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Dr. Robert Oliver  
Innovation and Enterprise  
The Old Anatomy Building  
Charterhouse Square  
London EC1M 6BQ  
Tel: 0207 882 5707  
Fax: 0207 882 6043  
e-mail: [r.s.oliver@qmul.ac.uk](mailto:r.s.oliver@qmul.ac.uk)

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Dear Sirs,

## **Lambert Report Consultation Response**

Queen Mary, University of London has adopted a positive approach to interactions with business and industry. Collaborations and partnerships are actively encouraged.

### **1. Collaboration**

Successful collaborations between universities and industry develop over a period of time only if it is seen to be to the mutual benefit of both parties, and among other things this requires a good working relationship and a mutual trust between the senior participants on both sides. This has been the experience in Queen Mary where industrial partners must also be able to demonstrate to their wider community and the world in general that their collaborations are with leaders in their field. This enhances the company's own standing in the process. When links are good and effective, they are also often long lasting, producing benefits to both sides.

#### **1.1 Industry's use of academic publications**

The passage of information between universities and industry in its most basic form has frequently been via the inspection of patent information. The process most commonly goes from university to industry. This kind of transfer of knowledge often precedes closer collaborations. In the opposite direction the inspection of patent information is a useful first step towards the identification of an appropriate industrial partner for a university applied research project. Queen Mary intellectual property management staff members are aware of the valuable patent information now readily available through the Internet sources and endeavour to use this data purposefully.

#### **1.2 Joint ventures**

Joint ventures of some form are becoming commonplace in funding of research and development activity in universities. These can take a number of forms. Queen Mary has participated in the government supported and very successful TCS scheme which allows the extension of consultancy activity into a fuller applied research or early development project by assistance in the funding of a placement of a university member of staff in a company, predominantly for the benefit of the industrial partner.

The College has established a number of joint ventures with companies such as one near to completion currently with a Cambridge biotechnology company. A degree of care is necessary as in such a relationship the university is likely to be the minor partner. The major partner can engineer a buy out against the university's best interests unless agreements and contracts are carefully drawn up.

The College is also negotiating a joint venture with the LDA to develop an innovation centre focussed on biotechnology on part of its Whitechapel campus. This centre will help to promote an increase in entrepreneurial culture within the research community in the College. It will also attract appropriate companies into close proximity with university research departments where synergistic relationships will be fostered.

### 1.3 Informal contacts

The informal contacts made with industry as a result of networks, conferences and other meetings are invaluable in the provision of leads into productive collaborations. There are many examples within Queen Mary of how collaborations and partnerships spring from informal contacts between academics and industrialists at national and international meetings.

From a base in the London area there is ready access to a number of organised networks.

These include:

- The London Technology Network
- The London Biotechnology Network
- The Eastern Region Biotechnology Initiative
- Thames Valley Technology
- Medinet London
- Creative Business Network
- M4 Innovation Group
- Southern Biotech
- Licensing Executives Society
- Henley Incubator Extrapreneurs Meetings

Members of the Innovation and Enterprise Unit regularly attend meetings of these groups and gain much from participation.

Many contacts are made less formally by members of the Unit at meetings, conferences and seminars. The best business development managers are outgoing and sociable people, not afraid to go up and talk to people they don't know. Recruiting and retaining appropriate staff is vital to the successful development and operation of university technology transfer offices. Within Queen Mary the Innovation and Enterprise Unit (the technology transfer office) has a role in assessment of market intelligence together with a determination of 'business need'. A process of matching this with the College's skill base can then be made. A process of brokering relationships between the industry and the academics involved with research in the College can then be undertaken.

### 1.4 Formal contacts

Formal contacts such as licensing, research contracts, consultancy projects and spin out company formation almost never happen without a number of informal contacts first. As a university with a wide range of research interests, there is a long list of contacts that could be classified as formal.

These include:

- Aventis
- Glaxo Smith Kline
- ICI
- Pfizer
- Roche
- BT
- Nokia
- Nortel
- MMI
- Peptor (Israel)
- Bioenvision (US)
- Strakan
- Zenosis

As mentioned above most contacts come about as a result of interpersonal contacts as a result of alumni in industry, staff moving to industry, informal contacts from any number of mechanisms and lastly, serendipity.

### 1.5 Case Study

The College has had collaboration with Amersham plc for nearly 20 years and has been involved in a number of projects, some of which have led to the development of commercial products. This started in a very small way following a contact made at a conference in France with an initial grant of £1,707 but over a period of a few years this had developed into a collaboration involving 5 funded postdoctoral researchers, working on projects very close to the market. This was due to (i) our success in solving their problems, (ii) reasonable costings for the research, and (iii) a willingness on our part to show flexibility. This latter point is very important since changes in direction can occur very quickly in industry and they don't want to have negotiated narrowly defined objectives to find that their priorities have changed and they are left paying for work they no longer want. The recent emphasis on carefully drawn up legal documents can seriously restrict this flexibility. Recently Amersham seems to have made a policy decision to deal with more research "in house" and there has therefore been a consequential cutback in external funding. This is not an isolated example but in our particular case it has reduced the level of support to a single postdoctoral worker and it is unlikely that they would fund external activity at the level received in the past. While industry still seeks the assistance of academics to help them solve their problems, in our experience there seems to be a growing reluctance to fund this sort of research within the University sector.

### 1.6 The local Regional Development Agency (LDA)

The London Development Agency (LDA) is actively involved in the promotion of aspects of innovation development in London. The LDA was involved with Queen Mary in the joint sponsorship of an Innovation Forum associated with a DTI event in Summer 2002. This was also combined with a SMART Award ceremony and a networking event. Recently the LDA organised a conference focussed on various aspects of innovation. There was however a disappointing attendance by representatives of business and industry. The reason may have been the very wide range of innovation topics covered.

Queen Mary has good working interactions with the LDA having established a number of relationships at a personal level. This is particularly notable in connection

with the Innovation Centre development project mentioned above and the Centre of the Cell Project (part of the New School of Medicine and Dentistry building in Whitechapel).

### 1.7 Clinical Trials

The College School of Medicine and Dentistry together with the Barts and London NHS Trust is involved with a wide variety of clinical trials studies with many pharmaceutical and biotechnology companies. These have consultancy elements in terms of interpretation of findings but also have a contract research aspect where a direct service is being provided for industry. These trials often provide a contact mechanism into industry and a first step into companies.

## 2. Strengthening relationships

### 2.1 Barriers

- In scientific collaboration the major barrier to establishing collaboration is not usually at the level of the scientists themselves but at the legal/financial level. The blame for this occurs on both sides. As universities are placed under greater financial pressure they are becoming more aware of the potential value of the expertise that their staff possess. They see overheads income as a major potential source of income and many have appointed individuals with the remit to increase the level of overheads recovered. By their very nature, these individuals are a hindrance to developing collaborative links since they are usually judged by their 'financial' success not by the number of collaborative links that have been developed. Moreover, the very fact that these units have been established means that a higher level of overheads recovery has to be obtained simply to pay for their activities.
- At the same time industry sometimes has unreasonable expectations. There is a feeling in some quarters that one of the roles of universities is to assist industry and that this is a knowledge-based resource that should be available to them (since industry has already made a major financial contribution to their cost via the taxes they pay). One of the attractions of collaborating with universities in the past was that they were seen to be reasonably cost effective. The costs of employing a researcher in a university was lower than employing their own staff but at the same time there was an acceptance that academics were less easy to control and that many of them would carry out work less relevant to the industrial company while being funded by that company. The demands for higher levels of overheads and, perhaps more importantly, the lengthy delays in getting work underway while legal/financial negotiations are concluded are becoming more of a disincentive to get involved in externally funded research (and especially at some universities).
- The demands for large royalties and greater control of IP are making the financial case for going outside the company for help less attractive. One also needs to remember that industrial companies are often international and that their collaborations are not simply tied to UK universities. In the same way as employing staff in this country is become more expensive, so the cost of funding research in UK universities is becoming more expensive compared with other countries.

- The recent EPSRC-commissioned Whitesides' International Review of the Standing and Potential of UK Chemistry Research commented that the UK has very strong ties between industry and the university sector in the chemical area but that this was both a strength and a weakness (the latter resulting from the greater emphasis on applied chemistry at the expense of blue skies research).
- In terms of management and organisation issues, there is the impression that neither universities nor business really value technology transfer work. The reason is the same for both - universities are too cheap!
- Departments that price consultancy and technology transfer activities on a cost recovery basis will naturally see this work as less valuable than their "core" academic work. If, however, the work generates a substantial surplus that is used to pay for core academic activities, experience in the College Centre for Commercial Law Studies (CCLS) is that academic staff are keen to undertake such work. It is important that the members of staff who generate the surpluses feel they have a say in how they are spent.
- From a business perspective, the comparator is a consultant such as Accenture, probably charging around £2K per consultant day. On a cost recovery basis, universities will charge maybe £300 per day. This means that the contribution of universities is seen as less professional and less valuable.
- Intellectual property. Universities have real structural problems in managing this effectively, because it is not seen as a valuable institutional asset but instead as a personal asset of the academic. This is largely true for copyright (though not exclusively so), and certainly true for know-how.
- One of the biggest barriers is the inability of commercial organisations to prove that they own all rights in the IP they are trying to exploit. In a university, this task is almost impossible under current practices. A second problem in relation to IP is that much of the value of IP (in particular potential patentability and the exclusive possession of know-how) can be destroyed by publication, in its widest sense, and yet publication is at the heart of the academic mission.
- Feedback obtained from some companies (notably the Environment Agency) is that there is a public/industry perception that universities are unprofessional and that their members of staff are unlikely to perform according to modern day commercial pressures. This was highlighted in a conversation with the Scientific Investigations office for the EA who said that over the last few years of all the university driven research projects they had run only one had delivered on time (we are pleased to report that this was a Queen Mary collaboration project).
- On another angle there is a conflict between university goals and commercial goals. We are under increasing pressure to produce high quality research and therefore there is less benefit in working on 'commercial contracts'. In some respects it could be said that we are discouraged from doing this, as it doesn't bring in any overheads etc. Industries on the other hand, don't have money to spend on research, they want results. They all want to use the new techniques, but they don't necessarily want to put up the funds to do the initial research.

## 2.2 Improvements

There are several ways in which universities and industry can improve the prospects of benefiting from each other's resources:

- The HEROBC and HEIF initiatives have had an effect in universities in focussing attention on their interfaces with business mostly through the creation of technology transfer offices. The continuing success of these initiatives depends on retention of the experience and continuity in staff recruited. This in turn is dependent on continuation of a sensible funding structure. The support units should make themselves valuable to the point where they are indispensable. This in turn will put pressure on institutions to fund them should independent finance not be forthcoming. Self-sufficiency in terms of financial returns from the exploitation of intellectual property is likely to take significantly longer than the few years of the initial funding, especially if this relates to returns from spinout companies where a five to ten year time scale is realistic for exit strategies.
- The Innovation and Enterprise Unit in Queen Mary has the brokering role mentioned above but a large part of the role is education for both sides. The first of these is finding out what the University departments have to offer in terms of expertise and capability. There is also a similar task on the industry side finding out what industry and business wants from any collaboration. This is then followed by a relationship building exercise where there may be a match between what the University can provide and what the market wants; essentially building value into the process.
- A continued emphasis on appropriate networking groups perhaps initiated by the regional development agency could encourage contact between universities and industry. There are several successful networks in the London area but there is, for instance, an absence of a suitably dedicated network for companies and researchers in materials or biosensors and nano-technology.
- Some increased form of financial encouragement to companies to provide continuing education involving universities in or close by the workplace may also provide an additional route of contact into companies. This could be delivered in a number of ways using a variety of multi media delivery methods, typically in collaboration with FE Colleges. In the medium term this should also result in an increase in the exploitation of innovation.
- The chief barriers to technology transfer are typically regarded as financial ones. There is some limited initial funding available through seed funds; these however are being increasingly handled as venture capital funds. It is then progressively more difficult to obtain major funding. One of the most significant developments that could be made would be the putting in place of the very earliest funding at the point before ideas are at the stage where venture capitalists are prepared to engage.
- The SMART award system is commendable, but the qualification for company entry to the scheme has an upper limit of university equity share ownership of 25%. This gives problems in operating the system with spinout companies. Universities have to invest significant resource for instance in the protection of intellectual property through the patent system and as a result, most

universities expect more than 25% of the pre-funded spinout equity.

- The conflict between protection of IP and publishing results requires a two-fold approach: (a) education of academics so that they (i) recognise potentially exploitable IP and (ii) do not compromise it by early publication; and (b) resources to provide immediate advice on how to preserve IP whilst allowing publication to the widest possible extent.
- Intellectual property issues are generally understood in the larger institutions where there is a critical mass of IP to justify dedicated staff. Other HEIs without this critical mass are forced to buy in relatively expensive consultancy advice and often do not benefit from a coherent approach. One approach might be the creation of some form of centralised university function to provide this advice at an 'academic' rate for these institutions. This could work in London where there is a high concentration of such HEIs. The approach would need some initial kick-start funding and then could be self sufficient in a few years.
- Intellectual property and the issues surrounding it are currently being actively considered in Queen Mary as in other institutions. Universities as employers, academics as inventors/creators and businesses that fund research work all have a vested interest in this issue. The real issues are only now being understood and are not fully resolved. In the meantime this is an area of concern for those on all sides.

The third and fourth questions are aimed at industry and as such are not addressed here.

Yours sincerely,

Dr Robert Oliver