Sheffield Hallam University | Biomolecular Sciences Research Centre

BMRC Newsletter 2018

ROYAL SOCIETY OF CHEMISTRY

IBMS Institute of Biomedical Science

Royal Society of Biology

SILVER Athena SWAN

Front cover: supplied by PhD student Cristina Russo. This was 'Proteomics' journal cover photo for issue 14/2018. Mass spectrometry imaging of a living skin equivalent model showing marker ions of the stratum corneum and epidermis.

Mass spectrometry imaging (MSI) is a relatively new and powerful technique able to study intact tissue sections providing ion distribution maps of many non-labelled species simultaneously. Here the methodology used was to exploit signals from endogenous species to define the epidermis (in red; $[M+H]^+$; *m/z* 184) and stratum corneum (in green; $[M+H]^+$; *m/z* 264) of Labskin, a living skin equivalent model.

ANNUAL NEWSLETTER

2018

Welcome to the Biomolecular Sciences Research Centre (BMRC) Annual Newsletter

I am very pleased to introduce the BMRC annual newsletter, which details many of the successes that our staff and students have achieved during the last academic year. The report provides a showcase of some of our activities and achievements. In BMRC we have a very active PhD student community who contribute to our vibrant research environment. You will find in the report details of PhD degrees awarded this year and also the many external travel grants awarded, conference presentations given and prizes that our students have been awarded. It certainly has been a successful year for the research students and I am sure the coming year will bring more success. Staff within BMRC and the Department of Biosciences and Chemistry have also been successful this year in obtaining external funding for their research, giving invited talks at national and international conferences and publishing their research in peer reviewed journals; many of these publications are co-authored by PhD students. Our research community is enhanced during the year through visiting scientists and Erasmus students as well as summer project students coming in to work in our laboratories.

In addition to these research activities, staff and students have engaged in outreach and public engagement events to stimulate interest in biosciences and chemistry by young and old alike!

I would like to thank all the staff and research students for their hard work and commitment to research in the last academic year, this really contributes to the vibrant research environment in BMRC and the Department of Biosciences and Chemistry.

I hope you enjoy reading the report and seeing all we have achieved in the year!

Nicola Woodroofe
Head of BMRC

Recent doctoral completions

Callie Seaman completed her part-time PhD entitled *'Novel single component hydroponic nutrient solutions'*. Callie was supervised by Prof Neil Bricklebank and Dr Philip Gardiner. Her PhD was sponsored by an EPSRC Industrial Case Award.

Hasan Aldewachi's PhD entitled *'Chromogenic detection of dipeptidyl peptidase IV in biological samples'* was supervised by Dr Philip Gardiner and Prof Nicola Woodroofe. Hasan was funded by the Embassy of the Republic of Iraq.

Mootaz Salman's PhD *'The mechanisms of aquaporin expression and translocation in cerebral pathologies'* was supervised by Prof Nicola Woodroofe, Dr Matt Conner, Dr David Smith, Dr Alessandra Princivalle and Dr Susan Campbell. His PhD was funded by the Iraqi Embassy.

Jodi Brookes passed her viva and has been awarded a PhD for her project entitled *'Biological and chemical hazards in water-mix metal working fluids and mists'*. She was supervised by Prof Malcolm Clench and Prof Tom Smith.

Abdurrahman Eswayah has passed his viva and was funded by the Libyan Embassy for his project entitled *'Bioremediation of soluble selenium compounds'*. His supervisors were Dr Philip Gardiner and Prof Tom Smith.

John Swales was based at Astra-Zeneca and completed a part-time PhD entitled *'Mass Spectrometry Methods for Profiling Xenobiotic Distribution in Biofluids and Whole Tissues'*. His supervisory team consisted of Prof Malcolm Clench and Dr Catherine Duckett.

Aimee Paskins completed her PhD called *'Aggregation and Conformation of Alpha-Synuclein: Effects of Ligand Binding and Phosphomimetics'*. Aimee was supervised by Dr David Smith, Dr Caroline Dalton and Dr Catherine Duckett.

Lisa Deininger successfully defended her thesis entitled *'Multi-informative and specific detection of blood via MALDI MS based strategies'*. The Director of Studies was Professor Simona Francese with supervisors Professor Malcolm Clench, and Professor Chris Sammon from MERI.

Francis Codjoe completed his full-time split PhD on 11th November 2016. *'Detection and Characterisation of Carbapenem-resistant Gram-negative Bacilli Infections in Ghana'* was supervised by Dr Keith Miller as Director of Studies and Professor Tom Smith, and Dr Eric Sampane-Donkor, Associate Professor of Medical Microbiology at University of Ghana.

Karl Norris successfully defended his PhD thesis on 23rd August and has passed his PhD subject to minor modifications. The title of his thesis is *'eIF2B bodies and their role in the control of protein synthesis'*, supervised by Director of Studies Susan Campbell and first supervisor Ben Abell.

Rasha Dosh passed her viva and has been awarded a PhD for her project on *'Developing models of the small intestine'*. Rasha was supervised by Director of Studies Prof Christine Le Maitre and supervisors Dr Nikki Jordan-Mahy and Prof Chris Sammon.

BMRC PhD graduate destinations

Karl Norris is working as a postdoctoral research assistant at Lancaster University's Engineering Department on a project entitled *Food2Bone: Novel food waste-derived composite biomaterials for bone tissue regeneration.*

Mootaz Salman has moved to the United States and is now working as a Postdoc at Harvard University.

Amal Arhoma is teaching at a university medical school in Libya.

Nikhil Lalwani was successful in securing a Doctorate Extension Scheme which will allow him to remain in the UK for another 12 months post completion.

Nicola Wright is working as a sales representative for SLS (Scientific Laboratory Supplies).

Ekta Patel started a position as MALDI Applications Specialist at Kratos Analytical Ltd. She works with new and existing customers to develop solutions to their MS imaging problems and runs training courses and seminars on the company's products.

Mariam Sheilabi is currently working as a translator for Arabic/English at Sheffield Teaching Hospitals.

Ben Sholademi is working at a private pathology laboratory in York and will shortly be submitting his application for equivalence as an NHS Clinical Scientist.

New faces and visitors to the BMRC

New staff

On 3rd January former PhD student **Dr Callie Seaman** took up a postdoctoral position for one year, 0.5 FTE, working with Prof Neil Bricklebank on '*Enhancing metal uptake in soya*'. She was funded by Innovate UK.

On 8th January, **Dr Bryony Cotterrell** joined the BMRC as a postdoctoral researcher for one year working with Dr Tim Nichol, Dr Mel Lacey and Prof Tom Smith on the MRC Confidence in Concept grant awarded earlier this year on a project *'Antimicrobial coatings for catheters and in-dwelling devices, using controlled release non-antibiotic antimicrobial agents'*.

From the 5th February we welcomed two **Erasmus students** from Lisbon, Portugal, who were here for four months: Cristiana Godinho Ferreira de Matos, supervised by Dr Rebecca Leyland and Dr Neil Cross and Maria Ana Santos Safara da Trindade Marcelino, supervised by Dr Nicola Aberdein and Dr Daniel Kelly.
During the autumn semester 2018/19, Luisa Maria Silva Brito and Madalena Isabel Ribeiro de Oliveira will be working with us on ERASMUS+ Traineeships. They will be with us between 14th September and 25th January 2019. Luisa will be supervised by Prof Christine Le Maitre and Madalena by Drs Laura Cole/Liz Allen.

Dr Petros Pousinis joined the BMRC on Monday, 11th June. Petros is working with Prof Nicola Woodroofe and Dr Laura Cole as a postdoctoral researcher on a project '*Lipidomics biomarkers*

for Multiple Sclerosis using Mass Spectrometry' funded for two years by the National Multiple Sclerosis Society (USA).

Joseph Snuggs has been successful in securing a postdoc position within the BMRC, working with Prof Christine Le Maitre on the MRC funded project *'Injectable hydrogel for the regeneration of the intervertebral disc: evaluation using an ex vivo loaded disc culture model'*.

Christine Rustenburg was working in the Biomolecular Sciences Research Centre from 30th July 2018 until 3rd August 2018. The purpose of this visit was to undertake experimental work under the supervision of Professor Christine Le Maitre on a project entitled *'Inducing Degeneration in a Goat IVD Model'*.

Lisa Holnsteiner, from IMC University of Applied Sciences Krems, Austria, is working with Dr Dan Kelly on a project entitled *'Investigating the anti-inflammatory effects of testosterone in atherosclerosis'*. This placement started on 13th August for 25 weeks until 1st February 2019.

New doctoral students

Paul Mardling, previous research assistant in the BMRC started his PhD on 3rd January. His PhD is entitled '*Bladder tissue engineering using auxetic materials'* is funded by a Vice Chancellor's scholarship and Pioneer Healthcare Ltd. Director of studies is Professor Christine Le Maitre with supervisors Professor Andy Alderson (MERI) and Dr Nikki Jordan-Mahy.

Another January 2018 start, **Oliver Slay**'s PhD is entitled *'Identification of variants contributing to schizophrenia using high-throughput genomics'*. His supervisory team consist of director of studies Dr Lucy Crooks and supervisor Dr Caroline Dalton. This PhD is funded by the BMRC.

Hatem Sallem's PhD, funded by the Libyan Embassy, is entitled *'Optimisation and validation of a human in vitro 3D living skin equivalent model for metabolism studies of topically applied xenobiotics'*. The director of studies on this full-time PhD is Prof Malcolm Clench with supervisors Dr Vikki Carolan and Dr Catherine Duckett. Hatem started in the BMRC in February 2018.

In October 2018, the following students will start their doctoral studies:

Amy Grayson - *'Analysis of nuclear lamina dynamics in blood cancer models'*
Amy completed a BSc BMS at SHU in 2016 with a 1st class, including a placement year in a research lab at the University of Sheffield and then did an MRes degree at Manchester Metropolitan University. Director of studies is Dr Tanya Klymenko with supervisor 1 Prof Malcolm Clench, supervisor 2 Dr Andrejs Braun, and supervisor 3 Dr Caroline Dalton.

Katie Hudson – *'Evaluating anti-cancer pathways in 2D and 3D cell culture systems'*
Katie completed a BSc BMS at SHU in 2018 with a 1st class, including a placement year in a research lab at the University of Sheffield. Director of studies is Dr Rebecca Leyland with supervisor 1 Dr Neil Cross and supervisor 2 Dr Nikki Jordan-Mahy.

Filipe Hanson – *'Investigating the role of the delta subunit of eIF2B during stress and disease'*
Filipe has just completed a master's degree at Sheffield Institute of Translational Neuroscience.

His director of studies is Dr Susan Campbell with supervisor 1 Dr Liz Allen and supervisor 2 Dr Alison Cross.

Alex Knowles – *'Cellular cross-talk during stress and periodontal infections'*
Alex completed an MSci (Biology) in the BMRC this year and was supervised by Dr Prachi Stafford for his research project. His director of studies is Dr Prachi Stafford with supervisor 1 Dr Susan Campbell and supervisor 2 Dr Neil Cross.

Jacob Earnshaw – *'Modelling liquid crystalline behaviour in confined and microphase separated environments'*
Jacob was awarded a 1st class degree in Chemistry from SHU this year. This is a VC Scholarship with MERI, Prof Doug Cleaver (MERI) as the director of studies and supervisor 1 Dr Alex Hamilton and supervisor 2 Dr Tim Spencer (MERI). The project is match funded by Merck Chemicals.

Liam Little – *'A Breathomic Approach to Diagnose Malignant Mesothelioma'*
Liam is currently completing an MSc in the Department of Biology and Chemistry and will join the BMRC in February as a VC Scholar with Dr Sarah Haywood-Small as director of studies, and Laura Cole as supervisor.

Joseph Ready – *'Development of LA-ICPMS and associated techniques for the analysis of crop enhancement products'*
Joseph's director of studies will be Prof Neil Bricklebank and his supervisors are Dr Catherine Duckett and Prof Malcolm Clench. This is a studentship funded by the Biotechnology and Biological Sciences Research Council and Croda.

We are still to appoint another studentship and we are also optimistic that we will have three international students starting in October, but this is dependent on visas being obtained.

The **Integrated Masters students** working in BMRC for the upcoming academic year are:

MSci: Simeon Hubbard, Drew Capper, Dylan Watson, Jake Hunter, Toby Masters, Hollie Shaw, Hannah Stokes, Tammy Alsop, Tagreed Altayyib, Paige Pattison.

MChem: Lucy Alexander, Greg Duly, Karmjit Grewal, Joshua Millar, Amy Morris, Laura Winter, Timothy Wootton, Jack Porter, Bethan Clarke, Beth Rushworth.

Conference round-up

Doctoral student Rasha Dosh attended the **First Iraqi Student Conference** which was held at the University of Sheffield on 29th September 2017. Rasha participated with a poster entitled *The use of pNIPAM-Laponite hydrogel in 3D cell culture model of intestine* which won her 3rd prize. Rasha is supervised by Dr Nikki Jordan-Mahy and Prof Christine Le Maitre.

PhD student Jeremy Hart attended the **Workshop for the EU Reference Labs for Dioxins in Food and Feed** in Freiburg, Germany, in Nov 2017, where he gave an oral presentation.

Alex Andrews, final year PhD student, won first prize for his poster at the **Northern Vascular Biology meeting** at Liverpool's John Moores University on 6th December. His poster title was

Porphyromonas gingivalis induces platelet aggregation and changes in calcium flux (A. M. Andrews, S. Haywood-Small, T.J. Smith, P. Stafford).

On 7-8th December doctoral students Emma Henly, Kirstie Rawson, and Sophie Hutchinson attended the **BSAC Antibiotic Resistance and Mechanisms Workshop** in Birmingham, where they all presented posters. All three PhD students had received travel grants of £150/each. Kirsty Rawson was awarded first prize for her poster entitled *Modification of antimicrobial peptides derived from* Scorpio maurus palmatus *venom*. Kirsty is supervised by Dr Keith Miller and Prof Peter Strong.

Rob Tempest (PhD student) and Dr Nick Peake attended the **UK Extracellular Vesicle Forum** in Birmingham on 12th December 2017. The UK EV forum in 2018 will be held in Sheffield, and the formation of a UK EV Society was announced at the forum, which Nick will be involved with. Nick also presented his work at the International Society for Extracellular Vesicles in Barcelona in May.

Postdoctoral researcher Dr Abbey Thorpe won Best Oral Presentation at the **RSC Biomaterials Special Interest Group Annual Meeting**, which took place on 10-11th January 2018 in Bradford. Her talk was entitled *Mesenchymal Stem Cell delivery within a Thermally Triggered Hydrogel Regenerates Nucleus Pulposus Matrix Following Injection into Degenerate Nucleus Pulposus Tissue*.

On 31st January, Dr David Smith spoke at the **Higher Education Academy STEM conference** in Newcastle about object-based learning in the class room to engage and enthuse. The talk covered the use of objects within the classroom and workshop sessions as an invaluable way of increasing participation and generating conversation.

Again in Birmingham was the **Microbiology Society's Annual Conference,** taking place on 10-13th April, which was attended by PhD students Emma Henly, Sophie Hutchinson, Salaheldeen Enbaia and Hania Aween. They all received a grant of £233/each towards travel and accommodation from the Microbiology Society. Emma gave a talk and the other PhD students all presented posters.

Dr Alessandra Princivalle presented her work as invited speaker at the **International G2018 GABAB Receptor Conference** in May 2018 which was held in Cagliari, Sardinia, Italy.

Dr Alessandra Princivalle gave an oral presentation at the **International League Against Epilepsy**, British Chapter on 4-6th October. The ILAE is the premier professional association of doctors and other health professionals who are working in the field of epilepsy. The organisation comprises national chapters in over 100 countries in all continents of the world. Alessandra's talk was on 'Temporal Lobe Epilepsy discussing genetics and GABAb receptor 1'.

PhD student Jeremy Hart gave an oral presentation entitled *Background and Development of the Congener Profiling Program* at the **EU Workshop for Halogenated POPs in Feed and Food**, in Dublin, Ireland, May 2018.

On 7-11th June PhD students Kirstie Rawson, Emma Henly, and Sophie Hutchinson attended **ASM Microbe 2018** (American Society for Microbiology) in Atlanta, USA, together with Senior Lecturer Dr Keith Miller. All PhD students presented posters. Sophie Hutchinson and Kirstie Rawson received a travel grant over $750 from the **American Society for Microbiology (ASM)**

to attend. ASM Microbe 2018 provides a one-of-a-kind forum to explore the complete spectrum of microbiology from basic science to translation and application.
PhD student Emma Henly received a £1200 President's Fund Grant from the **Society for Applied Microbiology** to attend the same conference. This is what Emma Henly thought about the event:

> *I received the president's fund grant to present a poster at The American Society for Microbiology's annual conference - ASM Microbe 2018. This was a very exciting opportunity for me as I had never attended an international conference before and being able to present my work to the 12,000 attendees was very exciting. I am currently in the second year of my PhD so I thought this would be a good time to get my work out there and make a name for myself. I still have time in my project to include new ideas and collaborations but still have enough to present at a conference. The people I met whilst at the conference were very interested in my work and I was asked lots of questions. I'm glad I was able to answer them all! I feel that presenting my work to experts in the field has given me confidence in my project and I have come away with new ideas on how to develop my project further.*

In June, a group of PhD students with Prof Malcolm Clench attended the **ASMS Conference** in San Diego, USA. PhD students included Cristina Russo, Lucy Flint, who both presented a poster, and Jeremy Hart who gave an oral presentation *Ion Mobility Mass Spectrometry of All Mono to Deca-Chlorinated Biphenyl Isomers.*

Dr David Smith presented his work on *Who goes where? The importance of peer groups and social interactions in the lecture space* at both the **Biochemical Society Educational Symposium and Horizon STEM** at the University of Hull. The research looked at the reasons students chose to sit in a given location in the lecture theatre and the subsequent effect on attainment. This work has recently been accepted for publication in FEBS Open Bio and can be access online here: https://newsroom.wiley.com/press-release/febs-open-bio/does-it-matter-where-students-sit-lecture-halls.

Our chemistry research group have been attending **MERCIA** (Middle England Regional Chemistry Interactive Alliance) meetings at Keele and Huddersfield University and presenting their current research. MERCIA is an independent alliance of chemists from selected universities in the historic Mercia region, including Nottingham Trent University, Sheffield Hallam University, University of Hull, Liverpool John Moores University, Manchester Metropolitan University, Keele University, and University of Wolverhampton. PhD students Paula Chirila, Phil Lane, and Jack Slater and staff Prof Neil Bricklebank, Drs Danny Allwood, Alex Hamilton, Simon Turega and Chris Whiteoak attended.

Dr Nicola Aberdein and Dr Rebecca Leyland presented a pedagogical poster presentation called Providing Productive Feedback to HE students at the **SHU Annual Learning and Teaching Conference** in July 2018.

PhD students Guma Beleid, Paul Mardling and Postdoc Simon Partridge attended T**he Tissue and Cell Engineering Society Conference 2018** hosted at Keele University at the beginning of July. All presented posters and Simon won 1st prize with his poster titled *'Development of Injectable Thermoresponsive Clay-Polymer Nanocomposite Formulations'.*

Drs Sarah Haywood-Small, Laura Cole and PhD student Oana Voloaca attended the **Action Mesothelioma Day** (AMD2018) on 6th July in Leeds. This is an annual nationwide event to remember and bring together the people affected by this disease in the UK. The event is organised by the June Hancock Mesothelioma Research Fund, the same charity that partially funds Oana's PhD. It was a great opportunity for the patients and the relatives to meet

mesothelioma specialists, ask loads of questions, and learn about the current research as well as for the researchers to meet the patients, update them on current work and results, and see the impact this work has outside laboratories. This full day event brought together researchers, patients, relatives, specialist nurses, legal experts who deal with mesothelioma cases, June Hancock Mesothelioma Research Fund trustees and local support groups.

In July, Oana Voloaca and Paul Mardling (Cohort 3) attended three days of Doctoral Training Alliance (DTA) Summer School for "Applied Biosciences for Health" students. Sophie Hutchinson and Kirsty Rawson joined them for one day of the event as part of the Cohort 2 and 1, respectively. Professor Christine le Maitre and Dr Keith Miller also attended as part of the team of supervisors that shared their knowledge, expertise and skills in strategically-important research areas with the PhD students throughout the event. DTA Summer School is an annual event aiming to bring together PhD students, supervisors and other members of the professional community from over 14 universities across the UK. Hosted by University of Huddersfield, this year's event focused on "Making an Impact: research, writing and you". The sessions were designed to help students' professional development, improve academic writing skills, help them make an impact throughout the PhD and later in the scientific careers, and develop interpersonal skills such as team work, communication and networking. Apart from the professional session, the members of DTA community also had the chance to let their hair down at informal social activities such as BBQs, drinks reception and annual dinner.

First year doctoral student Paula Chirila won a poster prize at the **5th Royal Society of Chemistry Early Career Symposium**, which took place 30 - 31st August 2018 in Liverpool. Her poster was entitled *Towards a Sequential One-Pot Preparation of 1,2,3-Benzotriazin-4(3H)-ones Employing a Key Cp*Co(III)-catalyzed C-H Amidation Step.*

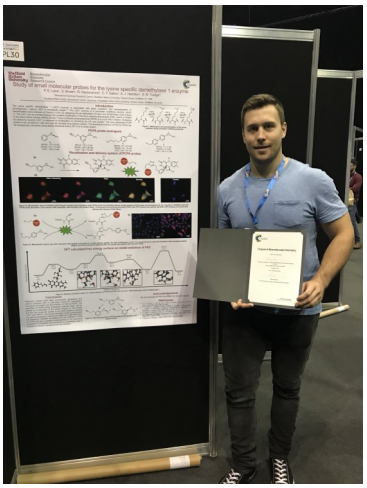
Cameron Heaton and Oana Voloaca, both first year PhD students, were accepted to present

posters at the **22nd International Mass Spectrometry Conference** (IMSC), 21-26th August in Florence, Italy and they were also awarded the **Nico Nibbering Travel Award** of €200/each. Well done to Cameron who was awarded the Analytical and Bioanalytical Chemistry Springer Publishing poster prize for 'Excellent presentation of particularly significant innovative analytical research'. Professor Simona Francese chaired a session on Forensic Mass Spectrometry, which was one of the most attended - conference attendees were around 1500. Simona also chaired a workshop where practitioners and academics actively participated entitled *'WKS-M2: Police Casework – successes and Challenges from an Academic Perspective'* as well giving a careers talk to a young generation of scientists invited by the British Mass Spectrometry Society.

Both, Cameron and Oana, also got another grant (£250) from British Mass Spectrometry Society to attend the **39th British Mass Spectrometry Society Annual Meeting** in Cambridge in September, where Cameron, Lucy Flint, Cristina Russo, Hatem Sallem and Oana will be representing SHU CMSI and present their latest posters.

PhD student Rachel Hodgson and Dr Sue Campbell have received £400 travel grants from the **Biochemical Society** which covered the cost of their flights to **Translational Control** in Cold

Spring Harbor on 4-8th September 2018. This conference was organised by Tom Dever, Rachel Green and David Roggerio. It was a fantastic event which covered all aspects of how protein synthesis is controlled and regulated. Rachel presented a poster on her PhD research entitled *'eIF2B subunits localise to distinct populations of eIF2B bodies and allow for differential regulation by the ISR in cells linked to VWM'* while Susan presented a poster entitled 'Investigating the impact of eIF2Bα mutations on eIF2B body localisation'. This poster displayed the research carried out by Karl Norris a former PhD student in the Campbell lab. Both posters were really well received and generated a lot of interest in the work being carried out in the Campbell lab in the BMRC.



PhD students Paula Chirila, Phil Lane, Jack Slater and Drs Simon Turega and Chris Whiteoak attended the **7th EuChemMS Chemistry Congress** in Liverpool for which Paula received a grant of £575 from the Royal Society of Chemistry and Phil also received £375. All students presented posters and Chris gave an oral presentation summarising the most recent results from his research group 'Access to Unusual Heterocyclic Compounds Using Cobalt-Catalysed C-H Functionalisation as the Key Tool'. Phil Lane was awarded a poster prize in the area of "Organic and Biomolecular Chemistry" for his poster entitled *'A study of small molecular probes for the lysine specific demethylase 1 enzyme'*.

Nicola Woodroofe was awarded a travel grant of £620 from the **British Society for Immunology** to contribute to the costs of attending the **International Society for Neuroimmunology conference** in Brisbane in August, where she is chairing a session and presenting a poster on the work on Raman spectroscopy of MS brain tissue, which Ines Ramos has done.

The International Society for Neuroimmunology (ISNI) meeting is held every two years and this year was the 14th meeting held in Brisbane, Australia, 26-31st August. Here is Prof Nicola Woodroofe's report on the conference:

> The ISNI 2018 meeting in Brisbane was well attended with 612 delegates from 35 countries. Overall, 220 speakers presented at the meeting and 50% of speakers were female. This was a key remit for the organisers from the ISNI committee to ensure gender equality at the conference, as there had been issues with a high proportion (80%) of speakers being male at the previous conference. Although much of the meeting has historically focussed on multiple sclerosis (MS) and *in vivo* and *in vitro* studies related to MS pathogenesis, and this continued to be a major part of the conference, the involvement of the innate and adaptive immune system in a wider range of neurological conditions including epilepsy, infectious CNS diseases, amyotrophic lateral sclerosis and cognitive function and the importance of the gut brain axis were included. Key sessions I attended included 'Degeneration and regeneration in the nervous system', 'The microbiome and autoimmunity' with a focus on MS, 'Glia and microglia' as well as neurological conditions where the immune aspects are only recently being highlighted e.g. neuroimmune psychiatry. There has been an exponential increase in papers on the microbiome linked to CNS disorders including MS, autism, epilepsy and stroke. The Rita Levi Montalcini Neurobiology lecture, a highlight of the conference, was given by Prof Perry Bartlett, Chair in Molecular Neuroscience at the University of Queensland. The lecture was introduced by Professor Michal Schwartz, Weizmann Institute, who explained the history of Rita Levi Montalcini, an Italian Nobel prize winner at age 77 and an inspirational female scientist who discovered nerve growth

factor. Prof Bartlett reviewed his earlier work on stem cells and neurogenesis in the hippocampus and then expanded on his current work, initially in animal models and now in clinical trials on the use of exercise to increase neurogenesis and improve cognitive function, with the aim of delaying onset of Alzheimer's Disease.

As well as presenting a poster on Ines Ramos's Raman spectroscopy work on 'Revealing underlying differences in normal appearing white matter in primary and secondary progressive MS', my participation at the meeting involved chairing the metabolism session; altered metabolism can underpin neurological diseases such as traumatic brain injury, epilepsy, myositis, ageing and motor neuron disease, all topics covered in this session. I attended the European School of Neuroimmunology (ESNI) committee meeting where the meeting for 2019 in Amsterdam was discussed. As a member of the ISNI committee, I attended the committee meeting held during the conference to consider the venue for the 2022 ISNI conference. Quebec, Canada was unanimously voted as the venue, Japan and Denmark also being considered.

Dr Rebecca Leyland attended the **European Congress for Immunology**, which took place in Amsterdam on 2-5th September 2018. This conference is held every three years, attracts over 3000 delegates and is an internationally renowned event covering basic and translational immunology. Rebecca presented research to a wide audience of immunologists and cancer immunologists from across Europe, with her abstract being accepted as a 'late breaking' submission. The data which was presented showed publicly for the first time, a novel role for microRNA-155 in B-cell differentiation and was entitled 'MicroRNA-155 is essential for the proliferation and survival of plasmablast B-cells'. This work was supported by the BMRC, the Babraham Institute in Cambridge and the British Society for Immunology (BSI), whom Rebecca successfully received a £700 European travel award from to support her attendance at the conference. Rebecca has recently written a full scientific manuscript incorporating the data which was presented for submission to the Journal of Clinical Investigation and therefore the conference provided an opportunity for scientists and PIs to critically analyse this work. In addition, it allowed for feedback from the wider immunology community to be considered before manuscript submission. There was a workshop on successful publishing of scientific articles which was run by chief editors of a number of journals. This session was very useful and the content was disseminated to other researchers in the BMRC, which will help increase the discoverability of our research and aid in manuscript acceptance.

Prof Tom Smith attended the **Gordon Research Conference** on the Molecular Basis of Microbial One-Carbon Metabolism at the Grand Summit Hotel Sunday River (Newry, Maine USA) in August 2018. Topics at the conference ranged from controlling global warming to the implementation of cutting-edge molecular microbial ecology techniques in biotechnology. Tom presented results

from BMRC PhD students Salaheldeen Enbaia (co-supervised by Philip Gardiner) and Hania Aween (co-supervised by Prachi Stafford) on the molecular basis of bioremediation of toxic pollutants by methane oxidising bacteria from the environment. Microbial one-carbon metabolism is one of the major strengths of microbiological research in the BMRC and will be the focus of an MSci project during the coming academic year.

Doctoral students Lucy Flint, Cristina Russo, Hatem Sallem, Oana Voloaca and Cameron Heaton attended the **British Mass Spectrometry Society (BMSS) conference** in Cambridge at the beginning of September and all presented posters.

Professor Simona Francese gave a plenary presentation in Perth, Australia at **The Australian and New Zealand Forensic Science Society (ANZFSS) Symposium** "Forensic Science without borders" which took place between 8-13th September 2018, her talk was entitled 'Chemical criminal profiling through MALDI MS based technologies'.

Commercial Team update

Prof Malcolm Clench with support from Drs Jamie Young and Jill Newton, ran a very successful 5th Mass Spectrometry Imaging Symposium at Sheffield Hallam University on Wednesday, 18th April 2018. The symposium was run in association with the British Mass Spectrometry Society and was attended by over 120 delegates from all over the UK and Europe. This year the plenary speakers were Professor Pierre Chaurand from the University of Montreal, Canada and Professor Helen J. Cooper from the University of Birmingham, UK

The commercial team continues to carry out contract research and consultancy projects for a wide variety of clients. This year the team has provided services to SITraN at the University of Sheffield (UK), AF Chempharm (UK), B Braun Ltd (UK), the Danish police force, the University of Bristol (UK) and Cogwellin LLC (USA) among others. The team also continues to be a part of the National Diet and Nutrition Survey co-ordinated by the Medical Research Council on behalf of the Food Standards Agency.

Public Engagement Activities

The **Virtual Reality Prosthetics Body and Mind project** aimed to engage the public in cutting-edge biomedical and technological research. Developing and delivering interactive experiences and standalone artefacts relating to real-life challenges to stimulate interest, excitement and debate about joint physiology, limb loss and the psychological impact of prosthetic choice and use.
The project firstly engaged students and teachers from local University Technical Colleges (UTCs) to co-develop and evaluate interactive materials. Resources developed included Virtual Reality (VR) and augmented reality systems to engage the public, together with a number of interactive activities aimed to attract wide audiences, including those with limited awareness of bioscience, to local and national pop-up exhibitions taking place in Sheffield, London and Edinburgh.
Further, we developed together with local UTCs a number of interactive legacy activities which can be used in schools and are freely available via our website https://vrprosthetics.shu.ac.uk providing an accessible online resource to ensure project sustainability.

Dr Mel Lacey and her team have created **Bacteria Builder**, an online game that challenges you to learn about bacterial form and function to create bacteria which can survive in different kinds of environments. From the soil to the human ear, you'll need to know a flagellum from an efflux-pump to help your bacterial buddies thrive in their new homes. The game is a lesson-sized educational resource for budding microbiologists of all ages and was created with an Educational Resources Grant from the Society for Applied Microbiology. But don't just take our word for it, have a go yourself at www.bacteriabuilder.co.uk.

Dr Mel Lacey gave an invited presentation at the **Café Scientifique** in Scunthorpe in November 2017 on *What have gut bacteria ever done for us*. Mel's talk explained how gut bacteria may have more impact on our general health than previously thought. The talk was very well received based on comments on Facebook.

With a public engagement grant from the Royal College of Pathologists (£620) and the Microbiology Society (£1000), BMRC staff and PhD students put on the **'Horror Within'** event at Millennium Galleries in October 2017. This was a fantastic event with a whole range of activities and talks about the human body and attracted more than 200 attendees.

PhD student Emma Henly and Senior Lecturer Dr Sarah Haywood-Small have secured £1000 Communicating Immunology funding from the British Society for Immunology for round two of the **Super Cells animation**: 'The Super Cells Part 2 – Inflammation Nation'. This is the finished product: https://www.youtube.com/watch?v=moV2zF1JV-c.

Both, PhD student Emma Henly and Senior Lecturer Dr Mel Lacey, have been awarded an outreach grant of £1000/each from the Microbiology Society. Emma's activity is called *The super cells! How bacteria and your immune system work together to keep you healthy* while Mel looks at microbes in *Explore Microbes – on tour*. Emma commissioned an animation to teach children about how the immune system fights microbes. The short film can be viewed here: https://www.youtube.com/watch?v=C1TiN-BaXCo. There will be a workbook to go with this animation.

For a fifth year running, we organised our yearly event **Explore Science and Engineering @ SHU** on 17th March, showcasing the work we do across the sciences and engineering departments, co-ordinated by Dr Kathy Rawlinson. Following on from last year's major success, we managed to up the attendance numbers and welcomed close to 1000 visitors! In addition to the various stalls, we delivered small talks and demonstrations in the Pennine Lecture theatre throughout the day, which was a favourite with the audiences. If you would like to get an impression of the day, please see our video here: https://youtu.be/mHGEYcfqt1I. Next year's event will take place on 16th March 2019 and is worth putting in your calendars now.

On 5th April, doctoral students Paul Mardling and Alex Andrews spoke at the Barnsley **Skeptics in the Pub** in The Old No.7 cellar bar. Their talks were entitled *I didn't expect that when I pulled it!* and was about the use of auxetic materials in tissue engineering and *Could your toothbrush save your life?* about the links of poor dental hygiene and strokes, respectively. Skeptics in the Pub is an informal social event designed to promote fellowship and social networking among skeptics, critical-thinkers, and other like-minded individuals. The usual format of meetings includes an invited speaker who gives a talk on a specific topic, followed by a question-and-answer session.

Senior Lecturer Dr Tom Bassindale was approached by **ITV News Calendar** to test the contents of anabolic steroids they had obtained from an underground laboratory. Underground labs have no quality control procedures and the steroids produced do not always contain the drugs listed on the label. Tom tested the steroids provided, using BMRC's ultra-performance liquid chromatography instrument with mass spectrometry to identify the compounds present. In this case, the three vials did contain the correct ingredients, but many others do not. ITV Calendar News sent a news crew to watch Tom doing the testing and discussed the general laws around steroids, the possible reasons people may use them and the potential harms involved in using steroids particularly when injected. The finished clip can be viewed here https://www.shu.ac.uk/research/specialisms/biomolecular-sciences-research-centre/news/tom-bassindale-tests-steroids-for-itv-calendar-news

Prof Simona Francese appeared live on **BBC Breakfast** talking about her fingerprint research. She was also interviewed on **Radio 4's Today Programme, Radio 5 Live, BBC World Service** and **regional BBC radio station**s across the country. It was the most-read story on the BBC website that day and you can read more on the SHU media centre. http://www4.shu.ac.uk/mediacentre/fingerprint-research-across-bbc. Further coverage has appeared in the Metro, Independent, The Sun, The Times, ITV News, Mail Online, international titles such as MSN Germany and the BBC World Service.

Prof Simona Francese spoke at **TED 2018** in Vancouver on 12th April about her research in fingerprint analysis. Session 7 of TED Talks 2018, entitled *Wow. Just wow.*, was designed to provoke an exquisite human emotion: the sense that the world is bigger and stranger than you had known. Simona says: 'Molecules are the storytellers of who are we and what we've been up to. We just need to have the right technology to make them talk.' Through her work, Simona is revealing the tales to be found in the microscopic remnants that we all leave behind. A person's prints can contain three

types of molecules: ordinary sweat molecules; molecules of substances that we've introduced into our bodies and sweat out; and molecules that we may contaminate our fingertips with. Professor Francese and her team achieve their breathtakingly detailed analyses by using solid state lasers which cause the desorption of molecules in fingerprints; mass spectrometry imaging measures the mass of those molecules and the mass tells us who those molecules are; at the same time, molecules can be visualised directly on the fingermark. With this technology it is possible to detect and visualise hundreds of different molecules in a single print with the potential to enable a more and more accurate identikit of the suspect as well as allowing the separation of marks when they're overlapping, something that tends to stymie the police. Their work can also fill in faint prints by improving ridge pattern continuity and clarity. In 2017, law enforcement in the UK and in other parts of Europe began using this technology in their criminal investigations. To see Simona's talk, follow this link: https://www.ted.com/talks/simona_francese_your_fingerprints_reveal_more_than_you_think

Ahead of her Inaugural Professorial Lecture, Christine Le Maitre was invited to talk to Paulette Edwards on **BBC Radio Sheffield** about defective cells and the implications for developing successful treatments to diseases. Christine's Professorial Lecture took place on 25th April 2018.

On 12th July we established the first **Ogden Primary Partnership** in South Yorkshire. This is a group of eight Sheffield primary schools working with Sheffield Hallam University with the aim to raise the profile of science in schools and enhance teachers' confidence in the planning, delivery and assessment of primary science through focussed CPD to increase pupils' science capital.

We held our first **Children's Science Ambassador Conference** at Sheffield Hallam University. The morning session was led by our science ambassadors, teams of four children from either KS1 or KS2, who have received training as science communicators. The programme included science ambassador presentations 'Our work in school this year', Science Busking – attended by academic researchers at Sheffield Hallam University, who were introduced to the experiments that the Ogden Ambassadors have been carrying out in their schools and science investigation with Dr Liz Allen in the University's new STEM lab. The Ogden Ambassadors were given a guided tour of Sheffield Hallam University's new STEM lab and ambassadors and their teachers then carried out some science investigations learning about the structure of DNA, and how to extract and measure the yield of strawberry DNA. The DNA extraction experiments were very successful and the ambassadors left with materials and resources to tell their classmates all about DNA and how to extract DNA from fruit.

Athena SWAN awards ceremony 16th July 2018 Swansea University

Advance HE Equality Charter Awards.

The Athena SWAN charter was established in 2005 to encourage and recognise commitment to advancing the carers of women in science, technology, engineering, maths and medicine (STEMM). In May 2015 the Charter was expanded to recognise work undertaken in arts, humanities, social sciences, business and law (AHSSBL), in professional and support roles and for trans staff and students. The Charter now recognises work undertaken to address gender equality more broadly, and not just barriers to progression that affect women.

At the ceremony in Swansea Sheffield Hallam University was awarded a bronze institutional award, which was a renewal of our previous award and this will be valid for 4 years and has a comprehensive action plan associated with the award which we plan to make considerable progress with implementing over the coming year. Aloma Onyemah (E&D) and Nicola Woodroofe (Chair of University Gender Operational Group) received the award on behalf of the University self-assessment team, from Sir Paul Nurse, Director of the Francis Crick Institute and Nobel Prize winner in 2001.

Funding awarded

Prof Malcolm Clench and Louise Freeman-Parry were awarded a **HEIF Impact fellowship** from Sheffield Hallam University for three months' continued support Dr Emily Lewis from January to complete the work with Innoven on the skin wound model, which should then be ready to market commercially. Emily was initially funded by an Innovate UK Knowledge Transfer Partnership fellowship.

Dr Rebecca Leyland was selected, following a competitive application, to attend a sandpit event organised by Cancer Research UK in collaboration with Arthritis Research UK on the theme 'Immune Homeostasis'. Although the project Rebecca worked on was highly recommended but did not get funded, she has made some very valuable collaborators for future research projects. This included the submission of a joint review with Dr Richard Chahwan at the University of Exeter entitled *Epigenomic modifications mediating antibody diversification* (Richard Chahwan and Rebecca Leyland).

Dr David Smith together with Beth Fielding-Lloyd, Sue Beckingham, Hongwei Zhang, Rachel Handforth and Prof Nicola Woodroofe have received **Hallam Guild** funding (£4000) for a project on research informed teaching at masters level 'Enhancing the postgraduate taught student curriculum through strengthen links between creating knowledge and shaping futures'. This project is across three faculties and involves student and staff questionnaires and focus groups.

Prof Tom Smith has been awarded £10,000 through the **BBSRC Networks In Industrial Biotechnology and Bioenergy (BBSRC NIBB) Business Interaction Voucher (BIV)** via the University of Nottingham. This is to work with Freeland and Ballast Phoenix Limited who have also provided matched funding.

Prof Christine Le Maitre is a partner on an EU grant that has just been awarded (EUR 15 million) to start inapril 2019 with Sheffield Hallam getting EUR 1,126,572.5. The project also involves Prof Chris Sammon (MERI) as the material scientist. The grant funds 2 PDRAs 1-2 years (based in

MERI) and a 4-year PDRA (BMRC based) plus a part-time technical post (BMRC) and a PhD student (BMRC) and 0.3FTE for Christine. Christine has worked extensively on this **iSPINE EU bid** over the last year so this is a fantastic achievement for her.

Prof Simona Francese, together with Lecturer Dr Laura Cole and a collaborator at the University of Sheffield has been awarded funding from the **MRC Confidence in Concept** for a PDRA for one year to work on cancer detection/prognosis from finger-mark analysis by mass spec.

A grant Prof Nicola Woodroofe is a co-investigator on has also been funded through the **MRC Confidence in Concept** scheme to look at stem cell treatments in MS. This will be based at the University of Sheffield. Medical Research Council Confidence in Concept (CiC) scheme is part of the MRC's Translational Research Strategy and is a component of the MRC/Innovate UK Biomedical Catalyst. The scheme is designed to "accelerate the transition from discovery research in any healthcare area within the MRC remit into translational development projects by supporting preliminary work or feasibility studies to establish the viability of an approach" Funding has been obtained by a consortium led by University of Sheffield (TUoS) with Sheffield Children's NHS Foundation Trust (SCH), Sheffield Hallam University (SHU) and Sheffield Teaching Hospitals NHS Foundation Trust (STH).

Dr Catherine Duckett and Dr Alex Hamilton have been awarded £3875 from the **Royal Society of Chemistry Inclusion & Diversity fund** for a project entitled INCLUDE: An Inclusive Chemical Landscape Underpinning Diversity & Equality. This project aims to understand and address the socio-economic disparity within the chemical sciences. An understanding of what causes the inequality will be gained through a number of events held with local schools and colleges, as well as industrial employers. Using this knowledge an online interactive platform will be designed and created to help promote a career in chemical sciences to students from lower socio-economic backgrounds. The project is being jointly lead by Dr Catherine Duckett and Dr Alex Hamilton.

Doctoral student Paula Chirila received a grant of £2500 from the **COST Action** (European Cooperation in Science & Technology) to visit the University of Girona for a month and a half. We have recently developed a one pot synthetic method for the preparation of 1,2,3-benzotriazin-4(*3H*)-ones starting from the amidation of readily available benzamides. During the visit Paula will be attempting to isolate a high valent Co(III) organometallic intermediate by reacting the previously prepared 1,2,3-benzotriazin-4(*3H*)-ones with a low valent Co(I) complex. Dr Xavi Ribas's group from University of Girona have prepared and stored the low valent Co(I) species. The collaboration between the two groups is essential for the project since the laboratory at Sheffield Hallam University is not equipped with a glove box to store the reactive low valent Co (I) compound. Furthermore, the group at Girona has access to an X-Ray Diffraction instrument needed to obtain the crystal structure of the organometallic intermediate. Dr. Xavi Ribas can offer valuable support in isolating Co(III) organometallic intermediates as he is an expert in the field and has reported in the past isolations of organometallic intermediates.

Prof Neil Bricklebank, together with Prof Malcolm Clench and Dr Catherine Duckett, has been awarded a prestigious four-year **BBSRC Industrial Case** PhD Studentship (value £100K) with Croda PLC (a global speciality chemicals company) for a project *'Development of LA-ICP-MS and associated techniques for the analysis of crop enhancement products'* which aims to develop methodologies to study the uptake and transport of metal nutrients by plants.

In other news

For the second year running, Dr Abbey Thorpe was awarded the Presidents' Award for the best podium presentation at The Society for Back Pain Research (SBPR) annual meeting, which was held on 2-3rd November 2017 in Northampton. Abbey's presentation title was *In Vivo Safety and Efficacy Testing of a Thermally Triggered Injectable Hydrogel Scaffold for Bone Regeneration and Augmentation.*

Prof Malcolm Clench gave a plenary lecture at the East Midlands Proteomics Workshop which took place on 15th November 2017 entitled *Mass Spectrometry Imaging of 3-Dimensional Cell Culture Systems.* He has also been invited to give a lecture on mass spectrometry imaging by Pharmaron (Chinese Pharma Company) in Beijing in November 2018. It is hoped this will lead to a collaboration with the company.

Graduation

On Thursday, 23rd November 2017, the following doctoral students graduated at the Graduation Ceremony held at Sheffield City Hall.

Degree of Doctor of Professional Studies: Dr Kirsty Edmondson-Jones; Dr Benjamin Sholademi.
Degree of Doctor of Philosophy: Dr Amal Arhoma, Dr Francis Codjoe, Dr Mohamed Tawfik Elzayat, Dr Nikhil Lalwani, Dr Liz Leese, Dr Scott Martin, Dr Ekta Patel, Dr Callie Seaman, Dr Mariam Sheilabi, Dr Abbey Thorpe, Dr Nicola Wright.

From left to right: Dr Scott Martin, Dr Liz Leese, Dr Mariam Sheilabi, Dr Nicola Wright, Dr Callie Seaman, Dr Abbey Thorpe, Dr Ekta Patel, Dr Kirsty Edmondson-Jones, Dr Francis Codjoe, Dr Nikhil Lalwani

Former BMRC PhD student and postdoctoral researcher Dr Abbey Thorpe was awarded the Jeremy Laskowski Memorial Prize for Excellence in PhD Research. Abbey's PhD was entitled *Mesenchymal Stem Cell Differentiation to Musculoskeletal Tissues in Injectable Hydrogel Scaffolds.* She was supervised by Professor Christine Le Maitre (BMRC) and Professor Chris Sammon (MERI).

Dr Neil Cross was awarded a readership title by the University Professoriate Committee in November 2017. This title recognises his contribution to research, which includes grant income,

successful PhD student completions and publications as well as his wider contributions to the Department and University.

Simona Francese was awarded the title of Professor of Forensic and Bioanalytical Mass Spectrometry by the University Professoriate Committee in February 2018. An internationally-known researcher in the area of bioanalytical and forensic mass spectrometry, Simona's ground-breaking fingerprint profiling method has been on trial with West Yorkshire Police which saw it successfully implemented during an investigation into a case of harassment. The Home Office has invested funding in the project and researchers hope to see the technology be used in high-profile cases. This award recognises the outstanding contribution Simona has made to research at Hallam and beyond.

50 years of Chemistry. On 27th November we celebrated 50 years of Chemistry at Sheffield Hallam University! Pro VC Christina Hughes and Prof Sir John Holman, President of the Royal Society of Chemistry gave talks and several of our alumni, Gillian Greenway, Professor at University of Hull, Anthony Bristow, Associate Principal Scientist, Astra Zeneca and Jackie Morton, Principal Scientist, Health and Safety Laboratories, Buxton and PhD student Cameron Heaton joined in a debate on the future of chemistry. The event was organised by Prof Neil Bricklebank.

The Sheffield Glial Symposium was held on 22nd November 2017 and is a joint University of Sheffield / Sheffield Hallam University event where PhD students Rachel Hodgson and Teresa Whitely gave oral presentations that were very well received.

New positions have been taken up by Dr Inês Ramos who has secured a new job as a Lecturer in the Department of Biomedical Science at De Montford University in Leicester. Dr Patrick Harrison has been appointed Lecturer of Biochemistry within the School of Maths and Physical Sciences at the University of Hull and Dr Abbey Thorpe has taken up a new role in Rheumatology Medical Scientific Liaison within Novartis Pharmaceuticals.

Congratulations to Dr Sarah Haywood-Small on winning a University Inspirational Teaching Award!

Sarah's principal research interests involve cellular interactions and immunoregulations; especially the importance of these mechanisms in cancer. She actively uses her research to underpin teaching in biomedical sciences, nursing, midwifery and other allied health courses.

Two of our PhD students, Alex Andrews and Mootaz Salman, starred on the SHU external website as part of a promotional programme for the VC scholarships. Both Alex and Mootaz got to the SHU final of the 3-minute thesis but narrowly missed out on the top spot.

Dr David Smith has been appointed to the Educational, Training and Outreach Committee for the Biochemical Society, which is evidence of his reputation in the field of biochemistry education research.

Dr Nicola Aberdein received a Distinction in Scholarship Award from The American Physiological Society. Nicola's article *Role of PTP1B in POMC Neurons During Chonic High Fat Diet: Sex Differences in Regulation of Liver Lipids and Glucose Tolerance* was chosen for APSselect, a collection from the APS that showcases some of the best recently published articles in physiological research.

Prof Malcolm Clench and Prof John McLean recorded a Webinar *Understanding Small Molecule Interactions within Living Systems with Mass Spectrometry Imaging* which was broadcast on Tuesday, 6th February 2018 and had a live Q&A session straight after. In biomedical research, understanding the mechanisms of life processes and disease is critical to the long-term goal of improving human health. In this webinar, two exciting talks discussed how MSI can add an extra dimension of data in microbiology and early phase pharma efficacy and toxicity studies. Professor Malcolm Clench discussed the combination of MSI and three-dimensional cell culture systems to provide insights in three areas, including the study of penetration enhancers on the absorption of an anti-fungal agent in a living skin equivalent model, the utility of MSI in the development of a novel wound healing model and the effect of doxorubicin in a novel 3D model of osteosarcoma. Quantitative MSI (QMSI) for active compounds and biomarkers of response were shown. Professor John A McLean, Stevenson Professor of Chemistry at Vanderbilt University, USA, presented technologies, methodologies and results using MSI to study the molecular components of inter- and intra-colony chemical signalling and communication in bacteria, and demonstrated the unique ability of this technology to rapidly facilitate the discovery of new natural products.

As part of the Society of Experimental Biology Plus (SEB+) committee Dr David Smith is organising a symposium on enhancing the student experience. The symposium will be held at the University of Plymouth on 11-12th December 2018 and will cover innovations in teaching, field work and student transition in HE.

Tom Smith has been invited to be an editor for Nature Scientific Reports, a Nature publishing group journal.

Visitors

In October 2017, **Bowel & Cancer Research** visited the BMRC and Dr Nick Peake, whose research has been funded by B&C Research, explained some of our current projects and gave the representatives a tour of the new BMRC labs. Lana Mead of B&C Research commented: 'I wanted to thank you so much for a fantastic afternoon yesterday and for all the efforts you put in to show me around and for arranging for your colleagues to join us. Everyone was passionate about their work - and great fun! I felt really included and welcomed, and I loved every minute. It was fascinating to hear about your work and so exciting at the results coming in, and the collaboration across conditions and diseases with your colleagues which will also help others.'

Former PhD student Amani Mahbub came back to the BMRC to work as an invited researcher from 21st June to 23rd August 2018. This work is being carried out in collaboration with Dr Nikki Jordan-Mahy. Amani has been looking at the molecular action of polyphenol in the treatment of leukaemia. Earlier work in the lab has shown that polyphenols can work synergistically with

standard chemotherapy agents such as the doxorubicin and etoposide, whilst having an antagonistic on other anti–cancer agents such as methotrexate and mercaptopurine. These effects vary depending of the lineage of the leukaemia cell line and the polyphenols used in the combination treatments. In the recent work, Amani has been unpicking the molecular pathways activated or inhibited by the chemotherapy agents and polyphenols when used alone and in combination. We have some very exciting results which demonstrate the action of polyphenols in the treatment of leukaemia and will be releasing the data shortly. Hamza Alaswad (funded by the Libyan government) who will return to SHU in October to continue this work, and will be supervised by Nikki Jordan-Mahy, Christine Le Maître and Amani Mahbub.

In August, we were delighted to welcome delegates from **Jiangxi Provincial Science and Technology Department and Jiangxi University of Science and Technology** to SHU to foster collaboration with MERI and the BMRC.

Prof Malcolm Clench and PhD student Hatem Sallem with the delegates from Jiangxi Provincial Science and Technology Department and Jiangxi University of Science and Technology

Between 1st August and 30th September 2018, Visiting Researcher Hanxian Liu, in collaboration with Professor Gavin Reynolds, will analyse a large database of laboratory and clinical information from her department, working towards publications, and observe some molecular genetic laboratory work.

The Deputy Vice Chancellor for Research at **La Trobe University**, Melbourne, Professor Keith Nugent, visited SHU on Monday 10th September, including the BMRC labs and was particularly interested in the interdisciplinary research we engage with across the University. La Trobe has been identified as a potential international strategic partnership and both universities are committed to increasing the extent to which we collaborate on teaching, student exchange, staff exchange and research. The objective of Keith's visit was to identify complementary research areas in which we can collaborate and initiate collaborative projects. The visit was a successful one and we are hoping will lead to collaborative projects in the future.

Successful summer studentships

Dr Karen Stanley with student Lauren Jaques, Society for Applied Microbiology, *The effect of Quorum Sensing Inhibitors (QSIs) on uropathogenic E. coli*, 8 weeks.

Dr Rebecca Leyland with student Kyle Owens, British Society for Immunology , *Investigating the combination of IFNy and polyphenols on immune-inhibitory mechanisms of cancer*, 8 weeks.

Prof Tom Smith with student Joe Quick, Society for Applied Microbiology, *Investigation of plant natural products as active components for antimicrobial coatings* , 8 weeks.

Dr Dan Kelly with student Jess Talbot, Society for Endocrinology, *Adipocyte-derived extracellular vesicles in cardiometabolic disease: developing a 3D adipose model*, 8 weeks.

Dr Simon Turega with student Gregg Duly, SHU Innovation Bursary, *Synthetic chemist, producing and packaging a bio-conjugate reagent for dissemination to partners inside and outside of Sheffield Hallam University*, 6 weeks.

Dr Nick Peake with student Rachel Sharp, Animal Free Research UK, *Building a physiologically relevant model of fat development during inflammatory bowel disease*, 8 weeks.

Rachel Sharp receiving her prize at the Summer Student Celebration, arranged by Animal Free Research UK

Dr Alex Hamilton with Jacob Earnshaw, CCP5, *Development of Teaching Materials for Undergraduate Chemistry, utilising DL_Poly*, 8 weeks.

Prof Malcolm Clench with Charlotte Curtis, British Mass Spectrometry Society Studentship, *Matrix Assisted Ionisation in Vacuum MS and Nanoparticle Co-Matrix MS of Multiply Charged Ions*, 6 weeks.

Work experience school students

We had four work experience students this year, including students from local schools, who worked in our labs for 10 days in June: one from Kind Edward VII school, one from Highfield School, Matlock, , one from Newfield School and one from Silverdale School.

Sheffield Innovation Programme (SIP) studentships:

SIP is the Sheffield Innovation Programme (http://sip.ac.uk/) and is an ERDF funded project that seeks to promote relationships between SME and our regional Universities. SIP Innovation Bursaries allow SMEs in the Sheffield region to carry out short lab-based research and development projects that will have a clear impact on their business growth and future research and development strategy. Projects are delivered by graduating students working within a university department under the supervision and guidance of an experienced academic. These are the first (hopefully of many) projects funded by the scheme.

Prof Malcolm Clench with Rachel Van Der Venn, Sheffield Innovation Programme with Rejuvetech Ltd., *Urinary Biomarkers of Acute Kidney Injury*, 6 weeks.

Dr Simon Turega with student James Derham, Sheffield Innovation Programme with Sky Chemicals Ltd, *Peracetic acid in situ formation with Sky Chemicals, formulating to solve problems*, 6 weeks.

Dr Akram Khan with Daniel Tomkins, Sheffield Innovation Programme with AF ChemPharm Ltd, *Separation by column chromatography and isolation of compounds from a natural product used in folklore medicine in Iran*, 6 weeks.

Publications

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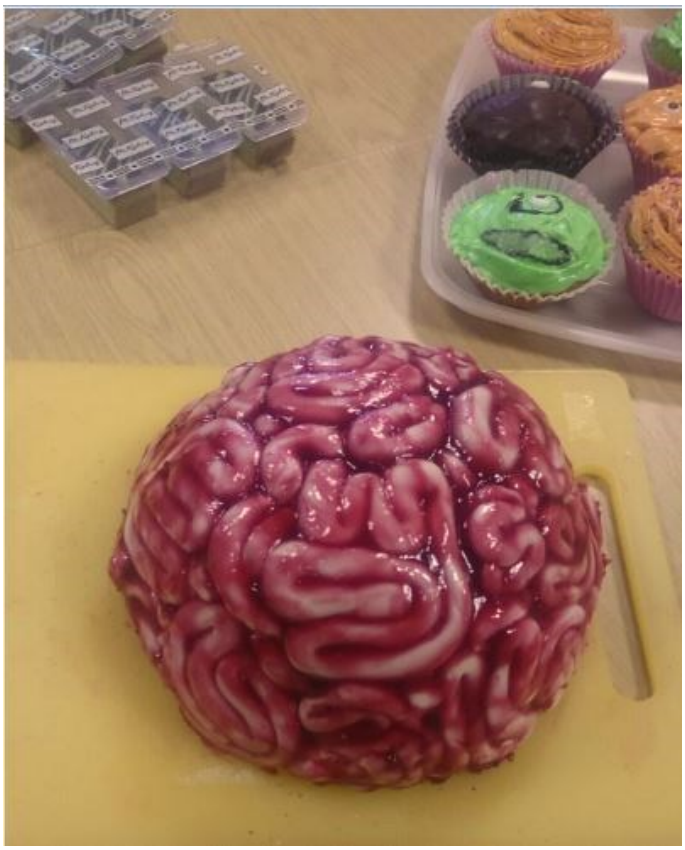
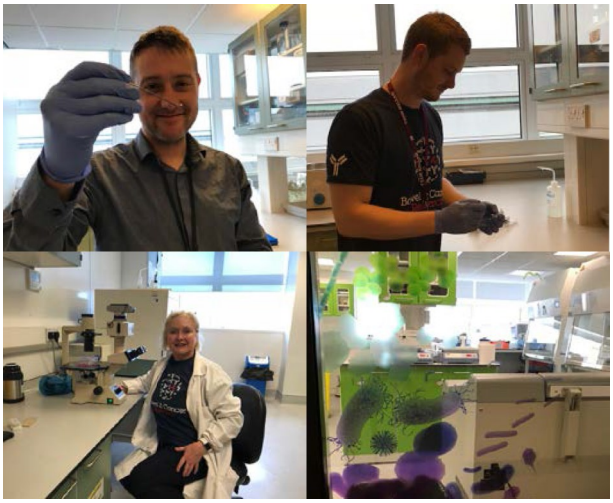
PhD students' spooky bake sale raised £92.47 and all money went to Sheffield Children's Hospital.



Dr Sarah Haywood-Small, Dr Laura Cole and PhD student Oana Voloaca at the Action Mesothelioma Day in Leeds.

Bowel & Cancer Research visit the BMRC



As a sign of their appreciation for the technical support they received, the MSc students made our technicians a cake! The images represent all the different projects the students are doing... Thank you!

Explore Science and Engineering @ SHU event

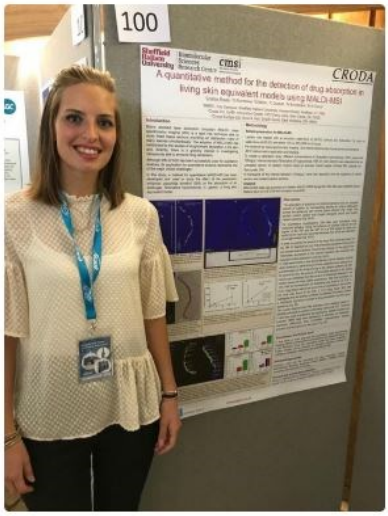
Delegates of the ASMS event, San Diego

Follow us on Twitter @BMRC_News

BMRC News @BMRC_News 4h
Congratulations to Rasha Dosh who has passed her thesis 'Developing models of the small intestine' with very minor corrections!
Rasha was supervised by Prof Christine Le Maitre (BMRC), Dr Nikki Jordan-Mahy (BMRC) and Prof Chris Sammon (MERI). @Chris_Sammosas @ProfLeMaitreIVD

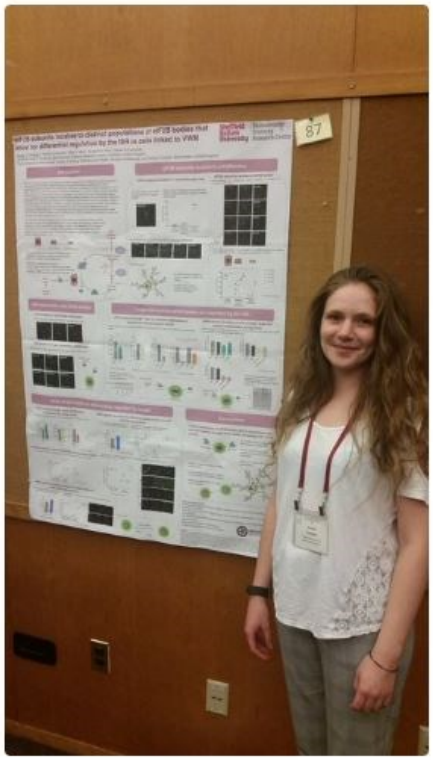
Cristina Russo
@Cristina_Russo3

I am very happy to have had the opportunity to present my work during the poster session at #BMSS2018 in #Cambridge @BMRC_News @bmss_official @BMRCSheffHallam



Susan Campbell
@sg_campbell

Well done Rachel, fantastic poster session at translational control csh 2018!! Thanks @BiochemSoc for travel grant. @Shu_bio, @BMRC_News



Paula Chirila
@PaulaChirila1

Could not be happier about the poster prize at the 5th RSC Early Career Symposium. Many thanks to the RSC for an exciting event.

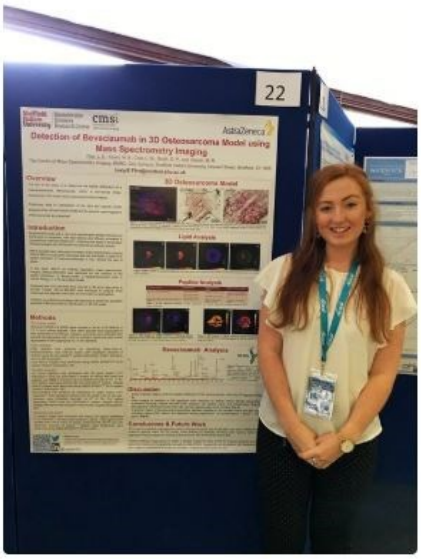
RSC ECS 2018 @RSC_ECS
Congrats to our poster prize winners!
#RSCECS2018

David Smith
@dave_thesmith

@SHUoverseas first day on my lecture tour around India and we have stopped for tea with @simplyhema #Bangalore next stop #Chennai

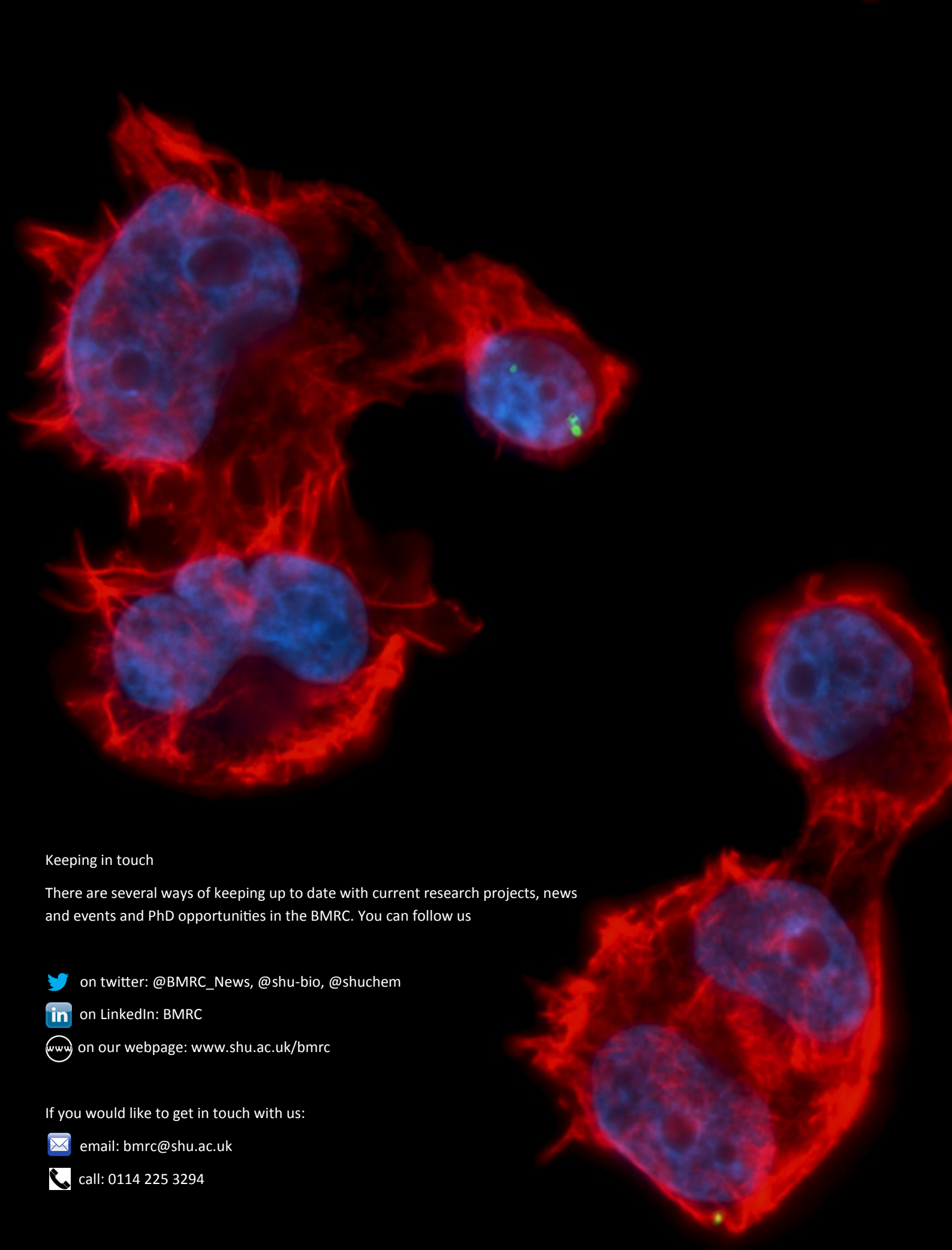
Lucy Flint
@lucyellenflint

Presenting my poster on mass spectrometry imaging at #BMSS2018 in Cambridge #phdlife @BMRCSheffHallam



Back cover: *Cell Invasion: Bacterial Warfare* supplied by PhD student Alex Andrews. Human megakaryocyte cells hold fast against the invading oral pathogen P. gingivalis.

Fluorescent labelling allows the visualisation of the invading bacteria (Green), the filamentous actin of the cell cytoskeleton (Red) and the DNA that makes up the cell nucleus (Blue). This technique provides these brief snapshots of the microbiological arms race that our cells undertake every day in an attempt to keep us healthy and free of infection. Showing how bacteria can exploit specific individual cells, internalise within the cytoskeleton and evade the body's immune system in order to survive and reproduce.



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