Alexandra Holmes, Biological Sciences
Characterisation of Potential Anti-Chlamydial Drug Targets

Chlamydia trachomatis is a species of clinically relevant obligate intracellular bacteria. Chlamydial infections are the leading cause of sexually transmitted disease and non-congenital blindness, a large-scale health risk and financial burden. As currently used antibiotics are inadequate at controlling these infections, there is a pressing need for improved therapies. Therefore, new leads towards treating these infections have the potential for a large societal impact.

Due to a reduced genome and lack of biosynthesis pathways, this species is unable to make its own nucleotides. These are molecules which are essential for producing energy and DNA. Therefore, C. trachomatis needs to acquire these nucleotides via an alternative mechanism. It depends on the two transporters, Npt1Ct and Npt2Ct. Transporters are proteins in the cell membrane that move molecules into and out of the cell. Blockade of these transporters could lead to nucleotide starvation and represent a novel anti-chlamydial therapy. Despite their clinical relevance, little is known about these transporters.

Drug development increasingly depends on information about the shape of the transporter and how it binds and transports molecules. To gain a better understanding of these aspects of Npt1Ct and Npt2Ct, the protein structures were computationally modelled using a similar transporter as a template. Following this, relevant nucleotides were computationally docked into these models to define important regions and amino acids.

This work provides a foundation for further study of the structure, function and mechanism of these transporters, which contributes both to scientific knowledge, and could facilitate the development of anti-chlamydial treatments.

Chelsea Pamplin, Biological Sciences

It has recently been shown that a protein called RE1-silencing transcription factor (REST) is upregulated in healthy brains with age but not in those with Alzheimer’s disease, suggesting a protective function of the protein. Specifically I researched the impact REST has on the cyclin-dependent kinase 5 (CDK5) pathway and oxidative stress-induced cell death both of which are well established as pathological aspects of the disease. To do this I developed two objectives:
- To investigate whether increasing REST expression decreases levels of two CDK5 activators, p35 and p39.
- To examine how REST expression and CDK5 activity affect cellular response to oxidative stress. Oxidative stress refers to an adverse state whereby cells cannot sufficiently prevent or repair damage caused by reactive oxygen species (ROS) such as hydrogen peroxide. The ageing process is characterised by a progressive decline in the efficiency of all physiological functions, including cellular ability to regulate ROS; this is reflected by studies describing age-dependent increases in oxidative damage. Thus it is hypothesised that by decreasing CDK5 activity REST could provide protection against Alzheimer’s disease through improving cellular response to oxidative stress. It is important to mention that REST affects the levels of around 2000 genes therefore this protective effect is likely through multiple pathways, however providing evidence of neuroprotection through CDK5 regulation is important as this forms the basis of a causal link to what was previously a suggestive association between REST and Alzheimer’s disease.
Session 16E │ Student-centered Curriculum, Feedback & Research

Oscar Hidalgo, Maths and Physical Sciences
Inverse Problems and International Competition

Frequently, researchers encounter problems in which the cause is unknown. Potentially, the research could not go further or present difficulties unless the cause is found. That is when Inverse Problems can take place. An Inverse Problem is the process of calculating the factors that produce an event or result from a series of observations. The field of Inverse Problems is a relatively new subject in science with just a little over one hundred years of study. However, it has demonstrated to be of great importance due to its wide range if applications in areas of optics, radars, machine learning, etc. Through Inverse Problems, scientists have found answers to questions such as: Can we hear the shape of a drum? The main challenge with these questions is that the equations that answer them cannot be solved directly. For this reason, this research will investigate how to find functions that can approximate the solutions in small intervals. The principal method to do so will be creating a function that consists of the union of pieces of other cubic polynomials. The polynomials, which are easier to handle, will be found through data already gathered in order to obtain a good approximation. In this way, it will be possible to find solutions to some of the inverse Sturm-Liouville problems which are used to determine the properties of a material such as its conductivity and potential.

Marcella Manfredonia, Lifelong Learning Centre
Does the implementation of a Plan, Do, Review activity in a Reception class assist children in their choices and direction and ultimately create more self-regulated learners?

This research looks at self-regulation in Early Years children. It looks at a child identified as having difficulties in self-regulating during free-flow activities and at two others who have less so. The research has attempted to implement an activity to assist those who have difficulties and enhance the independent learning skills of those who do not. Some examples of independent activity and learning are observed and known to be essential at the very start of the independent learning journey. The simple activity was designed and created based on present classroom provision. The activity enables pupils to make a pictorial plan of areas that they think they would like to access, to do this and then be encouraged to review their experience with as much support from the educator as required. Early Years classrooms are encouraged to promote independent learning and self-regulation. Twenty-one written observations are used alongside a filta score to assess how many times, participating children change their activity in a given time with a perception of their scale of involvement based on a scale designed in line with Laevers level of involvement scale (Laevers 1998; 2006; 2007). These are analysed alongside interview responses from staff in the setting. The study recognises that no self-regulatory strategy will work well for all. It also recognises that where positive changes in response to the activity were observed and it did seem to aid choice and direction there was not enough evidence to state that this ultimately creates more self-regulated learners.

Fraser Payne, Medicine and Health
How medical students understand, value and use the feedback that they receive on their consultation skills in primary care settings.

Feedback on consultation skills is a key feature of medical education, although the quality of feedback and the extent to which medical students recognise and value such feedback is
variable. This study explored how medical students understood, valued and used feedback during their clinical placements in primary care, to develop their practice.

An exploratory methodology and qualitative study design were used. Third year medical students who had undertaken a six week placement in primary care were recruited as participants (n=5). Participants undertook semi-structured interviews which were audio recorded and then transcribed verbatim. Thematic analysis was used to identify key themes from the interview data.

Participants demonstrated a developed understanding of feedback and felt the primary care setting fostered both increased opportunities for feedback and higher quality feedback. Feedback was provided by a range of sources including general practitioners, nursing staff and informally from patients during placements and participants valued multi-source feedback. Participants identified that the clinical setting and placement duration allowed for greater rapport between students and placement supervisors; this in turn led to more matured relationships which helped facilitate an open dialogue for feedback. Participants recognised that they had a role in ensuring feedback informed their practice and acknowledged that emotional responses to negative feedback disrupted this process.

This study has implications for how curriculum developers prepare students to use feedback to inform their clinical practice, and for clinical educators in both primary and secondary care settings in how they facilitate opportunities for feedback during placements.

Session 17C | Evolutions in Management & Business Technology

Esther Hernandez, Arts, Humanities and Cultures
Criminal Victims: An Analysis of Sino-Korean Migration, Gender and Human Rights Violations, 1990 until the Present Day

As early as 1990, North Korea was targeted by an extensive human rights campaign, yet allegations of gender-based violence, some as recent as 2018, remain overlooked in favour of stories about nuclear weapons. This nation fascinated the West, but ordinary civilians were rarely invited to offer their opinion. Indeed, around 200,000 North Koreans are hidden in China, however few have told their story, causing inaccuracies in our conception of this nation. Instead, our impression was constructed around political opinions.

This research focuses on women in North Korea and China from 1990 until today and questions why they were at particular risk. It examines gender discrimination in North Korea, trafficking and refugee status in China in order to understand how to prevent further abuses. This research focuses on female experiences to increase their visibility and create a more accurate picture of everyday life in North Korea.

The literature review of defector testimony and analysis of quantitative data indicated that sexism and gender-based violence were ingrained in North Korean society. Secondly, Chinese data revealed that legislation, such as condemning trafficked women as ‘illegal immigrants’ increased risks to refugees, despite their protected status internationally. This indicates that trafficking and gender inequality are significant problems for North Koreans, yet these problems were overshadowed by military concerns, thus normalising abuse against refugees. These findings demonstrate that refugee policy should prioritise vulnerable groups over international interests. This would increase the safety of vulnerable individuals and actually improve the lives of ordinary North Koreans.
Giorgio Govedaris, Education, Social Sciences and Law
Are corporations adequately held accountable for their violations of human rights?

This presentation assesses whether corporations are adequately held accountable for their violations of human rights. Part 1 examines the extent to which corporations are held accountable for their violations of human rights under the international human rights law, domestic human rights and notable human rights caselaw. Part 2 examines whether corporations should be held to a higher standard of account by possessing human rights obligations. Part 3 evaluates various reform strategies in respect of improving corporate human rights accountability in order to determine which strategy may be implemented to improve corporate human rights accountability.

This presentation argues that corporations are not adequately held accountable for their violations of human rights under the law. As a result, corporations should possess human rights obligations to improve the extent to which they are held to account for their violations of human rights. Finally, corporate human rights accountability may improve through the implementation of a mix of self-regulation through codes of conduct, soft law initiatives, hard law initiatives, and educational initiatives.

Session 17D | Applying Models & Simulations
Moustafa Abdelwahab, Engineering
Improving the design efficiency of connections found in reticulated structures through Structural Topology Optimisation and Additive Manufacturing technologies.

This research aims at exploiting the benefits of using Structural Topology Optimisation (STO) and Additive Manufacturing (AM) in the design and fabrication of the irregular node connections found in reticulated structures to achieve constructible connection with optimal structural efficiency.

STO is a prevalent optimisation technique used in numerous manufacturing sectors including automotive and aerospace to obtain highly complex and efficient designs (weight-to-stiffness ratio) unachievable through traditional manufacturing technologies (e.g., machining and casting). AM (also known as 3D printing) is a fairly recent manufacturing technology which overcomes many of the manufacturing limitations through a layer-based fabrication process. The current design and manufacturing methods of the connections of Reticulated Structures have not seen much development throughout the years with either traditional casting or welding fabrication commonly used. Thus, it was deemed necessary to undertake a design-based experimental research through optimising a specific type of connections to explore and identify the optimal structural efficiency levels which could be reached using STO. Furthermore, additively manufacturing these optimised connection designs would provide a proof of the applicability of the process as a more advanced fabrication alternative.

Studying the optimum optimisation levels of these connections could provide a more suitable approach for the application of STO in the current design methodologies to improve the structural efficiency of the output designs. Furthermore, the additively manufactured connections could be structurally tested and compared to the optimised models. This would provide valuable data to attain a clearer understanding of the relationship between actual AM output and theoretical STO output.
Nicholas Egunjobi, Engineering
The Computational Modelling of Boiling for Nuclear Reactor Thermal-Hydraulics

This study aims to understand and predict the complex phenomena involved in the nucleate boiling of two-phase flow, prevalent in both the thermal management and safe operation of nuclear reactors. Industrial nucleate boiling is currently predicted with computational modelling tools, however, caution is taken for these tools as they are accurate under specific conditions which is unfounded in normal operations.

The desire for complete modelling tools spans over decades of research and brings forth a vast number of experimental and theoretical studies. This, as well as an increasing number of computational tools, have been developed in order to understand the boiling phenomena. As such, there is a debate on the use of empirical models, currently used in industry and are seen as a panacea due to their reliability in specific conditions. In contrast, mechanistic models, aim to quantify the parameters under various conditions for further understanding.

This study proposes a mechanistic model based on the Klausner (1993) experiment for the analysis of thermal-hydraulic data to be validated by comparing against previous results. This can subsequently be incorporated into computational fluid dynamic codes to improve the accuracy of prediction.

The model was validated and proved to have an accurate prediction of thermal-hydraulic data, for instance, parametric bubble departure diameters decreased with increasing mass flux and decreasing heat flux in accordance with parametric trends present in literature. The study confirmed that mechanistic modelling is the route to take to improving the understanding of the boiling phenomena and obtaining accurate thermal-hydraulic data predictions.

Session 18A | Medical Drugs and Systems
Matthew Padgett and Samantha Boon, Medicine and Health
The effects of inducing neuroplasticity using Theta Burst Stimulation in the Posterior Parietal Cortex on a range of cognitive tasks.

Inducing neuroplasticity as a treatment for neuropsychological disorders is not adequately understood. Previous studies have utilised Theta Burst Stimulation (TBS) in the motor cortex (stroke) and in the prefrontal cortex (cognitive decline). However, inducing neuroplasticity via TBS in the Posterior Parietal Cortex (PPC), involved in motor and cognitive functioning, is poorly understood. Therefore, inhibitory (continuous) and excitatory (intermittent) TBS was administered to the right and left PPC across 4 sessions, 1 week apart, to twenty healthy undergraduates (aged 18-22) in a single blind, 2 (Continuous/Intermittent TBS) x 2 (Left/Right PPC) design, across a range of cognitive tasks, with eye (EyeLink 1000) or button box recordings taken. Reaction time and/or accuracy were measured before and after stimulation. Results showed no effects of stimulation, or sham stimulation, indicating the direction of plasticity did not inform resultant behaviour, and was not due to learning effects. However, performance changes did reveal hemisphere and task differences. Inhibition data demonstrated an interaction between stimulation and trial, and between stimulation and hemisphere on prosaccade trials. Further, SLT data showed a marginally significant interaction between stimulation and hemisphere. Finally, N-Back data showed a novel interaction between condition and hemisphere, with increasing task difficulty. Further research must examine the role of TBS in mediating cognitive function, and individual differences to stimulation. Furthermore, additional research is needed into the function/laterality of the PPC. Increasing knowledge of TBS effects
on cognitive function has ramifications for the treatment of neuropsychological disorders, such as stroke and depression.

Rachel Coneys, Biological Sciences
Modulation of microglia activation in Alzheimer’s Disease

Neuroinflammation as a result of excessive microglia activation is implicated in various neurodegenerative diseases. Elevated levels of histone deacetylases (HDAC) are associated with cognitive deficits and inflammation in Alzheimer’s disease. Inhibitors of HDAC (HDACi) prevent microglia activation in vitro and in vivo. The mechanisms underlying this attenuation are unclear, although recent data implicates HDAC2 as an important HDAC and a non-histone protein(s) as the target. Identifying how HDAC2 modulates this pathway is key to effective therapies. The present study investigated whether HDAC2 acts within the nucleus to exert inflammatory effects. BV-2 murine microglia were activated with lipopolysaccharide (LPS) and levels of cytokine expression were determined by RT-PCR. Transfection of recombinant HDAC2 in LPS stimulated BV-2 cells enhanced Interleukin 6 (IL-6) and inducible nitric oxide synthase (iNOS) expression. Removal of HDAC2’s nuclear localization signal (NLS), restricting HDAC2 to the cytoplasm, did not reduce this ability of HDAC2 to enhance microglia activation; IL-6 and iNOS levels increased to 208 ± 54%, n=6 and 149 ± 49%, n=5 respectively. Treatment with HDACi Suberoylanilide hydroxamic acid (SAHA) attenuated the HDAC2 (wild type or mutant) mediated increase in cytokine expression. Our data suggests HDAC2 activity in the nucleus or cytoplasm is equally effective in mediating microglia activation. Thus a protein that shuttles between the nucleus and cytoplasm is a likely target of HDAC2 within this inflammatory cascade. Identifying the protein/s would allow for the development of more selective therapies with reduced side effects for the treatment of neuroinflammation in neurodegenerative diseases.

Session 18B | Political Issues

Anton Witchell-Chibber, Arts, Humanities and Cultures

As conflict continues to engulf parts of the Middle East and North Africa, the discourse relating to Libya has often been overshadowed by events in Syria and Iraq. Yet, since 2011, the country has remained fraught by violence. For policymakers to push Libya’s warring factions towards national reconciliation, it is vitally important to understand how Libya descended into civil war. Equally, it is crucial that the consequences of NATO’s intervention in Libya in 2011 serve as a cautionary tale in the cost of liberal interventionism. My research asks two questions: to what extent was the initial intervention in Libya a success, and why in its aftermath did Libya develop into a failed state?

Using reports by human rights organisations such as Amnesty International and Human Rights Watch, alongside news bulletins, my research considers the failures of intelligence by the pro-interventionist powers in the threat level to the population of Benghazi, which formed the crux of the humanitarian argument to intervene. It explores the political alternatives to military intervention, which were ignored by the international community in favour of regime change. Finally, the research focuses on the struggles of post-Gaddafi Libya, questioning if Libya’s political collapse was foreseeable or if the pro-interventionists are guilty of inadequate post-war planning. It will be concluded that the lack of a centralised security apparatus gave rise to the proliferation of Qadhafi’s weapons stockpiles and left justice and political policy in the hands of the militias, who were co-opted into the establishment.
Heidi Powell-Biney, Arts Humanities and Cultures

Does the origin of a verb (Germanic or Latin) affect the grammatical acceptance of The Double Object Construction? A grammatical judgement task.

The Double Object Construction (DOC) (1) and its alternation (AltDOC) (2) arise when a verb takes two complements – a direct object (theme) and an indirect object (recipient) or its prepositional form (3).

The syntax of the DOC and its variation have been researched extensively (Stowell, 1981), however there is little literature that identifies its acceptance and what affects the DOCs and the AltDOCs use, as the AltDOC is considered marginal (Gerwin, 2013). This research identifies a number of linguistic aspects that affect the use & the grammatical rating of the DOC; the effects of how Latin and German verbs form past tense, syllabic structure, and the ordering of DPs. A grammaticality judgement task was administered to 24 balanced sex (under)graduates who are native English. Participants were required to rate from 1-4 how grammatical declarative DOCs and AltDOCs sounded when preceded by introductory contexts. Mixed three-way ANOVAs were used to identify the effect of verb stem, verb frame and DP heaviness (pronominal or DP) on participants’ ratings.

The results show that DP order had an effect on the grammatical judgement but was a result of verb frame rather than verb stem. The result of verb stem was probably moderated by the number of syllables; Germanic derived verbs rated higher than those of Latin in the DOC. The findings have particular importance as variations of the DOC are indeed used as productive constructions in British English.

(1) He gave me it
(2) He gave it me
(3) He gave it to me

Edie Fisher, Education, Social Sciences and Law

Power Through Song? An Empirical Study of Soft Power Influence within the Great Powers of Europe, through the lens of Voting Trends in the Eurovision Song Contest

World War Two and the Cold War saw the power structures and epicentres of the 20th century shift. As Russia grew in power, former Great Powers faltered as they attempted to adapt to new power structures. Joseph Nye’s theory of soft power encapsulated the move from hard military power, to persuasive soft power. His theory focuses on three sources: culture, political values, and foreign policy. However, whilst there is agreement the sources, there is no consensus on how to measure soft power. This study posits that the Eurovision Song Contest is a viable measure of Nye’s theory. As a quasi-political and cultural phenomenon, the contest offers an interstate platform to exercise soft power. In this study I used a negative binomial regression with random effects to test my theory that the contest can be used to measure soft power within the Great Powers of Europe. My findings were that major power status has a negative effect on points received. Furthermore, it was also found that countries with a lower Human Development Index score receive substantially more points, suggesting that Eastern - who, on average, have
lower scores than the West – are more likely to receive more points. Combined with the theory of bloc voting, the results suggest that Eastern countries receive a higher vote share. Within the Great Powers, Russia can be seen to be exercising the most influence within the contest. These results, coupled with the historic mirroring, suggests that Russia is currently the strongest power in Europe.

Session 20A │ TBD

Charlotte Horner, Medicine and Health

If it doesn’t challenge you, it doesn’t change you

A Qualitative Exploration of Positive Student Experience at University: Can University aid in the Recovery of Depression?

Depression in university students is associated with worsened academic performance and poorer social functioning (Eisenburg, 2007). Pressures to form friendships and achieve success create a largely negative environment (Yoon, 2017), but must it always be so? Whilst stressors exist, so too do opportunities for self-betterment as students find renewed purpose. Such aspects are neglected in literature, and the present study aimed to address this by examining the positive experiences of students who have recovered from depression at university with three questions:
(1): what aspects of university are useful in combating depression?
(2): how are these aspects experienced by students?
(3): can these experiences assist other students?

Five students aged 18-25 were recruited via a Facebook post on the University of Leeds Current Student page and posters advertising the study on-campus. Upon recruitment, they were interviewed using a semi-structured interview schedule. Interpretative Phenomenological Analysis aimed to understand their lived experience of depression in a university setting, and themes were generated from these interviews, including Empowerment and Development of Identity.

Aspects of university life were identified to improve outcomes of depression. For example, university offered students an opportunity to develop their adult-identity, representing a milestone in personal development as the individual acquired skills to interact with the world without relying on others and increase their self-esteem (Secker, et al, 2003).

Suggestions were then made regarding future study, including conducting interviews with university mental health professionals to provide data from different perspectives, which could offer new insight into mental health recovery at university.

Laura Wallace, Education, Social Sciences and Law

Exploring the Irish Catholic Identity and its Influence on Adolescent Female Sexuality

More than one in five countries have an official state religion and often, many make the assumption that Catholicism is the state religion of Ireland. Despite the Irish constitution stating on its first page In the Name of the Most Holy Trinity, from Whom is all authority and to Whom, as our final end, all actions both of men and States must be referred. (Bunreacht na hireann, 1945), Ireland is officially a secular country. This paper seeks to explore the notion that as an
Irish citizen, one’s Catholic identity is often assumed and that within this assumption there are implications for those attending Catholic institutions. In particular, this paper will examine the relatively under-explored area of Irish sexuality within the Catholic-dominated school systems and how the baptism barrier can create an assumed Catholic identity for Irish adolescents. In turn, the Catholic identity then works to influence the discourses towards a heteronormative framework which others female sexuality and desire. The existing bodies of work carried out on Irish sexuality and Catholicism have been predominantly written by Tom Inglis, but very little exists outside of these studies. The originality in this study’s approach is that, by examining the Catholic identity as it intersects with Irish social values that relate to sexuality, it draws attention to Foucauldian theories of power-knowledge. As a result, the power-knowledge imbalance becomes problematic in the context of female adolescent sexuality. This paper seeks to contribute to the debate that Ireland needs to drastically overhaul current sex education.