Appendix 4

Areas visited in UK and US

UK AREAS VISITED

CAMBRIDGE

Science base: A centre of scientific excellence represented by the University, and institutes such as: Laboratory of Molecular Biology, Babraham Institute, Sanger Centre, and the European Bioinformatics Institute.

Company base: Cambridge is the leading biotechnology centre in the UK with some 150 specialist biotechnology companies mostly located within 30 miles of the town centre.

Finance, business services and large companies: There are many investors and specialist service providers (some 200 firms) including patent agents, accountants, lawyers, venture capitalists. Major pharmaceutical research sites are located close by (e.g. Glaxo Wellcome at Stevenage and Smithkline Beecham at Harlow).

Premises and infrastructure: A number of Science Parks (e.g. Cambridge Science Park, and Granta Park) and incubator facilities (e.g. Babraham Bioincubator, St Johns Innovation Centre) available. Problems reported with restrictions on planning permission and transport infrastructure.

Networks and Regional Biotechnology Associations: The Eastern Region Biotechnology Initiative (ERBI) was set up in 1997 with matching funding from the DTI Local Challenge Fund to enhance the development of biotechnology in the east of England through networking and other activities.

Source: Visit and Eastern Region Biotechnology Initiative

SOUTH EAST (SURREY, SUSSEX, KENT)

Science base: Ten universities across the region of which Sussex is a leading bioscience research university.[43] Research institutes include BIBRA international which provides contract research and other services.

Company base: Estimated to be some 150 biotechnology related companies spread through out the region (including service providers). Leading companies include Vanguard Medica and Biocompatibles.

Finance, business services and large companies: Many of biotechnology related companies in area are service providers. Proximity to finance, and services communities in London. Many pharmaceutical industry companies represented in the area.

Premises and infrastructure: Specialist incubator space is available at the Sittingbourne incubator, Kent, and there are other incubators and Science Parks (e.g. at University of Surrey, Reading, and University of Southampton)

Networks and Regional Biotechnology Associations: Southern Bioscience was launched in 1998 and has increased networking opportunities as well as undertaking a range of other activities including overseas partnering and trade missions.

Source: Visit and Southern Bioscience

OXFORD

Science base: Oxford University is leading bioscience research university. Also other biotechnology research organisations, including: John Radcliffe Hospital, AEA Technology, MRC Radiobiology Institute, Wellcome Trust Human Genetics Centre.

Company base: More than 50 biotechnology companies based in Oxfordshire, many of whom are spin outs from Oxford University, e.g. Oxford Glycoscience, Oxford Molecular and Oxford Asymmetry.

Finance, business services and large companies: Well developed business angel network around Oxford and specialist service providers.

[43] Leading bioscience research university defined as among the top 10 universities funded by either BBSRC, MRC or Wellcome Trust (see Table 3 in main text)

Premises and infrastructure: The DTI supported BiotechNet is providing mentoring and incubator facilities. Oxford is well connected to London, Heathrow airport, and a number of major pharmaceutical companies in South East England.

Networks and Regional Biotechnology Associations: The Oxfordshire Biolink initiative, launched in April 1999, aims to enhance networking and promote biotechnology in the region.

Source: Visit and Oxfordshire Biolink

NORTH WEST

Science base: The Universities of Manchester and Liverpool represent a large number of bioscience researchers and seven RAE 5* or 5 rated bioscience departments. The North West is well placed for clinical research with leading institutes (Paterson and Christie), the Wellcome Trust Clinical Research Facility.

Company base: Up to 30 biotechnology companies estimated to be located in the North West around Manchester, including number of public companies (ML Laboratories, Tepnel Life Sciences, Proteus).

Finance, business services and large companies: Manchester has a large investment community and a strong presence of some technology investors, such as 3i. Limited number of investors who specialise in biotechnology. Strong track record in pharmaceutical and fine chemical manufacturing, and also some pharmaceutical industry research sites, (e.g. Astra-Zeneca at Alderley).

Premises and infrastructure: The newly constructed Manchester Biotech Incubator Building is a major £15 million investment providing specialist incubator space and support for biotechnology start ups. A further incubator facility is planned in Liverpool (MerseyBio). Manchester airport provides good international links. There are also some Science Parks, such as Westlakes, but not yet with a specialist focus on biotechnology.

Networks and Regional Biotechnology Associations: A North West biotechnology Initiative is in the process of being established with the aim of promoting the North West as a centre of excellence for biotechnology and providing networking opportunities

Source: Visit and North West Biotechnology Initiative

YORKSHIRE & HUMBER

Science base: York University has a number of bioscience research strengths, including plant science research in which close links are being established with the MAFF Central Science Laboratory. The White Rose partnership aims to promote collaboration in the biosciences between Leeds, Sheffield and York Universities.

Company base: Around 40 companies undertaking biotechnology activities, including some specialist biotechnology companies and University spin outs.

Finance, business services and large companies: Non specialist legal and financial support services in Leeds, Sheffield and York. Bioincubator York provides mentoring services for biotechnology start ups.

Premises and infrastructure: A number of science parks and incubators in the area (e.g. York Innovation Centre), although none of them yet have their own laboratory incubator space.

Networks and Regional Biotechnology Associations: BioScience York, supported by York City Council and the University of York, has been a major promoter of biotechnology in the region and helped engender collaborative patterns of working between companies and research institutes.

Source: Visit and York City Council

LONDON

Science base: Strong science base, accounting for over one third of public funded research in the UK. Leading bioscience research universities include: University College London and Imperial College. There are also a number of leading research hospitals including United Medical and Dental School, Guy's and St Thomas' Hospital.

Company base: Around 50 biotechnology companies in London some of which are company headquarters, including start ups and inward investors.

Finance, business services and large companies: home to many of the UK's biotechnology finance community and specialist service providers. Over 10 % of pharmaceutical employment is in London, including headquarters, R&D, and manufacturing sites.

Premises and infrastructure: Perceived shortage of incubators with laboratory space for start ups located close to the major research centres. Good transport links to other parts of the country and international

Networks and Regional Biotechnology Associations: No dedicated biotechnology network, though a relevant network is London Medicine.

Source: Visit and London First

NORTH EAST

Science base: Five universities (Durham, Newcastle, Northumberland, Sunderland and Teeside) with bioscience research. A major new investment, the International Centre for Life, will house the RAE 5* rated University of Newcastle Department of Genetics.

Company base: An estimated 18 biotechnology companies, including some start ups.

Finance, business services and large companies: Limited number of biotechnology investors (an exception is 3i), and business service providers. Several major pharmaceutical companies have manufacturing sites in the North East (e.g. Glaxo, MSD, Zeneca Life Science Molecules)

Premises and infrastructure: The International Centre for Life is to provide specialist incubator facilities for biotech SMEs, and other incubation units are available at the Business Innovation Centre, Sunderland.

Networks and Regional Biotechnology Associations: Plans to establish a North East Biotechnology Initiative to promote biotechnology in the area and improve networking and support for the sector.

Source: Visit and Government Office North East

CENTRAL SCOTLAND

Science base: Edinburgh, Dundee and Glasgow have leading research Universities and are world leaders in some areas of research such as Oncology at Dundee University and Neuroscience at Glasgow University. Other important research organisations include the Roslin Institute (nuclear transfer technology) and the Moredun Institute (veterinary biotechnology), as well as research hospitals such as Ninewells Hospital in Dundee.

Company base: 50 biotechnology companies in Scotland, mainly based in the triangle of Edinburgh, Glasgow and Dundee.

Finance, business services and large companies: Some leading CROs based in Scotland. e.g. Quintiles, and Inveresk. Small number of local specialist investors, service providers, and large companies in related sectors.

Premises and infrastructure: Number of relevant incubators and science parks, such as Edinburgh Bioparks and BioAdventures near Glasgow.

Networks and Regional Biotechnology Associations: Scottish Enterprise have supported networking activities, such as BioDundee.

Scottish Enterprise has also supported the development of the sector through assisting with grants and loans, and providing equity investments. Scottish Enterprise is developing a cluster strategy for the Scottish biotechnology sector.

Source: Visit and Scottish Enterprise

WALES

Science base: Bioscience research is undertaken in Universities throughout Wales. Cardiff is home to a leading bioscience research university and medical school.

Company base: Figures from Ernst & Young (1998) register 10 specialist biotechnology companies in Wales, and there are around 50 companies relating to biotechnology.

Finance, business services and large companies: Limited number of specialist finance providers and business services and few large companies relating to biotechnology. An exception is the research site of Nycomed Amersham located outside Cardiff.

Premises and infrastructure: Medicentre at University of Wales College of Medicine provides 32 accommodation units for new and growing healthcare companies. Some science parks located in South Wales.

Networks and Regional Biotechnology Associations: The Welsh Development Agency supports a number of initiatives which help networking, such as the Wales Medical Technology Forum, though not a dedicated biotechnology network. The Agency also produces a biotechnology directory and has a Centres of Expertise programme to promote HEI departments with strong industrial links.

Source: Visit and Welsh Office

NORWICH

Science base: Norwich has a strong bioscience research community of some 3000 scientists at the University of East Anglia, John Innes Centre and Institute for Food Research.

Company base: Few, if any, biotechnology companies located in Norwich Finance, business services and large companies: Specialist investment community and service providers nearby in Cambridge.

Premises and infrastructure: No specialist premises or incubator facilities available yet for biotechnology companies

Networks and Regional Biotechnology Associations: Norwich is included in the area covered by the Eastern Region Biotechnology Initiative. There are good informal networks between the University and research institutes.

Source: Visit and Norwich Research Park

AREAS OF UK NOT VISITED

Midlands: leading bioscience universities include Birmingham, Leicester, and Nottingham.

South West: The University of Bristol is a leading bioscience university. The Defence Evaluation and Research Agency provides contract research and other services for biotechnology companies.

Northern Ireland: The University of Ulster was 5* rated for Biomedical Sciences in the 1996 RAE. It has introduced a new BSc course in biotechnology. There are around 40 healthcare companies located in Northern Ireland.

US AREAS VISITED

BOSTON

Boston is one of the leading centres for biotechnology in the US, second only to California.

Science base: Major research organisations include the Massachusetts Institute of Technology (MIT), Whitehead Institute for Biomedical Research, and Harvard and Boston universities.

Company base: There are some 245 biotechnology companies in Massachusetts employing around 17,000 people, with leading companies including Biogen and Genzyme. It is one of the most mature of the US clusters with 79 companies founded in the 1980s, though it is still growing rapidly with 112 new companies since 1996.

Finance, business services and large companies: There is a large venture capital community (over 150 firms) in Massachusetts and further funding is available through the Massachusetts Technology Development Corporation and several other financing agencies.

Networks and Regional Biotechnology Associations: The Massachusetts Biomedical Research Institute, set up in 1984, aims to promote the sector by providing access to state and federal grants and loans and assisting technology transfer.

SEATTLE

In the context of the US biotechnology scene, Seattle is an "emerging" biotechnology cluster and now ranks among the top five biotech centres in the US by number of firms.

Science base: Major research centres are the University of Washington and the Fred Hutchinson Cancer Research Center, which are an important source of start ups and collaborations.

Company base: There are 115 companies in the Seattle biotechnology and medical technology cluster employing 12,400 people, with nearly one-third of the companies (36) formed in the last five years.

Finance, business services and large companies: The cluster lacks venture capitalists, though has a well established business angel community and specialist patent agents.

Networks and Regional Biotechnology Associations: The Washington Biotechnology and Biomedical Association has acted as a lobbying and networking organisation for the cluster and the State government have taken measures, such as tax reforms, to encourage the sector.