



## Innovation Grants results

What happens to all those Innovation Grants we award? We asked a couple of our recent grant recipients to let us have a layman's summary of the results of their research.



**Dr Yihua Wang** of the Faculty of Natural and Environmental Sciences, received a grant in 2017 for a study entitled "*Epithelial-mesenchymal transition (EMT) induced by RAS activation in alveolar Type II cells leads to idiopathic pulmonary fibrosis (IPF) or lung cancer invasion?*"

Idiopathic pulmonary fibrosis (IPF) is a life-threatening condition of the lungs where tissue becomes thickened, stiff, and scarred, limiting the amount of oxygen getting into the blood. As a result, IPF patients get breathlessness from everyday activities like walking. IPF affects approximately 6k people every year in the UK. Most patients die within 2-4 years after diagnosis. As approved therapies for IPF only slow disease progression there is significant unmet medical need.

An important role in the development of IPF is played by connective tissue cells called fibroblasts. These cells provide structure to the air sacs (alveoli) in the lungs. During development of IPF, characteristic changes to these fibroblasts are observed: the modified cells (known as myofibroblasts) contain increased amounts of contractile proteins, like those involved in muscle cell function, laying down scar tissue. It is believed that IPF occurs as a consequence of damage to the cells that line the air sacs in these lungs, called alveolar epithelial cells. Normally, when we suffer an injury, the body quickly starts a healing response that is switched off once the wound has been repaired. This requires precise communication between fibroblasts and alveolar epithelial cells if the air sacs in the lungs were damaged. In IPF, due to the abnormal communications or repetitive injuries, the healing process continues to occur resulting in the build-up of stiff scar tissue that affects the ability of the lungs to function properly.

We recently identified several factors being responsible for communication between lung epithelial cells and fibroblasts. The outputs of this project will inform further research, enhance our understanding of IPF, and the long-term aim is to provide effective targeted therapies for sufferers to reduce symptoms of this devastating disease and improve their quality of life as well as to identify biomarkers for IPF patients.

**Dr Matthew Blunt** of the Faculty of Medicine received a grant in 2016 for a study entitled "*Overcoming IL-4 mediated drug resistance in Chronic Lymphocytic Leukaemia*"



Chronic lymphocytic leukaemia (CLL) is currently incurable, with resistance already developing in a proportion of patients treated with the newest therapies called ibrutinib and idelalisib. We have recently identified a resistance mechanism in CLL to these drugs which is caused by the protein IL-4. Working with Dr Andrew Steele at the University of Southampton, our research has shown that inhibiting IL-4 with a novel drug called cerdulatinib can overcome this IL-4 mediated resistance mechanism and can kill CLL cells in the presence of signals found in the lymph nodes of patients. The lymph nodes being a site which is known to promote drug resistance in CLL patients. Cerdulatinib was found to induce expression of proteins which are associated with cell death, even in the presence of signals which usually promote drug resistance. We also showed that when cerdulatinib is combined with a recently approved drug called venetoclax it induced greater CLL cell death than either drug alone. Cerdulatinib was also able to induce more leukemic cell death than either of the approved drugs idelalisib and ibrutinib. In addition, our research has given further insight into how IL-4 promotes CLL cell activation and survival and this research may lead to improved therapies in the future for patients.

I am extremely grateful to Wessex Medical Research for this funding. Not only has it funded valuable research but it has also supported my own development as an early career researcher. I have subsequently been successful in obtaining fellowship funding which will allow me to continue researching novel therapies for people suffering from cancer.

## New Forest Show 2019



**D**espite the blustery conditions on the first day, all our researchers had a great time engaging with the public at this year's New Forest Show.



## Do you recognise him?

**M**any of you will have seen this advertisement in the national press and on television but how many of you recognized “our very own” Dr Edd James (he’s the one on the right!)? Edd, who leads a team in the new Centre for Cancer Immunology at Southampton, has been a strong supporter of Wessex Medical Research over many years. He has also received grants from us for a PhD studentship (as supervisor) in 2011 investigating ankylosing spondylitis and, together with Dr Laura Bourne, for an investigation into Cervical Cancer in 2014. This is in addition to a number of other grants where his name has appeared in a supporting role. Very much a rising star, we are very pleased to see Edd being given due recognition by Cancer Research UK.



Pledge right now to leave a gift in your Will to Cancer Research UK and together we will beat cancer for future generations  
To find out more, please visit [cruk.org/pledge](http://cruk.org/pledge)



Cancer Research UK is a registered charity in England and Wales (1090464), Scotland (SC045986) and the Isle of Man (1203). © Cancer Research UK 2019





## Innovation Grants 2019

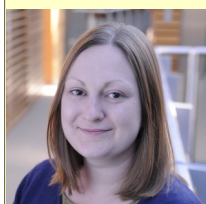
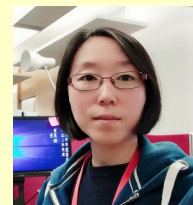
Once again, the Trustees have this year awarded five Innovation Grants, each of up to £20,000, to the following:

### Dr Shi-qi An

Faculty of Environmental  
& Life Sciences

“A high-content screen for novel small molecules that inhibit antibiotic-resistant bacterial infection.”

*The project aims to identify new chemicals that are effective on antibiotic-resistant bacteria by targeting mechanisms that are important for causing disease and survival in humans.*



### Dr Jenny Lord

Faculty of Medicine

“RNA sequencing in blood as a diagnostic tool for neurodevelopmental disorders.”

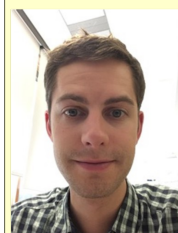
*This project will help diagnose children with rare diseases by sequencing the RNA “message” from genes to find errors in the way these messages are edited (spliced).*

### Dr David W. Cleary

Faculty of Medicine

“Transcriptomics of host - microbiota interactions using direct dual-RNA-sequencing.”

*Understanding how micro-organisms interact with us will enable the development of new strategies to combat infectious disease. Using novel RNA sequencing approaches, we will determine which genes are used more / less when a bacterial pathogen colonises the surface of the cells that line our airways.*



### Dr Simon Lane

Faculty of  
Engineering and  
Physical Sciences

“Surface Enhanced Raman Spectroscopy for non - invasive real-time monitoring of embryonic metabolic rate in assisted reproduction.”

*The project will use near-infrared light to probe the environment surrounding embryos in culture, allowing assessment of each embryo's activity. We hope that in the near future this information will improve IVF success rates.*

### Dr Sheah Lin Lee

Faculty of Medicine

“Establishment of a colorectal cancer organoid/peripheral blood mononuclear cell co-culture system to investigate T cell responses in colorectal cancer.”

*We aim to develop a research model which is bespoke to individual patients with bowel cancer. This model can help us identify who will respond favourably to immunotherapy and develop new methods to treat bowel cancer.*



### In Memoriam

Since our last newsletter, we have received donations in memory of our long time supporter

### Marion Hall

We extend our sympathy to her family and friends for their loss and our gratitude for the donations received.



In early October Hope for Guernsey played host to Professor Paul Townsend and his PhD student Jade Talbot who each gave excellent presentations on the work they are currently involved in at Manchester developing yet more sophisticated biomarkers for the early detection of cancers, especially of the breast, prostate, ovaries and lungs. Paul generously reminded the audience that his research had originally started with an Innovation Grant from Wessex Medical

Research in 2004 and had progressed both at Southampton (where much of the funding, through WMR, was by monies raised or granted on Guernsey) and now at Manchester where he controls a multi-million pound research budget.

For some time now, we have been promoting the idea of recycling used mobile phones and printer cartridges for the benefit of WMR. This is an ongoing appeal so please dig around and see what you can find.

You can send them direct to recycle4charity (go to their website at [www.recycle4charity.co.uk](http://www.recycle4charity.co.uk) for freepost instructions) but remember to tell them it's for the benefit of Wessex Medical Research and give our reference number (C16805).



*We are proud to be a member of the Association of Medical Research Charities and our last regular Peer Review Audit took place in 2015.*



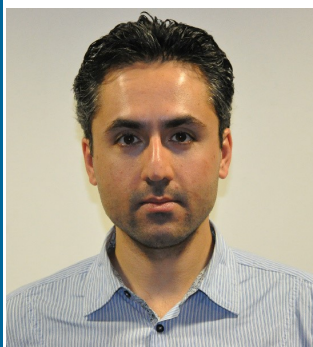
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## PhD Studentships

**W**e are pleased to report that, once again, in the Spring of 2019 we were able to award three PhD studentships. In accordance with current best practice, each award was for up to £100,000 and spread over three or four years, depending on the experience of the student at inception. The supervisors have now recruited their students and these each began their studies in October 2019. The supervisors and their selected projects (which have each been formally peer reviewed in accordance with the requirements of the AMRC) are as follows:



**“The role of FcγRIIb in alpha-synuclein toxicity and propagation through the brain in Parkinson’s Disease.”**

*People living with Parkinson's disease have clumps of a protein called alpha-synuclein in their brain. Neurons have receptors, such as FcγRIIb, that can bind to alpha-synuclein clumps, which help to spread the disease. We propose to test if we can block the spread of the neurotoxic clumps via FcγRIIb and whether an antibody therapy can prevent, or even halt, Parkinson's disease.*

**Principal supervisor: Dr Ali Roghanian**

*Assistant Professor in Cancer Immunotherapy & Immunology*

**“Toxicity of Particulate Emissions from Braking Systems – A Potential Role in Idiopathic Pulmonary Fibrosis.”**

*This project aims to better understand the chemical and physical characteristics of dust from car brakes, the effects that the dust might have on the lungs, and how different brakes and braking activities might alter these.*

**Principal supervisor: Dr Matt Loxham**

*Biomedical Research Centre Senior Fellow*



**“The tumour micro-environment as a determinant of antigen presentation and immune response in oesophageal cancer.”**

*To identify the consequences of genetic defects in antigen presentation machinery and rationalize the role of the tumour microenvironment in orchestrating immune responses. This will help fully evaluate the immune status of tumours and distinguish between patients.*

**Principal supervisor: Dr Matt Rose-Zerilli**

*Senior Research Fellow in Cancer Evolution*

Jointly funded with the Centre for Cancer Immunology

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