that a successfully developed platform will be used for 'proof-of-concept' psychopharmacological studies.
This project would be suitable for individuals with knowledge within cognitive neuroscience/neuropsychopharmacology. EEG experience is desirable although not essential as training will be provided.
This project with be co-supervised by Dr Anna Murphy of the Department of Biological Sciences and Dr Chris Retzler of the Department of Behavioural and Social Sciences, at the University of Huddersfield.

Contact Dr Anna Murphy a.murphy2@hud.ac.uk , 01484 472158

Mining the metagenomes of extreme environments

The scarcity of resources in extreme environments generates a severe competitive pressure for the microbial communities present, making them ideal hunting grounds for novel microbial products. Unfortunately, the recovery of these products from these environments is hampered by the fact that only a fraction of the organisms present are culturable. However, metagenomics provide an alternative approach which overcomes many of these problems. This project will apply metagenomic approaches to a range of extreme environments in order to generate a comprehensive overview of the metabolic potential of the resident communities. These metagenomes will then be used to construct whole genomes of uncultured organisms, guide media development for the recovery of previously uncultured organisms and to identify novel microbial products. The successful candidate will be joining a large, interdisciplinary and collaborative research team and will gain a wide range of transferable technical and personal skills.

Contact Prof P Humphreys p.n.humphreys@hud.ac.uk , 01484 472771

Biodegradable active films and coatings with protective photochromic additives

Active biodegradable film technology is an innovative concept to deliberately incorporate components that would release or absorb substances either into or from a packaged product or the environment surrounding the product.
Biodegradable films that can protect either sensitive products or the skin from deleterious UV radiation have not been explored to date due to the difficulty of identifying functional UV-responsive, self-indicating, photochromic components. The present project will bring together the expertise in biopolymers and colour chemistry of two departments within the School of Applied Sciences to develop and assess unique biodegradable photochromic films for a range of industrial applications.
The present project will utilise pectin as biodegradable film-forming material and a range of photochromic agents to form self-indicating film barriers to UV radiation.

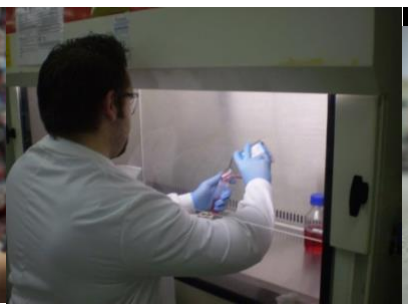
Objective 1: Pectin film formation and characterisation by means of thermal, mechanical and microstructural characterisation.

Objective 2: Encapsulation of photochromic entities and assessment of the stability and compatibility of a range of photochromic agents with pectin.

Objective 3: Evaluation of the capacity of the active films to shield from UV radiation and kinetics of lipid oxidation

Contact Dr Vasileios Kontogiorgos V.Kontogiorgos@hud.ac.uk 01484 472488

Comparative genomics and search for signatures of positive selection in *Apodemus spp*. …..


Chemistry

Analysis of Biological Macromolecules Using High-Field NMR and GC-MS

Modern analytical science techniques (NMR spectroscopy and mass spectrometry) are ideal tools for characterizing the structures of biological macromolecules. One group of macromolecules which have not been studied in great depth are the carbohydrate based structures used to decorate the surface of bacteria. These cell wall decorations are usually the first point of contact with mammalian cells when bacteria invade our bodies. Recent evidence has suggested that the contacts formed are responsible for influencing how our immune systems respond: producing either a positive or negative interaction. In this project we will use high-field NMR (600 MHz with cold probe) and mass spectrometry to characterise the structure of a range of carbohydrate based materials derived from bacteria.

Contact Prof. Andy Laws a.p.laws@hud.ac.uk Tel: 01484-472668

Biorefinery, bioenergy and biochemicals: biosynthesis towards value-added bio-products from biomass

The successful candidate joining the active biomass refining group at the University of Huddersfield will focus on value-added biofuel and biochemical production, replacing fossil fuel dependency. Specific aims for this project will be investigating lignocellulosic feedstock and marine biomass (macroalgae) for conversion into high value chemicals. Depending on skills and interests, this project will be suitable for a candidate with either a (bio)- chemical engineering or synthetic biology background. A 2-months visit to Hong Kong City University will be included as a part of the training program.

Contact Dr Chenyu Du c.du@hud.ac.uk 01484 472378

Surface composition and crystal growth of insoluble lead minerals in tap waters.

Many older properties in the U.K. are still connected to the water mains in the street by a length of lead pipe. The slow corrosion of this pipe results in the discharge of lead into drinking water. Lead is a public health issue and there are strict limits to the levels that are permitted in drinking waters. The current level in the U.K. is 10 ppb. Most water utilities in the U.K. add small amounts of phosphate to tap water as this has been found to be very effective at reducing lead concentrations. It is thought that this promotes the formation of insoluble lead phosphate minerals. But how these minerals grow is unclear. The insides of lead water pipes contain a thin mineral layer containing lead oxides, carbonates and phosphates and the focus of this project is on the crystallisation of these minerals. Full training will be given in a range of analytical techniques including powder x-ray diffraction, scanning electron microscopy, atomic force microscopy, inductively coupled plasma mass spectrometry, crystal growth and modelling of mineral solubilities. There will also be opportunities to work with major water utilities and to attend industrial and academic conferences. Candidates must be interested in environmental geochemistry and crystallisation but previous experience is not required.

Contact Dr Jeremy Hopwood j.d.hopwood@hud.ac.uk 01484 473989

Multimodal metal complexes as anticancer and antimicrobial theranostic platforms

The unique photophysical properties of transition metal complexes offer significant potential opportunities in areas of diagnostic imaging as well as light-activated therapeutic activity. This multidisciplinary project will bring together expertise in frontier transition metal photophysics and photochemistry, cancer pharmacology and state-of-the-art confocal microscopy to focus on the development of novel multimodal molecular platforms that enable selective diagnostic luminescent imaging and allow targeted photo-initiation of cytotoxicity. Full interdisciplinary training will be given in chemical synthesis and characterisation, photophysical study, cell culture and microscopic imaging. Applications are encouraged from enthusiastic, motivated and ambitious graduates from the chemical, pharmaceutical or biochemical sciences.

Contact Professor Paul Elliott p.i.elliott@hud.ac.uk 01484 472320

Development of a metal-doped nanostructured 'electro-photocatalytic' material to be activated by light and electromagnetic fields.

Currently, the materials that have photocatalytic properties are exclusively activated by light. The difficulty of providing a homogeneous illumination to materials in bulk form has limited the use of photocatalysis in a large industrial scale. The aim of the proposed research project is to develop a novel metal doped nanostructured catalysts that can be activated by light and by an electromagnetic field.

Dr Anyela Ramirez-Canon (A.M.Ramirez-Canon@hud.ac.uk) 01484 473399

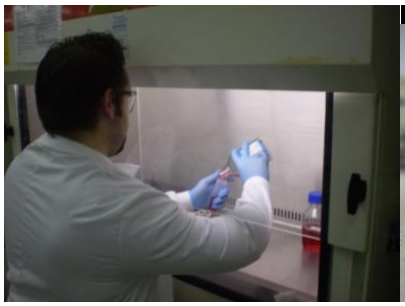
Novel Green Technologies: Harnessing the Utility of Reducing Sugars

The Camp group has long-standing experience in the use of renewable sugars in chemical transformations and as replacement for traditional petroleum based solvents.
Industrial and governmental drivers are pushing for greener, safe and more cost efficient methods for the production of the chemicals on which we have all come to rely. This PhD will be primarily focused on the development of (a) novel sugar-powered catalysis methods in which the reducing potential of the sugar is harnessed to power chemical reactions and (b) the use of the bio-available solvent Cyrene in industrially relevant processes. Initial area of focus will build upon our recently published work on a novel Suzuki-Miyaura cross-coupling reactioni as well as on the synthesis of ureas in Cyrene.ii
The successful candidate should have a 1st or good 2.1 MSci/MSc degree with at least one year of laboratory based research (i.e. laboratory based MSci/MSc project or industrial experience). The studentship is scheduled to begin in September 2018.

Further information about the group can be found at:
http://webspace.qmul.ac.uk/jasoncamp/Camp_Research_Group/Home.html

Informal enquiries may be addressed to Dr Jason Camp, tel: 01484 473180 or email: j.e.camp@hud.ac.uk

Hierarchical Investigation of Thermoelectric Oxide-Polyanion Structures …..



Pharmacy

Development of an *in vitro* intramuscular mimic using pharmaceutical analysis

Being able to predict the behaviour of drugs that are administered by intramuscular injection is not yet possible. Only once the medicine is injected in to humans can scientists determine how fast, and how much of the drug will be delivered to the site of action. There are many reasons why an analytical system to mimic this process would be beneficial including the avoidance of animal testing as well as improved drug development. This project will develop a chemical based model system that will be tested using known drugs to optimise its ability to predict drug behaviour to create an alternative way of characterising new medicines thus providing a viable alternative for the pharmaceutical industry. Applicants are not required to have previous experience in pharmaceutical analysis as all necessary training will be provided.

Contact: Dr Laura Waters l.waters@hud.ac.uk 01484 472190

Development and characterisation of novel mucoadhesive polymers for targeted site-specific mucosal drug delivery and forensic applications.

Targeting using mucoadhesive dosage forms enhances the therapeutic efficacy of drugs/macromolecules for treatment of GI tract, lungs, nose, eye, reproductive tract disorders. This project involves the development of novel mucoadhesive polymers e.g. thiomers, targeted to mucosal sites and design of models to simulate diffusion/permeation across mucosae, limiting requirements for animals and problems associated with the degradation of native mucus. In addition, mucoadhesive polymers will also be investigated for potential forensic applications as they have previously been shown to interact with fingermarks, for example. The project is interdisciplinary and should be extremely relevant to those wanting a career in pharmaceutical development, chemical engineering or polymer science. Full training will be given in a wide range of techniques including HPLC, MS, NMR, XRD, FT-IR, DSC, NTA, microscopy (SEM, AFM, Confocal, fluorescence), tensiometry, rheology, particle size analysis, cell culture and dissolution testing.

Contact Dr Adeola Adebisi A.Adebisi@hud.ac.uk 01484 473856

Medicines used for the treatment of rheumatoid arthritis in United Kingdom: Evaluating prescriptions patterns, costs and health outcomes

It is known that aggressive early treatment may deter long-term damage that is associated with rheumatoid arthritis. This project will explore utilisation patterns of medicines used for the treatment of rheumatoid arthritis using large primary care databases. The potential economic burden of these medicines as well as health outcomes associated with these medicines will be investigated. In view of effectiveness of available therapeutic options, the project will be key to provide robust information to prescribers, healthcare professionals and to funding bodies.

Contact Dr Syed Shahzad HASAN s.hasan@hud.ac.uk 07568497278

Novel tools for identification and prevention of Diabetes in high risk populations in UK

Diabetes is one of the major healthcare concerns in UK and is a significant cost to NHS. According to the NHS, there are 3.9 million people living with diabetes in UK, which is twice as many than in 1996. Like other diseases, an early diagnosis is very important for diabetes to avoid disease progression and risk for cardiovascular disease. Identification of high risk groups who may develop diabetes in next five years, therefore, is a key strategy to prevent developing disease and hence the national diabetes prevention program (NDPP) was launched in 2016 by the NHS and Public Health in England. The program significantly depends on the risk scoring system, taking inputs from age, sex, ethnicity, blood pressure, family history of diabetes, body mass index and waist measurements. This project is aimed to improve the current risk-scoring system in UK by developing a holistic approach to include visceral obesity into a robust risk scoring system to identify individuals at high risk of developing diabetes in UK, such as South Asians.

This project is in collaboration with Professor Jonathan Wheat at the Academy of Sport and Physical Activity at the Sheffield Hallam University, and shall involve travel between the sites. The ideal candidate should have a relevant degree with strong interest in the subject area and should be willing to commute to the Centre of Sports Engineering Research at Sheffield Hallam for data collection using 3D Surface Scanners. The project involves body measurements, image analysis, and development/ validation of risk scoring algorithms for diabetes.

Contact Dr Hamid Merchant hamid.merchant@hud.ac.uk 01484 472387

Antidiabetics in United Kingdom: Evaluating prescription patterns, drug utilisation and health outcomes
The number of patients with diabetes ….