Surrey Postgraduate Research Conference 2016: A Review

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On 13 and 14 April 2016, the University of Surrey held its 6th annual Postgraduate Research (PGR) Conference, boasting innovative and potentially ground-breaking research from each of the three faculties. The aim of the PGR conference was to encourage networking and promote further discovery by inspiring future researchers.

To quote Professor Michael Kearney, Surrey University ‘prides itself on research’, and so (emulating the success of the 2015 event) the volume and variety of projects presented this year was astounding. Over the two days, research was presented as posters or orally in the form of short presentations. With talks ranging from Victorian literature to fibre-based batteries, and from artificial intelligence to the use of cognitive narratives in pop music, there was a project to interest every individual. Our institution’s high calibre research contributes towards many aspects of global development, tackling an array of international issues ranging from antibiotic resistance (University of Surrey, 2014) to clearing up the space debris orbiting the Earth, which threatens satellites and space stations (Fingland, 2016).

The subject talks were grouped into ‘sessions’ following a theme or representing a specific faculty. As a final year biochemist, I initially attended talks relating to medicine and human health. As expected, many projects focussed on areas of scientific urgency such as cancer and cardiovascular disease, the UK’s two most common causes of premature death (Department of Health, 2014). I also attended lectures from other faculties despite fearing I would not understand the jargon. However, each presenter was able to effectively pitch their papers to individuals from all academic backgrounds. At no point did I feel out of my depth, as each presenter ensured their work was highly accessible to the layperson and assumed no prior knowledge of their field. Many were also able to find an optimal balance of education and humour, making each talk a joy to listen to. Most importantly, each presenter had time for questions at the end of their talk and further informal discussion was encouraged over refreshments at the end of each session.

I was most intrigued by the presentation by Hannah Whitmore, a FEPS¹ doctoral candidate. Whitmore is investigating the potential of homoisoflavonoids (naturally-occurring compounds found in plants) in curing blindness. I had previously read about these compounds exhibiting cytotoxic (cell-killing) and anti-proliferative (preventing rapid cell division) properties in a human cancer cell line (Yan et al., 2012; Dai et al., 2013), and so I was aware of their potential as a cancer therapeutic. However, it had not readily been apparent that blindness and cancer may be interlinked, nor had it occurred to me that an anti-cancer drug may be repurposed to treat other diseases such as retinal degeneration. It is important to recognise the value and potential future uses of our current resources. Whitmore’s project highlights the essentiality in

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¹ Faculty of Engineering and Physical Sciences.
identifying new uses for pre-existing natural compounds. With more plant species being discovered every year, the potential possibilities for future application within medicine are vast.

Another particularly noteworthy project was presented by Terry Wilson, also from FEPS, who is aiming to find a clean and renewable energy source to solve the ever-worsening global energy crisis. Wilson’s project explores the potential large-scale use of reversed electrolysis (RED) to generate energy - a process in which water samples with different salt concentrations (such as fresh river water and seawater) are run through stacks of alternating positively and negatively charged ion exchange membranes (Veerman et al., 2009). Ions move between samples along the salinity gradient generating a chemical potential difference (voltage), which can be harvested from the system (Veerman et al., 2009). As approximately 97% of Earth’s water is in liquid form covering ~71% of the planet’s surface (National Oceanic and Atmospheric Administration, 2016), there are huge quantities of potential energy which is not being harnessed, particularly in areas where fresh and salt water naturally meet, e.g. estuaries. Furthermore, the energy produced by this method would be sustainable and self-regenerative. In 2013, Europe consumed almost twice as much energy as it produced (Energy Information Administration, n.d.). It is now more important than ever for large-scale applications of RED to be explored. Looking at the larger picture, Wilson’s project is not just about identifying new energy sources, but about discovering alternate uses for current resources (a common feature in many of the presented projects, including the aforementioned project presented by Whitmore).

Interestingly, the PGR conference elucidated the degree to which research projects may overlap. Amongst the oral and poster presentations, there were some incidents of two or more PhD students from different faculties investigating different elements of the same research topic. For example, the mathematical characterisation of sleep/wake dynamics (Matthew Bailey, FEPS) overlapped thematically with a project exploring the effect of sleep on learning a new language (Alison Cooper, FHMS²). After seeing both presentations, it became apparent that both students may have had knowledge regarding the quantitative and qualitative aspects of sleep (respectively) which would benefit the other. Throughout my academic career, I have been vaguely aware of the importance of inter-disciplinary collaborations, but seeing both presenters in such close proximity emphasised the value of sharing knowledge. A seemingly insignificant discovery in one project may solve an issue encountered in the other. Input from different faculties allows the combination of different experimental and analytical approaches. Additionally, no two individuals will approach a problem in the same way. The process of discovery is dynamic in nature; the acquisition of knowledge is also self-propagating as

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² Faculty of Health and Medical Sciences.
answering one question often presents more problems to be solved. Furthermore, the interpretation of acquired data needs to be continuously questioned so as to ensure the conclusions formed are valid (and remain valid as the field advances). Thus, learning is a continuous process; research begets research. Sharing knowledge is paramount for advancement and may aid further innovation as inter-disciplinary collaborations gain popularity.

Aside from the oral and poster presentations, the conference also included two workshops focusing on how to publish work through different media and how to carry out market research. The workshops also included discussion about open access publication, where publicly funded research is made more available to those who wish to read it. The UK Research Councils aim to provide ‘unlimited’ and ‘unrestricted’ access to peer-reviewed research funded by the public (Research Councils UK, 2013) by promoting publication in journals without a paywall or with fewer restrictions on use (regarding copyright or licensing) (Suber, 2004). This helps ensure that ‘public investment in research secures the maximum economic and societal return’ (Research Councils UK, 2013). Whilst writing a literature review for my undergraduate dissertation, I recall my usable resources being restricted to those which did not require purchasing the full text. I felt that my ability to incorporate current research into my project was severely limited, as the most recent papers applicable to my topic were not at my disposal. If the distribution of pioneering research is promoted, future students will have the opportunity to increase the relevance of their work by enriching their projects with contemporary ideas. Furthermore, easier access to recent articles may encourage another generation of budding researchers.

The conference also included keynote speakers such as Dr Kevin Lin OBE, the Lead Interpreter in Chinese at the Foreign Office and an associate lecturer at Surrey. Dr Lin’s lecture was a personal highlight as it stressed the importance of invention and creativity in research. Research was suggested to be a tool for deepening our understanding of a world which has only been previously superficially observed. This speech alone emphasised the critical value of all research. When asked if technology would ever cause the art of interpretation to go extinct (‘Would artificial intelligence ever render human work useless?’) Dr Lin replied that ‘the future is judged with contemporary knowledge, and that as technology advances, so will understanding’. It is my belief that as individuals, we should not be afraid of our own potential to create, nor should we fear re-interpreting what we already ‘know’. Wisdom (loosely defined as a widely-accepted ‘fact’ in a particular field) is highly subjective. It is crucial to remember that a theory is only valid until it is disproven. This is where research become vital. Research does not merely revolve around exploration of the novel, but it is in the continual confirmation of what is already the ‘known’.
Overall, the atmosphere of the conference was brilliant with a mix of serious academic discourse and jovial highlights (such as the Bright Club, a stand-up comedy event for postgraduates and academics alike). There were also opportunities to network and socialise with experts in their field and industry representatives ‘scouting’ for talented individuals (for investment opportunities or future employment). But most importantly, there was time to discuss the educational and social implications of undertaking a PhD with current doctoral candidates. I left inspired.

Each year I leave the conference even more convinced in my desire to pursue postgraduate study. I am thrilled by my potential to create and excited about what is out there to discover. Research is more than just the pursuit of knowledge, for what use is knowing without meaningful application? There are many global issues to be solved, and Surrey is tackling them, one PhD project at a time.

The event is open to all undergraduates and I would thoroughly recommend attending.
References


