

Enterprise and Learning Committee

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Cardiff University, School of Medicine evidence to the "Committee inquiry into the economic contribution of higher education"

Cardiff University has already presented more detailed evidence to the committee on its wider economic contribution of the University. This submission will focus more specifically on the current structure of the School of Medicine's research system and present a perspective of its future capacity to contribute to the academic/industry interface in the context of the Lambert Review on Business-University collaboration.

School of Medicine, Cardiff University

Mission

The mission of the School of Medicine is to pursue the highest standards of research, education and training, in medicine and related subjects, so as to enhance the health and wealth of the people of Wales and the wider world.

The School of Medicine at Cardiff University is one of the largest in the UK, employing nearly 500 academic and 300 support staff with over 1000 undergraduate and 1100 postgraduate students currently enrolled on medical and science courses. The School has an annual financial turnover of over £50M of which nearly half comes from competitive external research funding.

Restructuring research in the School of Medicine

Prior to merger with Cardiff University, and in response to the need to rationalize research priorities and focus a strategic decision was taken to realign and strengthen the research structure within the School of Medicine (formerly University of Wales College of Medicine). This involved the creation of interdisciplinary research groups (IRG's) that effectively cut across the departmental structures and are grouped around defined themes. These are aligned to established areas of research excellence (partly identified by 5* success RAE2001 and subsequently matured). The designation of IRG status was a competitive process, based on the provision of a clear research development and strategic plan and aimed at generating critical mass and increased international competitiveness in these theme areas.

Initially four IRG's created in Neuroscience and Mental Health, Cancer, Infection, Immunity and Inflammation (I³) and Clinical Epidemiology (Primary Care) which were followed by the creation of IRG's in Cardiovascular Medicine and Matrix, Regeneration and Repair (MR2).

The creation of this IRG structure also had the added advantage of clear mapping onto the units of assessment for RAE2008. Although the external success of the IRG structure will be judged by the results of RAE2008, there is no doubt that their creation has contributed to increased research productivity and external income (Appendix I). Each IRG has a senior academic lead and an elected steering group that sets research priorities, organizes regular research meetings and allocates centrally devolved resources and PhD studentships. This structure has had a significant positive effect in promoting collaboration within and across IRG's, in Cardiff University and the wider Welsh academic community (e.g. the successful bid to the Healing Foundation to establish the UK Centre for Burn Injury Research).

To further facilitate this drive towards interdisciplinarity and translational research and to improve institutional responsiveness to large initiatives (e.g. MRC Translational Medicines Initiative) the School has also created a Research Management Group (RMG) that oversees the operational implementation of research priorities set by the School Research Committee. This structure draws together the IRG leads, and other key stakeholders (e.g. NHS R&D) to give management and direction to research priorities and opportunities. Central within this structure is the ability to both prioritise research areas and implement appropriate support structures to improve success rates in external funding and sustain the quality of research outputs. The instigation of rigorous internal peer review of grant proposals has been introduced to ensure that they are in priority areas and of the highest scientific quality.

Investments in Cardiff University that enable the development of the translational research strategy

Biomedical research income has increased markedly over the last few years in Cardiff University. In the year to July 2007, awards to the School of Medicine were in excess of £23m (Appendix 1) with over 50% of awards having a major translational component.

Cardiff University ranks in the top 10 Russell Group Universities for generation of patent income, amounting to almost £2M per year over recent years. The bulk of This relates to discoveries within the translational agenda. For example, the discovery of acridinium ester labels and their exploitation in immunoassay has generated income in excess of £15m for the University. In addition, substantial funding to support commercialisation has been awarded, including in excess of £1m over 3 years from the Welsh Assembly Government (WAG) to establish the Knowledge Exploitation Fund and a £3.6m investment by the University to create the Cardiff Partnership fund, already successful in spinning out 16 SMEs and generating £36m from industry and other partners.

There have been a number of substantial investments and major awards to underpin strategic developments in translational research in the School of Medicine. The new Clinical Research Facility in Cardiff comprising a 10-bed research ward and two treatment rooms, fully equipped and MHRA-accredited for phase I studies (funded as part of £14m JIF Award from Wellcome Trust), is fully operational (24/7) with four core staff jointly funded by University and Trust. Imaging resources in Cardiff have received investments in excess of £35m in

the last 5 years, providing state-of-the-art MRI/fMRI and magnetoencephalography (MEG) with research PET available in 2008 and the human PET opening in 2009. Other major relevant investments that will promote translation in Wales include the establishment of the Wales Centre for Burn Injury Research funded jointly by the Healing Foundation £5.6m; Cardiff University £5.6m; and Morriston NHS Trust £3.8m with a multidisciplinary cross-Wales vision to deliver all aspects of burn care provision from prevention to new treatments in the next decade.

These substantial investments in new initiatives and infrastructure are underpinned by access to core technologies that are essential to develop, support and validate translational research findings. Central facilities that serve the whole of Cardiff University include the Biostatistics and Bioinformatics Unit (BBU) funded by HEFCW (£1.5M) and the School of Medicine direction of SRIF II/III funding to develop financially sustainable state-of-the-art core facilities under the Central Biotechnology Services (CBS) (www.cardiff.ac.uk/medic/cbs) umbrella. This core facilities philosophy has given researchers access to centrally managed and funded technology platforms. CBS is centrally managed and based on a robust cost recovery model, allowing the School to provide centrally maintained state-of-the-art technology platforms to Cardiff University run in a sustainable manner. These technology platforms in turn use the local academic lead expertise to advise both internal University and external customers. Further commercial development of the CBS platforms is seen as an essential element of its financial model that involves a mixture of core University support, research grants and external income (from business or other Universities) to allow it to fulfill its mission in supporting high quality research outputs.

Another key feature that underpins translational research is the availability of defined patient cohorts and Biobanks and the capacity to analyse these (this being one of the major synergies with Bristol University that drive the proposed strategic alliance described below). The Cardiff Neuropsychiatric Genetics Group (supported by the MRC) has assembled large and well-characterised clinical samples over more than 15 years with sample collection on-going in many areas including psychosis (schizophrenia and bipolar disorder), Alzheimer's disease, attention deficit hyperactivity disorder, dyslexia, Huntington's disease and Parkinson's disease. The Wales Cancer Bank has successfully incorporated tissue/blood sample collection into routine clinical management in the NHS and is now leading this approach in the UK. Biological data are linked with the Welsh national clinical electronic patient record system. Biobank Cymru, opened October 2007, has already recruited more than 13,000 individuals.

Bristol/Cardiff Alliance in Translational Medicine (Sevenside Alliance for Translational REsearch (SARTRE))

Based on existing high level links between Cardiff and Bristol Universities and driven by the recent MRC calls under the Translational Medicine Initiative, the School of Medicine has recently led in the development of proposals with Bristol University to create a Strategic Alliance in translational Medicine. This strategic partnership (SATRE) is built around key areas of parallel research excellence in Cancer, Infection and Immunity, Neuroscience and Cardiovascular Medicine. The Alliance intends to operate across the whole translational medicine pathway from basic research findings, through discovery and IP to proof of concept and first in man clinical trials by providing appropriate project management and support structures at each stage and clinical trial facilities. The Universities of Bristol and Cardiff plan to harness their combined resources to effect a step change in volume and speed of world-class translational research. SARTRE will also engage other institutions and key individuals active in biomedical research in South Wales and the South West. This will provide access to a comparatively stable, large population base (6.2m, 10% of the UK total) ideally suited to the conduct of translational studies. Cardiff University and the University of Bristol have already agreed to this strategy at the highest level, and discussions are underway with partners including Peninsula Medical School and the University of the West of England (UWE). SARTRE will also be dependent on effective partnerships with NHS Trusts. The virtual NIHR established in Wales to provide a coordinated approach to translational research recognises the central role of Cardiff University in delivering this agenda.

This intention to work together fulfills one of the Lambert recommendations providing pooling of expertise, economies of scale and the sharing of complimentary expertise in Technology Transfer. This proposal has a clear remit to promote the translational research agenda (through recruitment of suitably qualified individuals with business experience), to create a cadre of translational clinicians and scientists (through appropriate fellowship schemes) and to drive increased University engagement with the wider business community in all its areas of operation.

The translational strategy of SARTRE is to:

Develop a common translational research agenda for the partner Universities and NHS Trusts, responsive to clinical need and reflecting areas of research excellence.

Map, consolidate and disseminate the Alliance's resources, including people, facilities, technologies, tissue/DNA banks, patient and population cohorts.

Create access to shared regulatory expertise to accelerate the progression from bench-to-bedside and idea-to-invention.

Establish systems for timely and rigorous management of proposed and ongoing research to guarantee best use of resources.

Build a flexible and sustainable portfolio of translational research funding from sources including Research Councils, NIHR, Wellcome Trust and other charities, Strategic Health Authorities, Welsh Assembly Government, South West Regional Development Agency, Industry and the Technology Strategy Board (TSB).

Introducing joint management systems to will facilitate delivery of this strategy:

Simplify and streamline the regulatory burden using a combination of shared in-house expertise and outsourcing as appropriate.

Ensure access to fully supported enabling technologies such as bioinformatics and imaging.

Actively manage the translational research portfolio, monitoring progress against defined milestones (modelled on the Pharma sector) building upon existing expertise in centralised project management and support.

Implement cost-benefit systems to decide which project components (including consultancy, regulatory, toxicology and agent production) should be outsourced.

Establish processes for IP protection and ownership that are flexible, fast and fair, agreed at the outset by all partners including industrial collaborators.

Establish joint training programmes in translational research.

The sustainability issue

One of the significant challenges faced by HEI's will be to sustain the quality and quantity of research outputs in the face of the changing funding landscape. Although the income trajectory of the School of Medicine is steeply upward there are nevertheless issues of sustainability of research infrastructure that will require an increased and more focused interaction with the business sector. One example is the provision of central research facilities and technologies that, year on year, increase in cost but are becoming more difficult to fund and sustain from conventional sources (Research Councils or Charities). The implementation of fEC has produced a model that should allow for the long-term replacement of infrastructure but with the increasing value of grant awards there is a real fear that financial shortfalls will eventually damage competitiveness and the ability to keep abreast of changing and expensive technologies. Identifying how we can build sustainability in the maintenance of core facilities will be essential for maintaining our contribution to science and society. Increasing the interaction with the business sector in the provision of contract or collaborative research is clearly an area that needs development. This model will use spare capacity in University facilities to provide companies with access to unique expertise and technology; it will be an essential part of the future development strategy. As an example, Ovasort a SME located in the MediCentre at Heath Park (and in receipt of two SMART Wales awards) is involved in a collaborative research program with the School of Medicine that utilises both our core Proteomics facility (run by CBS) and the associated scientific expertise of its academic lead to validate and develop its own proprietary IP.

Future Challenges

The Lambert review clearly outlines the challenges for increasing the engagement of academia with the business sector and suggests a shift in the focus of future developments in how HEI's should increase engagement with businesses. The review suggests that HEI's, while continuing to use third mission funding to defend and exploit their IP portfolios (through University technology transfer offices), should also in parallel develop additional and more reliable revenue streams through increased engagement with the business and industrial sectors in the areas of consultancy, contract research and earlier licensing of IP. Although these processes are ongoing in Cardiff University, there is further need to put in place appropriate structures to develop and further strengthen these activities. The School of Medicine is ideally placed to contribute to this given its portfolio of basic research, its core structures and resources and its academic and medical expertise in key disease areas. This aspiration maps directly to the key strategic aim of Cardiff University to ensure that research (and education) contribute to society and the economy.

In summary, over the next few years the School of Medicine, Cardiff University aspires to using its world leading research and clinical excellence, its unique (for Wales) portfolio of cutting-edge facilities and associated expertise to increase its engagement with the business community. Although this will still be reliant on development of the IP portfolio, there is a need to further develop other areas of engagement that include contract and collaborative research partnerships, consultancy agreements, licensing and efficient use of clinical trial facilities. These developments will enhance sustainability and growth to enable the School to deliver its broad contribution to the health and wealth of the nation.

School of Medicine, Cardiff University
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