Sêr Cymru Life Sciences Research
Network Wales Newsletter: Issue 5,
May 2018

Welcome to the 5th newsletter of the Life
Sciences Research Network Wales.
As we are now in our final year of the programme,
many of our PhD Projects are entering their final
stages and postdoctoral projects have completed.
The Network will draw to an official close on 31st
March 2019.

We continue to make excellent strides against key
performance indicators and are extremely grateful
to award holders for their continued reporting of
outputs.
Last quarter figures recorded an accumulated total
of 108 papers published in peer-reviewed journals;
£33.7 million in additional research funding
secured through competitive grant awards; 34
registered patent applications and 1 New
Chemical Entity being prepared for clinical trial;
the number of collaborations forged by NRN
projects with academia, industry and third sector
parties has risen to over 33.

The final Annual Scientific Congress will take
place from 11th-12th September 2018 at the St
David’s Hotel, Cardiff and will showcase the
research progression of projects undertaken by
our third and fourth round PhD students, as well
as selected postdoctoral projects. We are
delighted to welcome Vaughan Gething AM,
Cabinet Secretary for Health and Social Services,
to Congress this year and the programme also includes presentations by high-level external speakers from academia and the NHS. Congress provides an excellent forum for our community to come together to develop new relationships and research collaborations. We look forward to seeing you all there.

The Network has been involved in a range of conferences and Endeavour workshops over the last quarter: the third Sêr Cymru Postgraduate Conference in March was hosted by the Low Carbon, Energy & Environment NRN in Bangor and provided PhD students from the 3 Networks an opportunity to explore career development with an external facilitator. The British Society for Parasitology was hosted by Aberystwyth University in April, including oral and poster presentations by NRN-funded PhD and platform technology award holders. We hosted a nucleosides and nucleotides research event in March and an event exploring intellectual property rights.

We hope that you enjoy reading and hearing about Network research and activities in this newsletter and we are grateful for any contributions.

Forthcoming events

16/05/18: Respiratory Research Network: Harnessing respiratory research and innovation in Wales, Cardiff School of Biosciences, Cardiff. More information and registration details can be found [here](#).

03/07/18: Welsh Antimicrobial resistance and infection event, coordinated by Professor E Mahenthiralingham, Cardiff University.

14/11/18: Natural Compound Research for Tissue Repair and Regeneration in Wales workshop, St Fagans, Cardiff. More information and registration details can be found [here](#).
Project Outputs in Focus

A selection of outputs arising from individual projects across Wales is provided below:

These and others can be found on the LSRNW website

Long Life Imaging Probes for Dementia Patient Stratification

Dr Mauro Monti; Dr Ian Fallis, School of Chemistry, Cardiff University (Postdoctoral Project)

The Unmet Need

The early and categorical diagnosis of Alzheimer’s disease (AD) is currently not possible. The disease pathology remains a matter of much research and debate and it is clear that amyloid peptides, and especially amyloid beta (Aβ), are implicated in any such process.

This project aimed to develop imaging agents for AD (amyloid beta) plaques that are associated with, and are possibly the causative agent in, Alzheimer’s Disease. The unmet clinical need is that work addresses the challenges of the early diagnosis of AD and distinguishing AD from other non-AD related dementia. The long-term aim is to provide clinicians a method of categorically stratifying dementia sufferers into AD and non-AD patients.

Research Progression

The project succeeded in developing a new radiosynthesis of 48V for which IP protection is being sought. With its half-life of 15.9 days, 48V is ideal for the diagnosis of conditions where its imaging “window” of up to two months allows the accumulation of tiny amounts of tracer facilitated by a targeting moiety. It is thus anticipated that in the future, conditions such as Alzheimer’s Disease may be assessed by a non-invasive scan. The work is also facilitating a range of other projects, such as exploiting 48V in tracking stem cells as therapeutic agents and the fate of cancer stem cells in tumour generation.

Research Impact

The funding was:
- Has generated a patent submission.
- Has generated £29,552 from the Wellcome Trust and a CRUK application of £369.
- Has resulted in a publication in ‘Coordination Chemistry Reviews’.
- Has facilitated a range of further projects.

Added Value

Dr Mauro Monti at the NRN Drug Discovery Congress 2017

“The use of long lived tracers in medical imaging and drug discovery is a poorly developed area. We hope that facile access to isotopes such as 48V will permit the real-time imaging of chronic conditions.”

Pharmaceutical evaluation of novel tiglanes as modulators of dermal fibroblast-myofibroblast differentiation, scar formation and fibrosis; and elucidation of their underlying mechanisms of action

Jordanna Dally (PhD student); Dr Ryan Moseley, School of Dentistry, Cardiff University (PhD Studentship)

The Unmet Need

Chronic wounds and excessive scar tissue in skin are major causes of disease, resulting in significant pain and debilitating shortening of muscceans or joints, which can dramatically affect patients’ physical and psychological quality of life. Existing therapies are largely unsatisfactory in treating these conditions. Anti-cancer properties in seeds from Fontan’s Buckingham trees in the Queensland Tropical Rainforest were previously identified by an Australian company who provided match studentship funding to a team at the Cardiff School of Dentistry to evaluate anti-scarring properties and the underlying mechanisms of action of the compounds.

Research Progression

Match funding via an NRN Studentship has allowed the team to confirm the underlying mechanisms of action of the compounds in the seeds to clarify how they have anti-scarring properties. This work has resulted in the filing of 6 patents and an additional 2 years postdoctoral funding at the School of Dentistry provided by the Australian commercial partner.

Research Impact

The NRN funding has:
- Resulted in the filing of 6 patents with the PI as inventor.
- Secured an additional £251,706 postdoctoral research funding to develop therapies against abnormal wound healing and excessive skin scarbing.

Added Value

L-R: Dr Ikob Steadman; Jordanna Dally; Dr Ryan Moseley

“NRN studentship funding has helped me become a more well-rounded researcher. Through various NRN workshops, I have learnt a lot about early career progression & the importance of exploring future career opportunities now. Furthermore, the NRN’s PhD & Drug Discovery conferences have allowed me to network with other early-stage researchers, fostering the potential for future interdisciplinary collaborations. Post-NRD, I hope to stay in academia as a post-doctoral researcher. Ideally, in my current research field & in continued collaboration with my Australian funder, ORHCT. Thanks to the NRN for match-funding my studentship - which has been the toughest, but most rewarding, experience of my academic life so far.”

Contact: Dr Ryan Moseley: Moseley@cardiff.ac.uk
**Tackling Gynaecological Cancers: A precision medicine approach at Swansea University**

**ADC targets from in-silico high-throughput screening** identification into target validation; Dr Jetabel Garcia Parra; Prof Steve Conlan & Dr Deyarna Gonzalez, Medical School, Swansea University, (Postdoctoral Impact Project) Antibody-drug conjugates for gynaecological cancers; Belen Pan Castillo (PhD Studentship)

**The Unmet Need**
Antibody-drug conjugates (ADCs) are a new paradigm for novel targeted cancer therapy in precision medicine. Despite the challenges in their design, successful initial development of ADCs is dependent on the careful selection of appropriate cell surface antigens.

At present, there are no ADCs approved for the treatment of ovarian cancer. Ovarian cancer is frequently asymptomatic in early stages and resistant to chemotherapy. Most women diagnosed with ovarian cancer are in the advanced stage (stage III or IV) at which point the 5-year survival rate is around 25% and 40%. This is one of the reasons why ovarian cancer is the gynaecological cancer with one of the highest mortality rates worldwide. There is therefore an urgent need for the development of targeted therapeutic approaches.

**Research Progression**
The NRN Impact project was based on 2 previous NRN projects, a PhD Studentship which established screening technology and expertise for ADC development, and a postdoctoral project which developed a genome-wide in-silico approach to identify potential targets suited for ADC therapy. The main aim of the Impact project was to screen and validate novel targets for ovarian cancer ADC therapy to bring them into the first stages of ADC development.

**Research Impact**
NRN funding has generated:
- The identification and validation of new molecules suitable to be targeted with ADC technology in ovarian cancer and also in other female cancers.
- Potential patent applications, including the in-silico approach of target discovery and the new ADC targets.
- The development of an Advanced Therapeutics Development Programme at Swansea University.
- Additional research funding: SmartExpertise collaborative projects (€1.3m), Life Sciences Innovative Funding (LBH), Agar IP (€50k).
- New collaborations: with industrial partners (Aqua Bioservices, ADC Biotechnologies Ltd, Abzena, GE Biocore, resulting in more than €1.3m.
- Strong commercial/academic interest.

**Added Value**
Belen Pan Castillo

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**Targeting natural products to counter the challenge of MRSA**

David Faizakerley (PhD student); Professor Luis Mur, Aberystwyth University (NRN PhD Studentship)

**The Unmet Need**
Methicillin-resistant Staphylococcus aureus (MRSA) represents a major UK public health issue, resulting in around 3000 deaths every year due to antibiotic resistance and the formation of bacterial biofilms. This NRN PhD studentship sought to identify new antimicrobials from natural plant products effective both against MRSA and in blocking sensing mechanisms to suppress biofilm expression. The project combined the expertise of the Aberystwyth Natural Product group in using high-throughput screening to identify bioactive chemicals from Welsh invasive weeds and seaweeds and collaboration with the SMI Phytoventure, to ensure the delivery of cutting-edge science and valuable IP and process developments.

**Research Progression**
The project screened and isolated bioactive compounds from Himalayan Balsam and Japanese Knotweed for their antimicrobial properties. PhD research has led to the identification of a compound which demonstrates potent activity against MRSA and a wide range of bacterial species. Further mode of action studies are currently underway to understand the precise pathways of the compound. The data generated is being prepared for publication and discussions are ongoing to protect the valuable intellectual property of the work.

**Research Impact**
NRN funding:
- Contributed to the identification of a lead compound with potent antimicrobial properties.
- Has provided free access to NRN-funded platform technologies to elucidate mode of action of Roboworm and the Welsh Computer-aided Drug Discovery Platform.
- Has led to the generation of valuable intellectual property.
- Led to the submission of a publication.

**Added Value**
David Faizakerley presenting at the NRN Drug Discovery Congress 2017

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Contact: Dr Deyarna Gonzalez | d.gonzalez@swansea.ac.uk

[Links and contact information]
Previous Events
3rd Sêr Cymru Postgraduate Conference, 27th March 2018, Pontio Arts Centre, Bangor

The third Sêr Cymru Postgraduate Conference attracted 35 PhD students from the three Sêr Cymru National Research Networks to PONTIO Arts Centre in Bangor on 27 March. The day started with insightful and thought-provoking presentations by Adrian Hines, Head of Applied Science at the UK Met Office and Jenny Ames, Director of Jenny Ames Consulting Ltd. Both presenters shared their personal career journeys and the presentations provided practical tips on how to apply scientific skills to research careers within and outside academia, as well as other possible career pathways post-PhD. Following these inspirational talks, the day continued with an interactive workshop to initiate ideas to help the students decide what follows the PhD. Professional coaches challenged the students to identify the key rules and constraints they experience when identifying their career goals; what opportunities and skills they can develop to overcome these; and what actions they can take to proceed towards their goals. Different techniques grounded in research were used to help them identify each of these steps. Feedback on the day was positive and it was clear that dedicated training to focus on their career pathways was of great benefit to the attendees.
British Society for Parasitology Spring meeting, 8-11th April 2018, Aberystwyth
World leading parasitologists congregated in Aberystwyth for the Annual British Society of Parasitology Conference which took place from 8 –11 April 2018. Hosted by Aberystwyth University, the meeting included Ecological Parasitology, Veterinary Parasitology and a Tryp/Leish Symposium. The IBERS Parasitology team were heavily involved in the organisation of this year’s meeting with NRN funded PhD students and postdocs delivering oral and poster presentations.

The IBERS Parasitology Team on Aberystwyth University’s Penglais Campus (above).
Below: Alessandra Crusco, David Cutress, Helen Whiteland and Kezia Whatley presenting their posters at the event.
Antimicrobial Evaluation Service: Opportunity for free testing of compounds for Welsh researchers

Novel Antimicrobial Evaluation Service, Public Health Wales

The Life Sciences Research Network has provided funds to PHW to enable Welsh researchers to utilise the evaluation service free of charge. The data supplied could be used to secure further research funding and collaborations, thus aligning with key Network objectives.

The lack of antimicrobial compounds for clinical use is a global problem, putting in jeopardy future health and infection control - compounds which have potential antimicrobial activity are therefore being sought from all areas of academic research.

Further development of such compounds requires thorough testing using accurate and high-quality susceptibility tests and SACU offer a bespoke testing service, working with the researcher to best analyse the antimicrobial activity of any compound.

For further information, please contact Dr Mandy Wootton direct at Public Health Wales: mandy.wootton@wales.nhs.uk
Funding opportunities

Life Sciences Research Network Wales Translational Support Fund
The Network has time-limited funding to enhance the translational profile of existing drug discovery projects. The Fund will be open to applicants from all Welsh Universities whose existing projects fall within the remit of the NRN’s therapeutic areas of drug discovery, although priority will be given to previously funded NRN projects.
Funds of up to £5,000 will be awarded, to be utilised within a 3-month period from 30/06/18 to 30/09/18. A further round may be announced in the summer, depending on available funds. Please click here for further details and guidance, noting the closing date of 01/06/18.

Ongoing Open Call for Endeavour awards
Please note the call for Endeavour funding remains open until 31/08/18. The application form and guidance notes can be found here.

We support World Class Science within Wales and develop new therapeutic treatments in areas of unmet medical and veterinary need. The Network is led by Cardiff University and brings together research expertise in the Life Sciences from across Wales.

The Network forms part of the Welsh Government’s Sêr Cymru program and is part funded by a £7.3M award, 70% Welsh Government and 30% HEFCW. Sêr Cymru aims to build upon and enhance research in Wales, in line with the objectives of Science for Wales, the Welsh Government’s strategic agenda for science and innovation in Wales.

The Life Sciences Research Network provides a range of funding opportunities aimed at supporting academics across Wales to identify new collaborators, develop research ideas and build long-term research capacity.

Our funding is distributed across HEI’s in Wales and we work in direct partnership with Aberystwyth, Bangor and Swansea Universities, each having academic representation on our elite Management Board. When we fund research, we encourage collaboration with Industry, Charities, the NHS and other International Universities.

We welcome feedback on our newsletters and ideas for items to include in the next issue