

House of Commons Science and Technology Select Committee Inquiry:

'Managing Intellectual Property and technology transfer'

Written evidence from **PraxisUnico** and **AURIL**

PraxisUnico and the Association for University Research and Industry Links (AURIL) are the UK's national associations for knowledge exchange and commercialisation (KEC) professionals working in universities and public sector research organisations to manage IP, commercialisation activities, and collaborations between academics and external organisations to deliver social and economic impact¹.

We are ideally positioned to comment on this inquiry having represented the sector for almost two decades, during which time the KEC profession has grown, evolved and matured². Both associations work with key sector stakeholders to inform public policy around research commercialisation and knowledge exchange, including HEFCE whose current work to develop a 'Knowledge Exchange (KE) Framework' we are fully supporting. We are in regular contact with other professional associations such as the Association of Research Managers and Administrators (ARMA) and the UK Science Park Association (UKSPA) and have strong links to international organisations such as the Association of University Technology Managers (AUTM) and ASTP-Proton in the US and Europe respectively³. PraxisUnico was a founder member of the Association of Technology Transfer Professionals (ATTP) established to provide a standard for technology transfer professionals in recognition of the skills underpinning this work (RTTP)⁴.

We are responding to this Inquiry on behalf of our members; individual institutions will make their own submissions, reflecting the diversity of the UK's university sector which has been emphasised in the recent McMillan Group report 'University Knowledge Exchange (KE) Framework: good practice in technology transfer'⁵ whose findings and recommendations we fully endorse and support. We also highlight research commissioned by PraxisUnico which profiles the skills, qualifications and work of

¹ See www.auril.org.uk and www.praxisunico.org.uk.

² See <https://www.praxisunico.org.uk/resource/consultation-responses> for previous sector consultation responses.

³ See www.autm.net and www.astp-proton.eu/.

⁴ See <http://attp.info/>

⁵ HEFCE, September 2016 http://www.hefce.ac.uk/pubs/rereports/Year/2016/ketech/Title_109539.en.html

professional staff working in UK technology transfer offices⁶.

Key points

- The term ‘technology transfer’ is often used to refer to a wide range of business engagements between research organisations and business, which may or may not be income generating. It is also used in a more specific sense to refer to IP commercialisation, licencing and spin-outs from research conducted in universities. This activity plays an important part in the overall relationship between universities and business but is not a major driver in its own right for most universities.
- Managing intellectual property arising from academic research is done within the context of a university’s own structure and culture. The activity is governed by an institutional IP policy which has been agreed by the university’s governing body: this applies equally to those commercialisation units which are subsidiary companies. In addition to institutional regulations, IP managers must take account of external funder and industrial sponsor requirements as well as the charitable status of a university and the restrictions on State Aid.
- The UK’s technology transfer sector is very well regarded internationally and evidence shows that it has many areas of excellence. Technology transfer professionals are part of an international community of practice with strong and enduring links to the USA, Europe, Australia and Asia. Professionals have developed training (Praxis) and systems for benchmarking practice (RTTP).
- As a professional body, PraxisUnico ensures that sector stakeholders have opportunities to meet our members and engage in discussion and debate around key issues to reach solutions. These include, but are not limited to: HEFCE (KE Framework), Universities UK, RCUK, Intellectual Property Office, Royal Academy of Engineering, NCUB, UKSPA. Our membership includes service providers (e.g. Patent Agents, Lawyers) and companies.
- Technology transfer can achieve more but needs a supportive funding and tax environment with the economic stability that encourages businesses – of all sizes – to think long-term and take risks to invest in early stage technologies.

Terminology and structures for technology transfer

1. HEFCE defines technology transfer as ‘the exploitation of existing intellectual property (IP) through processes of licensing and creation of spin-out businesses’. Although this is an important activity for universities, for the majority it is a small part of a much broader set of ‘knowledge exchange’

⁶ [Knowledge Exchange and Commercialisation: the state of the profession in UK Higher Education](#), PraxisUnico, 2015.

activities and annual knowledge exchange income⁷.

2. PraxisUnico has adopted the term 'Knowledge Exchange and Commercialisation' (KEC) to refer to these activities in-line with UK Research Council terminology and to emphasise the range of engagement models that are available to external organisations. It encompasses:

- Building partnerships and developing commercial propositions for taking university ideas into society via patents, licenses, spin-out formation as well as identifying and building the case for follow-on funds and proof of concept funding;
- Collaborative R&D, contract research, academic consultancy, facilities & equipment hire, Continuing Professional Development (CPD) and programmes such as Knowledge Transfer Partnerships. An increasing amount of activity is collaborative in nature to attract greater investment in very early stage research breakthroughs for the long-term.

These activities are now mainstream and stand alongside universities' teaching and research missions.

3. Every university has staff dedicated to KEC, who may be based in a dedicated commercialisation office, or in a research (grant) support office or embedded within departments. Organisational structures for technology transfer are varied since they are determined by institutional culture (research intensive, specialised) and resources (financial, human). Universities will adopt different organisational models for the internal and external audiences that need to be addressed, and these will change over time as an institution learns what meets its own objectives most efficiently and effectively. The majority of universities do not have separately constituted commercialisation units and several outsource such activity to commercial consultancies and intermediaries.

4. For a fuller discussion of technology transfer structures, staffing, roles and responsibilities we refer the Committee to 'UK University Technology Transfer'⁸ which was compiled by a group of six universities in the wake of the Dowling Review, to PraxisUnico's report "Knowledge Exchange and Commercialisation: The State of the Profession in UK Higher Education"⁹, and to the McMillan Group report on technology transfer which emphasises the institutional diversity which is necessary for successful commercialisation activities¹⁰.

UK technology transfer is working and continues to develop

⁷ This is clear from analysis of the annual Higher Education Business-Community Interactions survey conducted by HESA for HEFCE. <https://www.hesa.ac.uk/data-and-analysis/providers/business-and-community>

⁸ The commercialisation units of Edinburgh, Imperial, Oxford, Cambridge, Manchester and UCL collaborated to produce a briefing paper, "[UK University Technology Transfer: behind the headlines](#)" in 2015.

⁹ [PraxisUnico/Research Consulting](#), 2016.

¹⁰ University Knowledge Exchange (KE) Framework: good practice in technology transfer' HEFCE, 2016.

5. We should celebrate the success of the UK's technology transfer sector. There is a view that universities are good at research but poor at turning research into partnership and opportunity. Successive government reviews have revealed that the opposite is true. The UK's place in global innovation rankings is high and the UK system is at least as productive as the US and outperforms the US on some measures: for example, UK universities are recognised as pursuing a broader range of knowledge exchange activities for public good. HEBCI data has been rising year-on-year for over a decade, faster than annual GDP growth. Total income generated from collaboration with external partners has now reached £4.2bn pa and provides close to £10 return on every £1 invested¹¹, demonstrating the value that businesses place on such interactions.

6. Around two-thirds of UK universities report Intellectual Property revenues in the annual HEBCIs survey. A small number of high-value deals are responsible for a significant proportion of the reported external investment received for staff start-ups and sale of shares in spin-offs and there is a concentration of activity among large, research intensive institutions which have the kind of IP portfolios (life sciences, physical sciences), pipelines, professional support staff and top-level institutional support to drive activity. This model is very similar to the US universities. Nonetheless, PraxisUnico and AURIL membership and engagement levels demonstrate how universities of all sizes and mission types are accessing training and professional networks to improve standards and attract more external engagement in various ways.

7. The UK's *"highly advanced and sophisticated national IP environment"* places it on almost a joint footing with the US as the best in the world¹². There is always room for improvement but indications are strong that current arrangements to exploit IP from UK universities are effective. Many global companies and investors cite the UK as one of the best places in the world to form and scale-up new start-ups. The quality of UK universities is a strong pull-factor for investors and a vital part of creating investor confidence. UKTI's Venture Capital Unit was established to increase the funding available for UK entrepreneurs and start-ups, including those spun out of universities, through connecting them with overseas sources of venture capital investment. The Unit has stated that *"investors have more confidence in the UK than any other European nation"*¹³.

8. In the past decade the technology transfer sector has created innovative models for: business

¹¹ HEFCE '[Assessing the economic impacts of the Higher Education Innovation Fund](#)' Oct 2015

¹² Global IP Center [International IP Index](#)

¹³ UKTI <https://www.gov.uk/government/publications/ukti-venture-capital-unit>

creation and growth (e.g., SETsquared¹⁴), research translation (Apollo Therapeutics¹⁵), seed and venture capital funding (provided by multiple individual and groups of universities) to fill the gap left by; a decline in early stage venture capital, a more risk averse business culture, and a move by larger corporates downstream in the R&D process. Universities collaborate to deliver these innovations, often combining disciplinary and cultural strengths to meet business needs. Increasingly, the social sciences and arts are being brought into KEC, stimulating more innovation in engagement models¹⁶.

Technology transfer is just one of many activities conducted by universities to generate social and economic benefit

9. Universities are charitable bodies regulated by the HEFCE in England and equivalents for Scotland, Wales and Northern Ireland to ensure that they fulfil their legal obligations under Charitable Law. As exempt charities (2011) they have a duty to provide public benefit from their core teaching and research activities. One of the ways of providing such a benefit is through partnering with business and other organisations to take new ideas into use in society. These partnerships are also conducted under over-arching charitable regulations and set within national laws on things like patents, state aid, tax law, international trade protocols etc. Such regulations are not always conducive to business collaboration or investment: State Aid is a complex area that KEC professionals have provided expert guidance on¹⁷; VAT regulations prescribe how university buildings can be used; and financial incentives such as R&D tax credits are not straightforward.

10. Universities have always been committed to the advancement of knowledge through research. An early focus on licensing research discoveries to industry or turning breakthrough research into new companies has developed into a much broader engagement with external organisations in the private, public and third sectors: a recent survey of academic engagement with external organisations identified 27 different modes of non-commercial interaction¹⁸. The language of collaboration, impact, innovation and enterprise reaches across and between disciplines and is embedded in institutional missions and strategies.

11. Universities act as important economic drivers within their local regions, providing skilled

¹⁴ The SETsquared partnership comprises the universities of Bath, Bristol, Exeter, Southampton & Surrey. <http://www.setsquared.co.uk/>.

¹⁵ Apollo Therapeutics is a university-business initiative to drive forward therapeutic innovation with the goal of significantly improving the speed and potential of university research being translated into novel medicines. <http://www.apollotherapeutics.com/>.

¹⁶ PraxisUnico will run its first training course for this disciplinary sector in December 2016.

¹⁷ 'State Aid in Research, Development and Innovation: a guide for universities' February 2016 <http://www.auril.org.uk/Publications/tabid/1152/Default.aspx>

¹⁸ NCUB 'The Changing State of Knowledge Exchange' p.37 <http://www.ncub.co.uk/reports/national-survey-of-academics.html>

graduate employees, technical expertise, facilities and collaborative opportunities. Many of the research-base contributions to productivity and innovation are from the flows of knowledge and people through schemes such as Knowledge Transfer Partnerships or other forms of collaborative working. More formal research commercialisation through licensing, spin-outs and start-ups (by new graduates) are helping to create hundreds of new companies every year; many supported in their growth by university incubators and science parks¹⁹.

Technology transfer offices adopt good practices and IP strategies from others, in the UK and internationally

12. Universities have a long history of learning from each other and the area of technology transfer and knowledge exchange is no exception. This predates the introduction of specific innovation funding. Prior to the merger with Praxis in 2009, Unico had been representing its members since 1994 and was a forum for university commercialisation offices to share best practice²⁰. In the early 2000s AURIL convened a group to produce a strategic guide to managing IP, which is still relevant today and demonstrates how – pre-Lambert and HEIF – universities were taking good practice in IP seriously²¹.

13. Praxis was established in 2002, in partnership with the Massachusetts Institute of Technology (MIT) under the ‘Cambridge-MIT Institute’ (CMI) initiative, to offer technology transfer training to an emerging professional sector within UK universities. Lita Nelsen remains a patron of the organisation. Over 3500 people have been trained from UK and international universities, as well as KEC professionals in non-university research organisations. Our ‘*Fundamentals of Tech Transfer*’ and ‘*Research Contracts*’ courses run twice a year and are regularly over-subscribed, demonstrating the value that employers put on training as part of professional development.

14. PraxisUnico and AURIL board members represent the profession in the USA, at AUTM, and via the pan-European organisation ASTP-Proton. Training developed in the UK has formed the basis of national training programmes in other countries and bespoke training overseas is growing in demand – demonstrating how the UK’s technology and knowledge transfer sector has flourished to become world-renowned²².

15. PraxisUnico is a founder-member of the Alliance of Technology Transfer Professionals (ATTP), the organisation established to provide an international standardised way of recognising professional

¹⁹ Spinouts UK holds a database of 2000 university spin-outs and start-ups. <http://www.spin-outsuk.co.uk/>

²⁰ Praxis and Unico merged in 2009

²¹ AURIL [Guide to Managing IP](#)

²² See <https://www.praxisunico.org.uk/international>

achievement – the Registered Technology Transfer Professional (RTTP). All PraxisUnico courses carry ATP accreditation. The scheme was initiated by universities themselves, rather than being a government funded initiative, and is based on peer review. Achieving RTTP accreditation demonstrates dedication and expertise to the profession and is a recognition that the professionals who facilitate technology transfer must have a common core skill set to manage the complex set of challenges that technology transfer presents, regardless of the country culture in which it is carried out.

16. In 2012 PraxisUnico found that about two thirds of the delegates on the first *'Introduction to Technology Transfer'* course (run in 2002) were still involved in knowledge transfer in universities or the private sector. Many now give their time to train new entrants to the profession, or develop skills in specific areas such as *'New Venture Creation'*. The fact that many senior sector professionals give their time to be involved with training and other advocacy activities is a very positive reflection on the sector and how it supports sharing of best practice. A full list of PraxisUnico courses is available at www.praxisunico.org.uk/training-events/training-catalogue.

17. Training and development is accessible to anyone (not just to PraxisUnico members) and is shared with other professional organisations. The Association for Research Managers and Administrators (ARMA) also has a long history of sharing best practice and recognises that today's research management involves knowledge and skills around knowledge exchange and management of IP. PraxisUnico and ARMA share members and provide complementary training and joint events since we recognise the importance of dialogue between different parts of the research and enterprise/innovation processes within institutions.

18. The current KE Framework project led by HEFCE²³ amply demonstrates how professional technology transfer associations work with key sector stakeholders to inform and influence public policy around research commercialisation and knowledge exchange. PraxisUnico and AURIL convened members to inform the Dowling Review, and have participated in subsequent discussions with the Royal Academy of Engineering around issues connected to spin-outs specifically. Our aim in this type of engagement is to represent the context in which our members work, but also to learn from the issues raised by external partners.

Funding arrangements for research commercialisation and whether they facilitate an appropriate balance of objectives and an appropriate balance between short-term and longer-term aims

²³ <http://www.hefce.ac.uk/kess/goodpractice/>

19. We reject the claim that technology transfer is too focused on short-term income generation. Since the third round of HEIF in 2005, universities have been required to submit HEIF strategies to HEFCE; these have been assessed and best practice identified and disseminated back to the sector. English universities are currently writing institutional 5-year strategies for 2016-17 as the basis for future allocations. A similar outcome strategy requirement has been put in place by the Scottish Funding Council.

20. Many universities put additional funding into the support of KEC activities, staff, infrastructure and, increasingly, early stage investment. A major development in the sector is ‘patient capital’ which enables a much longer investment perspective than traditional venture capital, vital for supporting early stage companies²⁴. This and the creation of university seed funds demonstrate how universities themselves are responding to shortfalls in financing for commercialisation²⁵.

21. Dedicated public funds for commercialisation, innovation and societal engagement have played a critical role in assisting the change from IP exploitation to broader knowledge exchange, ensuring that income generation is not the main aim of technology transfer offices. In England, HEIF is unique because it can be used to fund any kind of knowledge exchange activity at a university’s discretion and in line with institutional strategy, and allows the experimentation which is vital for innovation in business engagement. HEIF has allowed for continuity of staff employment – important for building relationships and deepening understanding of practice – and has meant that universities can expand their KEC activities without immediately trying to cover their costs.

22. Because of the long-term nature of research commercialisation it is unrealistic to expect that tech transfer teams will be able to generate surpluses to fund their operations in a particular year. In most cases this activity is a net cost to the University. Most offices therefore have a stronger focus on commercial research collaboration with business than on IP exploitation. In their 2012 review of HEIF strategies, PACEC noted that 46% of universities emphasised the need to develop longer-term relationships and strategic partnership rather than single-transactions because they recognised *“the mutual benefits of these types of relationships not least the synergies with research and teaching but also the potential for growing repeat, deeper interactions.”*²⁶

23. PraxisUnico’s research demonstrated the variety of ways in which performance is assessed by

²⁴ See the paper written by Tony Hickson for HEFCE <http://www.hefce.ac.uk/kess/goodpractice/>

²⁵ ‘Proof of Concept’ funding was reviewed for Innovate UK by IP Pragmatics. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/510998/Innovate_UK_Proof_of_Concept_Review_Report_-_Final.pdf. The report notes a rise in the number of universities managing their own funds over the past 5 years.

²⁶ PACEC for HEFCE, ‘[Strengthening the Contribution of English Higher Education Institutions to the Innovation System: Knowledge Exchange and HEIF Funding](#)’ April 2012

universities. The survey found that over the past three years there had been an increased emphasis on non-financial returns from KEC activities: e.g. the number of external partners, the strength of relationships, the number of academics engaged. Financial targets are important but emphasis is put on long-term trends particularly for patents, where the timescales associated with formal commercialisation of IP rights are long.

Access to commercialisation opportunities for SMEs and large businesses

24. Over a decade ago, the Lambert Review made an important point about demand for university research ideas:

“The main challenge for the UK is not about how to increase the supply of commercial ideas from the universities into business. Instead, the question is about how to raise the overall level of demand by business for research from all sources.”

This was reinforced by a Science & Technology Select Committee report on “Bridging the Valley of Death; improving the commercialisation of research” (2013) which commented that:

“We recommend that the Government’s objective should be to create a commercial demand for university engagement to which they are already primed to respond. This echoes and reinforces the point made almost 10 years ago in the Lambert Review.”

25. Data shows growth across a wide range of innovation activities: in the academic year 2014-15 income from businesses alone reached £1bn according to HEBCI data. But it is unrealistic to assume that university collaboration will be of value to all businesses – the key question is whether if more collaboration is encouraged that this will lead to increased economic value for UK plc.

Commercialisation opportunities are made available on university websites and through third party ‘brokers’ (such as the recently launched ‘Konfer’ system) and business development managers in universities are charged with reaching new customers. But there are clear issues of supply and demand to consider here: there are 5 million businesses in the UK but under 200,000 academics across all disciplines. Because universities cannot engage with all businesses they tend to focus their activity on organisations which have the best ability to take up the research into useful products and services and/or have the internal capacity to dedicate time to working with an external partner. These type of companies will be proactive in seeking out collaborative opportunities themselves. This will tend to favour larger organisations with more resources but considerable efforts are being made to reduce actual or perceived barriers to entry for SMEs²⁷. It should be noted that HEBCI data reflects an ongoing increase in income from this business sector.

²⁷ For a full assessment of HEIs work with SMEs see the ERC’s 2016 report ‘University-SME engagement: the geography of connectivity across England and the effects on innovation’ http://dera.ioe.ac.uk/26434/1/2016_unisme.pdf.

26. In March 2016 PraxisUnico and HEFCE ran a training course for SMEs which aimed to increase understanding of how to work with universities. Demand for the course was very low, although satisfaction with the content was high. SME interaction also features regularly at our annual conference²⁸.

What measures universities, business leaders and Government should take to assist the commercialisation process, and to reach a common understanding of how the different stakeholders involved can engage in the process.

27. Our overarching recommendation is to endorse and support the recommendations made by the McMillan Group in its review of technology transfer. These acknowledge the success and strengths of UK technology transfer and the role of KEC professionals who support a very wide-range of activities with diverse external organisations. We fully support the need for continuous improvement and are actively working with stakeholders to achieve this. Above all, universities need to have stability of policy and funding in order to plan for the long-term: we are in a period of intense instability and so caution against dramatic changes to a sector which is working well in difficult times.

28. Sector stakeholders must be brought together – businesses, academics, intermediaries and funders – to share understanding of what is needed to create more demand for UK commercialisation ideas, greater investment in early stage research, and longer-term commitment to sustain spin-outs and start-ups.

29. Other recommendations are to:

a) Acknowledge and promote the role of KEC professionals, and the skills and experience that underpin technology transfer as part of our knowledge exchange activities. Encourage development and sharing of these skills, particularly for smaller or less experienced offices as part of the existing community of practice²⁹. Support the national and international training and networking offered by PraxisUnico and others, and empower professionals in their development of standards and accreditation in knowledge exchange and commercialisation with national and international partners.

b) Address tax and VAT issues which constrain collaboration. R&D tax credits need to be simplified: if all projects with universities were automatically classed as eligible it be very helpful in terms of marketing services (e.g. to SMEs). VAT on academic buildings should be changed to that businesses can co-locate with universities without causing tax challenges. This was also recommended in the

²⁸ For example see <https://www.praxisunico.org.uk/news-policy/blogs/conference-report-2015-successful-engagement-smes-what%E2%80%99s-secret>

²⁹ In support of a recommendation by the McMillan group. <http://www.hefce.ac.uk/kess/goodpractice/> para 119.

Dowling Review (Recommendation 12).

c) Improve funding and finance for technology transfer. To bring down engagement risk, the sector needs security, regularity and flexibility of funding mechanisms with low transactional costs. This is to get more experimentation and a 'suck it and see' approach that should appeal to SMEs in particular. There should be extension and / or expansion of what currently works well (KTPs) and what has worked well in the past (Challenge Fund); long-term collaborative funds such as the 'Awards in Collaborative Excellence (ACE) proposed in the Dowling Review would be effective. Government should encourage the use of Patient Capital and proof of concept and seed fund development leading to successful equity investment.

End.