

HORIZON 2020





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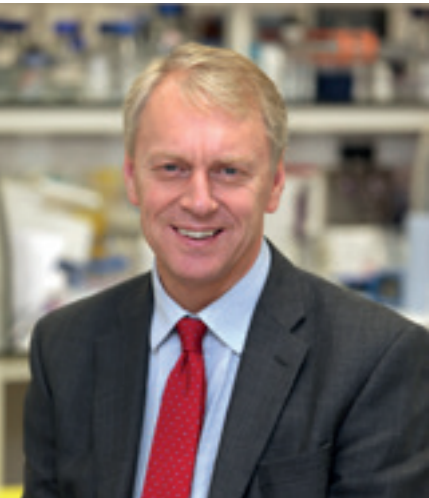
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Welcome to Horizon 2020

Professor Chris Day
Vice-Chancellor

I'm delighted to introduce to you Newcastle University's Horizon 2020 brochure which celebrates our first successes in the EU's Horizon 2020 Framework Programme for Research and Innovation. The brochure showcases the first 50 Horizon 2020 awarded projects across our three Faculties. These projects include:

- i. collaborative efforts across European and international borders in tackling major global challenges
- ii. European Research Council grants that fund the best researchers to undergo research at the frontier of science
- iii. Marie Skłodowska-Curie Training Networks and Fellowships that provide dedicated training of early stage and experienced researchers respectively

Together these projects are worth approx. €25 million to the University and involve around 450 partner institutions from across Europe and beyond.

This success is a clear recognition of the excellent research that we do at Newcastle and serves as a tribute to the exceptional dedication of our staff to engage with such a highly competitive yet important programme. I would therefore like to use this opportunity to thank our staff for their continuous engagement with Horizon 2020, which helps build research excellence and cross-border collaborations and therefore contributes to the international standing of our university.



Medical Sciences

ChiLTERN

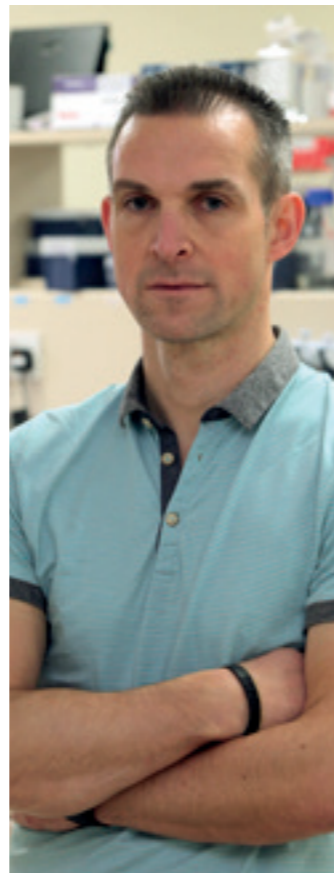
Children's Liver Tumour European Research Network

Programme: Health, demographic change and well-being
 Research and Innovation Action – Consortium of 20 partners
 Project Coordinator: University of Birmingham
 Principal Investigator at Newcastle: Dr Gareth Veal (Newcastle Cancer Centre Pharmacology Group, NICR)



This project builds on a unique opportunity to undertake a comprehensive research programme as part of the single largest clinical trial ever undertaken in children diagnosed with liver cancer. An international Phase 3 trial, the Paediatric Hepatic International Tumour Trial (PHITT), will aim to recruit 1200 patients with liver tumours internationally in a 5 year period; 300 of these within Europe in the period of the Horizon 2020 funded Children's Liver Tumour European Research Network (ChiLTERN) project. The project will aim to provide biological, technological and pharmacological platforms which will address a number of key issues currently facing children with liver cancer.

Dr Veal's team at the Northern Institute for Cancer Research in Newcastle will play a key role in leading a major Work Package within the ChiLTERN project, sponsored through the CRUK Clinical Trials Unit of the University of Birmingham. This will involve the development of novel biomarkers to predict children who may have an increased risk of developing toxicity, a major drawback to current treatment, with serious long term effects including hearing loss, renal toxicity and cardiac impairment. The results from ChiLTERN will allow future therapy strategies to be developed to utilise alternative chemotherapy regimens in those children at risk whilst maintaining high cure rates. Importantly, results generated from ChiLTERN will provide important information that can be directly applied to reducing therapy-induced toxicity in a significantly larger number of children with cancers other than liver tumours.



ChondUb

Identification and characterisation of novel WWP2 substrates and their role in chondrogenesis and osteoarthritis

Programme: Marie Skłodowska-Curie Actions
 Individual Fellowship (IF)
 Project Coordinator: Newcastle University
 Principal Investigator: Professor David Young, Institute of Cellular Medicine
 Research Fellow: Dr Marta Anna Radwan

Osteoarthritis (OA) is characterised by slowly progressing cartilage degradation. It is the most common form of arthritis affecting >10% of the EU population over 60 years of age, and the major cause of disability worldwide. The pathogenesis is still elusive and there is no cure available. Current treatment involves pain relief and joint replacement surgery. Chondrocytes are the only cells residing in healthy cartilage, and are responsible for cartilage development and turnover.

WWP2 is an ubiquitin ligase involved in stem cell differentiation, cancer development and immune responses, and importantly plays crucial roles in cartilage and craniofacial development. However, its role in cartilage biology and OA development has not been elucidated. Ubiquitination regulates most signalling pathways and cellular processes.

I aim to identify and characterise WWP2 substrates in human chondrocytes. In addition, I will investigate the role of WWP2 and its substrates in cartilage biology with the goal to uncover molecular targets for treatment of OA and other WWP2-related diseases.

The project is aligned with the "Health, Demographic Change and Well-Being" and "Understanding disease" challenges of Horizon 2020. The work will be performed under supervision of Dr. Weissman at the National Cancer Institute (US) and Prof. David Young at Newcastle University (UK).

COMSTAR

The effects of early-life adversity on cognition: A comparative approach

Programme: European Research Council (ERC)
Advanced Grant
Project Coordinator: Newcastle University
Principal Investigator: Professor Daniel Nettle, Institute of Neuroscience
Website: <http://www.danielnettle.org.uk/>



This project asks: what are the long-term consequences of experiencing stress early in life? Unusually, it asks this same question in humans, and in a common local species of bird, the European starling. Information from the two species is complementary. In humans, we often have long-term follow-up, and we can ask people to report their levels of stress and other variables. However, we can't experimentally manipulate childhood stress. This means we can only ever reveal correlations, and never be sure if they are causal. In the starlings, we can take nestlings soon after they hatch, and cross-foster them to grow up in nests with different levels of competition, giving us a clearer window on cause and effect. The extraordinary thing about these two very different species is that many of the consequences of early-life stress look rather similar: for example, individuals that were stressed early on show signs of accelerated aging; are prone to have high body masses as adults; and behave in more impulsive ways. We are trying to develop new methods for understanding what the effects of early-life adversity are in our two species, whether it matters for adult health and wellbeing, and, importantly, why these effects should exist.



ELFBAD

L-form bacteria, biotechnology and disease

Programme: European Research Council (ERC)
Advanced Grant
Project Coordinator: Newcastle University
Principal Investigator: Professor Jeff Errington, Institute for Cell & Molecular Biosciences



Despite the clear importance and multiple functions of the bacterial cell wall, many bacteria appear to be able to switch into a cell wall deficient or "L-form" state. L-forms are very heterogeneous in size and shape and generally require osmotic stabilisers, such as 0.5 M sucrose, for viability. However, by lacking the requirement for a cell wall, L-forms are completely resistant to common cell wall antibiotics, such as β -lactams, and they are probably protected from some elements of innate immune recognition. L-forms are therefore of potential interest in relation to their possible involvement in human disease. They have often been reported in clinical specimens obtained from patients with recurrent or persistent infections or on long term prophylaxis with β -lactam antibiotics.

Unfortunately, until recently, most of the work on L-forms had been done in the pre-molecular era, when it was difficult to characterise the L-forms and particularly to identify their origins and relationship with other resident pathogenic bacteria. Recently, several labs have revisited the L-form issue and started to apply modern molecular and cell biological methods.

The proposal is divided into three Themes:

- Improve our understanding of key features of the L-forms of our best characterised model system, *B. subtilis*, including both basic science and possible biotechnological applications
- Extend our analysis of basic L-form biology into several diverse bacterial systems, of relevance to both biotechnology and infectious disease
- Explore in detail the possible clinical relevance of L-forms, aiming to identify specific clinical situations in which they are relevant or, at least, to establish model systems in which the interactions between L-form and mammalian systems can be studied

EPoS

Elucidating Pathways of Steatohepatitis

Programme: Health, demographic change and well-being
 Research and Innovation Action - Consortium of 10 partners
 Project Coordinator: Newcastle University
 Project Leader(s): Professor Quentin M. Anstee, Institute of Cellular Medicine
 Co-Investigators: Prof Christopher P. Day, Prof Ann K. Daly, Prof Fiona Oakley,
 Prof Heather Cordell
 Website: <http://www.epos-nafld.eu/>



Non-Alcoholic Fatty Liver Disease (NAFLD) is strongly associated with obesity, diabetes and other features of the metabolic syndrome. It is rapidly becoming the leading cause of liver disease in the UK and worldwide.

The work of the EU H2020 funded EPoS (Elucidating Pathways of Steatohepatitis) consortium builds upon work started during the previous FP7-funded FLIP project to explore the reasons for individual variation in NAFLD outcomes. The ultimate goal will be to develop a global understanding of how inter-individual differences and environmental factors interact at the cellular, organ and organism level to promote the development of NAFLD and, importantly, the progression to fibrosing steatohepatitis (NASH) and end-stage liver disease. EPoS will establish what drives the progression to fibrosing steatohepatitis, cirrhosis and end-stage liver disease; and integrate this knowledge to inform cost effective diagnosis, prevention and treatment strategies for patients.

Bringing together scientists and clinicians from leading centres in Europe to further understand the disease, the €6 million EPoS programme has been funded by the first round of the European Union Horizon 2020 framework for health research and innovation. The EPoS consortium is led from the Institute of Cellular Medicine, Newcastle University and includes investigators based at the University of Cambridge and iXscient in the UK; Institute of Cardiometabolism and Nutrition in Paris (France); Consiglio Nazionale delle Ricerche-Istituto di Fisiologia Clinica di Pisa, Università degli Studi di Torino, and the Università degli Studi di Firenze (Italy); University of Helsinki (Finland); Steno Diabetes Center and Nordic Bioscience (Denmark); Johannes Gutenberg-Universität Mainz (Germany).

ETN-FPI

European Training Network on Full Parallax Imaging

Programme: Marie Skłodowska-Curie Actions
 Innovative Training Network (ITN)
 Consortium of 8 partners
 Project Coordinator: TTY-Saatio, Finland
 Principal Investigator at Newcastle: Professor Jenny Read, Institute of Neuroscience
 Website: <http://www.full-parallax-imaging.eu/>



Current displays fall far short of truly recreating visual reality. This can never be achieved by painting an image on a flat surface such as a TV screen, but requires a *full-parallax* display which can recreate the light traveling in every direction through every point in space. Recent years have seen major developments towards this goal, promising a new generation of ultra-realistic displays with applications in medicine, informatics, manufacturing, entertainment, gaming and more. However, achieving this will require a new generation of researchers trained both in the relevant physics and in the biology of human vision.

The European Training Network on Full-Parallax Imaging (ETN-FPI) aims at developing this new generation. Fifteen early-stage researchers will be employed on novel inter-disciplinary FPI projects, working on theoretical and applied optics, multi-dimensional image processing, and visual neuroscience. The training program began with a week-long training school on "3D displays and the human visual system" hosted here at Newcastle.

The researchers trained within the network are expected to gather competitive skills which will enhance their employability in a rapidly growing sector in academia and industry, helping position Europe as a leader in this emerging multidisciplinary field.



FAIR-PARK-II

Conservative iron chelation as a disease-modifying strategy in Parkinson's disease: a multicentric, parallel-group, placebo-controlled, randomized clinical trial of deferiprone

Programme: Health, demographic change and well-being
Research and Innovation Action – Consortium of 15 partners
Project Coordinator: Centre Hospitalier Regional et Universitaire de Lille, France
Principal Investigator at Newcastle: Professor David Burn, Institute of Neuroscience
Website: <http://fairpark2.eu/>



FAIR PARK II is a 5-year clinical study to validate the effectiveness and tolerance of an iron-trapping treatment, deferiprone, in people with early Parkinson's. Pre-clinical evidence using this drug suggests that reducing cerebral iron overload could limit neuronal death and therefore slow down the progression of Parkinson's disease.

This study will compare two groups of patients. One group will receive deferiprone for 9 months and the other a placebo (non-active substance). Deferiprone or placebo will be randomly assigned to patients and neither patients nor the study doctors will know which group the patients belong to (a "double-blind" study design). Each patient's participation in the study will last 10 months and will include 6 visits to hospital.

Clinical, biological (blood test, lumbar puncture) and radiological (MRI) examinations will be carried out during the visits to analyse more precisely the disease mechanisms and the interactions with the treatment. Study doctors will use several different scales to assess the symptoms relative to Parkinson's disease in order to measure treatment effects.

24 expert centres spread across eight European countries (France, Spain, Portugal, England, Germany, the Netherlands, Czech Republic and Austria) are involved in this study, with the goal of recruiting 338 patients by 2018.

GermAge

The aging germ cell – biological pathways, risk factors and mechanisms underlying an increasing medical and socio-economic problem

Programme: Health, demographic change and well-being
Research and Innovation Action – Consortium of 4 partners
Project Coordinator: Technische Universitaet Dresden
Principal Investigator at Newcastle: Professor Mary Herbert, Institute of Genetic Medicine
Website: <https://cgcweb.med.tu-dresden.de/germage/>



The central aim of GermAge is to understand the molecular mechanisms underlying the decline in germ cell quality during aging. We aim to characterise determinants, pathways and risk factors for age-dependent infertility, aneuploidy and inherited diseases. The ever-increasing trend to delay parenthood represents a serious risk to human reproductive health, and has major socio-economic implications within Europe and other developed economies. GermAge will primarily focus on female reproductive ageing, however, we will also build on emerging evidence on the detrimental effects of male ageing on the health of offspring. Our highly synergistic interests include the chromosome biology of oocytes, quality control mechanisms such as the spindle assembly checkpoint, and the mutation load in aging spermatogonial stem cells. The project will include work on mouse and human germ cells. The work will contribute to improved diagnostic tests based on new biomarkers of oocyte quality and individualized genomics on age-related quality decline of oocytes and spermatocytes. We also aim to raise awareness of the risks associated with postponing parenthood and to highlight the importance of the problem from a public health perspective.

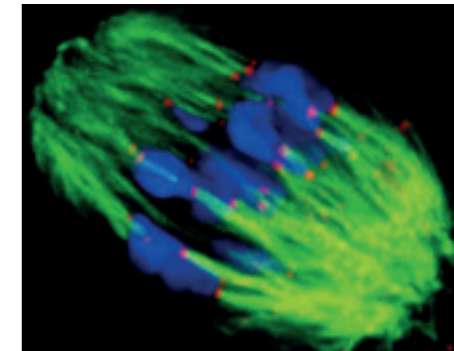


Figure 1
Image shows oocyte chromosomes aligned on meiotic spindle in preparation for the 1st meiotic division, which generates a haploid genome in preparation for fertilisation. Chromosomes are shown in blue, microtubules are shown in green and centromeres are shown in red.

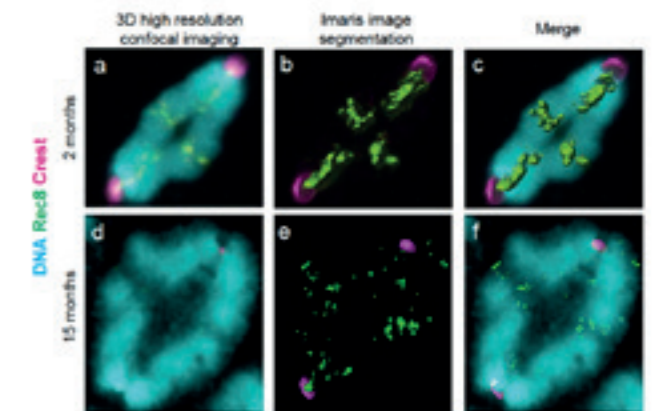


Figure 2
Images show the deterioration in oocyte chromosome structure and the decline in chromosomal cohesin during female ageing. Top panel shows an example of a chromosome from a mouse oocyte from a 2 month old female and the bottom from a 15 month old female. Cohesin (Rec 8) is shown in green and Crest (red) labels the centromeres.

HOARDEVOL

The evolution of food hoarding: from environmental pressures to brain mechanisms

Programme: Marie Skłodowska-Curie Actions
 Individual Fellowship (IF)
 Project Coordinator: Newcastle University
 Principal Investigator: Dr Tom Smulders, Institute of Neuroscience
 Research Fellow: Dr Lindsay Henderson

The emergence of novel behaviours not only provides insight into the selective pressures which cause behaviours to evolve, but also provides an opportunity to understand how existing physiological and neurological mechanisms can be modified to control them. Some species have evolved to store rather than consume food while availability is high, for consumption when food is scarce. This behaviour is called food hoarding and is present in multiple taxa. Key physiological and neurological mechanisms have been shown to underpin an animal's motivation to hoard food, including the stress hormone corticosterone (cort) and consumption regulating neuropeptides, neuropeptide Y (NPY) and agouti-related protein (AgRP). However, whether variation in cort, NPY and AgRP, or an interaction between them regulates hoarding behaviour is yet to be examined. This project will experimentally address these knowledge gaps using two closely related bird species that live in social groups during winter when hoarding motivation is high: the food hoarding coal tit (*Periparus ater*) and the non-hoarding great tit (*Parus major*). We will identify the brain regions activated during high hoarding motivation between hoarding and non-hoarding species, and examine whether cort, NPY and AgRP receptor density, and NPY/AgRP expression within these regions is linked to hoarding behaviour.

MBD

Mapping bacterial division in *Bacillus subtilis*

Programme: Marie Skłodowska-Curie Actions
 Individual Fellowship (IF)
 Project Coordinator: Newcastle University
 Principal Investigator: Professor Jeff Errington, Institute for Cell & Molecular Biosciences
 Research Fellow: Dr Agata Lucyna Starosta

The bacterial cell cycle is of fundamental importance and an important potential antibiotic target; however, many details of the molecular mechanisms involved remain elusive. Sporulation in *Bacillus subtilis* is an important model system for cell cycle studies. Here, I propose applying the ribosome profiling method, not only to identify novel factors involved in the *B. subtilis* cell cycle, but also to create a map of factors regulating this process. I will use advanced genetic methods and microscopic techniques to characterize the functions of the novel factors, gaining insights into their role in the cell cycle.

My extensive experience in prokaryotic translation gained in the laboratory of Dr. Daniel Wilson in Munich, Germany, combined with the exceptional genetics and cell biology expertise of the laboratory of Prof. Jeff Errington in Newcastle, England, creates a great opportunity to study important fundamental aspects of bacteria, with potential implications for healthcare, drug discovery and industrial biotechnology, as well as providing the foundation for a successful independent career in science.

MIA

Multidisciplinary Institute for Ageing

Programme: Spreading Excellence and Widening Participation
 Specific Grant agreement and Coordination and Support Action – Consortium of 5 partners
 Project Coordinator: Comissao de Coordenacao e Desenvolvimento Regional do Centro, Portugal
 Principal Investigator at Newcastle: Professor Thomas von Zglinicki, Institute for Cell and Molecular Biosciences
 Website: <http://miacoimbra.org/>



This project describes a teaming partnership between the University of Coimbra (UC) (partner in a low-performing country) and the Newcastle University Institute for Ageing (NUIA) to create, in Coimbra, a new Centre of Excellence in Ageing Research – the Coimbra Multidisciplinary Institute of Ageing (MIA). This flagship project for the Centro Region of Portugal is aligned with the regional RIS3 and will be coordinated by the regional authority CCDRC (strategic coordinator) and by UC (operational coordinator).

In this teaming project, NUIA as the senior partner is supported by two further world-leading centres in translational ageing research: the University Medical Center Groningen (UMCG) and the Mayo Clinic Robert and Arlene Kogod Center on Aging.

The overall objective of the new Centre for Excellence is to improve health and wellbeing of an ageing population. It will gain a forefront position in ageing research and develop, validate and deliver interventions that can extend human healthy life expectancy and minimize inequalities in healthy lifespan. It will train young researchers and engage the public in support and implementation of innovative good practices. MIA will be integrated into the Ageing@Coimbra Vitality Campus, a European Innovation Partnership on Active and Healthy Ageing Reference Site.



The attendants of the first MIA-Portugal Teaming International Summer School on Ageing that was held in Algor, Algarve in April 2016. 21 students from Portugal, UK, Netherlands, Denmark, Germany and Lithuania participated in the Summer School and the following institutions were involved: University of Coimbra, Newcastle University, University Medical School Groningen, Mayo Clinic, University of Copenhagen, University of Cologne, Unilever, Biocant, Treat-U, Luzitin, CNC.IBILI, Instituto Pedro Nunes, Previum.

MTT

How does future thinking work? Uncovering its evolutionary and developmental origins

Programme: Marie Skłodowska-Curie Actions
 Individual Fellowship (IF)
 Project Coordinator: Newcastle University
 Principal Investigator: Dr Tom Smulders, Institute of Neuroscience
 Research Fellow: Dr Gema Martin-Ordas

Time is always moving forward. However, humans can remember past events (eg. our last holiday) and imagine and plan for events that have not happened (eg. our next job interview); that is, we can mentally travel back into our past (i.e. episodic memory) and our future (i.e. future thinking). Having a comprehensive picture of this capacity involves not only studying Mental Time Travel (MTT) in humans but also in non-human animals. Due to conceptual and methodological limitations, the field of MTT is still in its infancy. Comparative and interdisciplinary studies - involving more than one animal species - are needed to understand the evolution and development of this capacity. I aim to address this issue by developing two novel empirical approaches to test how non-human primates (chimpanzees), corvids (rooks) and human children use information about past events to think and imagine future events. The results of this research will provide crucial insights for theories of cognitive development (eg. the relation between theory of mind, executive functioning and mental time travel) and human evolution (eg. the role of mental time travel in humanity's ability to build upon knowledge or skills generation after generation).

NoHoW

Evidence-based ICT tools for weight loss maintenance

Programme: Health, demographic change and well-being
 Research and Innovation Action - Consortium of 12 partners
 Project Coordinator: Region Hovedstaden, Denmark
 Principal Investigator at Newcastle University: Professor Falko Sniehotta, Institute of Health & Society
 Website: <http://nohow.eu/#home>



Obesity-related problems pose a significant threat to the health and wellbeing of people across Europe, and impose a growing economic burden. Effective programmes to help people lose weight already exist, but most people regain the weight they lose: weight loss maintenance is difficult. If weight loss is not maintained, its health benefits are significantly reduced.

To tackle this problem, as part of the NoHoW project, psychologists at the Institute of Health & Society are investigating the most effective behavioural strategies for people with obesity to achieve weight loss maintenance. Our knowledge of these strategies will be combined with cutting-edge activity-monitoring technology and distilled into a 'Toolkit' for weight loss maintenance. The Toolkit's core components focus on people's motivation, their control of energy-balance behaviours (eating and being physically active) and their regulation of stress and emotions.

The effectiveness of the Toolkit will be tested in a randomised controlled trial by people with obesity who have lost weight in Denmark, Portugal and the UK. We will discover whether different combinations of the core components are more or less effective than others in supporting weight loss maintenance over the course of 18 months. The end result of the project should be an evidence-based, technologically-advanced Toolkit to help more obese people keep the weight off long term.

OptoVision

Optogenetic investigation of cortical layer-6 neuron contributions to dynamic visual perception

Programme: European Research Council (ERC)
 Starting Grant
 Project Coordinator: Newcastle University
 Principal Investigator: Dr Michael Schmid, Institute of Neuroscience



In order to achieve a more complete understanding of neocortical brain functions in health and disease, we need to delineate the computations of specific cell populations and how they dynamically exert their impact on connected target neurons.

Here, I propose to investigate the functions of neurons in layer-6 of primary visual cortex (V1) and their influence on connected neurons, i) in the lateral geniculate nucleus (LGN) of thalamus, and ii) to more superficially located V1 cells, during visual perception in non-human primates (NHP). My core hypothesis is that due to their unique connectivity with LGN on one hand and layer-4 of V1 on the other hand, layer-6 neurons are in an ideal position to facilitate the transmission of visual information from LGN to V1 when spatial attention is allocated to specific visual targets.

The central aim of my investigations will be to delineate how the computations and network interactions of layer-6 neurons dynamically change during attention and ultimately lead to improved behavioral performance. To this end, selective targeting and manipulation of LGN projecting V1 layer-6 neurons will be enabled using the methods of optogenetics (ChR2) and viral delivery techniques. Methods to measure brain activity and assess the impact of optogenetic stimulation will include behavioral assessment, functional magnetic resonance imaging (fMRI) and extra-cellular multi-electrode electrophysiology. Data analysis will include measures of directed (functional and effective) connectivity and en-/decoding approaches using a (predictive coding) Bayesian inference framework. With this approach we will gain new insights into the basic principles of information flow in the visual system.

Beyond their immediate impact on basic science, the results of the experiments will be contributing towards a better understanding of the diseased brain such as in schizophrenia or attention-deficit-hyperactivity (ADHD) syndrome.

PECTIN

The microbial degradation and utilization of complex pectins by *Bacteroides* in the human intestine

Programme: Marie Skłodowska-Curie Actions

Individual Fellowship (IF)

Project Coordinator: Newcastle University

Principal Investigator: Professor Harry Gilbert, Institute for Cell & Molecular Biosciences

Research Fellow: Dr Immacolata Venditto

The large bowel is colonized by a community of microbes, the microbiota, which has a significant impact on human health and nutrition. Complex carbohydrates are the major nutrients available to the microbiota. The most extensive glycan degrading organisms in the microbiota are the *Bacteroides*. Given the importance of glycans (complex carbohydrates) to the microbiota, dietary and nutraceutical strategies, based on complex carbohydrates, can, potentially, be deployed to ensure that the structure of this ecosystem maximizes human health.

This approach, however, is greatly restricted by a critical lack of understanding of the mechanisms by which complex glycans are metabolized by the microbiota. Significantly, the wealth of genomic/metagenomic microbiota sequence data now available presents an exciting and unparalleled opportunity to make decisive advances in our understanding of glycan metabolism in the human large bowel.

This project seeks to capitalize on this genomic information, in harness with recent functional data from the host laboratory, to understand the mechanisms by which **pectin**, the major component of the human diet that is metabolized by the microbiota.

The data will inform **novel prebiotic** and **probiotic** strategies to maximise the impact of the microbiota on human health. At a generic level, by understanding glycan resource allocation in the microbiota, this project will provide novel insights into the molecular mechanisms that lead to the evolution of novel glycanase functions in this highly competitive microbial ecosystem. This, in turn, will provide a robust functional context to bioinformatic-based predictive biology.

PROMISS

Prevention of Malnutrition in Senior Subjects in the EU

Programme: Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy

Research and Innovation Action – Consortium of 23 partners

Project Coordinator: Stichting VU-VUmc, Netherlands

Principal Investigator at Newcastle: Professor Carol Jagger, Institute of Health & Society

Website: <http://www.promiss-vu.eu/>



PROMISS is a multi-country project aiming to turn the challenge of tackling malnutrition in community-dwelling older persons into an opportunity for healthy ageing for the future.

The PROMISS consortium contains worldwide expertise in epidemiology, clinical trials, geriatrics, nutrition, physical activity, microbiomics, as well as in behaviour, consumer, sensory and computer sciences and builds on strong collaborations with the food industry and SMEs. Data from well-established longitudinal ageing studies and national nutritional surveys will be combined with new data from short- and long-term intervention studies in older persons at risk. This holistic approach will provide insight into the causal pathways between diet, physical activity, appetite and malnutrition, thereby providing the necessary evidence to develop optimal, sustainable and evidence-based dietary and physical activity strategies to prevent malnutrition and enhance active and healthy aging.

PROMISS will also deliver food concepts, products and persuasive technology to support adherence to these strategies, specifically developed with older user involvement to meet the needs and fit the preferences of older consumers. In close collaboration with stakeholders, PROMISS will translate these strategies into practical recommendations to guide policy and health professionals at EU- and Member States level. PROMISS promises prevention of malnutrition, additional healthy life years and a strengthening of EU's food industry.



RUBICON

Training network for research on molecular and biomechanical interactions in connective tissue disorders

Programme: Marie Skłodowska-Curie Actions
 Research and Innovation Staff Exchange (RISE) - Consortium of 5 partners
 Project Coordinator: Università degli Studi dell'Aquila, Italy
 Principal Investigator at Newcastle: Professor Michael Briggs, Institute of Genetic Medicine
 Website: <http://rubicon-network.org>
 Twitter @rubicon_network



RUBICON is a global network for staff exchange of scientists and for research training into connective tissue disorders. It will bring together leading scientific groups from 5 European and 5 non-European countries to study the molecular and biomechanical factors involved in the pathophysiology of connective tissues. The ambitious objectives of RUBICON are to increase our knowledge of the mechanisms underlying diverse connective tissue disorders, identify commonalities and targetable pathways.

RUBICON participants will investigate genetic determinants, extracellular matrix components, biochemical factors and signalling pathways involved in connective tissue homeostasis and pathogenesis. Extensive training will include new technologies and innovation, study design, interdisciplinary laboratory research, data analysis and research management. Webinars, courses and meetings will provide additional opportunities for training and networking, and will also be open to external participants.

RUBICON is a unique interdisciplinary network including cell biologists, molecular biologists, animal biologists, morphologists, geneticists, biochemists and clinicians who will cross-fertilise their respective research fields. The long-term goal of RUBICON is to consolidate a class of young scientists to secure future developments in the connective tissue arena and create a solid basis for further collaboration in this field.



TIPPDECRA

Tolerogenic immunotherapy with peptide-pulsed dendritic cells in rheumatoid arthritis

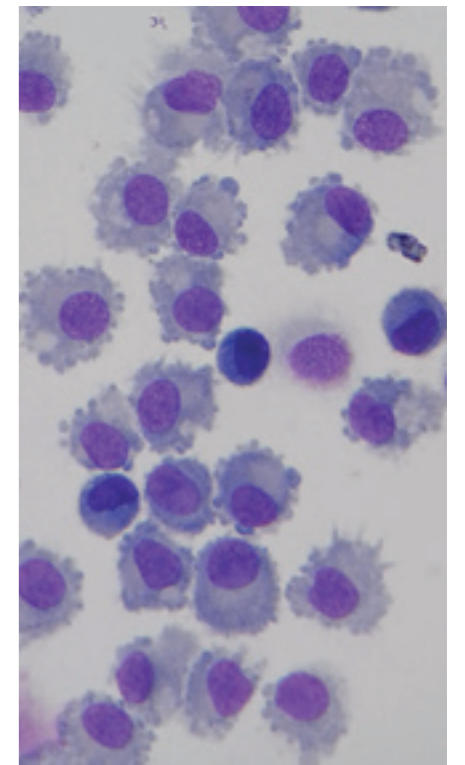
Programme: Marie Skłodowska-Curie Actions
 Individual Fellowship (IF)
 Project Coordinator: Newcastle University
 Principal Investigator: Dr Catharien Hilkens, Institute of Cellular Medicine
 Research Fellow: Dr Rachel Spiering

Rheumatoid arthritis (RA) is a disabling and painful disease of the joints that affects roughly 1 in 200 people in Europe. RA is caused by the patient's own immune system attacking their joints. Currently available drugs can improve symptoms, but there is no cure. We have developed a new treatment for RA, which involves growing specialized white blood cells - called '**tolerogenic dendritic cells**' or 'tolDCs' - from the patient's own blood. These are then injected back into the patient's knee joint to switch off destructive immune attacks. We now wish to target these tolDCs to relevant joint components, to make this cell therapy more effective. We have selected heat shock proteins (HSPs) as the target for our tolDCs, because they are present at high levels in the rheumatic joint and they can be a focus of immune attack in RA. We therefore propose to load tolDCs with HSPs and test their ability to switch off harmful immune cells.

The aims are to:

1. Define a cocktail of HSPs suitable for loading on tolDCs
2. Show that HSP-loaded tolDC can switch off harmful immune cells

If successful, this work will underpin a clinical trial with HSP-loaded tolDCs in RA patients.



Therapeutic tolerogenic dendritic cells

VISION DMD

Phase 2 Clinical Trials of Vamorolone: An Innovative Steroid-like Intervention on Duchenne Muscular Dystrophy

Programme: Health, demographic change and well-being
Research and Innovation Action – Consortium of 7 partners

Project Coordinator: Newcastle University

Principal Investigator: Professor Katherine Bushby, Institute of Genetic Medicine

Website: <http://vision-dmd.info/>



VISION-DMD aims to advance clinical development of the orphan drug vamorolone as a new therapy to revolutionise care for all patients with Duchenne muscular dystrophy (DMD) by 2020, in line with IRDiRC goals. DMD is an incurable, rare muscle wasting disease; boys progressively weaken, lose ambulation and death occurs by early adulthood. Corticosteroids (CS) are widely recognised to increase muscle strength over a certain period of time and delay disease progression but global acceptance as standard of care is very variable due to severe side effects. Vamorolone is an innovative steroid-like drug designed to retain CS efficacy and improve membrane stabilization with reduced side effects. Vamorolone has the potential to increase the therapeutic window to slow disease progression and improve quality of life and lifespan for all DMD patients.

Building on positive preclinical and Phase 1 results funded by government grants and international patient groups and based on FDA and EMA advice, VISION-DMD proposes a Phase 2 registration directed clinical programme aimed at an affordable therapy. Phase 2a will study the safety and tolerability of ascending doses of vamorolone in ambulant DMD boys; Phase 2b will demonstrate the efficacy and safety of two doses of vamorolone in young ambulant DMD boys. Both studies will be followed by extension studies for long term safety and efficacy data collection. The project proposes the Time to Stand Test as a highly relevant and reliable primary endpoint. Innovative exploratory serum biomarkers and novel wide scale MRI techniques will be used to investigate the vamorolone pharmacodynamics and the effect on muscle cellular pathology. Vamorolone will meet the unmet need for better treatment for DMD with widespread acceptance and potentially be used in combination with stratified therapies as they are developed. The consortium links the leading networks TREAT-NMD and CINRG with ECRIN-ERIC for trial delivery and regulatory undertakings in Europe/US.



Science,
Agriculture and
Engineering

Biorapid

Rapid Bioprocess Development

Programme: Marie Skłodowska-Curie Actions
 Innovative Training Network (ITN) - Consortium of 9 partners
 Project Coordinator: Newcastle University
 Principal Investigator: Professor Jarka Glassey, School of Chemical Engineering & Advanced Materials
 Website: <http://www.bio-rapideu/>



Reducing lead times of new medicinal drugs to the market by reducing process development and clinical testing timeframes is a critical driver in increasing European (bio)pharmaceutical industry competitiveness. Despite new therapeutic principles or regulatory initiatives to enable more efficient production, such as Quality by design (QbD) with associated Process Analytical Technology (PAT) tools, the slow progress in the development of new bioactive compounds still limits the availability of cheap and effective medicines. In addition, the competitiveness of European (bio)pharma industry is impacted by the unavailability of suitably trained personnel.

The Rapid Bioprocess Development ITN, employing 15 ESRs, brings together industrialist and academic experts with its main aim to address this critical need by developing an effective training framework in rapid development of novel bioactive molecules from the very early stages of potency and efficacy testing to the biomanufacturing process characterisation and effective monitoring. The main focus of the research is on oncology related proteins and recombinant proteins to be used in diabetes treatment, although the resulting methods will be applicable to other bioactive molecule process development.

CPSE Labs

CPS Engineering Labs - expediting and accelerating the realization of cyber-physical systems

Programme: Information and Communication Technologies
 Innovation Action - Consortium of 9 partners
 Project Coordinator: Fortiss GMBH, Germany
 Principal Investigator at Newcastle: Professor John Fitzgerald, School of Computing Science
 Website: <http://www.cpse-labs.eu/>



CPSE Labs is an international network of design laboratories supporting businesses developing products and services that exploit cyber-physical systems (CPS). CPS use networked computing technology to enhance non-ICT products and services. Examples include autonomous agricultural robots, advanced manufacturing, and smarter logistics.

Mastering the engineering of complex and trustworthy CPS is key to successful innovation and product development. Current CPS, however, are often engineered at high cost and with unknown risks, and recent progress from R&D projects is not readily accessible to most innovators. CPSE Labs therefore equips innovators with CPS engineering infrastructure, knowledge and tools for realizing new products and services, completing new value chains, and transferring experience between application domains.

CPSE Labs build on centres of CPS design expertise – in Madrid, Munich, Oldenburg, Newcastle, Stockholm and Toulouse – growing their innovation support capabilities. To this end, we have built a portfolio of experiments in which we help transfer research results into novel products and services; we then gather and promote the experience and best practices gained from experiments. We are developing a marketplace for sharing platforms, architectures and software tools for trustworthy CPS engineering. The ultimate goal is to establish a CPS engineering framework that sets a world-wide standard.

Feed-a-Gene

Adapting the feed, the animal and the feeding techniques to improve the efficiency and sustainability of monogastric livestock production systems

Programme: Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy
 Research and Innovation Action – Consortium of 23 partners
 Project Coordinator: Institut National de la Recherche Agronomique
 Principal Investigator at Newcastle: Professor Ilias Kyriazakis, School of Agriculture, Food & Rural Development
 Website: <http://www.feed-a-gene.eu/>



Feed-a-Gene aims to better adapt different components of monogastric livestock production systems (i.e. pigs, poultry and rabbits) to improve the overall efficiency and to reduce the environmental impact. This involves the development of new and alternative feed resources and feed technologies, the identification and selection of animals that are better adapted to fluctuating conditions, and the development of feeding techniques that allow optimizing the potential of the feed and the animal.

To reach this overall objective, the project will:

- Develop new and alternative feeds to make better use of local feed resources and by-products of the food and biofuel industry
- Develop methods for the real-time characterization of the nutritional value of feeds to better use and adapt diets to animal requirements
- Develop new pig and poultry traits of feed efficiency and robustness to select animals that are more adapted to changes in feed and environmental conditions
- Develop simulation models of livestock functioning to better understand and predict nutrient and energy utilization of animals along their productive trajectory
- Develop new management systems for precision feeding and precision farming combining data and knowledge from the feed, the animal and the environment using innovative monitoring systems, feeders and decision support tools
- Evaluate the overall sustainability of new management systems developed by the project
- Demonstrate the innovative technologies developed by the project in collaboration with partners from the feed industry, breeding companies, equipment manufacturers and farmers' organisations to promote the practical implementation of project results
- Disseminate new technologies that will increase animal production efficiency, whilst maintaining product quality and animal welfare and enhance EU food security to relevant stakeholders



H-DisNet

Intelligent Hybrid Thermo-Chemical District Networks

Programme: Secure, clean and efficient energy
 Research and Innovation Action – Consortium of 7 partners
 Project Coordinator: Katholieke Universiteit Leuven, Belgium
 Principal Investigator at Newcastle: Professor Tony Roskilly, Sir Joseph Swan Centre for Energy Research
 Website: <https://www.h-disnet.eu/>

The innovative thermo-chemical (TC) network technology of H-DisNet will contribute to next-generation district energy networks. The technology will exploit the high chemical potential of absorption processes for loss-free transport and storage of energy. It will be applied to form an intelligent district network with thermal, electric and gas networks.

This intelligent thermo-chemical district network will significantly

- increase energy efficiency of heat transport and storage
- increase utilization of residual heat and renewables at low temperature
- contribute to a wider usage of district networks by allowing heating and cooling in one multifunctional network and by including the additional services drying and humidity control
- reduce the primary energy usage by forming heat cascades.



The project will serve to gain the required knowledge about processes, components and network applications and to demonstrate the feasibility to allow the industrial R&D to pick up the technology and to bring it to the market. Three project work levels serve this purpose:

1. The partners develop the TC components and intelligent network technology and demonstrate it in residential and industry environments
2. Smart control strategies and network identification tools will be developed by building advanced TC network simulators
3. Based on simulation and case study data, an economic and environmental assessment will determine the potential of the technology and establish the path to market.

IbD

Intensified by Design® for the intensification of processes involving solids handling

Programme: Advanced manufacturing and processing
Innovation Action – Consortium of 22 partners

Project Coordinator: Innovacio i Recerca Industrial i Sostenible SL (IRIS), Spain

Principal Investigator at Newcastle: Dr Kamelia Boodhoo, School of Chemical Engineering & Advanced Materials

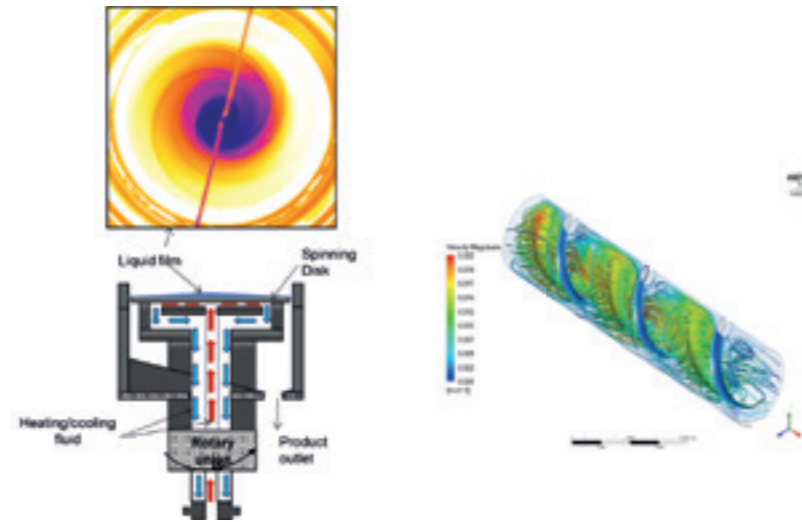
Website: www.ibd-project.eu



IbD® will create a holistic platform for facilitating process intensification in processes in which solids are an intrinsic part, the cornerstone of which will be an intensified-by-design® (IbD). The IbD approach involves the use of robust data about a process to 'redesign', modify, adapt and alter that process in a continuous, intensified system, and will be the new paradigm in the intensification of processes based on statistical, analytical and risk management methodologies.

The IbD Project will deliver the EU process industry with an affordable and comprehensive devices-and-processes design-platform endeavoured to facilitate process intensification (PI), which specially targets - but is not limited to - solid materials processing. Five industry case studies will be implemented in mining, ceramics, pharmaceutical, non-ferrous metals and chemicals industries to validate the IbD methodologies, tools, PI modules, control and fouling remediation strategies and the ICT Platform itself for the industrial implementation of PI in processes involving solids.

The School of Chemical Engineering and Advanced Materials, Newcastle University, is represented in this project by Dr Kamelia Boodhoo, Dr Anh Phan and Dr Vladimir Zivkovic,



with a share of the total funding awarded of €638,913. The contribution of the research team at Newcastle University, working in close collaboration with David Reay & Associates, will involve extensive characterisation of the capabilities of existing PI technologies such as spinning disk, oscillatory flow and microfluidic systems as well as more novel concepts such as Taylor-Couette technologies for solids processing applications.

INTO-CPS

Integrated Tool chain for model-based design of CPSs

Programme: Information and Communication Technologies
Research and Innovation Action – Consortium of 11 partners

Project Coordinator: Aarhus Universitet, Denmark

Principal Investigator at Newcastle: Professor John Fitzgerald, School of Computing Science

Website: <http://into-cps.au.dk/>



It is easier than ever to make products 'smart' by embedding computing devices in them, and to network them so that they share information and cooperate. The potential benefits are enormous: for example, at Newcastle we work on smart technologies to increase rail network capacity safely, to match supply to demand in urban infrastructure, and to better manage buildings' power consumption. These 'cyber-physical' systems integrate computing, mechanical, electrical, control and other systems, so their design needs to be more multi-disciplinary and collaborative than that of conventional products.

INTO-CPS is creating one of the first industry-strength toolchains for multidisciplinary design of cyber-physical systems. We link established tools using a 'Functional Mockup Interface' that allows us to integrate their outputs in a semantically sound way. This allows us to integrate diverse models of system architectures, performance and physical behaviour, to simulate system performance from an early design stage, select optimal designs and avoid pitfalls before committing to expensive physical prototypes. We are piloting the tool chain with companies in the agriculture, building automation and automotive industries with the aim of reducing development costs as a result of better early design.

ITS Observatory

Programme: Smart Green and Integrated Transport
 Coordination and Support Action – Consortium of 10 partners
 Project Coordinator: European Road Transport Telematics Implementation Coordination
 Organisation – Intelligent Transport Systems & Services Europe (ERTICO), Belgium
 Principal Investigator at Newcastle: Professor Phil Blythe, School of Civil Engineering & Geosciences
 Website: <http://its-observatory.eu/>



Intelligent Transport Systems (ITS) have been growing in importance for over 20 years, yet a European one-stop information portal is still lacking, and sound evidence of ITS measures' effectiveness and benefits is insufficient and inaccessible. The ITS Observatory bridges this knowledge gap through its tools for gathering and delivering deployment information and insights for ITS stakeholders.

The ITS Observatory is a flexible and user-friendly crowd-sourced knowledge platform, which offers the ITS community the opportunity to demonstrate innovations, programmes and projects, organisations, solutions and other ITS information to the wider community. It also serves as a 'one-stop shop' to find ITS-related information, people and places, and acts as a starting point for professional interactions.

"If you need to find information about which ITS projects are deployed where, or if you want the world to know about your own ITS success stories and product portfolio, then the ITS Observatory is meant for you".

The ITS Observatory is a project funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 653828. For the European Union the ITS Observatory is a high priority offering seen as a future motor for pan-European ITS deployments. The ITS Observatory will have an owner who will continue to offer the services for the long term, beyond the duration of the project (which concludes in March 2017), based on a sustainability strategy and business model.

M4ShaleGas

Measuring, monitoring, mitigating, managing the environmental impact of shale gas

Programme: Secure, clean and efficient energy
 Research and Innovation Action - Consortium of 18 partners
 Project Coordinator: Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek
 TNO, Netherlands
 Principal Investigator at Newcastle: Dr Neil Thorpe, School of Civil Engineering & Geosciences
 Website: www.m4shalegas.eu



The accelerated development of shale gas is accompanied by growing public concern regarding the safety of shale gas extraction and its impact on human health and the environment. In Europe, shale gas exploitation could increase our resources and production of natural gas; a critical fuel for the transition to a low carbon energy system. However, there are a number of important gaps in our present understanding of shale gas exploration and exploitation, and a strong need for independent, science-based knowledge of its potential impacts in a European context.

The M4ShaleGas program focuses on reviewing and improving existing best practices and innovative technologies for measuring, monitoring, mitigating and managing the environmental impact of shale gas exploration and exploitation in Europe. The technical and social research activities will yield integrated scientific recommendations for

1. how to minimize environmental risks to the subsurface, surface and atmosphere
2. propose risk reduction and mitigation measures
3. how to address the public attitude towards shale gas development.

The 18 research institutes from 10 European Union Member States that collaborate in the M4ShaleGas consortium cover different geopolitical regions in Europe, including Member States that are at the forefront regarding shale gas exploration and exploitation in Europe as well as Member States where shale gas exploitation is not yet being actively pursued. The project governance ensures proper integration of all research activities. Knowledge and experience on best practices is imbedded by direct collaboration with US and Canadian research partners and input from representatives from the industry. During the project, results will be public and actively disseminated to all stakeholders.

Newcastle University is working on the surface aspects task, with Newcastle's specific contribution being on the investigation of the environmental impacts of transport operations associated with fracking.

MOLMIC

Molecular Biology of Sulfide-Oxidizing Nitrate-Reducing Microorganisms Involved in Microbiologically-Influenced Corrosion

Programme: Marie Skłodowska-Curie Actions

Individual Fellowship (IF)

Project Coordinator: Newcastle University

Principal Investigator: Professor Ian Head, School of Civil Engineering & Geosciences

Research Fellow: Dr Sven Lahme

Corrosion is a multi-billion € problem for the oil and gas industry. Microbiologically-influenced corrosion (MIC) in this sector is usually linked to souring of oil fields due to production of toxic and corrosive H_2S by sulfate-reducing bacteria (SRB). Injection of nitrate into sour oil fields is a bioengineering strategy, which removes H_2S by promoting sulfide-oxidizing nitrate-reducing bacteria (soNRB). However, incomplete oxidation of H_2S to corrosive sulfur intermediates can aggravate corrosion. This suggests that a predictive understanding of soNRB metabolism and appropriately adjusting the nitrate dosage can prevent the risk for soNRB-mediated MIC.

MOLMIC will investigate the ecophysiological role of soNRB in oil field corrosion by using isolated cultures, specific enrichments and complex communities. It aims to

1. understand the sulfur metabolism of oil field soNRB by gathering genomic and transcriptomic information through next-generation sequencing
2. link different soNRB metabolisms to corrosion by monitoring corrosion rates and gene expression under various conditions
3. evaluate soNRB MIC and countermeasures in complex communities by testing different nitrate dosing strategies and predictive genetic diagnostics.

MOLMIC will significantly contribute to our understanding of nitrate-mediated corrosion and has the potential to design a molecular biological corrosion monitoring tool for the oil industry.

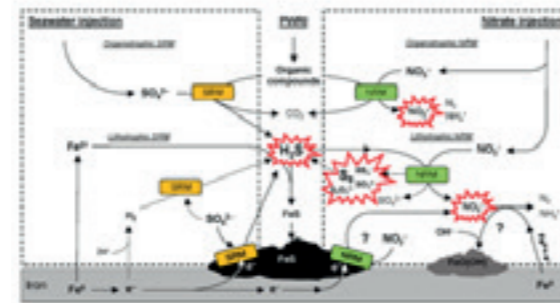


Figure 1 Metabolic and chemical processes potentially involved in corrosion during seawater injection (left) or nitrate injection (right) during oil production. Produced water re-injection (PWRI) into the reservoir potentially increases availability of organic compounds (e.g. acetate), which can sustain organotrophic sulfate-reducing microorganism (SRM) or nitrate-reducing microorganisms (NRM). Modified from Lahme and Hubert (2016) Corrosion risks associated with (bio)chemical processes in sour systems due to nitrate injection or oxygen ingress. In *Microbiologically Influenced Corrosion in the Upstream Oil and Gas Industry*, Ed. Torben Lund Skovhus, Dennis Enning and Jason Lee. CRC Press, US, in press.

NOVELOG

New cooperative business models and guidance for sustainable city logistics

Programme: Smart, Green and Integrated Transport

Research and Innovation Action – Consortium of 28 partners

Project Coordinator: Centre for Research and Technology Hellas, Greece

Principal Investigator at Newcastle: Mr Tom Zunder, NewRail, School of Mechanical & Systems Engineering

Website: <http://novelog.eu/project-partners/>



Urban areas represent the greatest challenges for freight transport and service trips, both in terms of goods distribution and service allocation performance, and environmental impacts (air emission, traffic congestion, road safety, accidents and noise). The purpose of the proposal is the enabling of knowledge and understanding of freight distribution and service trips by providing guidance for implementing effective and sustainable policies and measures. This guidance will support the choice of the most optimal and applicable solutions for urban freight and service transport, and will facilitate stakeholder collaboration and the development, field testing and transfer of best governance and business models.

This shall be achieved through:

- the targeted understanding of urban freight and service trips, fostered by data collection on city logistics
- field testing and implementation of representative city logistics measures
- the development and application of a modular, integrated evaluation framework for the assessment of these measures
- the development of a typology between cities and potential city logistics components
- the provision of guidance to cities, shaping consistent implementation channels for successful solutions, all according to the local needs and constraints.

These activities will be accompanied by the production of practical tools that could support the take-up impact of NOVELOG project to wider international city and industrial networks and beyond the project's lifetime. NOVELOG will contribute to the European Commission's research and policy agenda through the generation of sound knowledge that introduces a new approach to guidance strategies that supports a more sustainable urban environment.

PRISMACLOUD

Privacy and Security Maintaining services in the CLOUD

Programme: Information and Communication Technologies
 Research and Innovation Action - Consortium of 16 partners
 Project Coordinator: AIT Austrian Institute of Technology GmbH
 Principal Investigator at Newcastle: Dr Thomas Gross, School of Computing Science
 Website: <https://prismacloud.eu/>



PRISMACLOUD is an EU funded research project developing the next generation of cloud security technologies. The project brings novel cryptographic concepts and methods to practical application to improve the security and privacy of cloud based services and make them usable for providers and users. The **main idea and ambition** of PRISMACLOUD is to **enable end-to-end security** for cloud users and provide tools to **protect their privacy** with the best technical means possible - **by cryptography**.

With a current volume of over USD 100 billion and annual growth rates of over 10%, the world-wide market for cloud computing can be considered as the major growth area in ICT. However, big companies and public authorities are reluctant to entrust their most sensitive data to external parties for storage and processing. The reason for their hesitation is clear: there exist no satisfactory approaches to adequately protect the data during its lifetime in the cloud.

PRISMACLOUD addresses these challenges and yields a portfolio of novel security enabled cloud services, guaranteeing the required security for sensitive data in the cloud. Similarly, user privacy issues are addressed by data minimization and anonymization techniques as well as by privacy-preserving cryptographic techniques.

ReArrhenius

Re-evaluation of temperature correction in microbial biodegradation kinetics

Programme: Marie Skłodowska-Curie Actions
 Individual Fellowship (IF)
 Project Coordinator: Newcastle University
 Principal Investigator: Dr Russell Davenport, School of Civil Engineering & Geosciences
 Research Fellow: Dr Paola Meynet



The investigation of the environmental fate of chemicals intentionally released into the environment is priority for the European regulatory frameworks for chemicals, as it is essential for preventing long-term adverse ecological effects and human exposure. In environmental exposure assessment, the effect of temperature oscillations (daily/seasonal) on the rate of micropollutant degradation is routinely predicted using correction factors (such as Q_{10}), based on the Arrhenius equation, which gives degradation kinetic rate constants as a function of temperature.

Despite its popularity, the Q_{10} approach is still the object of great debate among scientists, as the Arrhenius relationship holds over a very small temperature range for biological systems, in which microorganisms can function, and it is based on the assumption of compositional and functional ubiquity of the microbial communities. However, a change in temperature does not only impact chemical kinetic rates, but also determines shift and adaptation of the microbial population towards degraders that survive and perform better at the altered temperature.

This project aims to evaluate the validity of using a Q_{10} approach to predict the rates of micropollutant biodegradation in aerobic biological systems, integrating biotransformation assays, kinetic modelling and high-throughput microbiological assays. This multidisciplinary work is bringing together the expertise of renowned European academic (Newcastle University, Swiss Federal Institute for Environmental Science and Technology) and industrial (Bayer CropScience, AstraZeneca) institutions, and will result in the production of new rigorous methodologies for environmental exposure assessment.



REFRESH

Resource Efficient Food and dRink for the Entire Supply cHain

Programme: Climate action, environment, resource efficiency and raw materials
 Research and Innovation Action – Consortium of 26 partners
 Project Coordinator: Stichting Dienst Landbouwkundig Onderzoek, Netherlands
 Principal Investigator at Newcastle: Dr Gavin Stewart, School of Agriculture, Food & Rural Development
 Website: <http://eu-refresh.org/>



REFRESH is an EU research project contributing directly towards Sustainable Development Goal 12.3 of halving per capita food waste at the retail and consumer level and reducing food losses along production and supply chains, reducing waste management costs, and maximizing the value from un-avoidable food waste and packaging materials.

REFRESH focuses on the reduction of avoidable waste, synthesising evidence to better understand the drivers of food waste. The project takes an innovative, systemic approach to curb food waste through a holistic "Framework for Action". This is underpinned with guidance to legislators and policy makers to help support effective governance to tackle food waste. Dr Matt Grainger and Dr Gavin Stewart are the Newcastle University project partners, building decision-support tools to inform evidence-based policy. Working closely with economists at the University of Bologna, they are integrating Agent-Based and Bayesian models in an object orientated framework to provide probabilistic predictions of how differing policies will impact on food waste.

REFRESH runs from July 2015 to June 2019 and is funded by the Horizon 2020 Framework Programme of the European Union under Grant Agreement No. 641933.

Road2CPS

Strategic action for future CPS through roadmaps, impact multiplication and constituency building

Programme: Information and Communication Technologies
 Coordination and Support Action – Consortium of 7 partners
 Project Coordinator: Steinbeis Innovation gGmbH, Germany
 Principal Investigator at Newcastle: Professor John Fitzgerald, School of Computing Science
 Website: <http://www.road2cps.eu/>



The miniaturisation of sensing, actuating and computing components together with the increasing number of systems that interact in strongly networked environments have given rise to the concept of Cyber-Physical Systems (CPS), which aims to address the challenges of complexity and unpredictability that such environments bring. These challenges and the need to optimise performance and ensure safety and security are partially addressed by current research in areas such as transport, health, smart grids and smart cities. Nevertheless, there is a huge gap between theoretical concepts, technical developments and successful application, as well as considerable differences in maturity of CPS between application domains.

Road2CPS responds to this situation by:

- Analysing past and ongoing projects, identifying gaps and bridging efforts to amplify their impact
- Developing technology, application and innovation roadmaps for CPS to catalyse early adoption
- Enhancing CPS implementation and exposing exploitation opportunities via case studies
- Bringing together key players into task forces to contribute to plans for future actions

Our work provides European organisations with the direction required to establish their own future visions of CPS environments, supporting their efforts to stay at the forefront of new developments and preparing them for future challenges in the industrial application of CPSs.

SEEVCA

Self-Enforcing Electronic Voting For Commercial Applications

Programme: European Research Council (ERC)
 Proof of Concept Grant
 Project Coordinator: Newcastle University
 Principal Investigator: Dr Feng Hao, School of Computing Science



This project aims to commercialise Self-Enforcing E-Voting (SEEV), a new paradigm of verifiable e-voting technologies without involving any trusted tallying authorities (invented under the ERC starting grant No. 106591), for classroom voting and related applications. A prototype of a Verifiable Classroom Voting (VCV) system, based on the SEEV technology, has been developed by the PI's team at Newcastle University, and in the past two years has been successfully trialled in real classroom teaching within the campus with very positive student feedbacks. With the funding support from this Proof of Concept project, we plan to extend this VCV prototype to make it commercially available to all universities and schools, with basic user accounts provided for free, while premium user accounts will be available for a fee but bundled with dedicated support and more computing resources. Additional revenues include advertisements and professional services (which provide customized VCV to companies, organizations and governments for various voting applications). The received revenues will be used to maintain/upgrade the system, sustain the growth in users and cover the cost of creating and protecting the IPR on SEEV (several potentially patentable developments on SEEV are being made in the ERC project).

Although the focus of this proposal is on classroom voting and similar small-scale elections, the underlying SEEV technology is also applicable to large-scale elections. It has the promising potential to address many security defects in today's (unverifiable) e-voting products that have been widely used in many democratic countries (eg. USA, Brazil and India). The IPR created during the course of this project will serve our long-term goal of commercialising SEEV for large-scale national elections and enhancing worldwide democracy in a digital age.

SETRIS

Strengthening European Transport Research and Innovation Strategies

Programme: Smart, Green and Integrated Transport
 Coordination and Support Action - Consortium of 18 partners
 Project Coordinator: Newcastle University
 Principal Investigator: Professor Mark Robinson, School of Mechanical & Systems Engineering
 Website: <http://newrail.org/setris/>



SETRIS provides a cohesive and coordinated approach to research and innovation strategies for **all transport modes** in Europe.

To fulfil the aim, SETRIS:

1. identifies synergies between the transport European Technology Platforms (ETPs) strategic research and innovation agendas (SRIAs) and between these and relevant national platforms
2. reviews and updates the existing SRIAs for each of the transport ETPs within a multi-modal and integrated transport system framework
3. benchmarks past and present research initiatives affecting the achievement of integrated transport SRIAs and market uptake
4. defines comprehensive, credible and realistic implementation plans for each SRIA in a coordinated framework of running ETPs
5. supports, shapes and contributes to future TRA events

SETRIS outputs will be implemented through the involvement, for the first time, of representatives of all the relevant transport modes and all five of the transport-related ETPs, below, within one single collaborative initiative:

- ACARE - Advisory Council for Aviation Research and Innovation in Europe
- ALICE - Alliance for Logistics Innovation through Collaboration in Europe
- ERRAC - European Rail Research Advisory Council
- ERTRAC - European Road Transport Research Advisory Council
- Waterborne

The ETPs will develop a framework for long-term cooperation between actors from all transport modes that will support the cohesive and coordinated approaches to integrated transport research and innovation strategies.



SOILCARE

Soil Care for profitable and sustainable crop production in Europe

Programme: Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy

Research and Innovation Action - Consortium of 28 partners

Project Coordinator: Dr Rudi Hessel Soil, Water and Land Use, Alterra, WUR, Netherlands

Principal Investigators at Newcastle: Professor Mark Reed, School of Agriculture, Food & Rural

Development and Dr Elizabeth Oughton, School of Agriculture, Food & Rural Development

Website: <http://www.soilcare-project.eu>



European crop production is to remain competitive while reducing environmental impacts, requiring development and uptake of effective soil improving cropping systems. The overall aim of SOILCARE is to identify and evaluate promising soil-improving cropping systems and agronomic techniques increasing profitability and sustainability across scales in Europe. A trans-disciplinary approach will be used to evaluate benefits and drawbacks of a new generation of soil improving cropping systems, incorporating all relevant bio-physical, socio-economic and political aspects.

Existing information from literature and long term experiments will be analysed to develop a comprehensive methodology for assessing performance of cropping systems at multiple levels. A multi-actor participatory approach will be used to select promising soil-improving cropping systems for scientific evaluation in 16 study sites across Europe covering different pedo-climatic and socio-economic conditions. Implemented cropping systems will be monitored with stakeholder involvement, and will be assessed jointly with scientists. Specific attention will be paid to adoption of soil-improving cropping systems and agronomic techniques within and beyond the study sites. Results from study sites will be up-scaled to the European level to draw general lessons about applicability potentials of soil-improving cropping systems and related profitability and sustainability impacts, including assessing barriers for adoption at that scale. An interactive tool will be developed for end-users to identify and prioritize suitable soil-improving cropping systems anywhere in Europe. Current policies and incentives will be assessed and targeted policy recommendations will be provided. SOILCARE will take an active dissemination approach to achieve impact from local to European level, working with multiple audiences, to enhance crop production in Europe to remain competitive and sustainable through dedicated soil care.

TAMS4CPS

Trans-Atlantic Modelling and Simulation for Cyber-Physical Systems

Programme: Information and Communication Technologies

Coordination and Support Action - Consortium of 3 partners

Project Coordinator: Loughborough University

Principal Investigator at Newcastle: Professor John Fitzgerald, School of Computing Science

Website: <http://www.tams4cps.eu/>



Computing devices and software are becoming integral to our home, work and public environments. Such *cyber-physical systems* range from industrial machines with decision-making software up to next generation power grids and building management systems. For business and society to benefit from this expansion, while avoiding the pitfalls that such complexity creates, we need enhanced methods and tools for modelling and simulating the effects of integrating cyber and physical processes.

Both the US and EU have major research and innovation programmes in cyber-physical systems. In TAMS4CPS, we lay foundations for future transatlantic collaborations in modelling and simulation for such systems. We focus on several challenging aspects of cyber-physical systems engineering, including:

- Architectures, principles and models for safe and secure cyber-physical systems
- Systems design and virtual engineering
- Autonomous, adaptive and cooperative systems
- Computing platforms and energy management
- Integration of socio/legal/governance models

Through workshops in both the EU and in top US universities, we are developing a joint strategic research and collaboration agenda, test cases that serve to benchmark technology advances, and a web-based report on the state of the art, to act as a baseline for future collaborative research.

TRA VISIONS 2016

Programme: Smart, Green and Integrated Transport
 Coordination and Support Action - Consortium of 6 partners
 Project Coordinator: Foundation Wegemt – A European Association of
 Universities in Marine Technology and Related Sciences
 Principal Investigator at Newcastle: Dr George Kotsikos, School of Mechanical
 & Systems Engineering
 Website: <http://www.travisions.eu/TRAVisions/index.xhtml>



The concept of this project is to organise two competitions for transport research awards to be announced at the TRA conference in 2016:

- A student competition with the goal of stimulating the interest among young researchers/students in the field of sustainable surface transport
- A competition for senior researchers in the field of innovative surface transport concepts based on results only from EU-funded projects



ACCOMPLISSH

ACcelerate CO-creation by setting up a Multi-actor PLatform for Impact from Social Sciences and Humanities

Programme: Europe in a Changing World - Inclusive, Innovative and Reflective Societies
Coordination and Support Action – Consortium of 14 partners
Project Coordinator: Rijksuniversiteit Groningen, Netherlands
Principal Investigator at Newcastle: Professor Mark Shucksmith, Institute for Social Renewal
Website: <http://accomplishh.eu/mobilehtml#contact>



Social Science and Humanities research has significant potential to enable the understanding of, and suggest solutions to, the challenges facing society. Nevertheless, a gap exists between the production of knowledge and the policy and practice processes needed to act upon it. Co-creation of research can help academia and other societal institutions to work together to cross the boundaries of expertise each holds and ensure that such research results in maximum economic and social benefit. However, little attention has been paid to how co-creation can be enacted, and the tools and skills needed to ensure such collaborations are effective.

The ACCOMPLISSH project brings together academia (including both researchers and research support staff) industry, governments and societal partners in what is termed a 'quadruple helix' to engage in dialogue to identify the barriers to, and facilitators of, co-creation. Fourteen universities from 12 countries will be working with these partners to analyse the theory and practice of co-creation and identify models of co-created research design and research communication. This will lead to the testing of promising models and identifying ways forward for capacity building in co-created research.



ChroMoLEME

The Character of Monastic Landscapes in Early Medieval Europe

Programme: Marie Skłodowska-Curie Actions
Individual Fellowship (IF)
Project Coordinator: Newcastle University
Principal Investigator: Professor Sam Turner, School of History, Classics and Archaeology
Research Fellow: Dr Emmet Marron

The rural monasteries established across Europe in the 6th and 7th centuries played a key role in establishing the church's centrality to medieval society. Scholars have traditionally accepted the medieval hagiographers' descriptions of these sites as remote foundations in a wilderness known as the desertum.

This interdisciplinary project will contrast these textual sources with an emerging body of archaeological evidence to question the traditional narrative. It will show that monasteries were intimately linked to political and economic networks and often founded in landscapes that were not only inhabited, but quite likely also Christianised. A case study of the 6th-century foundation at Annegray (France) will use an innovative GIS (Geographical Information System) environment to integrate conventional historical and archaeological data with innovative historic landscape character analysis using new remote sensing data. The resulting model will inform comparative study with comparable sites in France, Italy and Switzerland.

The Fellow will receive advanced training in Geographic Information Systems (GIS), digital 3D survey and spatial data analysis. He will learn how to integrate conventional sources with remotely-sensed data from geophysical survey, airborne lidar (light detection and ranging), and terrestrial laser scanning (TLS) to create an innovative approach to Historic Landscape Characterisation (HLC). The method pioneered in the project will be broadly applicable to landscape studies of different periods and regions across Europe and beyond. During the project Dr Marron will develop extensive skills in a series of cutting-edge techniques, significantly enhancing his prospects of a successful career in interdisciplinary landscape research.



CoHERE

Critical Heritages: performing and representing identities in Europe

Programme: Europe in a Changing World - Inclusive, Innovative and Reflective Societies
 Research and Innovation Action - Consortium of 12 partners
 Project Coordinator: Newcastle University
 Principal Investigator: Professor Christopher Whitehead, School of Arts & Cultures
 Website: <https://research.ncl.ac.uk/cohere/>
https://twitter.com/cohere_eu
<https://m.facebook.com/cohere.eu/>



The CoHERE project seeks to identify, understand and valorise European heritages, engaging with their socio-political and cultural significance and their potential for developing communitarian identities. CoHERE addresses an intensifying EU Crisis through a study of relations between identities and representations and performances of history. It explores the ways in which heritages can be used for division and isolation, or to find common ground and 'encourage modern visions and uses of its past.' The research covers a carefully selected range of European territories and realities comparatively and in depth; it focuses on heritage practices in official and non-official spheres and engages with various cultural forms, from the living arts to museum displays, food culture, education, protest, commemorations and online/digital practice, among others. CoHERE is funded through Horizon 2020, and responds to the Reflective Societies programme. The multidisciplinary consortium comprises 12 partners over 9 countries.

Key approaches are:

1. The relational study of productions and experiences of heritage at institutional, social and personal levels, including research into people's activities and attitudes;
2. Research by practice and the provision of public-facing dissemination activities;
3. The development of instruments (models for policy, curricula, museum and heritage practice) intended to promote reflection on and valorisation of European heritages.

CRIC

Cultural Narratives of Crisis and Renewal

Programme: Marie Skłodowska-Curie Actions
 Research and Innovation Staff Exchange (RISE) - Consortium of 8 partners
 Project Coordinator: Newcastle University
 Principal Investigator: Dr Jorge Catala-Carrasco and Dr Patricia Oliart, School of Modern Languages
 Website: <http://www.culturalnarratives.org/>



The project "Cultural Narratives of Crisis and Renewal" (CRIC) examines cultural production and cultural practices in periods of societal crisis at the turn-of the 20th Century on both sides of the Atlantic. It considers cultural production not just as a vehicle to elaborate cohesive narratives in moments of crisis, but as a space to create alternative imaginaries for social renewal. We explore the reconfiguration of regional and/or national cultural landscapes into globalized real (and virtual) spaces that erode the cultural frontiers of the nation-state.

CRIC addresses the scarcity of scientific research on cultural narratives elaborated around conjunctures of crisis and renewal, from the 1970s transition to neoliberalism in Latin America to the aftermath of the 2008 financial crisis in Spain.

The project supports international networking, high quality academic publications, and knowledge transfer through research and training events, conferences and exhibitions.

We are more than 40 researchers in Hispanic and Latin American culture from Newcastle University, Universitat de València, University of Groningen and Universitat de Lleida in Europe, and Universidad Austral de Chile, Pontificia Universidad Católica del Perú, Universidad Nacional de Córdoba, Argentina, and Universidad Nacional Tres de Febrero, Argentina in Latin America.



GLOBALGLASS

Global Glass Adornments Event Horizon in the Late Iron Age and Roman Period Frontiers (100 BC - AD 250)

Programme: Marie Skłodowska-Curie Actions

Individual Fellowship (IF)

Project Coordinator: Newcastle University

Principal Investigator: Professor Ian Haynes, School of History, Classics & Archaeology

Research Fellow: Dr Tatiana Mleva

Website: <http://www.romanglassbangles.com/>



The project is multidisciplinary comparative research on the cross-cultural consumption of personal adornments, known as glass annulars, i.e. rigid, ring-shaped objects composed of coloured glass, used by the inhabitants of the European northwest borderland regions during the transition from the Late Iron Age to Roman period, c. 100 BC – AD 250.

This project introduces the pan-European 'glass adornments event horizon', which signals the existence of an active multicultural community with its own forms of decorative identification in the borderland regions. It will assess the evidence for this phenomenon, firstly, in four north-western European countries: Germany, the Netherlands, Belgium and United Kingdom, and secondly, explore its regional ramifications by concentrating on one area, United Kingdom, in order to understand the manifestation of this inter-cultural event in a local setting.

The project combines thorough literary and museum research with scientific and hands-on experiments, and pays particular attention to engaging and disseminating the results to the wider public. It challenges long-standing perceptions related to the function and gender nature of glass adornments. It investigates the mobility of materials, artefacts and craftspeople, and reconstructs the networks of interethnic craft interaction in borderland zones. It analyses the transformative role these annulars played in the formation of inter-European and regional identities in a transitional period when new cultural forms and practices emerged in the European Northwest.

LIAR

Living Architecture

Programme: Future and Emerging Technologies (FET OPEN)

Research and Innovation Action – Consortium of 6 partners

Project Coordinator: Newcastle University

Principal Investigator: Professor Rachel Armstrong, School of Architecture, Planning & Landscape

Website: <http://livingarchitecture-h2020.eu>

Living Architecture (LIAR) is a modular bioreactor-wall which is based on the operational principles of microbial fuel cell technology and synthetic 'consortia' of microbes. LIAR is conceived as a next-generation selectively-programmable bioreactor and integral component of human dwelling, capable of extracting valuable resources from waste water and air, generation of oxygen and production of proteins and fibre by manipulating consortia performance. Its operational principles are grounded in distributed sensing, decentralised autonomous information processing, high-degree of fault-tolerance and distributed actuation and reconfiguration. Applications within urban systems are examined as a form of customizable micro-agriculture for installation in domestic, public (schools, hospitals) and office environments. Such a system has far reaching impacts on the building performance (resilience, resource recycling) manufacturing and design with ecosystems.



The project establishes:

- Foundational concepts through which 'designed' metabolisms can computationally process, recycle, remediate and synthesise valuable compounds from waste water
- Transferable principles by which synthetic ecosystems can shape the environmental performance of our living spaces to increase our health, productivity and ecosystems impact
- New standards for synthetic 'ecosystems' through consortia design, engineering and optimization

PmSust

The project of Sustainability: the role of Project Management in developing a more sustainable economy and society

Programme: Marie Skłodowska-Curie Actions
Individual Fellowship (IF)
Project Coordinator: Newcastle University

Principal Investigator: Professor Daniel Muzio,
Newcastle University Business School
Research Fellow: Dr Luca Sabini

This project investigates the role of the Project Management (PM) profession in developing a sustainable economy.

Sustainability has acquired a growing strategic importance over the last 10 years, bringing with it a requirement for changes in traditional practices and paradigms of production for its successful implementation. These changes are typically managed as projects and delivered by dedicated project managers who are assumed to have the knowledge and skills to take into account the social, financial, political, cultural and environmental sustainability of a project. As such, project managers, through their distinctive roles, skills and competences, occupy an important position in accomplishing sustainability but little is understood about how they do this.

Using qualitative methods such as interviews, content analysis and ethnographic observation, the project focuses on how sustainability is incorporated in PM discourse and practice by studying how the profession makes sense of sustainability, and also sustainability in practice.

The topic of the project is very timely as it addresses the sixth point currently on the Horizon 2020 agenda: Inclusive Innovative and Reflective Societies. The expected contributions of this fellowship will be in: (a) explaining the institutionalization of sustainability within PM professional practices; (b) identifying under what conditions project managers adopt sustainability practices; (c) conceptualizing sustainability in PM contexts.

RES.CO.PART

Research Consultation and Participation: developing a tool for managing cultural heritage and landscape

Programme: Marie Skłodowska-Curie Actions
Individual Fellowship (IF)

Project Coordinator: Newcastle University

Principal Investigator: Professor Sam Turner, School of History, Classics & Archaeology

Research Fellow: Dr Stelios Lekakis

Website: <http://www.ncl.ac.uk/hca/projects/rescopartresearchconsultationandparticipationdevelopingatoolformana.html>



The last two decades have witnessed a marked turn in the heritage management debate towards the social values of cultural heritage. This could be considered a result of several ongoing sociopolitical and economic processes, with significant impact on the theoretical appreciation of cultural heritage and criticism of the established management practices.

Although theory thrives, a few practical tools have been provided to meet this growing appreciation of the social values of cultural heritage, and cater for a more democratic and empowering heritage management.

This project aims to devise and implement a new tool for the engaging and sustainable management of cultural heritage. Based on solid theoretical grounds, the RES.CO.PART tool will attempt to promote the efficient involvement of communities as stakeholders in decision-making processes for the management of cultural heritage in landscape.

It will combine interdisciplinary methods of mobile technologies, spatial analysis with research practices from cultural anthropology, attempting to retrieve and present ethnographic data to interested interlocutors. The end product will be a modular, mobile application that could function as a probe for collecting ethnographical information and as a medium of presenting them.

Areas of focus are central Naxos in the Aegean Sea (GR) and part of the East Devon 'Area of Outstanding Natural Beauty' (UK).



SAMA

Spaces of Anti-Muslim Acts in the Greater Paris and Greater London regions

Programme: Marie Skłodowska-Curie Actions

Individual Fellowship (IF)

Project Coordinator: Newcastle University

Principal Investigator: Professor Peter Hopkins, School of Geography, Politics & Sociology

Research Fellow: Dr Kawtar Najib

Website: <http://research.ncl.ac.uk/sama/>



Everyday public spaces are significant when it comes to experiences of anti-Muslim discrimination as the hostility directed at Muslim communities in many European countries tends to manifest itself in busy urban public spaces close to religious buildings. Incidents of Islamophobia have intensified especially since the armed attack of Charlie Hebdo publishing offices (a French satirical magazine) in January 2015.

By analysing the spatial effects of Islamophobia, we seek to assess the impacts of anti-Muslim discrimination in France and the United Kingdom. Through the SAMA project, we will identify the spaces where anti-Muslim acts happen, the spatial practices and the scales of belonging of those who are discriminated against, and how markers of social difference such as class, gender and age intersect with race and religion in experiences of Islamophobia. As well as recording the highest levels of anti-Muslim acts, Paris and London both act as socio-spatial laboratories through which we can explore and better understand the complex dynamics of religious discrimination.

To undertake this project, Dr Kawtar Najib has moved from France to Newcastle University to work with Professor Peter Hopkins on a research project called "Spaces of anti-Muslim acts in the Greater Paris and Greater London regions". This project will offer significant insights for the fight against racism and hate crimes in Europe. Dr Najib will gain research expertise in Islamophobia, social geographies, inter-European comparative research and GIS (Geographical Information Systems).



SPES

Servi Publici: Everybody's Slaves

Programme: Marie Skłodowska-Curie Actions

Individual Fellowship (IF)

Project Coordinator: Newcastle University

Principal Investigator: Dr Federico Santangelo, School of History, Classics & Archaeology

Research Fellow: Dr Franco Luciani

In the ancient Roman world public slaves (*servi publici*) were employed by the State for a variety of lowly, but fundamental, administrative tasks and civic activities. In a number of modern Mediterranean and Transatlantic countries public slaves were also essential to the running of the State administration.

The SPES project sets out to provide a full-scale reconsideration of the position of public slaves in the Roman economy and society through a multidisciplinary and comparative study.

It represents the first attempt ever made to cross-fertilize ongoing historical work on ancient and modern slavery in order to deal with the problem of the slaves owned not by a private person, but by a whole community.

For the first time, the researcher will also build a versatile on-line database which will collect all the sources concerning public slaves in the Roman world.

The preliminary step will be a full overview and a complete collection of the primary evidence, which will combine textual sources with iconographic and archaeological material. The second step will be understanding the social reality of public slavery in the Roman world through the comparison with some modern manifestations of it.

Strength2Food

Strengthening European Food Chain Sustainability by Quality and Procurement Policy

Programme: Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy
 Research and Innovation Action – Consortium of 30 partners
 Project Coordinator: Newcastle University
 Principal Investigator: Professor Matthew Gorton, Newcastle University Business School
 Website: www.strength2food.eu



Strength2Food seeks to improve the effectiveness of EU food quality schemes (FQS), and public sector food procurement (PSFP), and to stimulate Short Food Supply Chains (SFSC) through research, innovation and demonstration activities.



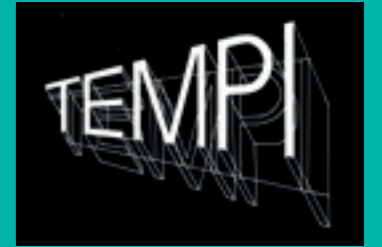
The 30-partner consortium, representing 11 EU and 4 non-EU countries, combines academic, communication, SME and stakeholder organisations. It will undertake case-study based quantitative research to measure economic, environmental and social impacts of FQS, PSFP and SFSC. The impact of PSFP policies on school meal nutrition will also be assessed. Econometric analysis will determine the impacts of FQS and SFSC participation on farm performance, as well as understanding price transmission and trade patterns. Consumer knowledge, valuation and use of FQS labels and products will be assessed via survey, ethnographic and virtual supermarket-based research.

Lessons from the research will be applied and verified in six pilot initiatives. These include a school meals initiative to improve nutritional outcomes and economic benefits, and in-store trials with a grocery retailer to upscale sales of local produce. Other pilots seek to: expand regional food labelling; stimulate a short supply chain for fish; increase sales of FQS products in non-traditional markets; and improve returns to producers via a smartphone app.

TEMPI

The Time of Early Metalwork in Prehistoric Italy

Programme: Marie Skłodowska-Curie Actions
 Individual Fellowship (IF)
 Project Coordinator: Newcastle University
 Principal Investigator: Dr Andrea Dolfini, School of History, Classics & Archaeology
 Research Fellow: Dr Cristiano Iaia
 Website: <http://research.ncl.ac.uk/cias/research/tempi/>



The project intends to build a new chronology and classification method for the earliest metal artefacts cast in prehistoric Italy (copper axes, daggers and halberds), c.4500-2000 BC. The project combines radiocarbon dating and an innovative approach to artefact classification, which takes into account the technological modifications undergone by the objects during their life-cycles. Technological change will be assessed by means of two non-invasive methods of artefact characterisation, namely use-wear analysis and neutron diffraction analysis, which will be applied to over 100 early metal objects from British and Italian museum collections. The analysis will reveal conscious technological choices on the part of the prehistoric copper smiths as well as use-related and other unintended changes in the shapes and features of the objects. At the same time, published radiocarbon dates will be reassessed and new dates will be obtained for early Italian metals.

This is the first attempt ever made to ground the chronology of early Italian metalwork in a comprehensive set of radiocarbon dates. Given the central role exerted by early Italian smiths in receiving, originally elaborating, and further transmitting the manufacturing technology of copper, the project will bring about dramatic changes in our understanding of prehistoric metallurgy on a broader Euro-Mediterranean scale.





In Summary

Professor Nick Wright

Pro-Vice Chancellor for Research and Innovation



The brochure has showcased a wide range of projects undertaken by our staff through Horizon 2020. We are very proud to see such fantastic collaborations and delighted that many of them represent long-term relationships.

Newcastle University is a strong believer in open collaboration and we are very determined to nurture and invest in our international activities over the years ahead. We are proud to contribute to the European Research Area and our researchers benefit immensely from being involved in Horizon 2020 projects. It is clear that international collaboration is one of the strongest enablers of high quality research with particular benefits for early-career researchers.

We hope that we can contribute fully to further rounds of Horizon 2020 in the future and continue our collaborations with our valued partners.

Contact

Dajana Dzanovic
EU and International Research Funding Team Manager

Newcastle University
Research & Enterprise Services
Old Library Building
Newcastle upon Tyne
NE1 7RU

Tel: +44 (0)191 208 5373
Email: dajana.dzanovic@ncl.ac.uk



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