DERRIFORD RESEARCH FACILITY
Our research output in clinical medicine is ranked top in the UK, with 80% of the research classed as 'internationally excellent' or 'world leading'.

The University of Plymouth Brain Tumour Research Centre of Excellence, led by Professor Oliver Hanemann, is one of only four in the UK funded by Brain Tumour Research. It is playing a key role in researching new treatments for brain tumours, the biggest cancer killer of children and adults under the age of 40, and tumours of the nervous system.

The significance of our cross-discipline approach in Parkinson’s disease is recognised through the appointment of Dr Camille Carroll as National Institute for Health Research (NIHR) Clinical Research Network (CRN) National Specialty Lead for Neurodegeneration. There are 127,000 people with Parkinson’s in the UK with one more person diagnosed every hour.

With three core aims at the heart of everything we do, exceptional clinical learning, strong social engagement and world class research, the Faculty has earned a strong and enviable track record for delivering high calibre training for a wide range of health professionals. Training more than 1,600 students and professionals each year, 'drives forward the vision for Plymouth as the ‘First Choice for Health’ in the South West.'

Through our graduates and research we celebrate our vision. In addition, we see this recognised through various accolades and privileges. We enjoy ‘top three’ national status for preparedness for both newly qualified doctors and their clinical supervisors (General Medical Council national Training Survey), and/or for our dental school (The Guardian University Guide 2018), whilst our dynamic and rapidly expanding research operation and reputation continues to shine a spotlight on just how much this comparatively young Faculty is achieving.

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In both education and research we are recognised for quality and achievement, but we cannot afford to stand still. We are committed to finding the solutions to some of the biggest medical challenges.

At Plymouth we train in the specialities that pretty much reflect the whole workforce of the NHS, and our education mission is underpinned by research.

Professor Rob Sneyd, Dean, Faculty of Medicine and Dentistry
INSTITUTE OF TRANSLATIONAL AND STRATIFIED MEDICINE - ITSMed

Launched in 2014, ITSMed brings together our world-class research in both basic laboratory and translational clinical science. ITSMed's effective research collaborations and transdisciplinary links between clinical and non-clinical scientists are underpinned through its integrative 'bench-to-bedside and back' research strategy. This approach to translational medicine which delivers impact and patient benefit is sustained by our Peninsula Clinical Trials Unit.

Our research has attracted international researchers including Matthias Futschik, Professor in Bioinformatics, Edgar Kramer, Professor of Neurodegenerative Diseases, Professor Ji-Liang Li who joined us from Oxford University as Chair in Cancer Immunology, and Professor Syed Hussain who joined us as Chair in Oncology. Our research has also resulted in a number of BBSRC awards and funding from various bodies such as Innovate UK, MRC, NHRI; BBSRC, while enjoying significant support from charities such as Brain Tumour Research.

Through our Biomedical Research Group led by Professor Simon Jackson, we focus on three themes of research: cancer, infection, immunity & inflammation, and clinical neuroscience, facilitated by cross-cutting expertise in Diagnostics, Clinical Trials and Public Health research. In these, we have unique combinations of research and technologies that are developing critical mass and international recognition, all of which will continue to prosper with the teams operating in the Institute’s brand new physical headquarters, the Derriford Research Facility.
Derriford Research Facility is an integral part of the University’s £25 million investment to accelerate the translation of medical and dental research into patient care and improved outcomes for people living with devastating conditions. Critically it provides space: space to grow strong and resilient teams of biomedical and clinical researchers to work collaboratively and produce significant opportunities to expedite therapeutic treatments.

Located adjacent to the main Faculty building and neighbouring University Hospitals Plymouth NHS Trust (Derriford Hospital), it places additional world-class research laboratories next door to a major teaching hospital thereby encouraging cross-organisation collaboration. It reflects our role as a research-led University, with a major commitment to healthcare education.

It further underpins our drive to transform the medical research landscape of the region. It will enrich effective collaborations with Derriford Hospital, medical and pharmaceutical companies, and is co-located with the Peninsula Clinical Trials Unit, NIHR Peninsula Clinical Research Network on Plymouth Science Park.

Investment attracts and retains talent: providing researchers with cutting-edge equipment and the space to grow teams; including the best PhD students. This in turn supports the securing of high value grants and draws in commercial partners. We believe the impact will extend to Derriford Hospital, as leading consultants become aware that Plymouth is a first choice destination for a research-rich career.

“The physical proximity of Derriford Research Facility to the hospital provides an even greater boost to collaborative working and advancing clinically relevant research in the laboratory. This will significantly help to attract further clinical academics at all levels, and research funding to help us achieve our ambitions for growing biomedical research, alongside translational and health services research in Plymouth and surrounding areas.”

Professor Adrian Taylor, Associate Dean of Research, Faculty of Medicine and Dentistry
We are investigating the mechanisms that initiate cancers and what makes them spread. We are working to discover approaches for early diagnosis, treatment and prevention in key areas of cancer research such as brain tumours, leukaemia, lymphomas and oral cancer. Our development and success takes many forms.

Introducing some key areas within our research environment...

Our internationally recognised work with low-grade brain tumours meant we were chosen to be a Brain Tumour Research Centre of Excellence. Led by Professor Oliver Hanemann it is currently one of only four centres in the UK to be partnered with the Brain Tumour Research charity. Dr Claudia Barros and Xinzhong Li along with Professors David Parkinson and Ji-Liang Li all currently have funded projects in brain tumour research.

Professor Simon Rule has been awarded significant funding by Cancer Research UK to lead a national research study (ENRICH) to compare the effectiveness and side effects of using a BTK (Bruton’s Tyrosine Kinase) inhibitor in a trial against standard chemotherapy in patients with mantle cell lymphoma, a trial which is showing early success with participating patients in remission.

Professor Syed Hussain’s major areas of interest are management of urological cancers, clinical trials, early drug development and translational medicine. He has set up a large number of clinical trials from early phase to late phase studies during his career thus providing early access to novel drugs for patients.

An important focus on the development of new therapies lies at the interface between two of our research areas, cancer and immunology. Professor Ji-Liang Li who joined us from Oxford University, is investigating the microenvironment of tumours and translational cancer medicine aimed at developing new therapeutic targets or biomarkers. His work also investigates the use of immunotherapy in new ways to tackle cancer.

Dental research in oral cancer is led by Dr Bing Hu, focusing on early markers of cancer initiation and biomarkers for metastasis – the spread of cancer.

Dr Amiya Patra, Vandervell Senior Research Fellow in Cancer immunity, is exploring the role of the immunity transcription factor NFAT (nuclear factor of activated T cells) in leukaemia. NFAT is important in immune responses. A better understanding of the molecular mechanisms of carcinogenesis – the initiation of cancer formation – allows direct translation into new therapies evaluated in clinical trials.

‘Cancer is a leading cause of death and morbidity worldwide, and with an ageing population and lifestyle trends its incidence is likely to continue to rise. Cancer is therefore an important core theme of our biomedical research’. Professor Simon Jackson, Lead, Biomedical Research, ITSMed
There are more than 100 variants of the disease commonly classified as Non-Hodgkin Lymphoma (NHL), a form of cancer deriving from the immune system. One of the most aggressive forms is the incurable Mantle Cell Lymphoma (MCL), which accounts for around 6% of all NHL cases. There are approximately 600 new patients yearly diagnosed with this incurable disease in the UK, which reduces life expectancy to around three years from diagnosis.

Simon Rule, Professor in Haematology at the Faculty of Medicine and Dentistry, and Consultant Haematologist at Derriford Hospital, is one of the world’s leading experts in MCL and has coordinated scores of ground-breaking clinical trials over the last 15 years, in conjunction with the pharmaceutical industry. More recently these have been chemotherapy based oral treatments. The most active of these have been a class of drug that targets Bruton’s tyrosine kinase, or BTK, a protein that is important in keeping the lymphoma cells from dying.

The first drug in this class is Ibrutinib, which has, over a number of trials with patients who’ve relapsed from other forms of treatment, produced near-unprecedented positive results with rarely no side effects in the majority of patients. Now a world first clinical trial, ENRICH, is under way, funded by Cancer Research UK, which is comparing this drug as a front-line treatment to the standard form of chemotherapy.

Derriford is the first hospital in the world to use these drugs and is at the cutting edge of incorporating them into treatment regimes.

“Moving the University scientists into Derriford Research Facility next to the hospital is key to successful collaboration. The aim of our work is to end up with a bio-marker that will tell us how to treat the patients.”

Professor Simon Rule
Brain tumours continue to kill more children and adults under the age of 40 than any other cancer, and currently 10 people die of a brain tumour every day.

At Plymouth, through our Brain Tumour Research Centre of Excellence, with a team led by arguably one of Europe’s leading researchers on low grade brain tumours, we focus on meningiomas, the most frequent primary brain tumour alongside other low grade tumours. These tumours develop in the layers of tissue that surround and protect the brain and spinal cord and they progress from low grade to more dangerous forms of cancer of the brain and/or nervous system.

We are getting very near to understanding how this happens and once we do our findings will help us to find new biomarkers and new and existing drugs to replace current treatment regimes – which include invasive surgery and radiotherapy.

By investigating the potential of existing drugs which are being used to treat other conditions in humans, for the treatment of brain tumours, we will be able to bring drug-based therapies to patients sooner rather than later, as these drugs would have already been through the testing necessary before use in humans. This is known as drug repurposing.

We have a unique tumour collection, which allows us to further the research to look for biomarkers, some of which we have started to identify. These will help diagnose disease, predict the course of the disease and then identify the appropriate drug response. This can then be translated into clinical trials.
In 2014, 11,449 new cases of oral cancer were diagnosed in the UK, and there were 2,386 deaths caused by the condition. Survival rates for head and neck cancers range from 19-59% yet 91% are preventable.

Leading a team of eight researchers Dr Bing Hu, Associate Professor in Oral and Dental Health Research, is carrying out world-leading research in two major fields of dental research; cancer and regenerative medicine.

Given the statistics, there is a particular focus on early detection of cancer and biomarkers for metastasis – the development of secondary malignant growths. To discover a potential therapy solution the team are working with at least eight collaborators worldwide, including the prestigious Max Planck Society in Germany and the University of Cambridge.

Another major goal for dental researchers worldwide is developing the ability to regenerate hard tissue. They need to be able to do this because hard tissue such as enamels, the hardest tissue in the body, have no regenerative capability due to the loss of the cells producing enamel after tooth eruption. Equally dentine, the tissue forming the body of a tooth beneath the enamel and cementum, which protects the tooth root surface, also have limited repairing ability. At Plymouth, we are currently seeking to identify, characterise and differentiate the dental stem cells for these three areas of regeneration. Research in this area also contributes to that of regenerating other oral tissues/organisms such as skin, oral mucosa and salivary glands.

For this reason we have the opportunity to attract the best scientists to join our team and accelerate our research.

“Scientists care about the research environment, and they want to see if they are able to work here. I’m convinced that the new research building can attract top quality researchers to come here. I’m already aware of one post-doctoral candidate who has decided to apply for a bigger grant to come here. It is a very positive sign.”

Dr Bing Hu
This area of our research focuses on global health challenges in the areas of liver disease, innate immunity, pollution and health, bacterial pathogens and antibiotic resistance, vaccine development and oral health and disease.

Introducing some key areas within our research environment...

Our internationally recognised hepatology research led by Professor Matthew Cramp, Chair in Hepatology at the University of Plymouth and Consultant Gastroenterologist at Derriford Hospital, continues to expand and diversify its research portfolio. It is now adding the study of liver cancer development and its prevention to its main areas of activity in hepatitis C virus infection, and alcoholic and non-alcoholic fatty liver disease.

A significant breakthrough in our antibiotic resistance research led by Dr Mat Upton has attracted substantial funding to progress into early phase clinical trials.

Dr Michael Jarvis has been awarded funding by the US National Institutes of Health, Medical Research Council and Innovate UK for his work on new self-disseminating vaccines for infectious disease.

Professor Simon Jackson is leading the research centred on immunological and inflammatory responses to infection, through which it is hoped a better understanding will help to develop therapies for severe infectious conditions such as sepsis that carry a particularly high mortality.

Professor Ji-Liang Li is using molecular and cellular biology and immunology approaches to dissect mechanisms of tumour growth and metastasis, to develop novel therapeutic targets and improve therapeutic efficacy by optimal combinations of chemotherapy, targeted therapy and immunotherapy.

Dr Gyorgy Fejer has developed novel, continuously growing, non-transformed model of lung alveolar macrophages (AMs), cells that play key roles in important diseases such as lung infection, asthma and chronic obstructive pulmonary disease. This new system has already made possible the identification of several, previously unknown, innate immune phenomena in AMs.
Derriford Research Facility provides the specialist laboratory facilities needed to expedite our research. It will also enable new interdisciplinary areas of research, such as a project that will allow us to work with Associate Professor Michael Jarvis, to investigate the development of liver cancers and the role of antibodies in tumour behaviour and treatment response.

Professor Matthew Cramp

Liver disease is a growing medical concern for many developed nations with obesity, alcohol and viral hepatitis related cases. This is now reaching epidemic proportions in some areas, with more people dying, and at a younger age, than ever before.

The search for a vaccine for Hepatitis C is the key research theme for Professor Matthew Cramp, President elect of the British Association for the Study of the Liver. Over the course of 17 years, he has established the Hepatology Research Group and the South West Liver Unit at Derriford Hospital, from where he both treats patients and conducts many clinical trials. Currently the research focuses on two groups of people who have been exposed to the virus yet have shown remarkable resistance to it. The first are a group of drug users in the city of Plymouth and, working with colleagues at Imperial College London, they are studying the role that lipids – fat-like substances that occur in the bloodstream – play in the transmission of Hepatitis C.

The second is a cohort of eight people who have received a blood transfusion from a donor infected with Hepatitis C. Using DNA sequencing, the team are trying to identify the source of their immunity and whether it could be harnessed in drug form.
The threat of emerging infectious, ‘zoonotic’ diseases that originate in animals and affect humans was brought to the world’s attention with the 2014 Ebola outbreak.

Virologist, Dr Michael Jarvis has for a number of years been researching the development of a new self-disseminating form of vaccination, which reaches far beyond that of the standard inoculation programmes. Through a herpes virus vector he hopes to develop a new means to prevent and treat many infectious diseases.

The research team has demonstrated the potential of virus-based vectors, which in effect become ‘carriers’ for the vaccine spreading immunity with a single species, to provide protection against Ebola virus in the experimental non-human primate model. This has been followed by the awarding of £400,000 from Innovate UK to develop a new and economic vaccine to stop the spread of zoonotic infectious diseases – from animals to humans – by creating an immune response in animals using a bovine herpesvirus.

Similar related vaccination strategies may equally be a means to resolve the bovine TB problem in cattle and badgers. The impact of bovine TB on farmers continues to be overwhelming, whole herds devastated as the result of one positive TB test. In addition to the financial and personal loss of each individual, the cost of bovine TB to the UK looks to be in excess of £1bn over the next 10 yrs.

“Our research projects are highly collaborative, I will be working with the Defence Science and Technology Laboratory Porton Down, UK, University of Liege, Belgium and Kansas State University and Derriford Research Facility provides us with this critical infrastructure of support.”

Dr Michael Jarvis
The next phase of development is pre-clinical testing, leading to Phase 1 clinical trials. Colocation with clinical colleagues at Derriford Research Facility will make the aim of the creation of a licensed drug within the next six years a real possibility.

Dr Mat Upton

Antibiotic resistance has been identified by Dame Sally Davies, Chief Medical Officer for England 2013, as a big threat to global health as climate change.

According to Lord O’Neill’s Review on Antimicrobial Resistance, it is estimated that it attributes to around 700,000 deaths worldwide each year. Unless action is taken, this is projected to rise to 10 million lives each year by 2050.

Antibiotics are vital in the prevention of infection as well as its cure. Without them, surgery would again become life-threatening.

As bacteria evolve and become resistant to last-line therapies, the antibiotic arsenal available to health services diminishes. This makes Dr Mat Upton’s research into developing a new class of antibiotic – a first in class antimicrobial peptide for use in treating and preventing drug-resistant infections and the first new family of antibiotics to be discovered for 30 years – critical.

The new antibiotic is called epidermicin and Dr Upton’s early research is extremely positive, showing that a single dose is as effective as six doses of the standard of care – unprecedented in terms of activity. In effect this means his team are finding completely new antimicrobial compounds which they need to develop as new and innovative therapeutics.

Dr Mat Upton

“The next phase of development is preclinical testing, leading to Phase 1 clinical trials. Colocation with clinical colleagues at Derriford Research Facility will make the aim of the creation of a licensed drug within the next six years a real possibility.”

Dr Mat Upton
Sepsis affects over 26 million people worldwide each year and is the largest killer of children – more than 5 million each year. Sepsis is the final common pathway in the vast majority of deaths from infection worldwide.

Every year, 150,000 people in the UK develop sepsis and 44,000 of those die, whilst over 25,000 suffer life-changing disabilities, such as organ failure and amputated limbs. Sepsis is more common than heart attacks and kills more people than bowel, breast and prostate cancer combined and the incidence is rising 8% every year. Furthermore, it costs the NHS over £12 billion a year. Despite our understanding of the molecular and cellular mechanisms that give rise to sepsis is limited. To date, there have been over 300 clinical trials of potential therapies for sepsis without any improvements in mortality. Inflammation, a key part of our immune defence against infection, becomes dysregulated in sepsis resulting in tissue damage, and can lead to a vicious cycle of persistent inflammation and immune suppression. Professor Simon Jackson and his team are researching how monocytes, key cells in our defence of infection, are activated by bacterial molecules, in particular, the role lipid metabolism plays in switching monocytes into different activation states to produce molecules that can initiate tissue damage and organ failure, the hallmarks of sepsis.

Understanding how macrophages respond to infection will allow us to characterise different phenotypes, physical characteristics, of the immune response that are associated with the development of sepsis and identify novel therapeutic targets. It will also allow us to identify biomarkers that could strictly patients for the most appropriate therapy. Interestingly, recent evidence suggests that altered macrophage activation may also play a role in many other diseases with an inflammatory component including dementias and cancer.
We are investigating complex questions and societal challenges in the areas of neurodegenerative disease, brain health, damage and disease.

Introducing some key areas within our research environment...

Professor Jeremy Hobart is a renowned expert in the design, testing and validation of clinical rating scales for measuring health outcomes, with particular focus on the diagnosis and management of multiple sclerosis patients.

Dr Shouqing Lou has been awarded funding by the MRC for his work on the role of autophagy and cell death in Huntington’s disease.

Dr Claudia Barros and her team are investigating the differences between the types of neural stem cell. An understanding of the mechanism of difference is important because it could lead to the future development of neural stem cell-based therapies to counter the neural loss observed in a variety of neurodegenerative disorders (such as dementias and Parkinson’s disease) and in brain injury.

Professor David Parkinson’s brain tumour research is particularly focused on control and repair in the peripheral nervous system.

Professor Simon Jackson is investigating novel associations between lipopolysaccharide-induced inflammation in the gut and Parkinson’s disease, and will be collaborating with researchers in clinical neurology based at Peninsula Clinical Trials Unit, led by Dr Camille Carroll.

Dr Edgar Kramer’s research investigates the development and maintenance of the nervous system, with a focus on premature death of dopaminergic neurons associated with Parkinson’s.

Focusing on brain injury following the loss of blood supply, and particularly how the brain cells are injured, Professor Bob Fern’s research is investigating the third biggest killer in Western society, Stroke, which currently doesn’t have any effective treatment.

‘As we live longer, neurodegenerative diseases are becoming a key impediment to healthy aging and lifespan. Our focus is to understand the underlying mechanisms of such diseases, finding new drug targets and new targeted therapies and then translating these new treatments into the clinic.’

Professor Simon Jackson, Lead, Biomedical Research, ITSMed
Around 8,000 people in the UK and 200,000 worldwide are currently living with this devastating hereditary brain disease. The disease is ultimately fatal, and symptoms affect the ability to walk, talk, think and reason until eventually they become reliant on other people for their care. Those born to a parent with Huntington’s disease have a 50:50 chance of developing it, and there is currently no cure.

Researchers at Plymouth, led by Dr Shouqing Luo, have received a grant of nearly £520,000 from the Medical Research Council, to analyse a protein called Bim, which causes cell death in various tissues including those of the brain. At present it is unclear how Bim levels and activity increase in Huntington’s disease. They have found that levels of Bim activity were increased in tissue samples from people who had died with Huntington’s disease, which led them to surmise that this could be linked to a brain cell death process in the disease.

Dr Luo’s team is looking at how Bim regulates two important cell functions: autophagy – recycling cell waste into energy, which is important to cell survival – and apoptosis, programmed or natural cell death. Research targeting both autophagy and cell death, and how to manipulate Bim levels are critical to providing a solution to develop an effective therapy for Huntington’s disease.

“Our world-class facilities at Derriford Research Facility will provide great opportunities for us to build a connection with clinicians and further enhance our strength with Huntington’s disease research”

Dr Shouqing Luo
“For us in clinical research, Derriford Research Facility allows us to work much more closely with colleagues investigating aspects of cell death in Parkinson’s and related conditions, which hopefully will lead to more exciting clinical studies for the benefit of our patients in the future.”

Dr Camille Carroll

127,000 people have Parkinson’s disease in the UK. Currently there is no cure for this progressive neurodegenerative disease.

Dr Camille Carroll, is National Institute for Health Research (NIHR) Clinical Research Network (CRN) National Specialty Lead for Neurodegeneration. She is a researcher in Clinical Neuroscience at the University of Plymouth and Honorary Consultant Neurologist at Derriford Hospital. Her work focuses on early Parkinson’s disease detection and clinical trials of neuroprotective interventions in Parkinson’s disease. As Chief Investigator, Camille is currently leading a multi-centre trial coordinated by the Peninsula Clinical Trials Unit called PGI SIM, investigating simvastatin as a potential protective treatment to prevent nerve cells from dying in Parkinson’s disease. This is an interventional trial comparing simvastatin with placebo, and is being carried out in 23 centres across England.

Camille also leads the award-winning Parkinson’s Neurology Service in Plymouth, as well as the Parkinson’s Excellence Network for the peninsulas of Devon and Cornwall, renowned for the extent to which people with Parkinson’s and their families are involved in developing the service and becoming involved in research. This approach is cyclical in that allows research questions to lead to service improvements which in turn generates more research, involving people with Parkinson’s and their families at every step of the process.

PARKINSON’S DISEASE
Dr Camille Carroll

127,000 people have Parkinson’s disease in the UK. Currently there is no cure for this progressive neurodegenerative disease.
Our clinician led medical research brings together researchers and clinicians from academia, medical research charities, NHS Trusts, industry and patients. Together they develop and evaluate novel treatments through clinical trials.

Aided by a strong collaborative, translational approach – taking the research to the patients and known as ‘bench-to-bedside’ – our research focuses on addressing unmet patient needs and complex challenges in clinical medicine in the areas of cancer, neuroscience and liver disease.

Our research is enabled by our close working relationship with neighbouring Derriford Hospital, one of Europe’s largest hospitals with an excellent track record for patient recruitment into clinical trials, and supported by the University’s Medical Statistics team and its UKCRC registered Peninsula Clinical Trials Unit (PenCTU).

The PenCTU is a leading academic clinical trials unit, with expertise in designing, developing, supporting and co-ordinating high quality, clinical trials that will directly influence clinical and healthcare practice. PenCTU currently receives National Institute for Health Research (NIHR) CTU support funding. This funding has been awarded to support the Unit in developing and supporting NIHR trials.

This research interface will now be further enhanced through biomedical research collaborations through Derriford Research Facility.

DIAGNOSTICS
Derriford Research Facility enables us to expand our systems biology technology, which facilitates significant future clinical research development. Systems biology has been responsible for some of the most important developments in the science of human health. Its approach, through is that the networks that form the whole of living organisms – genomics and proteomics – are more than the sum of their parts and can predict how these systems change over time and under varying conditions, and to develop solutions to the world’s most pressing health issues. The development of predictive models enables scientists to discover new biomarkers for disease, select patients based on unique genetic profiles, and target drugs and other treatments to greater effect.

Through our diagnostics cross-cutting research we bring together laboratory scientists, clinicians and technical, statistical, bioinformatics and database expertise. These include:

- Bioinformatics and systems biology led by Professor Matthias Futschik – molecular networks in human health and disease, systems biology of stem cells, gene regulation in cyanobacteria, development of databases and software tools.
- Medical statistics led by Siobhan Creanor – statistical support and analysis across a wide range of biomedical and clinical research areas, trials and services.
- Bioinformatics and statistics led by Xinzhong Li – analysis and interpretation of data generated by biomedical / clinical research studies with focus on Alzheimer’s disease, brain tumours and biomarker discovery.
- Blood diagnostics led by Tracey Madgett – focus on genotyping of transfusion blood supplies and Down’s syndrome biomarkers for non-invasive prenatal testing.

The manifestation of Huntington’s disease is highly complex and involves multiple cellular processes. This complexity has resulted in huge and diverse sets of data, which in turn pose considerable challenges to scientists in collating, analysing and cross-referencing varied data sources.

An international team of researchers, bioinformaticians and biostatisticians has developed the first freely available data network for scientists researching this debilitating and fatal condition. A unique feature of this new resource is that it links various cellular processes in a molecular network to provide a more holistic view of the disease.

Leading the project from the University of Plymouth is Professor Matthias Futschik, who believe that this approach might also be applied to other neurodegenerative disorders, such as Alzheimer’s and Parkinson’s disease, and potentially facilitate the development of new therapies for these diseases too. This is further enhanced through collocation with leading biomedical researchers at Derriford Research Facility.

“...the move into Derriford Research Facility without any doubt facilitates collaboration between different disciplines and with clinical research. In no case, it allows me to contribute to the research by providing expertise in advanced computational biology, and equally to the bio medic teams supporting experimental validation of the computational results.”

Professor Matthias Futschik

DATA NETWORK FOR NEURODEGENERATIVE RESEARCH

DIAGNOSTICS

CLINICAL TRIALS

Our clinician led medical research brings together researchers and clinicians from academia, medical research charities, NHS Trusts, industry and patients. Together they develop and evaluate novel treatments through clinical trials.

Aided by a strong collaborative, translational approach – taking the research to the patients and known as ‘bench-to-bedside’ – our research focuses on addressing unmet patient needs and complex challenges in clinical medicine in the areas of cancer, neuroscience and liver disease.

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COLLABORATING WITH BUSINESS

Working with industry is central to our approach to deliver research with real-world impact with patient, public and economic benefit.

From licensing of our IP and novel technologies, R&D collaborations and accessing our expertise through consultancy to contract research and use of our state-of-the-art facilities the Derriford Research Facility provides a range of opportunities to help grow your business, develop new products and services and achieve your innovation goals, in partnership with the University of Plymouth.

DEVELOPMENT OF NEW ANTIBIOTICS

Derriford Research Facility based scientists led by Dr Mat Upton and the Antibiotic Resistant Pathogens research group are working in partnership with Ingenza Ltd (Edinburgh) and the National Physical Laboratory (NPL, London) to develop a design and manufacturing platform for the production of a new family of antibiotics.

Funded by Innovate UK, the consortium will take a model bacteriocin, discovered by University staff, and enhance its performance in terms of range of action, stability and potency, prior to scaling-up manufacturing for commercial production and full clinical evaluation. This is envisaged as the first phase in the development of a pipeline of new antibiotic drugs to help address the global crisis caused by antibiotic resistance.

University Hospitals Plymouth NHS Trust is the largest hospital in the South West Peninsula, providing comprehensive secondary and tertiary healthcare.

The population it serves is characterised by its diversity – the rural and the urban, the wealthy and pockets of deprivation, and wide variance in health and life expectancy. Population ageing is a recognised national trend, but is exacerbated locally by the drift of younger people out of the area and older people in. The proportion of our population aged 85 or over is growing ahead of the national average by approximately 10 years, giving Plymouth the opportunity to innovate on behalf the nation in services for the elderly.

The University of Plymouth Faculty of Medicine and Dentistry has long had strong links with the hospital, at teaching, consultant and patient level. This is in addition to providing leading translational research in partnership, including the development of an alternative to chemotherapy for some leukaemia patients; research around hepatitis, liver disease and liver cancer.

“Derriford Research Facility is incredibly important to the partnership to take forward our research ambitions for our local population. Building on this complementary expertise, streamline the pathways between clinical services and research. With half a million people coming through the doors of the hospital every year, every person is also an opportunity to drive innovation and excellence in healthcare, science and research.”

Ann James, HonD Health CEO, University Hospitals Plymouth NHS Trust
Peninsula Medical Foundation is an independent charity fundraising for University of Plymouth Faculty of Medicine and Dentistry.

“We work with individuals, communities, businesses, trusts and foundations, all of whom share our vision to help improve the healthcare and quality of life for people across the region and beyond. Their generous support has enabled us to raise almost £4 million since 2002.

Our Patrons and Trustees all have strong connections with Devon and Cornwall. What unites them is a common belief in the high quality work of Plymouth’s Peninsula Medical and Dental Schools and their need for support so that they can continue to thrive and transform lives.

Together with our leading researchers, we believe that Derriford Research Facility has the potential to be a flourishing research and teaching environment for the brightest and the best in healthcare. As we have seen, these are the talented minds with the potential to develop therapies and cures for devastating conditions such as cancer, neurodegenerative diseases and infection. Their presence creates a culture of excellence, which in turn has a direct bearing on the quality of care delivered by local health services. But when it comes to retaining and attracting talented professionals we are up against the strongest competition. Although Plymouth is a ‘young’ medical school, and our teams are doing outstanding work with what they already have - we desperately need to continue to enrich and expand our infrastructure if they are to thrive.”

Denis Wilkins FRCS
Chair, Peninsula Medical Foundation

RESEARCH GRANT FUNDING AWARDS, INCLUDE…

Dr Mat Upton, Innovate UK, £535,000, Design and development of new antibiotics
Dr Xiaohui Li, EU Horizon 2020, £497,121, Gene Therapy: training a new generation of genetic engineers and innovative early-stage researchers in the area of genetic tumour treatment
Dr Bing Hu, Biotechnology & Biological Sciences Research Council (BBSRC), £546,705, Role of Forchii gene as a central regulator of epidermal planar cell polarity signaling expression and function
Dr Claudia Barros, BBSRC, £481,000, Decoding the molecular identity of neural stem cells
Dr Michael Jarvis, Innovate UK, £408,589, Multivalent Attenuated Vaccine against Viral and Bacterial Zoonoses in Ruminants
Dr Kim Tieu, Medical Research Council (MRC), £437,163, Manipulating mitochondrial dynamics as a therapeutic strategy for Parkinson’s disease
Dr Camille Carroll, Cure Parkinson Trust / The J P Moulton Charitable Foundation, £557,856, Simvastatin as a neuroprotective treatment for Parkinson’s disease
Prof Simon Rule, Cancer Research UK, £443,564, Moving up a dimension: 3D in vitro models as effective alternatives to live fish studies

Denis Wilkins FRCS
Chair, Peninsula Medical Foundation

Rebecca Furse, Business Development Manager, Peninsula Medical Foundation

Dr Simon Jackson, BBSRC, £443,564, Moving up a dimension: 3D in vitro models as effective alternatives to live fish studies

Dr David Parkinson, MRC, £334,694, Interaction between Sox-10 and the tumour suppressor Merlin in tumours of the nervous system

Prof. Simon Jackson, MRC, £319,301, Decoding the molecular identity of neural stem cells

Dr Michael Jarvis, Innovate UK, £319,301, Multivalent Attenuated Vaccine against Viral and Bacterial Zoonoses in Ruminants

Dr Prof. Simon Rule, Cancer Research UK, £308,900, Role of Forchii gene as a central regulator of epidermal planar cell polarity signaling expression and function

Prof. Simon Jackson, Natural Environment Research Council (NERC), £278,471, Detection and characterisation of inflammatory agents associated with bioaerosol emitted from livestock and intensive agriculture

Prof. Dr Shouqing Luo, MRC, £503,000, Targeting Bim as a dual regulator of autophagy and apoptosis to tackle Huntington’s disease

Dr Shouqing Luo, MRC, £497,121, Targeting Bim as a dual regulator of autophagy and apoptosis to tackle Huntington’s disease

Prof. Simon Jackson, MRC, £413,100, Interaction between Sox-10 and the tumour suppressor Merlin in tumours of the nervous system

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HEADLINES

€3.7 MILLION project for the next generation of brain tumour researchers

NATIONAL neurodegeneration role for Plymouth academic and clinician

Innovate UK funds NEW kind of vaccine to target deadly pathogens emerging from animals

Consortium receives funding to DISCOVER, DEVELOP AND MANUFACTURE new antibiotics

NEW RESEARCH offers hope to neuro-tumour patients

NEW data network for Huntington’s disease research

University spin-out company addresses NEW VACCINES

South West cardiac study chosen as NIHR 10th anniversary SHOWCASE project

NEW research may pave the way for peripheral nerve damage repair

Medical Research Council funds development of NEW STRATEGIES to treat and prevent Hepatitis C virus infection