



Swansea University
Prifysgol Abertawe

Momentum

Research news from Swansea University

Issue 19 : July 2015

In this issue

- Swansea triumphs in Quality Research (QR) funding awards
- 30 years of Mass Spectrometry research
- Food of the future revealed



Bar e Pizzeria
Tudo de cor para voce
esta esperando por a alegria para a
Santa Marta
085-7342 (11) P&A SANTA MARTA - Tudo de cor para voce

Welcome to the July 2015 edition of *Momentum*.

Our reputation for research excellence is growing. This is reflected through the recent news that the Higher Education Funding Council for Wales (HEFCW) has rewarded Swansea University with the largest growth in Quality Research (QR) funding in Wales for 2015/16. Professor Hilary Lappin-Scott leads with an article on what this means for the University.

In this issue, we welcome the return of the SURF Research as Art Competition. Research as Art is a unique competition which provides a platform for researchers at Swansea University to convey the importance and beauty of their research. We showcase some of the captivating images from the 2015 competition shortlist here.

Professor Rory Wilson and his team in Biosciences have made extraordinary discoveries about animal behaviour thanks to the revolutionary Smart 'Daily Diary' Tag. We celebrate this work in our research profile.

Also in this issue, impulsive behaviour and the internet; 'food of the future' microalgae; and how Swansea University's Research Institute of Applied Social Sciences (RIASS) is working across all disciplines to improve the world we live in.

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On the cover

Winner of the Research as Art 'Illumination' Award: 'Favela Painting', Richard Smith (Department of Geography)



The image depicts painted favelas in Rio de Janeiro's southern zone and conveys the importance of colour to improving residential life. Only a rendered dwelling can be painted, lending an identity, permanence and legitimacy to dwellings that are classified as illegal constructions.

The painted buildings also serve as a form of resistance for favela neighbourhoods and communities to the desires of property developers due to their prime locations near Rio's most famous beaches and landmarks.



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For more details about Swansea University's research

Swansea University – a rising star in research

Professor Hilary Lappin-Scott on Swansea University's rapidly-ascending profile



Professor Hilary Lappin-Scott, Pro-Vice-Chancellor - Research and Innovation and Strategic Development

Swansea is fast developing a reputation as a Welsh university with global ambition, and one synonymous with 'research excellence'. We advocate an integrated approach combining teaching, research and industry, increasingly important in today's world.

We bring together the knowledge of some of the world's most talented researchers in a multi-disciplinary environment, with cutting-edge facilities, all of which aims to contribute positively to global societal challenges.

This combined approach helped us become a top 30 research university in the results of the Research Excellence Framework (REF) 2014, as we soared up the league table from 52nd place in 2008 to 26th, cementing the University's position as one of the top research institutions in the UK. In the REF 2014, over 90% of Swansea's research was rated 4* (world leading) or 3* (internationally excellent) with an overall rating of 22nd in the UK for impact.

In May this year we celebrated being rewarded with the largest growth in Quality Research (QR) funding in Wales and the third largest growth of all research-intensive universities in the UK for 2015/16 as Swansea University was allocated an extra

20% (£2.25m) of QR funding by the Higher Education Funding Council for Wales (HEFCW).

Just one other Welsh University (Bangor) saw its HEFCW allocation increase with the other eight funded institutions all receiving a decrease. Over half of HEFCW's funding for 2015/16 has been allocated for research and the large increase for Swansea University reflects its growing research reputation.

“**Swansea is a rising star amongst research institutions, attracting additional funding as a reward for its innovation, growth and research**”

The success in research funding growth is firmly based on Swansea's improved research reputation in the REF 2014 in which Swansea was assessed to have more than doubled the volume of its world leading (4*) research.

Taken together these two achievements represent the largest combined growth in Quality Research funding and research

reputation of any research-intensive university in the UK.

Swansea is a rising star amongst research institutions, attracting additional funding as a reward for its innovation, growth and research, adding to the delivery of an excellent student experience. The HEFCW funding will enable us to continue with our mission to be a research-led Welsh university of international quality providing career-enhancing opportunities for our students and using our research to support the economy, health, and civic society in the region and beyond.

Swansea University's remarkable growth in QR funding and research reputation is further supported by other recent successes that illustrate that Swansea is fast becoming a top UK and international institution.

The University has recently been recognised as a 5 star institution in the globally recognised university quality rating system by QS Stars. This places Swansea in the company of top global universities such as Harvard, Stanford, Yale, Oxford and Cambridge who have also been awarded 5 stars.

In addition, within the Guardian University League Tables 2016, Swansea University has improved by a remarkable 42 places in just 5 years – from 94th to 52nd in the UK. In particular, the rankings also confirm Swansea University as a top-20 institution (ranked 18th) for graduate employability, indicating that our graduates are well supported and well equipped to find employment once they leave university.

Up to this point, Swansea University has achieved these momentous results on a single campus. The new Science and Innovation Bay Campus, to open this September, and the redevelopment of the existing Singleton Park Campus, will mark the next step in the University's journey in becoming a world-leading institution promoting collaboration with industry, excellence in teaching and continuous innovation.

**Professor Hilary Lappin-Scott,
Pro Vice Chancellor**

Impulse and the internet

Professor Phil Reed from Swansea University is one of the researchers involved in a study that has revealed that individuals with a problematic use of the internet become more impulsive after exposure to it.

Professor Reed collaborated with Professor Roberto Truzoli and Michela Romano from the University of Milan, and Dr. Lisa A Osborne from Abertawe Bro Morgannwg University (ABMU) Health Board, to conduct the study.

Levels of problematic internet use in 60 individuals, with an average age of 24, were measured using the Internet

Addiction Test. Participants were exposed to a choice assessment, in which they could choose between a small immediately-delivered outcome (impulsive), a medium-sized outcome with a medium delay (optimal), and a larger longer-delayed outcome (self-controlled).

They were given 15 minutes access to the internet before being presented with the choice test again. It was found that about 30% of the participants had internet problems, with no difference being found between male and female rates of problematic internet use.

After internet exposure however, higher-problem users displayed greater impulsivity than before they used the internet, reflected by a move from self-controlled to impulsive choices, suggesting that individuals reporting internet-related problems become more impulsive after exposure to the internet.

£2.5 million for the ultimate close-up

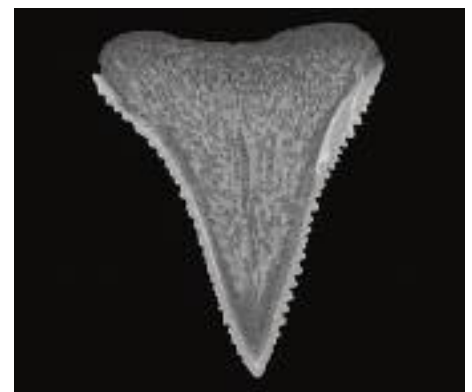
A Swansea University research team has won a £2.5 million award for equipment allowing experts to examine materials right down almost to the atomic level.

The award, given to materials scientists Dr Richard Johnston and Dr Cameron Pleydell-Pearce in the University's College of Engineering, is from the Engineering and Physical Sciences Research Council (EPSRC). It will fund a micro-level CT scanner, which allows researchers to analyse objects at very small scales, and a transmission electron microscope, which means they can study tiny samples of materials at even higher magnification, almost at the level of atoms.

The new equipment, added to other state-of-the-art imaging equipment already in the College of Engineering, means that Swansea will be able to offer an integrated imaging facility, where researchers can examine objects at all scales. Crucially, they will also be able to combine the data they get from looking at the same object using different techniques and equipment, building up a much fuller picture of how materials behave.



Bird Skull using X-ray imaging



Shark tooth

Relaunch of the EPSRC UK National Mass Spectrometry Facility



(left to right): Professor Hilary Lappin-Scott, Pro-Vice-Chancellor, Swansea University; Professor Gareth Brenton, Head of the Institute of Mass Spectrometry, Medical School, Swansea University; Edwina Hart MBE CStJ AM, Minister for Economy, Science and Transport; Professor Julie Williams, Chief Scientific Adviser for Wales; Professor Keith Lloyd, Dean and Head of the Medical School, Swansea University.

In March, Edwina Hart AM, Minister for Economy, Science and Transport, officially opened the newly refurbished National Mass Spectrometry Facility at Swansea University.

Funded by The Engineering and Physical Sciences Research Council (EPSRC), the mid-range research facility, which is located within Swansea University Medical School, offers comprehensive mass spectrometry facilities and services for leading university research groups throughout the UK, as well as having some commercial research opportunities.

Swansea University has long been established as a centre of excellence for mass spectrometry, with the siting of the Royal Society Research Unit in 1975 followed by the Mass Spectrometry Research Unit and then the EPSRC National Mass Spectrometry Centre in 1987.

Welsh Government Minister Edwina Hart said: "A recent Research Excellence Framework report identified that Welsh universities are producing world-class and internationally important scientific research.

Investing in highly technical facilities like this new mass spectrometer is key to improving this research even further. It is also very pleasing to

see Swansea University working in partnership with business to maximise the economic and social benefits of scientific research."

Thirty years of Mass Spectrometry

Professor Gareth Brenton, Head of the Institute of Mass Spectrometry at Swansea University, reflects on the facility's illustrious history.

"The relaunch of the EPSRC UK National Mass Spectrometry Facility was a celebration of 30 years of operation, beginning with the award of the first grant of £670K to Dr James Ballantine in 1985 who established the then named SERC Mass Spectrometry Service at Swansea University.

Dr Ballantine was a superb scientist and teacher, whose first mass spectrometry PhD student was Professor Colin Pillinger FRS, the UK scientist behind the Beagle 2 mission to Mars; samples were passed into a miniaturised mass spectrometer on Beagle 2 for chemical analysis, to search for any signs of life.

Whilst mass spectrometry is an applications-based technique, a unique strength in Swansea has been in instrument design with over ten large mass

spectrometers built and designed in Swansea, some of which have appeared in commercial products, earning hundreds or millions of pounds for the UK economy.

Over the last two years the Facility has conducted research that has been published in 220 Research Excellence Framework (REF) submissions, supporting 815 researchers. Since the last grant was awarded, the Facility has been named on 3,583 publications. I believe this success is down to the magnificent team who operate the Facility."

Mass Spectrometry supports research into possible first case of leprosy in UK

Scientists from Swansea University's Mass Spectrometry Facility have assisted with research on the 1,500 year old skeleton of a Scandinavian man found in Essex who may have been the first to bring leprosy to Britain. Swansea University collaborated with scientists from the University of Southampton, the University of Surrey, University of Birmingham, Leiden University in the Netherlands, and the English Heritage Centre for Archaeology on the two-year project which successfully yielded DNA that was good enough for the leprosy strain to be identified.

Research as Art 2015

Research as Art is the only competition of its kind, open to Swansea University researchers from all subjects, and with an emphasis on telling the research story, as well as composing a striking image.

A distinguished judging panel of senior figures from the Royal Institution, NewScientist.com, the Science and Technology Facilities

Council, and Art Across the City, selected a total of 17 winners from entries to the Research as Art 2015 competition. Along with the overall winner, there were judges' awards in four categories relating to engagement – inspiration, emotion, illumination, and innovation – and 12 highly-commended entries. The winners were announced in June.



Overall Research as Art winner: “Rising from the page: bringing medieval women to life”, Dr Sparky Booker (History and Classics).

This image by Dr Sparky Booker, a postgraduate researcher in the department of History and Classics within the College of Arts and Humanities), in collaboration with Dr Deborah Youngs, won the 2015 Research as Art competition.

Dr Booker said: “This image symbolises two key challenges of my research on women and their access to justice during the Middle Ages. Firstly, I am reliant on written, legal sources that are formulaic, often brief and incomplete, and rarely record the woman's voice. Secondly, in my attempts to interpret this information, how do I lift them off the page and produce a rounded picture of medieval women?”

I collate the material, look for patterns, shape arguments and create my own theories about their experiences. But in doing so, there is always the danger that I assume their experiences are the same and, like this paper chain of women, produce a homogenised view. I know, nevertheless, that it is still worthwhile to try to reconstruct and understand, and the figures rising out of the manuscripts represent the hopefulness of historical research as well as its dangers.”



2015 winner of the ‘Inspiration’ Award: ‘MicroMoon’, Dr Mark Coleman, (College of Engineering)

The image shows a metallic particle measuring around half a millimetre in diameter.

Dr Coleman said: “When I was a boy I always wanted to be an astronaut, to explore the universe, to seek out new life and all that. I may not be an astronaut, but who knows; one day I may design a material that will travel into space.”

2015 winner of the 'Impact' Award: 'Passion and Perseverance: Researchers Playing their Part', Liza Penn-Thomas (English)

Liza Penn-Thomas said: "Every researcher sees their own passion reflected back at them in their work. This surreal image captures the inspiration and perspiration that carries us through a long project.

We need both passion for our subject and dedicated perseverance. The subject of my PhD, theatre tradition in Wales, helped convey this dual nature of research."



2015 winner of the 'Emotion' Award: 'Who am I?', Dr Tracey Sagar & Debbie Jones (Criminology)

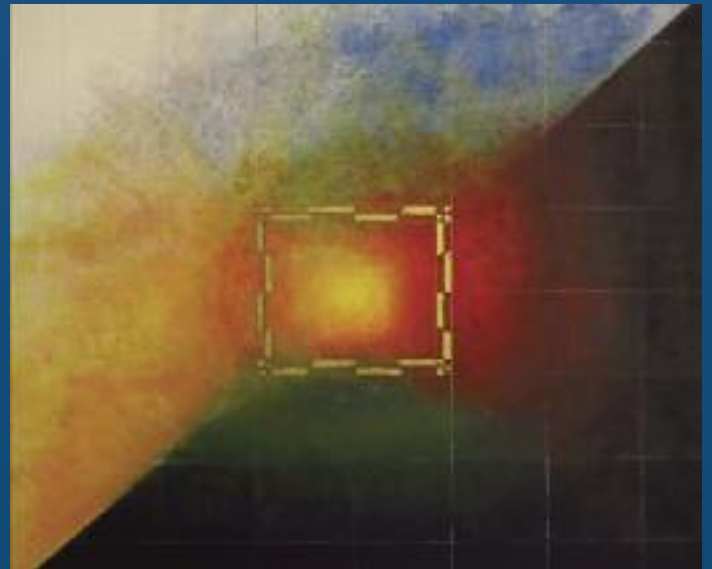
This visualisation is taken from the Student Sex Work Project film 'Fog of Sex' which has provided a powerful mechanism to ensure that the narratives of student sex workers are heard and better understood.

The impact and understanding of the image is described by 'Belle' whose sex work persona is portrayed.



2015 Highly Commended: 'Can art help communicate social theory?', John Parker (Geography)

Using elements from Duccio and Turner (glittering gold, the golden ratio, colour primaries, vortices) this picture attempts to express the ambitiousness, multiplicity, ambiguity and urgency of French sociologist, social psychologist and philosopher, Émile Durkheim's social theory.



2015 Highly Commended: 'The Archives Treasure Hoard', Richard Burton Archives, Ian Vine (Information Services and Systems)

More than 50 individual photographs were overlaid to create this image of the Richard Burton Archives at Swansea University, a treasure trove filled with gems of ideas and information to be mined, polished and presented to the world..



Swansea University scientist reveals 'food of the future'

Dr Carole Llewellyn from Swansea University's Algal Team has revealed research at the forefront of her field in a BBC documentary which set out to investigate the role of good and bad fats in our diet.

In *The Truth About Fat*, Dr Llewellyn explained how microscopic algae - the microalgae - can play an important role in providing us with the good fats our bodies need.

Dr Llewellyn said: "Our research focuses on microalgae so tiny we can't see them with the naked eye. These microalgae are

microscopic living cells that can contain high levels of omega oils, the benefits of which have been well documented."

The programme showcased the facilities at the Centre for Sustainable Aquaculture Research (CSAR) where Dr Llewellyn put the algae under the microscope to reveal how just a teaspoon of seawater can contain thousands of microalgal cells.

However, due to the volumes of seawater that would be needed to obtain a sufficient biomass for extraction, the CSAR Algal team

is cultivating the microalgae to high concentrations in large fence bioreactors called photobioreactors. Dr Llewellyn said: "Under controlled conditions of light and nutrients, the algae grow to high concentrations, making it easier to harness their omega-3 fatty acids.

The resulting dry biomass is actually edible, and very rich in protein, nutrients and omega oil. From this we can produce a pure algal oil. It is a food for the future and is also very sustainable."



Dr Carole Llewellyn with algae samples in the lab

Addressing major societal changes

Launched in November 2011, the Research Institute for Applied Social Sciences (RIASS) is a flagship, cross-University collaboration bringing together the very best research within the social, human, health and environmental sciences.

This May, RIASS held a conference showcasing the wealth of applied social science research being conducted across the University, with the aim of disseminating knowledge to colleagues across the campus, and generating opportunities for collaborative research.

In a session entitled 'Health & demographic change', Professor Vanessa Burholt, Director of the Centre for Innovative Ageing (CIA), shared findings from CFAS-Wales (Cognitive Function and Ageing Study). This is a two-decade long study from 1993 to 2013 looking at changes in the social support networks of older people. The session also included a talk by Dr Camilla Knight, senior lecturer in Sport Psychology in the College of Engineering in which she explored the critical need for parental involvement and support in developing

children's sporting potential.

Other highlights included a talk by Professor Nuria Lorenzo-Dus and Dr Cristina Izura from the Language Research Centre, on the first multidisciplinary, empirical study of the communicative practices used by online sexual predators in a session entitled 'Secure Societies – protecting freedom and security'. The session also included work by Dr Stuart Macdonald and colleagues on assessing and responding to the threat of cyberterrorism. Also presenting in this session was Dr Sergei Shubin from Geography, whose work has attracted £1.3 million in developing inter-disciplinary approaches to poverty alleviation in connection with the Swansea-Siavonga partnership.

Addressing the event, Pro Vice Chancellor Professor Iwan Davies said the conference reflected the depth and breadth of social science research activity at the University, and congratulated the community on its integral role in Swansea's success in the Research Excellence Framework (REF) 2014.



The role of parents in children's sport was discussed at the RIASS conference

Student Sex Work Project reveals survey results



A three-year project funded by the BIG Lottery focusing on student attitudes to student participation in the sex industry has produced results from a survey involving more than 6,750 students across the UK.

The Student Sex Work Project was officially launched in September 2012 with the overarching aim of developing and delivering an integrated sexual health service for all students in Wales. Dr Tracey Sagar and Mrs Debbie Jones of Swansea University's Centre for Criminal Justice and Criminology lead the project.

Results of the survey revealed that nearly 5% of UK students that responded to the survey have worked in the sex industry, more male students than female students are likely to be involved, and that nearly 22% of students have considered working in the sex industry.

Dr Tracey Sagar said: "We now have firm evidence that students are engaged in the sex industry across the UK. Our research has not been about encouraging students into sex work, but about supporting students who are in sex work. And this is the reality: students are engaged in sex work occupations. This is a fact. Another fact is that some of them need advice, support and sometimes assistance to step away from the industry. It is vital now that universities arm themselves with knowledge to better understand student sex work issues and that university services are able to support students where support is needed."

The project is led by Swansea University in partnership with Terrence Higgins Trust, Cardiff and Vale University Health Board – Integrated Sexual Health Service, the National Union of Students Wales and Newport Film School.

A Wild Life – Professor Rory Wilson



Professor Rory Wilson and colleague tagging a whale shark

Professor Rory Wilson is the Swansea University zoologist who pioneered the Smart 'Daily Diary' Tag, an animal tracking device which allows us an insight into the secret lives of some of the most elusive and endangered creatures on earth.

A lead scientific consultant for National Geographic's "Great Migrations" series, his work takes him to extreme habitats, from the Poles to the Equator. He studies such dangerous or bizarre creatures as leopards, sharks, albatrosses, elephant seals, armadillos, and sloths.

In May he was named as one of Britain's 50 most influential conservation heroes by BBC Wildlife Magazine, alongside other eminent figures such as broadcasters Sir David Attenborough and Chris Packham and primate scientist Jane Goodall.

Professor Wilson developed a fascination with animal movement as a 15 year old: "At about that age" he recalls, "I identified that animals move in terribly unpredictable ways, and lots of things on earth don't do that."

His curiosity grew and he formed the idea for an animal tagging system in the early eighties when working on his dissertation on

penguins in South Africa. He expanded into other species from there and has published extensively on the behaviour and energy expenditure of airborne, land and marine animals.

In 2006, Professor Wilson was awarded a Rolex Award for Enterprise to develop the electronic tag that would track the movement of marine and land animals. Wilson called the device a "daily diary," and it provides astounding data on animals' movements and their environments.

"It's a self-contained, maniacal scribe," Professor Wilson says. "Once it's attached to an animal, whether fish, beast or fowl, the device records a mass of data — everything from the animal's minute movements through space and time, to the temperature of its environment and light levels. In other words you can be there — really be there — with the animal when you couldn't be otherwise."

News of the fledgling device reached National Geographic producer David Hamlin, who, at the same time, had the idea for a programme called "Great Migrations", an examination of the epic, global movements, and often life and death

struggles, made every year by the largest and smallest creatures on earth.

Hamlin brought Professor Wilson in as chief scientific consultant on "Great Migrations", with the Swansea team. The impact of the programme was phenomenal, reaching over 330 million people in 166 countries and in 34 languages.

Professor Wilson said: "We've gone from just looking at how animals move to actually putting tags on them to see exactly how they move, even though we can't see them. So we can follow whales a kilometre under the water or soaring birds a kilometre up in the air."

Professor Wilson cites cross-disciplinary research as essential: "I am thrilled to be on the 'Wildlife Power List' in BBC Wildlife Magazine but it is as much a tribute to 'the team' as to me. Without brilliant physicists, computer scientists and off-the-wall biologists, I'd be dreaming more than doing."

"Animal movement science requires so much from so many disciplines. Computer scientists can create incredible visualisations from the animal tagging data and can show us how animals are moving and behaving. It can give us insight into areas such as animal migration and control. Locusts for example - we can find out where they go, what they're going to do in a population sense; and how a population is changing, expanding due to climate change and so on."

The next big thing is predicting animal movement, explains Professor Wilson: "Imagine looking at an animal and saying: I'm going to tell you what it's going to do next — and being right."

It is a new chapter for Professor Wilson, and one that goes a long way to fulfilling a lifelong dream. As he explains: "When you put a tag on a new animal you've never tagged before, you have no idea what's going to come out of the book when the tag comes back, so you take it off, you read it, you put it on the computer, and all of a sudden, it's this incredible story that's been written by the animal on where it's been and what it's done. And you're the first person to open the book on it. It really is a thrill."

Graduates in Focus: Annemiek Ballesty



Annemiek Ballesty (nee Alsem) is a 1989 Business Studies graduate. She is currently the Vice President for Fossil Group (FOSL) in China.

Why did you choose to study at Swansea University?

Swansea University had a respected business department (Management Science). The degree was more analytical than some of the other courses I looked at and the University was located on the coast in a beautiful part of the UK. I attended an open day and felt very welcomed by the staff, not to mention blown away by the coastline around Swansea.

What did you enjoy most about your course at Swansea?

I enjoyed the wide variety of subjects we covered, from accounting and law to industrial relations. The professors and staff were very supportive; I enjoyed the case studies and the IT lab was state of the art at the time.

What are you doing now career-wise?

I am Vice President - Commercial Operations - Asia Pacific for Fossil Inc (FOSL). I am based in Hong Kong. Fossil is an American corporation which designs, manufactures and distributes its own and licensed accessories brands, including Burberry, Michael Kors, Diesel and Emporio Armani. Our primary categories are watches, jewellery and leather goods. I am responsible for our Asia Pacific operations, for all channels from e-commerce to direct retail. We service over 5,000 direct retail and partner-managed points of sale both

online and bricks and mortar. My team's role is to ensure we buy the right product, deliver it to the right point of sale at the right time with all the marketing, visual merchandising and training needed to support the customer-facing retail team.

How has Swansea University and your course helped you with your chosen career path?

My university degree was an important stepping stone in my career path. It gave me a good grounding in all aspects of general management and I still apply some of the theory I learned at Swansea in my daily business life.

What are the most challenging parts of your job?

Hitting the numbers. When you work for a quoted company you have to hit the numbers every quarter and if you don't you have to explain. Asia Pacific is a very important region for Fossil so it receives a lot of attention from our corporate office as well as the stock market. You need to remain motivational for your staff and manage pressure.

What are the most rewarding parts of your job?

I love interacting with people – my team, customers and suppliers; and seeing my team grow both in experience and confidence. I am quite competitive so hitting the numbers gives me a kick. I also get to work with amazing brands and am very lucky that I get to travel to many interesting places.

What was the best careers advice you were given?

Understand your strengths and your passions and focus on them.

What advice do you have for current students and new graduates?

During your time at university make sure you socialise and become involved in different activities. Don't just stay within your department or hall of residence. University is as much about developing your interpersonal skills as your technical skills.

What are your plans for the future?

Big question. Having lived in six different countries I continue to want to explore the world so who knows what comes next.

What have you done that you are most proud of?

Personally, I have two beautiful children. I am definitely proud of being a mother. Professionally, being promoted to Vice President and being transferred to Asia.

What are your favourite memories of your university years at Swansea?

Living in Mumbles with a great group of friends, several of whom I am still in touch with today, almost 25 years later.

And finally, describe yourself in three words...

Passionate; Hardworking; Fun-loving.

Stay connected

Graduates of Swansea University become members of the Alumni Association, a network of past students who support each other professionally and socially around the world.

Alumni have an important role in helping the next generation. If you would like to feature in future publications, or indeed, if you can offer work placements or research opportunities to our students, please email alumni@swansea.ac.uk



Keep up-to-date with news from Swansea University and the Alumni Association
www.swansea.ac.uk/alumni

Young Researchers - Dr Guillaume Méric



Dr Méric holding a petri dish containing a culture of *Staphylococcus aureus* (MRSA).

Dr Guillaume Méric is a microbiologist from Swansea University Medical School, currently working in the Medical Microbiology and Infectious Disease group led by Professor Samuel Sheppard.

My research interests are generally broad, centring on the population biology, ecology and evolution of bacteria, particularly in the clinical context. The goal is to contribute to a better understanding of infectious disease, and to provide useful insights on the evolution and control of pathogenic bacteria that can infect us.

Throughout my research career, I have been particularly interested in foodborne human pathogens causing gastroenteritis, such as *Campylobacter* or *Escherichia coli* and also more recently in hospital-acquired infections, such as those caused by *Staphylococcus* and MRSA.

Since my arrival at Swansea University in 2012, I have contributed to the publication of nine research papers, mainly on *Campylobacter*, the leading cause of bacterial

gastroenteritis in the world. With Professor Sheppard, I have also co-edited a reference book on *Campylobacter* ecology and evolution. More recently, my work focused on MRSA and their ability to exchange DNA with other species of *Staphylococcus*.

My research in Swansea typically involves the generation and comparison of hundreds of bacterial genomes to understand the genetic basis of infectious disease as well as the evolution of pathogens. Our laboratory also has the advantage of bringing these results to the bench, and testing the function of these genes *in vitro* or in cellular models.

Last year, I was awarded an individual research fellowship by the Welsh Government through the National Institute of Social Care and Health Research (NISCHR) to work on bacterial genomics and eHealth research. This collaboration with the Centre for Improvement in Population Health through E-records Research (CIPHER), led by Professors Ronan Lyons and David Ford of Swansea University, will use the Secure Anonymised Information Linkage (SAIL) database to

investigate links between bacterial isolates from Welsh hospitals, and anonymised socio-demographic or medical history of the corresponding infected patients. This project will hopefully allow us to better understand the causes and consequences of infectious disease in Wales.

Generally speaking, I feel that the advent of affordable bacterial genomics is defining new paradigms in microbiology and infectious disease, as it unlocks an unprecedented amount of information from the DNA of bacteria, which is their 'blueprint' in a way. It holds the promise of a clearer understanding of what makes us sick and how, but also opens the door to multiple and complicated challenges that are mainly technological.

So much data is generated that new methodology needs to be created to identify the important elements that will allow clinicians and doctors in hospitals to improve diagnostics and treatment.

Swansea University, thanks to recent, considerable and timely investment from the Medical Research Council (MRC) in the Cloud-based Infrastructure for Microbial Bioinformatics (CLIMB) Consortium, is steadily becoming a very important place to be for researchers who want to tackle these challenges, and I feel very fortunate to be at the heart of this significant and strategic effort.

Factfile:

2014 – Awarded a Research Fellowship by the National Institute for Social Care and Health Research (NISCHR) for research in the Sheppard Laboratory

2012 – Recruited as postdoctoral researcher, Medical Microbiology and Infectious Disease group (Sheppard Laboratory, Swansea University Medical School)

2012 – PhD, Institute of Food Research (IFR) and University of East Anglia (Norwich, UK), supervised by Dr. Sacha Lucchini

2007 – MSc, Microbial Ecology and Evolutionary Biology (National Institute for Applied Sciences (INSA) / University of Lyon, France)

2005 – BSc, Microbiology (University of Lyon, France)