CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

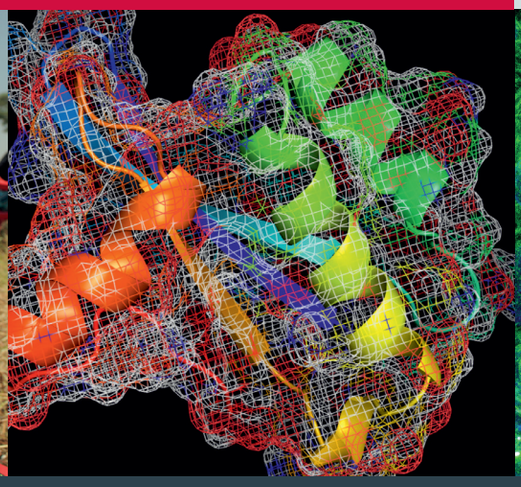
School of Pharmacy and Pharmaceutical Sciences

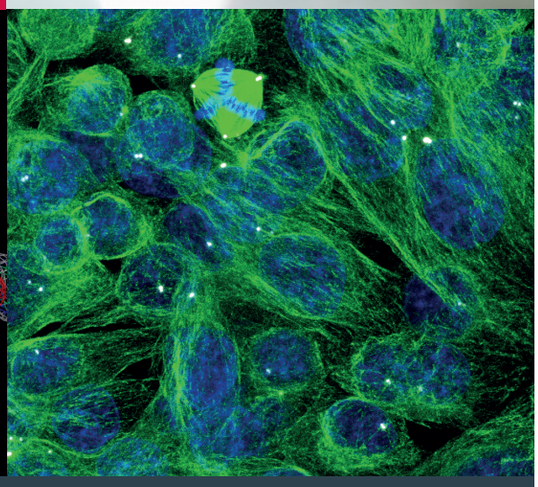
Ysgol Fferylliaeth a Gwyddorau Fferyllol

100 MLYNEDD YEARS 1919 2019

o addysgu ac ymchwil of teaching and research

Research Handbook





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Foreword

Professor Arwyn T Jones
Director of Research

It is particularly exciting for us to present you with our Research Handbook as the School celebrates our first 100 years of delivering teaching and research excellence.

Much has changed since October 1919, when we welcomed our first cohort of pharmacy students to Cardiff, and whilst a centenary affords an opportunity to look back with pride on the significant achievements of the past, we must also remain focused on the future. This includes renewing our firm commitment to the research mission of the School, College and University by enhancing our physical research environment in the Redwood Building and investing in new enabling technologies to provide our talented researchers with fresh opportunities to conduct innovative and impactful research. History reflects that advancing knowledge through research is central to all our activities under a mission to deliver a breadth of ambitious, original and significant research and scholarship, enabled through national and international interdisciplinary collaborations and professional and public partnerships. Within this context we strive to ensure that our research has impact outside of academia through its application in the development of new medicines, interventions and policies.

Research excellence

Our pursuit of research excellence was recognised in the outcome of the UK-wide Research Excellence Framework (REF), published at the end of 2014. This process of independent review by expert panels judged us joint first in the UK for the quality of our research - indicative of an environment that is conducive to producing research of world-leading quality. This recognition of excellence within the School's research is a foundation on which we will build further success as we look forward to the next independent assessment (REF2021). We continue to excel at generating data that has made it to publication in leading journals in the field of pharmaceutical science. Some of this research and these papers are highlighted in this handbook and reflect our interdisciplinary research covering a very broad pharmacy and pharmaceutical science remit.

Translating our research

Our research mission recognises the necessity of translating our discoveries to ultimately deliver benefits to patient and public health and wellbeing. In this recent period we have witnessed translational research at the highest level using research originating from work conducted in our laboratories. Amongst many examples, the research discoveries of our School have been used: in developing improved performance of pharmaceutical capsules used worldwide in inhaler devices for the management of respiratory disease; designing new anticancer agents now in advanced late stage clinical trials; developing new and improved products for use in infection control of contaminated surfaces within clinical environments; to substantiate rollout of public health initiatives as part of pharmacy services, such as the influenza vaccination service.

Working with communities

Public engagement with our research is critical for fulfilling our civic mission commitment and building relationships with stakeholders such as schools, colleges and other organisations at local, national and international levels. Once again our School has excelled in this area with flagship programmes under our common theme of The Science of Medicines. Engagement activities such as Pharmabees and Brain Games allow us to take our research into the community and inspire children and adults to take an interest in science.

Training early career researchers

An essential aspect of the School's research mission is the mentoring of the next generation of scientists covering our broad range of research. The School has long excelled in the quality and rigour of its supervision and monitoring practices. The School continues to attract highly qualified graduates from around the world to study and undertake research for higher degrees. Our research training is increasingly interdisciplinary and translational in nature. This strategic direction recognises the complexity of the major research challenges in the health, biomedical and life sciences landscape. We have innovated in the way in which our research students work with other Universities (e.g GW4) and with the SME sector (e.g. CALIN). Beyond PhD training, our School is invested in supporting a significant research endeavour associated with our postgraduate taught community: students on MSc/Diploma Clinical Pharmacy, MSc Clinical Research, MSc Cancer Biology and Therapeutics. It is pleasing to see so many of our respective graduates are using the skills they have developed in Cardiff in a wide range of challenging and prestigious career pathways.

As a School we recognise the vital importance of all those involved in the research endeavour, from academic investigators, research fellows and students, research assistants, technicians and the entire professional-services staff. We all strive to ensure the School reaches the highest levels of research excellence, enabling discoveries that benefit wider society.

Whether you are a prospective staff member, an applicant for postgraduate studies, a new collaborator, a potential research funder or a professional stakeholder we warmly invite you to visit us and engage with our research community. We look back with pride at what we have achieved this year and over the last 100 years and at the same time, look ahead to a period of new discoveries and impactful research that deliver improved healthcare outcomes.

Our **World-Leading Research** has **impact**

The School of Pharmacy and Pharmaceutical Sciences is involved in world-leading research ultimately aimed at improving human health.

The excellence of our pharmaceutical science and health related research is recognised internationally. It spans the complete continuum from basic to applied translational science and clinical practice.

Case Study 1: Synthetic materials inspired by biological cells could provide the next generation of smart diagnostics

Dr Castell and his team have developed new materials using water and oil which could play a vital role in healthcare and diagnostics in the future. Using the science of microfluidics, the technique manipulates tiny volumes of fluid to create a series of interconnected water droplets inside a small droplet of oil, itself encased within a gel-like, semi-permeable shell.

Detailed in the *Journal Angewandte Chemie*, these new materials are inspired by biological cells and their development makes it possible to take previously fragile molecular membranes outside of the laboratory and interface them with the wider world.

Membrane based droplet networks, able to incorporate protein machinery and display emergent functional properties, have been predicted to find vital roles in future healthcare and diagnostic applications. However, they have so far typically not fared well outside well controlled laboratory conditions. By using microfluidics to surround these systems with a thin hydrogel shell, the team have been able to significantly stabilise the membrane networks, providing mechanical rigidity whilst maintaining environmental interaction, facilitating their use in environments outside of the laboratory. The development of these materials underpins a €4.4M EU research project "Artificial Cells with Distributed Cores to Decipher Protein Function" that seeks inspiration from biology to recapitulate some aspects of biological functionality arising from chemical compartmentalisation. It is envisaged that such artificial cell technology will ultimately be used as programmable and reconfigurable matter for a range of applications from smart diagnostics to drug delivery, to chemical synthesis and energy harvesting.

1. A multi-core protocell made up of membrane separated water droplets in an oil environment surrounded by a gel capsule sits stably, outside the normal lab environment, on a leaf
2. The membrane separated compartments of a microfluidically produced protocell catch the light as they sit stably on a twig able to interface with the natural environment.
3. The birth of a protocell: Freshly made membrane compartmentalised eDIBs (encapsulated droplet interface bilayers) rest in their microfluidic housing before being released into the lab for testing.
4. A single membrane compartmentalised protocell sits on a microscope slide where the chemistries of its internal cores can be observed by researchers.

Horizon2020 ACDC - Artificial Cells with Distributed Cores to Decipher Protein Function https://cordis.europa.eu/project/rcn/218680/factsheet/en

Baxani D. et al. 'Bilayer Networks within a Hydrogel Shell: A Robust Chassis for Artificial Cells and a Platform for Membrane Studies' *Angewandte Chemie International Edition*, Volume 55, Issue 46, November 7, 2016 Pages 14240–14245. (Open Access).

Case Study 2: Cancer immunotherapy

Dr Youcef Mehellou, whose research group focusses on proteins called phosphates in cell signalling and drug discovery, has developed a series of molecules that awaken the body's immune system to fight cancer.

The activation of the immune system to attack and eliminate cancer cells and tumours is proving to be an effective strategy for treating this disease. Dr Mehellou's research group discovered a series of compounds that are able to selectively target and activate one type of immune cells, which are thought to be important in fighting cancer in humans. This activated sub-type of immune cells was then shown to be effective in eradicating bladder cancer cells.

The research was based on a naturally occurring molecule in bacteria, which is known to activate the immune response in humans. However, this molecule has poor drug-like properties. To enhance the drug-like properties of this naturally occurring compound, Dr Mehellou and his team designed and made a series of derivatives, now termed "ProPAgens", of this naturally occurring compound. These new derivatives exhibited potent activation of the immune response, which led to the elimination of bladder cancer cells.

The compounds are a very promising starting point in the development of new immunotherapeutic drugs against many diseases like cancer and tuberculosis. The potency of these compounds in eradicating cancer cells is quite impressive and the team are currently optimising them further in order to study their efficacy and safety in cancer models.

Davey MS et al. Synthesis and Biological Evaluation of (E)-4-Hydroxy-3-methylbut-2-enyl Phosphate (HMBP) Aryloxy Triester Phosphoramidate Prodrugs as Activators of Vγ9/Vδ2 T-Cell Immune Responses. *Journal of Medicinal Chemistry 2018*, 61, 2111-2117.

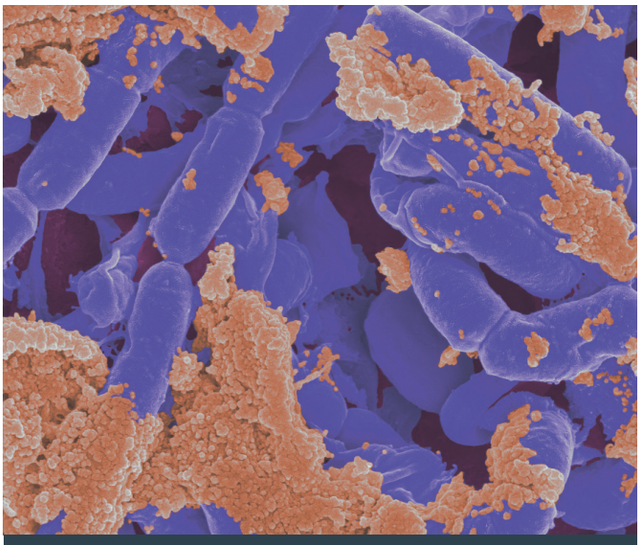
Kadri H et al. Aryloxy Triester Phosphonamidates of Phosphoantigens Exhibit Favorable Stability and Potent Activation of Vγ9/Vδ2 T-Cells. *ChemRxiv 2018*, DOI: 10.26434/chemrxiv.6755033.v1.

Case Study 3: Providing a safe healthcare environment

Hospital acquired infections (HAI) are estimated to cost the NHS approximately £1 billion a year. Antimicrobial wipes are relatively new products, increasingly used as part of infection control regimens in healthcare settings. Specifically, wipes are used for the decontamination of surfaces by decreasing or killing microbial pathogens that contribute to hospital acquired infections.

The Cardiff team led by Professor Maillard, developed a tailored testing protocol for evaluating the efficacy of antimicrobial wipes which enabled the design, evaluation and marketing of novel products that contributed to a significant revenue for the UK industry partner. The procedure enabled the accurate evaluation of antimicrobial wipe performance and delivered quantitative reporting outcomes that included: i) % microbial bioburden removed from surfaces; ii) % transfer prevented from wipes to surfaces and iii) % kill of target microorganisms retained within the wipe.

Not only is the new procedure recommended by the Royal College of Nursing and forms the basis of improved standards for efficacy testing but it has allowed manufacturers and end users to effectively understand product efficacy.



Biofilm of *Escherichia coli*

Case Study 4: Medication usage in care homes

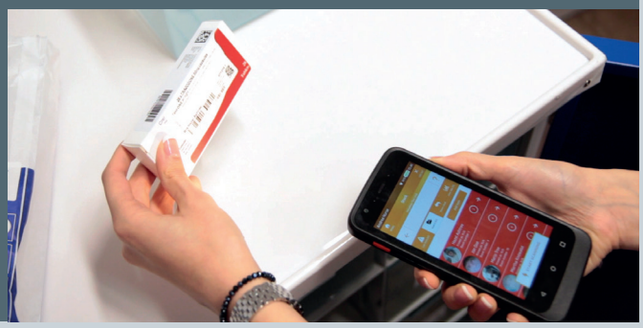
In the UK, there are approximately 430K older people currently living in care homes, a figure some three times greater than that represented by the UK acute hospital sector. Residents of care homes represent a particularly vulnerable patient cohort due to multiple co-morbidities and exposure to polypharmacy that can lead to increased susceptibility to adverse drug events. Efforts have been made to measure inappropriate prescribing and administration in care home using a variety of validated tools. Whilst these studies have concluded that there are issues, the studies have been relatively small scale.

The research team led by Dr Mat Smith, in collaboration with Invatech Health (a Bristol based health technology SME), have evaluated a combined electronic prescription capture system and electronic medicines administration record keeping system in over 150 care homes and pharmacies; currently the system captures data on more than 15,000 care home residents. The captured prescribing data alongside medicines administration records is then mined to explore population level issues related to epidemiology and prescribing practices. The system has been shown to reduce administration errors by 90% and medicines wastage by 20% in care homes and allows pharmacists to proactively intervene in the management of medicines in the care homes and address prescribing issues with the prescriber.

The system has also been used to explore expanded models of medicines administration in care homes with a particular focus on enabling carers to undertake medicines administration to residents under the delegation of nurses in order to free nurse time to engage in more advanced aspects of care planning.

In 2016 the team was awarded the Health Service Journal Award for Improving Care with Technology.

Cardiff University and Invatech Health have recently been awarded an Innovate UK Knowledge Transfer Partnership Grant to explore ways to use the big data collected by the ATLAS electronic medication administration record system.



Case Study 5: Discreet contraception for world's poorest countries

Innovative microneedle technology is being developed as an effective, pain-free and discreet method of delivering contraception across the world's poorest countries, thanks to a new research consortium led by Cardiff University and supported by the Bill & Melinda Gates Foundation.

The project will focus on pre-clinical work to develop microneedle patches that have the potential to be painlessly and inconspicuously administered by the user themselves within a few seconds and can last for up to six months. This new method of contraception would meet the needs of some of the world's poorest and most vulnerable women.

Cardiff University's School of Pharmacy and Pharmaceutical Sciences and School of Engineering have secured funding for the ambitious project that brings together additional expertise of partners from academia (Edinburgh University), industry (InnoCore Pharmaceuticals, Maddison Product Design, Isca Healthcare, REMEDI), NGOs (Population Council, PATH), partnerships (Hub Cymru Africa), charitable bodies (Knowledge For Change, Life for African Mothers) and NHS Trusts.

According to the World Health Organization, '214 million women of reproductive age in developing countries who want to avoid pregnancy are not using a modern contraceptive method'. Better access to contraceptives and voluntary family planning would result in fewer unintended pregnancies, fewer women and girls dying during pregnancy and childbirth, and fewer infant deaths.

Additionally, empowering women and girls to make their own choices about if, and when, they have children would vastly improve their educational and economic opportunities, as well as leading to healthier families and communities.

However, there are many socio-economic and cultural barriers preventing women from obtaining contraception even when they want to plan or prevent pregnancy. There may be a lack of awareness of the risk of becoming pregnant, and some may be deterred by the cost, inconvenience or concerns about side effects. And many simply can't physically access effective methods of contraception.

The Bill & Melinda Gates Foundation is funding research in a bid to address these issues and to develop practical and effective methods of contraception that are centred around the needs of the user. The grant will allow the consortium to assess the technical feasibility, usability and acceptability of the self-administrable contraceptive microneedle patch for use in the countries that need it most.

Leading the project with Dr Sion Coulman, Professor James Birchall, from Cardiff University's School of Pharmacy and Pharmaceutical Sciences, said: "Voluntary family planning is something that many of us take for granted but in some of the poorest countries women and girls don't have this choice."

We are delighted to be working with the Bill & Melinda Gates Foundation and our project partners to develop a new method of contraception that will hopefully give women a simple, convenient and painless way to achieve contraception for six months at a time.

Utilising its biodegradable polymer platform, InnoCore Pharmaceuticals will develop microneedles exhibiting the required mechanical properties for effective and painless puncturing of the skin, followed by tightly controlled contraception delivery for up to six months. "We are very excited to contribute to the development of innovative and affordable contraceptives for women in developing countries by partnering with this great research consortium, supported by the Bill and Melinda Gates Foundation," says InnoCore Pharmaceuticals.

Currently, two of the most popular methods of contraception in low and middle-income countries are injections – which are effective for three months – and implants, which last for three years. Both of these methods are invasive and in the case of the implant, requires a skilled professional for insertion and removal. This can contribute to women not accessing these forms of contraception.

If successful, the program will lead to an affordable long-acting contraceptive that combines easy and painless self-administration with full bioresorption, thereby avoiding the need for removal surgery.

By the end of this 18 month project, the usability, acceptability and feasibility of this new microneedle contraceptive patch will have been evaluated. Technical studies in laboratories will run in parallel with visits to low and middle-income countries in Africa so that the research team can fully understand the needs of the women who wish to make use of this new method of contraception.

Staff Profiles

Professor Les Baillie

Professor of Microbiology

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An international expert on the bacterium Bacillus anthracis, the causative agent of anthrax and its illicit use as a bio-weapon. He led research groups in the UK and US to develop rapid diagnostics and therapeutics against this pathogen. Since joining Cardiff he has expanded his research interests to include the discovery of novel antimicrobial compounds from natural products such as honey. He leads the Pharmabees project and a number of STEM based engagement initiatives which seek to inspire the next generation of Welsh scientists.

Research keywords: Bacillus anthracis, Clostridium difficile, spore structure, biodefence, medical countermeasures, pathogen detection, bacteriophages, antibacterial natural products, honey, bees, biodiversity, public engagement

KeyPublication 1:
Schelkle, B.et al. 2018. Caenorhabditis elegans predation on Bacillus anthracis: decontamination of spore contaminated soil with germinants and nematodes. Frontiers in Microbiology 8, article number: 2106.

Key Publication 2:
Hawkins, J.et al. 2015. Using DNA metabarcoding to identify the floral composition of honey: a new tool for investigating honey bee foraging preferences. PLoS ONE 10(8), article number: e0134735.

Professor James Birchall

Professor of Pharmaceutical Sciences and Deputy Head of School

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Graduating with a BPharm (Hons) from Bath University in 1993 and completing his PhD researching drug and DNA delivery systems in 1998 (Cardiff University) Professor James Birchall now has over 20 years experience in the pre-clinical and clinical development of novel formulation and device combinations for administering medicines, vaccines and biologics, predominantly via cutaneous or pulmonary routes. During this time collaborative external awards of over £16 million (over £9m awarded directly to Cardiff University) have been received from healthcare industry, Research Council, professional bodies, governmental authorities and charities. Extraject Technologies Limited, a Cardiff University spin-out company, was incorporated in 2013 to commercialise research activity.

Research keywords: microneedle, transdermal, topical, pulmonary, formulation, medical device, human skin model, inhaler

Publication 1:
Zhao, X.et al. 2017. Formulation of hydrophobic peptides for skin delivery via coated microneedles. Journal of Controlled Release 265, pp. 2-13.

Publication 2:
Gualeni, B.et al. 2018. Minimally-invasive and targeted therapeutic cell delivery to the skin using microneedle devices. British Journal of Dermatology 178(3), pp. 731-739.

Dr Jenna Bowen

Lecturer

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Jenna graduated from the Cardiff School of Pharmacy and Pharmaceutical Sciences in 2006. Following completion of a pre-registration year in community pharmacy, she returned to undertake a PhD, which she defended in late 2011. Now working as a Lecturer within the School, Jenna's research lies in the field biosensing with particular focus on the development of point-of-care diagnostic tools to enable rapid diagnosis, patient stratification and personalisation of therapies. She enjoys working across disciplines and has established collaborations with engineers, physicists, clinical academics and industrial partners from across the globe in order to deliver impactful, translational research.

Research keywords: Point-of-care diagnostics, sepsis, sensing, electrochemistry, magneto-optics, molecular imprinting, drug delivery

Key Publication 1:
Jolly, P.et al. 2016. Aptamer-MIP hybrid receptor for highly sensitive electrochemical detection of prostate specific antigen. Biosensors and bioelectronics 75, pp. 188-195.

Key Publication 2:
Tamboli, V. K.et al. 2016. Hybrid synthetic receptors on MOSFET devices for detection of prostate specific antigen in human plasma. Analytical Chemistry 88(23), pp. 11486-11490.

Professor Andrea Brancale

Professor of Medicinal Chemistry

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Andrea Brancale undertook his PhD under Professor Chris McGuigan, focusing on the design and synthesis of novel antivirals. With his appointment as lecturer he directed his research interests to the use of computer-aided techniques to design and discover novel antiviral and anticancer compounds. In 2017, he was promoted to Professor. He is author on more than 140 peer-review papers, and an elected Board Member of the International Society for Antiviral Research. In 2013, he was presented with the Young Researcher William Prusoff Award. In 2016 he was awarded the Innovation in Healthcare Award from Cardiff University. He is the Scientific Director of the Life Science Research Network Wales.

Research keywords: Medicinal Chemistry, Computer-aided drug design, antivirals, anticancer

Key Publication 1:
Ferrara, M.et al. 2018. Small molecules targeted to the microtubule-Hec1 interaction inhibit cancer cell growth through microtubule stabilization. Oncogene 37, pp. 231-240.

Key Publication 2:
Bassetto, M.et al. 2016. Computer-aided identification, synthesis and evaluation of substituted thienopyrimidines as novel inhibitors of HCV replication. European Journal of Medicinal Chemistry 123, pp. 31-47.

Dr Oliver Castell

Serious Brain Power Early Career Researcher and Lecturer

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Research in the Castell lab is at the intersection of the biological and physical sciences and concerns the development and application of single-molecule techniques to help unravel the complexity of the cell membrane. In turn, he is interested in applying the knowledge gained to the development of new materials and tools inspired by biology, shaping our capability to engineer at the molecular level. These next generation membrane-based materials hold great potential in diverse areas including medical applications, biophysical studies and as chemical processors. Here, Dr Castell is Cardiff University's co-lead in €4.4M EU H2020 project; ACDC - Artificial Cells with Distributed Cores to Decipher Protein Function.

Research keywords: artificial bilayers, single molecule imaging, membrane proteins, synthetic biology, artificial cells, total internal reflection fluorescence (TIRF) microscopy, microfluidics, droplets, 3D printing, droplet interface bilayers, instrumentation development, electrophysiology

Key Publication 1:
Baxani Kamal, D.et al. 2016. Bilayer networks within a hydrogel shell: A robust chassis for artificial cells and a platform for membrane studies. Angewandte Chemie - International Edition 55(46), pp. 14240-14245.

Key Publication 2:
Dijkman, P. M.et al. 2018. Dynamic tuneable G protein-coupled receptor monomer-dimer populations. Nature Communications 9(1), article number: 1710.

Dr Allan G. Cosslett

Senior Tutor and Lecturer

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A BPharm graduate from UWIST (1983), I completed a PhD under the supervision of Dr MI Barnett (UWCC 1991) on lipid emulsion stability in parenteral nutrition admixtures and using this knowledge then helped setup the Fresenius Kabi – Cardiff University stability assessment unit, which I continue to manage today. I have worked with a wide number of NHS partners on investigating parenteral nutrition compounding, delivery and stability issues as well helping gain an understanding of the issues associated with intravenous drugs in sterile medical devices. Just over £2.5M has been awarded over 25 years to assist these studies, with my experience and expertise recognised via the position of Academic Representative to the NHS Technical Specialist Education and Training and becoming the Brit Award Winner for Research and Education Activities associated with Parenteral Nutrition in 2014.

Research keywords: Parenteral Nutrition; Lipid Emulsions; Sterile Medical Devices; Intravenous Drug Stability; Sterile Compounding; Particle Size Analysis

Key Publication 1:
King, H.et al. 2018. A HPLC method to monitor the occurrence of lipid peroxidation in intravenous lipid emulsions used in parenteral nutrition using in-line UV and charged aerosol detection. Clinical Nutrition ESPEN 28, pp. 96-102.

Key Publication 2:
Ferguson, T. I.et al. 2014. A review of stability issues associated with vitamins in parenteral nutrition. e-SPEN Journal 9(2), pp. e49-e53.

Dr Sion Coulman

Senior Lecturer

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Dr Sion Coulman is a Senior Lecturer and has been a member of academic staff in Cardiff School of Pharmacy and Pharmaceutical Sciences since 2006. His research focuses on the innovation and optimisation of drug delivery technologies to be used to deliver therapeutics either to the skin or the lungs. Current research activities include the development of novel microneedle devices for drug delivery and sensing applications, the development of a 3D bio-printed skin model and the performance of capsules in dry powder inhalers.

Research keywords: Microneedles, skin, biologics, transdermal drug delivery, 3D bio-printing, tissue engineering, hard-shell capsules, dry powder inhalers

Key Publication 1:
Dul, M.et al. 2017. Hydrodynamic gene delivery in human skin using a hollow microneedle device. Journal of Controlled Release 265, pp. 120-131.

Key Publication 2:
Chong, R. H.et al. 2016. Evaluating the sensitivity, reproducibility and flexibility of a method to test hard shell capsules intended for use in dry powder inhalers. International Journal of Pharmaceutics 500(1-2), pp. 316-325.

Dr Rhian Deslandes

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Rhian Deslandes joined the Cardiff School of Pharmacy in August 2006. She is currently a lecturer in pharmacy practice and a member of the Medicines Optimisation and Healthcare Outcomes research group. She has a particular research interest in non-medical prescribing, service improvement and delivery.

Research keywords: Non-medical prescribing, service evaluation

Key Publication 1:
Deslandes, R.et al. 2018. Development of a template to facilitate reflection among student pharmacists. Research in Social & Administrative Pharmacy 14(11), pp. 1058-1063.

Key Publication 2:
Courtenay, M.et al. 2018. Classic e-Delphi survey to provide national consensus and establish priorities with regards to the factors that promote the implementation and continued development of non-medical prescribing within health services in Wales. BMJ Open 8(9), article number: e024161.

Dr Will Ford

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Dr Will Ford's group studies the function of the heart and lungs. In the cardiovascular system, we study the vascular and cardiac effects of trace amines and cannabinoids. This is relevant to most cardiovascular diseases from hypertension to heart attacks and strokes. In the lungs we are primarily interested in corticosteroid-resistant forms of airway inflammation. Corticosteroids are used to control diseases like asthma and COPD where resistance results in poor patient outcomes. We work collaboratively with Prof Riccardi (School of Biosciences) on drugs called calcilytics. Originally designed as treatments for osteoporosis, they might be able to control corticosteroid-resistance inflammation.

Research keywords: Steroid resistant asthma, trace amines, cannabinoids, cardiovascular

Key publication 1:
Yarova, P. L.et al. 2015. Calcium-sensing receptor antagonists abrogate airways hyperresponsiveness and inflammation in allergic asthma. Science Translational Medicine 7(284), article number: 284ra60.

Key Publication 2:
Ford, W. R.et al. 2013. Human parainfluenza type 3 virus impairs the efficacy of glucocorticoids to limit allergy-induced pulmonary inflammation in guinea-pigs. Clinical Science 125(10), pp. 471-482.

Dr Julia Gee

Breast Cancer Campaign Senior Research Fellow

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Dr Julia Gee joined Cardiff School of Pharmacy & Pharmaceutical Sciences in 2000. Following a prestigious Breast Cancer Now Research Fellowship, she was appointed as a Senior Lecturer and is a member of its Breast Cancer Molecular Pharmacology group. Her research focus is deciphering mechanisms of resistance in breast cancer, in particular exploring the impact of prolonged anti-hormonal treatment on resistance signalling. Using clinical samples and in-house models, her aim is to discover potential new therapeutic targets to control resistance, an area of unmet clinical need that emerges in ~30% of primary breast cancer and virtually all advanced disease patients.

Research keywords: Endocrine resistance; breast cancer; signal transduction; anti-hormone; immunohistochemistry; gene expression profiling; cell models; target discovery and validation; pre-clinical drug screening; clinical translational studies

Key Publication 1:
Agrawal, A.et al. 2016. Biological effects of fulvestrant on estrogen receptor positive human breast cancer: short, medium and long-term effects based on sequential biopsies. International Journal of Cancer 138(1), pp. 146-159.

Key Publication 2:
Jordan, N. J.et al. 2014. Impact of dual mTORC1/2 mTOR kinase inhibitor AZD8055 on acquired endocrine resistance in breast cancer in vitro. Breast Cancer Research 16(1), article number: R12

Professor Mark Gumbleton

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Professor Gumbleton trained in Pharmacy and undertook postgraduate studies and fellowships in the UK and USA, with later Lectureship appointments at the Universities of Strathclyde and Glasgow. He is currently the Head of Cardiff School of Pharmacy & Pharmaceutical Sciences.

Professor Gumbleton's research activities include the study of how drugs and novel drug delivery systems interact with biological barriers through to the use of new technologies to explore molecular pharmacology and drug target identification. A strong translational theme is present in all projects. He has published over 100 original research articles, authored > 20 textbook chapters and successfully graduated > 35 PhD students.

Research keywords: Nanotechnology, blood-brain barrier, peptide, protein absorption, induced pluripotent stem cells, renal

Key publication 1:
Price, D. F.et al. 2017. The differential absorption of a series of P-glycoprotein substrates in isolated perfused lungs from Mdr1a/1b genetic knockout mice can be attributed to distinct physico-chemical properties: an insight into predicting transporter-mediated, pulmonary specific disposition. Pharmaceutical Research 34(12), pp. 2498-2516.

Key publication 2:
Menzel, C.et al. 2018. In vivo evaluation of an oral self-emulsifying drug delivery system (SEDDS) for exenatide. Journal of Controlled Release 277, pp. 165-172.

Dr Charles Heard

Reader

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Dr Heard joined the School in January 1987. He is currently Reader in Pharmaceutical Chemistry, and has diverse research interests under the general umbrella of Topical Drug Delivery, in particular anti-infectives. He has a wide variety of expertise including: formulation development, development of in vitro-ex vivo models, chemical analysis. He has collaborations across the University, including School of Dentistry, School of Optometry and Vision Sciences and School of Biosciences. Major research projects are aimed at treating ocular diseases, topical/wound infections, arthritis and periodontal diseases.

Research keywords: Topical drug delivery, dermatological, transdermal, ocular, antimicrobial, sublingual, formulation development, natural products, novel devices

Key Publication 1: Houston, D. M. J.et al. 2017. Potentiated virucidal activity of pomegranate rind extract (PRE) and punicalagin against Herpes simplex virus (HSV) when co-administered with zinc (II) ions, and antiviral activity of PRE against HSV and aciclovir-resistant HSV. PLoS ONE 12(6), pp. e0179291., article number: e0179291

Key Publication 2: Chan, W.et al. 2016. Topical delivery of a Rho-kinase inhibitor to the cornea via Mucoadhesive film. European Journal of Pharmaceutical Sciences 91, pp. 256-264.

Dr Meike Heurich

Lecturer

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Meike Heurich joined the School of Pharmacy and Pharmaceutical Sciences as a Lecturer in January 2017. A biochemist by training (Potsdam University, Germany), she gained her PhD (Cranfield University, 2008) in applied biochemistry and biosensor development. She then spent 4 years as a post-doctoral researcher at the School of Medicine, Cardiff University, studying innate immune defence mechanisms of the complement system. In 2012, she was awarded an independent career development fellowship (NISCHR, now Health and Care Research Wales) investigating the cross-talk mechanisms of complement with the coagulation system. Her research interests span the in-depth charactersation of cross-talk between the immune system and coagulation/clotting in health and disease, involving biomolecular analysis, clinical biomarker discovery and pathway-targeted therapeutics development.

Research keywords: Immunity; complement system; coagulation system; biomolecular interaction; binding affinity; biomarkers; pathway-targeted therapeutics

Key Publication 1:
Föcking, M.et al. 2019. Complement pathway changes at age 12 are associated with psychotic experiences at age 18 in a longitudinal population-based study: evidence for a role of stress. Molecular Psychiatry, pp. -.

Key Publication 2:
Heurich-Sevcenco, M.et al. 2016. Thrombomodulin enhances complement regulation through strong affinity interactions with factor H and C3b-Factor H complex. Thrombosis Research 145, pp. 84-92.

Dr Steve Hiscox

Reader

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As Reader in Cancer Biology in the School, my long-standing interest is in cancer invasion and metastasis particularly in the context of therapeutic resistance in a broad range of tumour types. My early translational work at the School of Medicine in Cardiff focused on understanding the role of c-Met signalling in GI cancers and more recently my research team in the School of Pharmacy was one of the first to identify a role for Src family kinases in the acquired drug resistant phenotype in breast cancer.

Research keywords: cancer invasion, migration, adhesion, metastasis, drug resistance, breast, colorectal, microenvironment, CAFs, endocrine treatment

Key Publication 1:
Bellerby, R.et al. 2016. Overexpression of specific CD44 isoforms is associated with aggressive cell features in acquired endocrine resistance. Frontiers in Oncology 6, pp. 139-151., article number: 145.

Key Publication 2:
Gangadhara, S.et al. 2016. 3D culture of Her2+ breast cancer cells promotes AKT to MAPK switching and a loss of therapeutic response. BMC Cancer 16(1), article number: 345.

Dr Karen Hodson

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I joined the School of Pharmacy and Pharmaceutical Sciences in December 1998. I am currently a senior lecturer in Pharmacy Practice, and run the MSc in Clinical Pharmacy and the Pharmacist Independent Prescribing programmes. My practice research concentrates on three key areas: non-medical prescribing, transfer of care and community pharmacy services. I have experience of both qualitative and quantitative methodologies.

Research keywords: Prescribing, non-medical prescribing, interface, transfer of care, Choose Pharmacy Application, community pharmacy services

Key Publication 1:
Hodson, K. et al 2014. Evaluation of the Discharge Medicines Review Scheme. WIHSC, Cardiff: http://www.cpwales.org.uk/Contract-support-and-IT/Advanced-Services/Discharge-Medicines-Review-(DMR)/Evaluation-of-the-DMR-Service/Evaluation-of-the-DMR-service.aspx

Key Publication 2:
Courtenay, M.et al. 2017. Overview of the uptake and implementation of non-medical prescribing in Wales: a national survey. BMJ Open 7(9), article number: e015313.

Dr Louise Hughes

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I am a senior lecturer pursuing research / scholarship in the broad areas of pharmacy education and pharmacy practice. My methodological expertise is applying qualitative research approaches to practice and education topics. Education research relates to developing and evaluating educational interventions while practice-based research focuses on evaluation of pharmacy services, in particular digital and technological opportunities to improve health outcomes. Research into spontaneous reporting of Adverse Drug Reactions is in conjunction with Yellow Card Centre Wales and the College of Medicine in Malawi where I was invited as a consultant to assist in setting up a new national pharmacovigilance centre.

Research keywords: pharmacovigilance, pharmacy education, Choose Pharmacy application, Discharge Medicines Review, interprofessional education

Key Publication 1:
Jenkins, A. I.et al. 2016. Too far away to work with each other: Does location impact on pharmacists' perceptions of interprofessional interactions?. Journal of Interprofessional Care 30(5), pp. 678-681.

Key Publication 2:
Deslandes, R.et al. 2018. Development of a template to facilitate reflection among student pharmacists. Research in Social & Administrative Pharmacy 14(11), pp. 1058-1063.

Dr Matt Ivory

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Dr Matthew Ivory joined the Cardiff School of Pharmacy and Pharmaceutical Sciences in July 2016 following the completion of his PhD. He is a UK registered pharmacist and lecturer, and has research interests spanning skin immunology and the formulation of vaccines and other substances for delivery to the skin. In particular, his research focuses on the multiple subsets of dermal dendritic cells and their roles in the uptake, processing and presentation of vaccine antigen to elicit immune responses.

Research keywords: Human skin immunology, vaccination, microneedles, formulation science

Key Publication 1:
Czubala, M. A.et al. 2016. TGFβ induces a SAMHD1-independent post-entry restriction to HIV-1 infection of human epithelial langerhans cells. Journal of Investigative Dermatology 136(10), pp. 1981-1989.

Key Publication 2:
Caucheteux, S. M.et al. 2016. Polypropylene sulfide nanoparticle p24 vaccine promotes dendritic cell-mediated specific immune responses against HIV-1. Journal of Investigative Dermatology 136(6), pp. 1172-1181.

Professor Dai John

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Dai is currently Professor of Pharmacy and Dean of Undergraduate Studies in the College of Biomedical and Life Sciences. His research interests more recently focus on education and professionalism, in pharmacy and in interprofessional contexts.

Research keywords: interprofessional education, pharmacy education, professionalism

Key Publication 1: Shelvey, B., Coulman, S. and John, D. 2016. Evaluating an undergraduate interprofessional education session for medical and pharmacy undergraduates on therapeutics and prescribing: the medical student perspective. Advances in Medical Education and Practice 7, pp. 661-670.

Key Publication 2: Spark, J. M.et al. 2017. What are the attributes of good pharmacy faculty (lecturers)? An international comparison of the views of pharmacy undergraduate students from universities in Australia and Wales, UK. Pharmacy Education 17(1), pp. 36-42.

Professor Arwyn Tomos Jones

Professor of Membrane Traffic and Drug Delivery, and Director of Research & Engagement

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Arwyn joined the Cardiff School of Pharmacy and Pharmaceutical Sciences in 2001 after gaining a PhD in Protein Crystallography from Birkbeck College University of London and undertaking postdoctoral research at Liverpool University, Harvard University and the European Molecular Biology Laboratory Heidelberg Germany. Research in his laboratory at national and international level falls under the umbrella of molecular cell biology, endocytosis and drug delivery, focusing on utilising endocytic pathways to allow small molecule drugs and biopharmaceuticals to gain access to their intracellular targets. He is very proactive in public engagement in science and holds a Diploma in Journalism from Bangor University.

Research keywords: Cell and cancer biology, endocytic pathways, drug delivery vectors, nanoparticles, plasma membrane and intracellular targeting

Key Publication 1:
Moody, P. R.et al. 2015. Receptor crosslinking – a general method to trigger internalisation and lysosomal targeting of therapeutic receptor:ligand complexes. Molecular Therapy 23(12), pp. 1888-1898.

Key publication 2:
Simpson, J. C.et al. 2004. A role for the small GTPase Rab21 in the early endocytic pathway. Journal of cell science 117(26), pp. 6297-6311.

Dr Emma Kidd

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Dr Emma Kidd joined the Cardiff School of Pharmacy and Pharmaceutical Sciences in October 1999. She is currently Reader in Pharmacology and Dean of Postgraduate Studies for the College of Biomedical and Life Sciences. Her current research focuses on understanding why people develop Alzheimer's disease with particular emphasis on the role of ageing and gender in the aetiology of this disease. Dr Kidd is involved in research to investigate the cognitive changes occurring with ageing, Alzheimer's disease and depression using a range of mouse models. She is also developing a novel antibody as a potential treatment for Alzheimer's disease.

Research keywords: Alzheimer's disease; age; gender; depression and Alzheimer's disease; molecular and cellular pharmacology; human brain research; in vitro and In vivo models of neurodegenerative diseases

Key Publication 1:
Evans, C.et al. 2019. Selective reduction of APP-BACE1 activity improves memory via NMDA NR2B receptor-mediated mechanisms in aged PDAPP mice. Neurobiology of Aging 75, pp. 136-149.

Key Publication 2:
Alsaqati, M., Thomas, R. S. and Kidd, E. 2017. Proteins involved in endocytosis are upregulated by ageing in the normal human brain: implications for the development of Alzheimer's disease. Journals of Gerontology, Series A 73(3), pp. 289-298., article number: glx135.

Dr Emma Lane

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Parkinson's disease is a largely sporadic neurodegenerative disorder which affects around 127 000 people in the UK. With no currently available disease modifying therapies, stem cell therapy is a growing field, with hESC and iPS cells ready for clinical trials. My research focus is on developing animal models of the disorder to better translate these developing therapies into a complex clinical arena in which patients are taking medication throughout these interventions and have extensive pathology. I also work with clinical colleagues to build facilitate characterisation of clinical cohorts and to bring Public and Patient Involvement into Parkinson's disease research in a meaningful and mutually beneficial way by leading BrainInvolve.

Research keywords: Parkinson's disease, in vivo models of disease, cell transplantation, neuroprotection, dyskinesia, Parkinson's PROM

Key Publication 1:
Breger, L. S.et al. 2017. Influence of chronic L-DOPA treatment on immune response following allogeneic and xenogeneic graft in a rat model of Parkinson's disease. Brain, Behavior, and Immunity 61, pp. 155-164.

Key Publication 2:
Breger, L. S., Dunnett, S. B. and Lane, E. L. 2013. Comparison of rating scales used to evaluate l-DOPA-induced dyskinesia in the 6-OHDA lesioned rat. Neurobiology of Disease 50, pp. 142-150.

Professor Jean-Yves Maillard

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Jean-Yves' expertise concerns biocides; their activity, mechanisms of action, and emergence of microbial resistance. He is the recipient of the WH Pierce Memorial prize (2004), the British Pharmaceutical Conference Science Medal (2004), the AD Russell Memorial Lecture Prize (2012), the Cardiff University Innovation and Engagement 2015 award and People Choice and Insider's Business and Education Partnerships 2015 Award. He is the Chief Editor of Letters in Applied Microbiology. He is the Director of the Cardiff Institute for Tissue Engineering and Repair and Chair of the British Standard Institute CH/216/1 Anti-microbial Hard Surfaces.

Research keywords: Biocides, antimicrobials, antimicrobial-resistance, sporicides

Key Publication 1:
Wesgate, R., Grasha, P. and Maillard, J. Y. 2016. Use of a predictive protocol to measure the antimicrobial resistance risks associated with biocidal product usage. American Journal of Infection Control 44(4), pp. 458-464.

Key publication 2:
Siani, H., Wesgate, R. and Maillard, J. 2018. Impact of antimicrobial wipes compared with hypochlorite solution on environmental surface contamination in a health care setting: a double-crossover study. American Journal of Infection Control 46(10), pp. 1180-1187.

Dr Efi Mantzourani

Senior lecturer in Pharmacy Practice

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I joined the School of Pharmacy in 2011 and am currently a Senior Lecturer in Pharmacy Practice. My methodological expertise lies in action research with focus on services provided via Choose Pharmacy, a national online platform acting as an interface between primary and secondary care. More recently I have been involved in the evaluation of a sore throat test & treat service that uses point-of-care-technology to optimise antimicrobial supply; I am also researching barriers and facilitators to transfer of care via Discharge Medicines Reviews. My scholarship concentrates on reflective practice and innovative opportunities for exposure to practice via role-emerging placements and inter-professional working.

Research keywords: Choose Pharmacy Application, electronic Discharge Advice Letters, Discharge Medicines Reviews(DMR), telehealth enabled provision of health service, reflective practice, placement education, role-emerging placements, interprofessional education

Key Publication 1:
Mantzourani, E., Way, C. and Hodson, K. 2017. Does an integrated information technology system provide support for community pharmacists undertaking discharge medicines reviews? An exploratory study. Integrated Pharmacy Research and Practice 6, pp. 145-156.

Key Publication 2:
Deslandes, R.et al. 2018. Development of a template to facilitate reflection among student pharmacists. Research in Social & Administrative Pharmacy 14(11), pp. 1058-1063.

Dr Youcef Mehellou

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Dr. Youcef Mehellou has been a member of the Cardiff School of Pharmacy and Pharmaceutical Sciences since January 2017. His research interests are highly interdisciplinary and cover synthetic chemistry, biochemistry, molecular modelling and protein crystallography. Current research projects are focused on the discovery and development of protein kinase modulators and their phosphate prodrugs as potential treatments for cancer, hypertension and Parkinson's diseases.

Research keywords: Medicinal Chemistry; Chemical Biology; Drug Discovery; Protein Kinases; Phosphate Produgs

Key Publication 1: Davey, M. S.et al. 2018. Synthesis and biological evaluation of (E)-4-hydroxy-3-methylbut2-enyl phosphate (HMBP) aryloxy triester phosphoramidate Prdrugs as activators of Vγ9/Vγ2 T-cells immune response. Journal of Medicinal Chemistry 61(5), pp. 2111-2117.

Key Publication 2: Osgerby, L.et al. 2017. Kinetin riboside and its ProTides activate the Parkinson's Disease associated PTEN-Induced Putative Kinase 1 (PINK1) independent of mitochondrial depolarization. Journal of Medicinal Chemistry 60(8), pp. 3518-3524.

Dr Benjamin Newland

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Ben Newland joined the Cardiff School of Biosciences in 2013 on a Sir Henry Wellcome Trust Fellowship (carried out in collaboration with the Leibniz Institute for Polymer Research, Dresden, Germany). He joined the Cardiff School of Pharmacy and Pharmaceutical Sciences in October 2017 to continue his highly interdisciplinary research into the use of nano, micro and macroscale materials for use in neuroscience research. Specifically he has developed microscale spherical hydrogel scaffolds for cell and growth factor delivery to the Parkinsonian brain and is developing a variety of other materials for applications in multiple sclerosis, cytokine delivery and neuroimaging.

Research keywords: Cell Transplantation; Growth Factor Delivery; Parkinson's Disease; Hydrogels; Cryogels; Microspheres; Microcarriers; Microfluidics; Polymer Nanotubes

Key Publication 1:
Newland, B.et al. 2015. Tackling cell transplantation anoikis: an injectable, shape memory cryogel microcarrier platform material for stem cell and neuronal cell growth. Small 11(38), pp. 5047-5053.

Key Publication 2:
Newland, B.et al. 2018. Soft and flexible poly(ethylene glycol) nanotubes for local drug delivery. Nanoscale 10(18), pp. 8413-8421.

Dr Fabrizio Pertusati

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Dr Fabrizio Pertusati holds an MsC degree in physical organic chemistry (fluorinated Gemini surfactants) and a PhD in asymmetric organic synthesis (atropisomeric biquinazolinones). He received postdoctoral training in solid-phase organic synthesis at Emory University and in organofluorine chemistry in the group of Nobel laureate Professor George Olah. From 2011 until 2016 he worked as research associate with Prof. Chris McGuigan on various projects (diastereoselective synthesis of phosphoroamidate prodrugs, fluorinated anticancer agents). Since 2017 he holds a temporary lectureship at the School of Pharmacy and Pharmaceutical Sciences. Research spans from Oncology (Anticancer Protide, Nucana), Rare diseases (NPC) and antibacterial drug discovery.

Research keywords: Anticancer Protide, Rare diseases, Nieman-Pick, stereoselective synthesis, organophosphorus, organofluorine, drug discovery, clinical development, glycosylation disorders, antibiotics, GMP drug development, mitochondrial DNA depletion syndrome

Key Publication 1:
Pertusati, F. and McGuigan, C. 2015. Diastereoselective synthesis of P-chirogenic phosphoramidate prodrugs of nucleoside analogues (ProTides) via copper catalysed reaction. Chemical Communications 51(38), pp. 8070-8073.

Key Publication 2:
Serpi, M., Ferrari, V. and Pertusati, F. 2016. Nucleosided derived antibiotics to fight microbial drug resistance: New utilities for an established class of drugs? Journal of Medicinal Chemistry 59(23), pp. 10343-10382.

Dr Polina Prokopovich

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Dr Polina Prokopovich joined the Cardiff School of Pharmacy in January 2011 as a Cardiff Academic Fellow. She is Senior Lecturer in Nanotechnology and Biomaterials and has research interests in the area of Materials/ Biomaterials and Drug Delivery. In particular, her research focuses on development of the targeted drug delivery for joint diseases; anti-inflammatory drug delivery systems to prevent wear particle-induced inflammation; orthopaedic antimicrobial nanocomposite bone cements; multifunctional hydrogels as bone graft materials and study of nanomechanical and surface properties of cells post exposure to metal, ceramic and polymeric wear particles. Research in Dr Prokopovich's group is sponsored by Wellcome Trust, Welsh Government, Innovate UK, EU funds and industries.

Research keywords: Targeted drug delivery for joint diseases; anti-inflammatory delivery systems; antimicrobial formulations, wound healing, bone cements, orthopaedic devices, nanomechanical properties of cells

Key Publication 1:
Giacomo, T., Perni, S. and Prokopovich, P. 2016. An injectable hydrogel as bone graft material with added antimicrobial properties. Tissue Engineering Part A 22(11-12), pp. 862-872.

Key Publication 2:
Al Thaher, Y.et al. 2018. LbL-assembled gentamicin delivery system for PMMA bone cements to prolong antimicrobial activity. PLoS ONE 13(12), article number: e0207753.

Dr Claire Simons

Reader

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Dr Claire Simons joined the Cardiff School of Pharmacy and Pharmaceutical Sciences in 1995 after postdoctoral work at the Michigan Cancer Foundation Detroit, Institut de Chimie des Substances Naturelles CNRS Paris and the University of Leicester. She is currently Reader in Medicinal Chemistry. Research concerns drug design through computational molecular modeling and synthetic medicinal chemistry with current research focused on (1) antiinfective enzyme targets with projects on development of inhibitors as potential therapeutics against bacterial, fungal and viral infections, and (2) anticancer enzyme targets with projects related to breast cancer and neuroblastoma.

Research keywords: Synthetic medicinal chemistry, computational modeling, enzyme inhibition, CYP enzymes, antiinfectives and anticancer drug development

Key Publication 1:
Taban, I.et al. 2017. Novel aryl substituted pyrazoles as small molecule inhibitors of cytochrome P450 CYP121A1: Synthesis and antimycobacterial evaluation. Journal of Medicinal Chemistry 60(24), pp. 10257-10267.

Key Publication 2:
Mohammed, A. F.et al. 2019. Synthesis and anti-HSV activity of tricyclic penciclovir and hydroxybutylguanine derivatives. Bioorganic & Medicinal Chemistry 27(6), pp. 1023-1033.

Dr Mathew Smith

Senior Lecturer and Director of Learning and Teaching

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Mat has a growing research portfolio with particular interests in improving the health of older adults in care homes through the optimisation of prescribing decision making and medicines management and the seamless care of patients across healthcare settings. Mat has particular expertise in digital transformation in care homes, technology enhanced care, evaluation of health technologies and the analysis of 'big data' related to prescribing decisions and medicines administration. His pedagogic interests lie in the design, implementation and evaluation of interprofessional education.

Research keywords: Health Technology, Telehealth, Big Data, Prescribing, Care Homes, Nursing Homes, Medicines administration, Medicines Management, Medicines Waste, Interprofessional education, Pharmacy Education

Key Publication 1:
Jenkins, A. I.et al. 2016. Too far away to work with each other: Does location impact on pharmacists' perceptions of interprofessional interactions? Journal of Interprofessional Care 30(5), pp. 678-681.

Key Publication 2:
Royal Pharmaceutical Society, Improving Medicines Use for Care Home Residents. March 2016. [available at: https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy%20statements/improving-medicines-use-for-care-home-residents-(wales).pdf?ver=2016-10-13-162139-760]

Dr Kathryn Taylor

Principal Research Fellow

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Dr Kathryn Taylor joined the Tenovus Centre for Cancer Research at Cardiff University in 1997 to investigate the role of LIV-1 family zinc transporters in breast cancer, moving to the Welsh School of Pharmacy in 2000 in the Breast Cancer Molecular Pharmacology Group. Her main focus is to investigate the mechanisms of how zinc transporters function at the molecular level both in health and diseases such as cancer. The continuation of discovery of mechanistic detail of how zinc transporters work should provide novel treatments for disease. Kathy is proud to be president-elect of the International Society of Zinc Biology.

Research keywords: zinc signalling; zinc transport; SLC39A family of zinc transporters; antibody generation; site-directed mutagenesis; post-translational modifications of proteins, zinc in breast cancer

Key Publication 1:
Ollig, J.et al. 2019. B cell activation and proliferation increase intracellular zinc levels. Journal of Nutritional Biochemistry 64, pp. 72-79.

Key Publication 2:
Nimmanon, T.et al. 2017. Phosphorylation of zinc channel ZIP7 drives MAPK, PI3K and mTOR growth and proliferation signalling. Metallomics 2017(9), pp. 471-481.

Dr Christopher Thomas

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Chris completed his degree in Chemistry with Industrial Experience in 2002 from Cardiff University before moving to the School of Pharmacy to undertake a PhD in transdermal delivery. Following this he completed a postdoctoral position in Cardiff University School of Medicine before being awarded a Marie Curie Fellowship in 2010 to study at Vanderbilt University School of Medicine, Nashville, TN. In 2013 Chris was awarded a NISHCR / Wellcome Trust fellowship before acting as co-investigator and Research Fellow on an MRC Research Award. Chris started his position as Lecturer in the School of Pharmacy and Pharmaceutical Sciences in Nov 2016.

Research keywords: Lipids, lipoxygenase, skin, immune cells, microbiome, bio-printing, keratinocytes, dermatology, wound healing

Key Publication 1:
Chiba, T.et al. 2016. The precise structures and stereochemistry of trihydroxy-linoleates esterified in human and porcine epidermis and their significance in skin barrier function: Implication of an epoxide hydrolase in the transformations of linoleate. Journal of Biological Chemistry 291(28), pp. 14540-14544.

Key Publication 2:
Hinz, C.et al. 2016. Human platelets utilize cycloxygenase-1 to generate dioxolane A3, a neutrophil activating eicosanoid. Journal of Biological Chemistry 291(26), pp. 13448-13464.

Dr Lowri Thomas

Lecturer

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I joined the school in late 2018, taking up a teaching and lectureship position. My research interest is in aberrant Ca2+ signalling, in particular with respect to the molecular mechanisms involved in the generation of cardiac arrhythmia. I specialise in the study of single ion channel gating in health and disease, and how this is altered by drug interaction. I have held several British Heart Foundation research grants in this area and collaborate with academics at institutions across the UK. My teaching interests include ion channel function/drug interactions, Ca2+ signalling, cardiac arrhythmia/physiology, as well as vascular disease processes.

Research keywords: Ryanodine receptor, cardiac arrhythmia, calcium signalling, single channel analysis, ion channel biophysics, molecular biology, catecholaminergic polymorphic ventricular tachycardia, flecainide, recombinant expression systems, single channel gating, calcium imaging, mutagenesis

Key Publication 1:
Thomas, N.et al. (2015) The mechanism of flecainide action in CPVT does not involve a direct effect on RyR2. Circulation Research 116(8), pp. 1324-35

Key Publication 2:
Thomas, N.et al. (2012) A mechanistic description of gating of the human cardiac ryanodine receptor in a regulated minimal environment. The Journal of General Physiology 140(2), pp. 139-58

Professor Marjorie Weiss

Professor of Pharmacy Practice

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My research interests are in prescribing, new roles for pharmacists and health care professionals' communication and consultation skills. My DPhil at the University of Oxford explored the non-clinical factors influencing general practitioners' prescribing. With pharmacists and nurses able to prescribe, my research has explored how patients and prescribers communicate and make decisions about medicines. Using consultation recordings, I have investigated how communication affects patient outcomes, as well as the training needed to improve prescribers' communication and consultation skills. I have also maintained a strong interest in professionalization in pharmacy and medicine, as well as what facilitates successful team working.

Research keywords: decision-making; patient adherence; prescribing; communication and consultation skills; community pharmacy; pharmacy education

Key Publication 1: Weiss, M. C.et al. 2015. Medication decision making and patient outcomes in GP, nurse and pharmacist prescriber consultations. Primary Health Care Research & Development 16(5), pp. 513-527.

Key Publication 2: Weiss, M. C.et al. 2016. GPs, nurses and pharmacists as prescribers in primary care: an exploration using the social identity approach / Hausärzte/-innen, Diplomierte Pflegefachpersonen und Apotheker/-innen als Arzneimittelverschreiber/-innen: eine Exploration mit dem Ansatz der Sozialen Identität. International Journal of Health Professions 3(2), pp. 153-164.

Professor Andrew Westwell

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Professor Andrew Westwell joined the Cardiff School of Pharmacy in January 2006. He is currently Professor in Medicinal Chemistry in the School, and Dean of Research and Innovation in the College of Biomedical and Life Sciences (formerly School Director of Research). His research interests span anticancer and anti-infective drug discovery, 18F PET radiochemistry and chemical analysis of new psychoactive substances. In particular, his research focuses on the discovery and pre-clinical development of new molecules targeting metastatic progression, the cause of death in >90% of cancer patients.

Research keywords: Anticancer drug discovery; synthetic medicinal chemistry; pre-clinical drug development; PET radiochemistry; new psychoactive substances

Key Publication 1:
Dart, D. A.et al. 2018. Novel trifluoromethylated enobosarm analogues with potent antiandrogenic activity in vitro and tissue selectivity in vivo. Molecular Cancer Therapeutics 17(9), pp. 1846-1858.

Key Publication 2:
Anderson, R. L.et al. 2019. A framework for the development of effective anti-metastatic agents. Nature Reviews Clinical Oncology 16, pp. 185-204.

Dr Alex White

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Alex's experience in drug discovery originates from a multidisciplinary PhD undertaken at the Northern Institute of Cancer Research, University of Newcastle. Postdoctoral research followed at Arizona State University, isolating and developing marine natural products as anti-cancer agents. Alex returned to Newcastle to join a collaborative programme with Agouron Pharmaceuticals (now part of Pfizer) resulting in the development of rucaparib; a drug recently licenced for the treatment of advanced ovarian cancer. His current research focuses on developing methodology for the large scale extraction of lead compounds from natural sources with potential for the treatment of various conditions, including cancer.

Research Keywords: Natural products, cancer, drug discovery, medicinal chemistry, marine natural products, brain cancer, ovarian cancer

Key publication 1: Owen, L., White, A. W. and Laird, K. 2019. Characterisation and screening of antimicrobial essential oil components against clinically important antibiotic-resistant bacteria using thin layer chromatography-direct bioautography hyphenated with GC-MS, LC-MS and NMR. Phytochemical Analysis 30(2), pp. 121-131.

Key publication 2: White, A. W.et al. 2000. Resistance-modifying agents. 9. Synthesis and biological properties of benzimidazole inhibitors of the DNA repair enzyme poly(ADP-ribose) polymerase. Journal of Medicinal Chemistry 43(22), pp. 4084-4097.

Dr Rowan Yemm

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Since joining the School in 2013 I have been pursuing a teaching and scholarship pathway focusing on topics relating to pharmacy practice and education. I am experienced in the application of multiple research methodologies including qualitative and quantitative approaches. My practice research spans both primary and secondary care settings, focusing on experiences and perspectives of patients and healthcare professionals on different healthcare services. I have recently begun teaching Health Psychology topics, and am working to develop research within the field of health-related behavioural change. My education research relates to the evaluation of professional competence in healthcare and subsequent assessment design.

Research keywords: service evaluation, patient perspective, health psychology, transfer of care, interface issues, continuity of care, behavioural change

Key Publication 1:
Yemm, R., Jones, C. and Mitoko, T. 2017. Displaying medication costs on dispensing labels as a strategy to reduce wastage: views of the Welsh general public. Integrated Pharmacy Research and Practice 6, pp. 173-180.

Key Publication 2:
Yemm, R., Bhattacharya, D. and Wright, D. 2014. What constitutes a high quality discharge summary? A comparison between the views of secondary and primary care doctors. International Journal of Medical Education 5, pp. 125-131.

PhD Successes

Farah Arikat

Thesis title:
Microneedle delivery of antigen-specific immunotherapy for Type 1 diabetes

Supervisors:
Professor James Birchall,
Dr Sion Coulman,
Dr Colin Dayan,
Dr Florence Wong

Summary:

Antigen-specific immunotherapy (ASI) involves induction of tolerance to autoantigens. An important protein in the development of type 1 diabetes (T1D) is the autoantigen, proinsulin (PI), the precursor of insulin. Microneedles (MNs) are micron-sized needles that penetrate into the upper skin layers. MNs provide advantages for autoantigen delivery including targeted delivery to the skin's dendritic cells (DCs), with minimal inflammation. The aim of this Thesis was to develop a PI-coated solid MN system and investigate the potential of this system to induce peripheral tolerance in the non-obese diabetic (NOD) mouse model of T1D. A highly concentrated PI MN coating formulation was developed containing the PI, diluent and a surfactant. The formulation enabled uniform and reproducible coating of the PI on to MNs. Delivery of PI from the MN system was investigated in mouse skin. MN application method and duration were optimised and resulted in skin puncture and reproducible delivery of PI to the skin. In vitro studies identified the insulin-reactive G9 CD8+ T cell as an appropriate biological readout for PI delivery. In vivo delivery studies indicated that MN delivered PI was delivered to the skin and subsequently processed by DCs into PI peptides, which were cross-presented in the skin draining lymph nodes to adoptively transferred G9 CD8+ T cells. This demonstrated that the PI-coated MN system has potential for inducing peripheral tolerance in the NOD mouse. T1D development was significantly delayed in NOD SCID mice that received cells from PI-treated NOD mice and cells from diabetic NOD mice (experimental group). However, no statistically significant difference in time to T1D development was observed between the experimental group and the control NOD SCID mice that received cells from untreated NOD mice and diabetic NOD mice. Further investigation of the dosage and dosing frequency of PI using the coated MN system is, therefore, warranted.

Bethan Broad

Thesis title:
An exploratory study of pharmacy graduate preparedness for preregistration training

Supervisors:
Professor Dai John,
Dr Louise Hughes,
Dr Sion Coulman

Summary:

Major changes to the role of the pharmacist in the past decade include an increased prevalence of pharmacist independent prescribing and a shift towards multi-disciplinary working. In 2011 the GPhC accreditation criteria for schools of pharmacy also changed significantly, moving to a more outcomes based education. Little is known about the preparedness of post-2011 graduates for modern practice in both hospital and community pharmacy settings. This study aimed to explore perceptions of this. Semi-structured one-to-one interviews were conducted to determine current perceptions of graduate preparedness for pre-registration training, what schools of pharmacy do well and areas for improvement. Fourteen members of academic staff (including teacher practitioners) from the Cardiff School of Pharmacy and Pharmaceutical Sciences, twenty-five employers (individuals involved in the supervision/training of pre-registration trainees) from hospital and community pharmacies, and seventeen recent pharmacy graduates from both hospital and community pre-registration training programmes were interviewed. A range of themes and subthemes were created through thematic analysis. The time between graduation and the early weeks of pre-registration training was identified as an important period in the transition from student to healthcare professional. This transition was eased by a graduate's prior exposure to the workplace (specific training site and more generally). All three stakeholder groups were supportive of enhancing spirality in MPharm curricula such that material learnt at university may be contextualised in pharmacy experiential placements. Students' exposure to patients improved their confidence and communication skills whilst their interactions with pharmacist role models informed their expectations of practice. While stakeholders perceive graduates to have appropriate knowledge, their ability to apply this may be improved, suggesting post-2011 graduates are not as prepared for pre-registration training as they could be. The need for enhanced student exposure to practice, patients and professions as part of the undergraduate degree has been identified.

Andrew Jenkins

Thesis title:
When 'I' is replaced by 'we', even 'illness' becomes 'wellness': Exploring pharmacists' interprofessional practice to better prepare pharmacy students for interprofessional collaborative working

Supervisors: Dr Mat Smith, Dr Louise Hughes, Dr Efi Mantzourani

Summary:

The drive to increase interprofessional teamwork in the healthcare environment has gained significant traction in recent years. This has partly been as a consequence of UK inquiries that have cited breakdowns in communication and teamwork as contributory factors leading to poor patient outcomes. One method to prepare practitioners for interprofessional teamworking is interprofessional education (IPE). The General Pharmaceutical Council specifies that IPE must be embedded within UK Master of Pharmacy (MPharm) programmes. However, there is a paucity of literature examining IPE related to pharmacy and limited knowledge of pharmacists' interprofessional interactions with healthcare professionals (HCPs). This makes it challenging for pharmacy educators to design IPE sessions that are reflective of practice. To address this, a mapping process was undertaken to identify IPE sessions that are delivered in UK MPharm programmes (17/29 schools responded). This identified significant variation in IPE sessions delivered in terms of learning outcomes addressed, topics covered, and the range of student HCPs involved. A mixed method study was then undertaken to explore pharmacists' interprofessional interactions in practice. A questionnaire was disseminated to pharmacists in Wales via community pharmacies (61.9% response) and hospital pharmacy departments (estimated 59.1% response). Analysis of returned questionnaires identified that although the extent of interprofessional collaboration varied pharmacists in both sectors most frequently interact with doctors and nurses. Semi-structured interviews were undertaken with pharmacists from both the community (n=14) and hospital (n=15) sectors to explore the nature of interactions. Using deductive and inductive thematic analysis, the nature of pharmacists' interactions with HCPs was elucidated, facilitators and barriers to interactions were determined and suggestions for IPE developed. Findings from these studies resulted in a series of recommendations for pharmacy educators and policy makers to facilitate pharmacists' interprofessional collaboration in practice and aid the development of relevant IPE that is of value to learners.

Helen King

Thesis title:
The stability of new generation intravenous lipid emulsions

Supervisors:
Dr Allan Cosslett, Dr Rebecca Davies, Dr Chris Thomas

Summary:

Intravenous lipid emulsions (IVLE's) form a staple part of parenteral nutrition (PN). PN provides life sustaining support where gastrointestinal nutrition is inadequate due to disease or prematurity. Whilst the physical stability of IVLE's is relatively well known and quantified, chemical stability is an area where little testing has occurred. Lipids are susceptible to breakdown through free radical attack leading to lipid peroxidation, a cyclical process resulting in the production of primary and secondary toxic lipid peroxidation products. This thesis presents the development and validation of a method for measurement of peroxidation and triglyceride (TAG) breakdown occurring within two IVLEs. The high-performance liquid chromatography (HPLC) method developed uses in-line ultra-violet (UV) and charged aerosol detection (CAD) to monitor the six main TAGs in Intralipid® and 10 TAGs in SMOFlipid® and detects the toxic secondary peroxidation products 4-Hydroxynonenal (HNE) and Hydroxyundecenal (HUE). The assay was validated in line and employed to test the chemical stability, the well established lipid emulsion (Intralipid®) and a newer lipid emulsion (SMOFlipid®). Both lipids were subject to up to 84 days storage within 50 ml syringes, 250 ml PN bags and 50 ml glass vials at room and fridge temperatures. The effect of light exposure was tested using light protected and non-light protected samples of each lipid. Results detail the extensive levels of TAG losses observed within each container and the detection of secondary peroxidation products. Fridge temperature limited TAG loss and peroxidation in all containers, however secondary peroxidation products were detected. Both SMOFlipid® and Intralipid® gave in excess of 30 % losses in TAGs over 84 days storage. HNE, HUE and a triglyceride remnant were all recorded in SMOFlipid® and Intralipid® syringes (both temperatures) and small volume PN bags at room temperature. Light protection within this study showed no significant difference vs non-light protection. The results obtained from the work within this thesis are of vital importance when considering the safety of IVLEs for intravenous nutrition. This work provides an initial data set on the levels of peroxidation occurring within two commercially available in-use IVLEs and highlights the necessity for the stability and storage limits of these emulsions to be re-assessed.

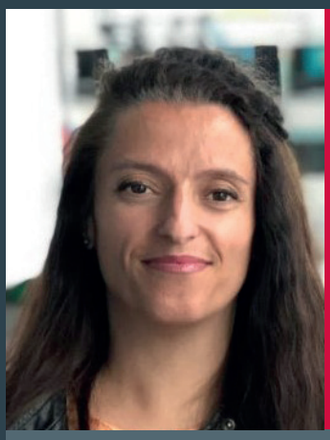
Shayda Rose Maleki-Toyserkani

Thesis title:
Eicosanoid and cytokine responses to bacterial infection

Supervisors:
Professor Les Baillie,
Dr Emma Kidd,
Dr Chris Thomas

Summary:

Infectious diseases remain some of the most serious health threats facing the world. The immune system is equipped to initiate a rapid and specific response to foreign invaders of the body, with its ultimate aim being to protect an organism from injury and disease. Eicosanoids, including prostaglandins and leukotrienes, are a family of lipids that play key roles in inflammation including helping leukocytes fight infection. Cells of the innate immune system including tissue macrophages, neutrophils and sentinel dendritic cells are major contributors of local eicosanoids. In mammals an inflammatory insult will result in a cytokine cascade whereby tumour necrosis factor α (TNF-α) is released, followed by interleukin-1β (IL-1β) and then IL-6. Downstream of these cytokines, others are released that serve as potent chemoattractants to induce migration of neutrophils and macrophages to the site of infection. It is known that exposure to varying bacterial components results in a different profile of lipids and cytokines, and by characterising mediator signals it may be possible to define biomarker fingerprints predictive for early bacterial infections. To analyse this, a combination of a targeted lipidomic approach and cytokine immunoassays were employed to identify neutrophil and macrophage responses to individual bacterial components and the whole organism. Work in this thesis has identified potential markers of bacterial infection, such as 12- HETE, 14-HDOHE and TNF-α, which, along with future advances, could be used to develop novel strategies for clinicians, nurses and primary care staff to analyse patients suspected of bacterial infection at the bedside. Work here provides an insight into how the eicosanoid and cytokine storms are generated alongside each other to accompany classic inflammation during specific bacterial infection. The ability to distinguish between species of bacteria causing infection could prove invaluable, reducing the time taken to establish the cause of infection, ultimately leading to better patient outcomes.



Chiara Moriconi

Thesis title:
Caveolin-1: a mediator of Glioblastoma cell invasion and an independent negative biomarker of Glioblastoma patient survival

Supervisors:
Professor Mark Gumbleton,
Professor Gavin Pilkington

Summary:

Glioblastoma multiforme (GBM) is a malignant and highly aggressive form of brain tumour, with extremely poor prognosis. One of its features is the ability of the tumour to invade through normal brain tissue resulting in tumour relapse. Our hypothesis was that Caveolin-1 (Cav-1), a major component of the caveolae and recognized to be involved in a number of signalling pathways, has a key pro-invasive role in GBM. We pursued our hypothesis by inhibiting the expression of Cav-1 in different adult GBM cell lines using different genetic techniques (liposome shRNA, lentiviral shRNA and CRISPR). We found that Cav-1 drives clonogenicity (CHAPTER 3) and invasion in a combination of two- and three-dimensional models (CHAPTER 5). We focused our research on the invasion phenomenon and, in order to provide a robust quantification approach to study invasion in 3D spheroid assays, we developed (CHAPTER 4) an open-source semi-automated script, INSIDIA, available for all researchers in the community to use. This tool was used to quantify the impact of Cav-1 on invasive capacity. In in-vitro systems, we explored the impact of Cav-1 expression upon molecules associated with the invasion phenomenon (CHAPTER 5). We found Cav-1 to be associated with CTSB, MMP1 and UPA and receptors like UPAR and CD44, as well as AKT activation. Interrogating the “The Cancer Genome Atlas” (TCGA) database, we confirmed that Cav-1 is an independent biomarker of poor prognosis in GBM patients (CHAPTER 6). This clinical data also found association of genes that may cooperate with Cav-1, including CD44, ITGA3, VIM, CTSB, CTSL, TSP-1, TIMP1 and MT1MMP. Collectively this thesis provides strong in vitro and clinical data supporting that Cav-1 as a key molecule promoting GBM invasion, and further identifying Cav-1 as a potential drug discovery target in GBM.

Elizabeth M Navarro Garcia

Thesis title:
Molecular mechanism of highly potent NS5A inhibitors.

Supervisor:
Professor Andrea Brancale

Summary:

Hepatitis C is responsible for causing chronic infections in over 170 million people all over the world who are at a risk of developing liver cirrhosis and hepatocellular carcinoma. Until recently, the standard-of care treatment consisted of Interferon-alpha and ribavirin, in addition to non-structural protein 3/4 (NS3) protease inhibitors, but due to the undesired side-effects, researchers developed more efficient therapies. Nowadays, small molecules targeting non-structural viral proteins: NS3/4 protease, NS5A D1 and NS5B polymerase activities can clear the infection in 98% of the cases. These direct acting antivirals (DAAs) are widely used, however, despite advances in recently approved potent DAAs the world-wide application of these therapies remains limited due to the expensive cost and potential drug resistance. NS5A is a nonstructural multifunctional protein. Mainly composed by an amphipatic helix, which is the major membrane anchor, Domain I, which is involved in RNA binding and assembly, and Domain II and III which are intrinsically unfolded domains and are known to interact with host factors. DAA targeting NS5A DI, Daclatasvir (DCV), has a picomolar range activity and it is used in combination therapy to combat HCV infection. Given the enormous medical relevance of NS5A inhibitors, the aim of this study was to decipher the mode of action of Daclatasvir, together with more insights to the role of NS5A structural elements. In the present study, experiments showed that DCV can block the envelopment of viral particles. Furthermore, we investigated the role of very conserved Proline residues in the structure of NS5A, identifying key Proline residues which are critically involved in RNA replication, and have an impact in HCV infection. This fact, also suggests that the some of these Prolines might be essential for the DCV binding, as we prove that they have a direct role in keeping the binding site of DCV. Lastly, we set up a molecular model which includes the intracellular membrane giving the full picture of how DCV works in the context of an intracellular membrane and its important interactions. Together our data, prove the dual mode of action of DCV targeting HCV replication and assembly. And importantly, we constructed a molecular model that can be use in the future to study structure-function of developing NS5A inhibitors.

Silvia Zilliotto

Thesis title:
Understanding how targeting zinc transporters prevents the development of aggressive cancer

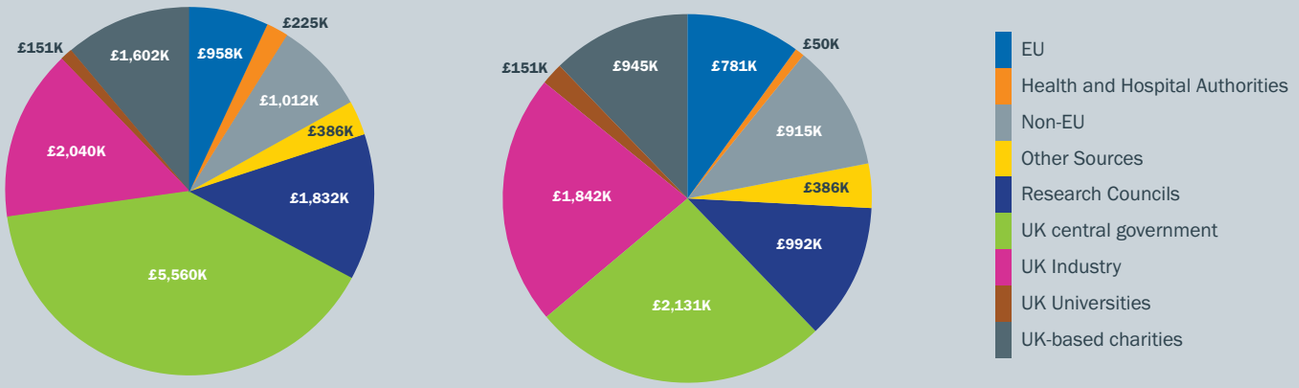
Supervisor:
Dr Kathy Taylor

Summary:

Zinc is one of the most abundant trace elements in the human body. Cellular zinc homeostasis is primarily controlled by zinc transporters, including the ZIP family of zinc importers. Since zinc homeostasis needs to be tightly controlled, dysregulation of these zinc transporters is associated with multiple diseases including cancer. ZIP7, a zinc transporter residing on the endoplasmic reticulum membrane, was discovered to be involved in driving endocrine resistant breast cancer. Findings within this project support the hypothesis that tamoxifen-resistant breast cancer cells are driven by the increased activation of ZIP7 which drives the invasive behaviour of this more aggressive breast cancer phenotype. This study confirmed the suitability of activated ZIP7 as a good biomarker of acquired resistance to anti-hormone treatment in breast cancer, a current clinical unmet need. Zinc is also important in cell cycle progression and, in particular, is essential for progression of cells through the G2 phase and mitosis. Our group have discovered a role for zinc transporters in the process of mitosis. This study expanded this discovery and demonstrated that blocking the specific zinc transporters with unique agents could inhibit mitosis. These agents were also shown to be effective at reducing the growth of different cancer cell lines. This study revealed novel targets for proliferative diseases such as cancer, which is manifested by uncontrolled growth.

Research Funding

Our research groups were part of collaborative research awards with other Institutions totalling £13,763,850 (A) for the financial years 2016-19, with £8,195,094 being allocated to the School of Pharmacy (B).



Current major grants

List of substantial grants (≥300K) awarded since 2016 that involve our staff:

- Prof A Westwell (Co-I) et al. "Medicines Discovery Institute". £2,312,749, 2017-22
- Prof A Jones (PI), Prof J Birchall, Dr J Bowen, Prof M Gumbleton, et al. "CALIN - Celtic Advanced Life Science Innovation Network". £856,825, 2016-20
- Dr E Lane(Co-I) et al. "Brain Repair and Intracranial Neurotherapeutics - the Wales BRAIN Unit". £807,000, 2018-20
- Prof J Birchall (PI), Dr M Barnes, Dr S Coulman, et al. "Embeddable sustained release microneedles for contraceptive delivery". £537,410, 2018-19
- Dr C Heard (Co-I) et al. "Targeted drug delivery to the cornea of the eye via medicated contact lenses and mucoadhesive thin films". £511,563 2019-21
- Prof A Jones (Co-I) et al. "Traceless non-invasive and spatiotemporal control of protein activity in cells". £510,222, 2017-20
- Dr O Castell. "Artificial cells with distributed cores to decipher protein function". £444,822, 2019-22
- Prof J Maillard (PI), et al. "To reduce microbial contamination on surfaces and infection by developing novel and effective antimicrobial surfaces". £366,521, 2019-22
- Prof J Birchall (PI), Dr S Coulman. "Develop and apply standardization test methods for MAPs in order to generate draft pharmacopoeial standard for the technology class". £358,368, 2018-21

New grants

New grants awarded to our staff since 2016 (grants ≥100K per annum):

- Dr F Pertusati (PI), Prof A Brancale. "Phosphoramidate prodrug synthesis". £264,236, 2017-19
- Dr J Gee (Co-I) et al. "Investigation of biomarker determinants efficacy of fulvestrant and the RET inhibitor vandetanib in oestrogen receptor positive breast cancer". £243,288, 2017-20
- Prof J Maillard. "Dry biofilm control". £225,175, 2016-20
- Dr N Thomas (PI), Dr O Castell. "Functional assessment of cardiac ryanodine receptor Ca2+release channel populations: A direct demonstration of coupled gating?". £223,056, 2016-19
- Dr M Smith. "Transfer and embed new knowledge and capabilities that will enable Invatech to exploit the full commercial value of extensive data and information generated and stored by its medicines management system and maximise new commercial market opportunity". £219,203, 2018-22
- Dr E Lane. "Determination of optimal medication to support efficacy of hESC-derived transplants for Parkinson's disease and assessment of side effect risk". £206,598, 2017-19
- Prof M Weiss (Co-I) et al. "Feasibility and acceptability of a new clinical pathway for the identification of non-responders to glaucoma eye drops (the TRIAGE study)". £194,991, 2017-19
- Prof A Brancale. "FIghtiNg DEngue viRus, a novel strategy for the development of fully protective antivirals that act by disrupting the DENV NS3/NS5 interaction". £146,635, 2018-20
- Dr N Thomas (PI), Dr O Castell), Dr B Cumbes. "Functional assessment of cardiac ryanodine receptor Ca2+ release channel populations: a direct demonstration of coupled gating?". £143,376, 2016-19
- Dr M Bassetto (PI), Prof A Brancale. "Vector-borne emerging diseases: Computer-aided design, synthesis and evaluation of novel antiviral compounds against Chikungunya and Zika viruses". £131,405, 2016-19
- Prof A Brancale (PI), Dr S Ferla."Small-molecule immune checkpoint inhibitors: An innovative approach to treat cancer". £122,647, 2018-21
- Dr C Heard (Co-I) et al. "Targeted drug delivery to the cornea of the eye via thin-film slow release technology". £111,052, 2017-18
- Dr E Kidd (Co-I) et al. "A high content analysis platform for analysing dementia-associated genetic variation". £108,300, 2017
- Dr W Ford. "Pharmacokinetics of vascular responses to dietary amines and amphetamines via trace amine-associated receptors". £106,861, 2017-20
- Prof A Brancale (PI), Dr S Ferla."Design, synthesis and evaluation of novel CD200, PD-1 and CTLA-4 small molecule inhibitors as potential cancer treatment". £100,000, 2019-22

Guest Seminar Speakers

Professor Adrian Porch
(School of Engineering, Cardiff University)

Electromagnetic field interactions with biological systems

Dr Frankie Rawson
(University of Nottingham)

Electrically Stimulating Developments in Medicine

Dr Katherine Long (Max Planck Institute of Molecular Cell Biology and Genetics, Dresden)

How does the human neocortex fold? Developing novel tools to understand the newly discovered role of extracellular matrix

Professor Giuseppe Battaglia
(University College London)

Cytonautics: Integrated approach to design cellular carriers

Dr David Williams
(School of Chemistry, Swansea University)

Biodegradable Copolymeric Nano-vectors/reactors as robust nanomedical technologies

Professor Vincent Cattoir
(Université de Caen Normandie)

How enterococci become resistant to antibiotics

Dr Tom McDonald
(University of Liverpool)

Designing in situ forming implants for long-acting drug delivery

Prof Ben Forbes
(Kings College London)

Adverse lung responses to inhaled medicines and how to avoid them

Dr Paul Russell
(DSTL Porton Down)

Spies, Lies but no Naked Thighs - Dealing with Nerve Agent in a Quintessential English City

Prof Nicola Tirelli
(Italian Institute of Technology, Genova, Italy)

Hyaluronic acid as a targeting agent. The interesting and the head-scratching facts.

Prof Patrick Eyers
(University of Liverpool)

Understanding and responding to drug-resistance in cancer cells

Prof Dame Lesley Fallowfield
(Brighton & Sussex Medical School)

For services to psycho-oncology: psycho what?

Dr Sam Butterworth
(The University of Manchester)

The Synthesis and Evaluation of CCL2 Conjugates

Dr Ute Jungwirth
(University of Bath)

Interrogating the role of cancer-associated fibroblasts in breast cancer progression

Dr Virginia Arechavala-Gomeza
(Bizkaia Health Research Institute, Bilbao, Spain)

Developing RNA treatments for rare diseases: much more than finding a new drug

Prof Maura Marinozzi
(Universita Degli Studi Di Perugia, Perugia, Italy)

Liver X Receptor (LXR) modulation meets immunotherapy: a still young, but already promising medicinal chemistry project

Professor Catherine Jopling
(School of Pharmacy, University of Nottingham)

The role of liver-specific microRNA-122 in hepatitis C virus replication

Dr Ian Ganley
(School of Life Sciences, University of Dundee)

Eating your mitochondria: what, why, where and how?

Publications

2018

Role of poly-beta-amino-esters hydrolysis and electrostatic attraction in gentamicin release from layer-by-layer coatings. Al Thaher, Y., Latanza, S., Perni, S., Prokopovich, P. *Journal of Colloid and Interface Science*, 526, 2018, 35-42.

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