

OXFORD BIOPHARMA CLUSTER



Introduction

About clusters

The term business cluster was popularised by Michael Porter in The Competitive Advantage of Nations (1990) who defined clusters as “geographic concentrations of interconnected companies, specialist suppliers, service providers, firms in related industries, and associated institutions (for example universities, standards agencies and trade associations), in particular fields that compete but also cooperate”. The boundary of the cluster for the Oxford map was set at a 20-mile radius of Carfax Tower. This equates to an area of approximately 1257 square miles (3256 sq km). Only those organisations trading at a postcode within this geography were included.

Organisations included on the map

The organisations featured on the map are involved, directly or indirectly, in the Biopharma sector – not the broader life sciences or healthcare sector. They include companies working on products and services aimed at disease prevention, diagnosis, therapeutic interventions and the monitoring of therapeutic treatment outcomes.

Cluster analysis

An analysis of the companies on the map was commissioned by Bidwells and undertaken by Jeanette Walker of letscellit.com. In addition to providing data about the trends driving the demand for property in the biopharma sector, the study also highlighted key issues that could affect the growth of the cluster and its global competitiveness in the future. These are included in the tables above. The analysis covered the companies in the clusters rather than the universities or hospitals. Mapping and analysing clusters at this level of detail is challenging, especially as much of the terminology associated with the Biopharma sector is open to interpretation. The map and associated analysis is a snapshot of the cluster as at March 2016 and does not include historical data.

20miles

The radius from Carfax Tower setting the boundary of the Oxford cluster



1257mi²

Equates to area of the cluster



About Bidwells

At Bidwells we like to think we are a bit different from other property consultants. We don't claim to do everything for everyone. But we do offer our clients an unparalleled knowledge and access to the markets we serve – and these are some of the most interesting markets with the highest growth potential in the UK.

Much of our work is concentrated in the 'Golden Triangle' encompassed by Oxford, Cambridge and London. Key activity in this area is focused on the science & technology, and education sectors. We also manage thousands of square miles of the UK's countryside and coastline where we are helping clients to take advantage of opportunities in the high performing areas of forestry, renewables, and agriculture.

Bidwells. Well Informed

About letscellit.com

Founded in 2009, letscellit.com provides business related consulting services to the biomedical industry. Founder Jeanette Walker has studied biopharma clusters for over 10 years and has played an active role in the development of the Cambridge cluster since 1997.

letscellit.com

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Inclusion and exclusion criteria

Companies working on products and services aimed at disease prevention, diagnostics, therapeutic agents and the monitoring of therapeutic treatment outcomes. Any of the companies could be engaged in one or more of the following activities: discovery/research, development, process development/manufacturing, warehousing, distribution, sales, marketing and consulting.

Purpose of technology, product or service	Examples	Category	Excluded
As a therapeutic intervention	<ul style="list-style-type: none"> • Small molecules; biologics; vaccines; cellular therapies, immuno-therapies, gene therapies; tissue engineered= products, wound healing and wound care products; regenerative medicine/ stem cell treatments • Branded and generic medicines 	Therapeutic product	Organisations engaged directly or indirectly in clinical or surgical interventions that do not have an associated medicine or therapy; stents are excluded unless they are drug-eluting stents; selfinflating tissue expander for use in reconstructive surgery
Monitor health in order to determine whether a person is at risk of requiring a therapeutic agent <ul style="list-style-type: none"> • Detect/monitor symptoms to assess • whether a therapeutic intervention may be required • Ascertain the extent of a disease • Assess whether a patient is eligible for a treatment • Inform treatment options or decisions • Predict treatment response 	Medical devices, diagnostic and other tests used by consumers and/ or healthcare professionals e.g. blood glucose monitors, blood pressure monitors, breath analysers, spirometers, imaging technologies	Therapeutic supply chain	Companies working in the area of functional foods, nutraceuticals; paternity testing
Administration of a therapeutic agent	Drug delivery devices e.g. patches, inhalers, autoinjectors, needles, nasal sprays etc	Therapeutic supply chain	
Support or facilitate the discovery, research, development, including clinical development, or manufacture of a therapeutic agent	Companies developing, selling or outlicensing a product or service that is based on scientific or clinical expertise. Includes: <ul style="list-style-type: none"> • contract research organisations e.g. analytical services, chemistry, biology, pre-clinical • technology platforms e.g. omics, • bioinformatics • equipment, instrumentation • reagents, kits, media, tissues • clinical services • regulatory affairs • technical consultants 	Therapeutic supply chain	Tools or equipment used solely to aid surgical intervention not used as part of a therapeutic intervention e.g. stents; medical materials used in surgical instruments
Determine whether the therapeutic agent has worked	Tests for measuring treatment outcomes; includes imaging products and technologies; patient monitoring; pharmacovigilance	Therapeutic supply chain	
Support the business-related activities of the companies listed above	Specialist strategic, financial or investment advisers e.g. financial due diligence and IP management, medical writing, publishers, marketing communications specialists, market research, business intelligence, investors, technology transfer offices	Business service provider	Patent attorneys, law firms, accountants, general marketing consultants, insurance agents, recruitment consultants, IT/AV consultants, property advisers, facilities managers, architects, web designers, local government, LEPS, logistics

Key facts about the Oxford cluster

Cluster = 20-mile radius from central Oxford;

1257 sq miles (3256 sq km); equivalent to one-sixth of Massachusetts

- 2 universities
- 1 research institute (non-university)
- 2 NHS Foundation Trusts
- 244 companies
- University of Oxford ranked # 2 in the world; # 1 in life sciences; # 1 in clinical, pre-clinical & health
- 2 companies listed in "FierceBiotech's Fiercest 15" in the last 5 years
- 9 publicly traded companies with combined market cap of \$1.83bn
- 1 \$bn company
- 97% SMEs
- 83% British; 17% foreign-owned
- US largest inward investor – about half the foreign companies
- Current decade on track to be most prolific in terms of number of companies established; almost a third of companies established in the last 5 years
- Oxford Biomedica oldest established therapy company
- Over half of all companies on science, technology or research parks
- Milton Park home to highest % of park-based companies
- R&D most prolific activity
- 16% Oxford University spin-outs
- Ratio of therapeutic product companies to supply chain companies approximately 1:3
- One-fifth therapeutic product companies; most therapeutic product companies (78%) building pipelines in the cluster (pipeline companies); 20 pipeline companies have clinical stage products; cancer treatments most prevalent; novel, small molecule discovery most prolific; 5 immuno-therapy companies
- 152 companies in the therapeutic supply chain; diagnostics/patient monitoring largest segment (21%) followed by instrumentation/equipment (19%); kits, reagents, media (13%) technical consulting (11%)
- 25% of companies have equity finance
- 91% of CEOs male; 76% aged 50+

Data correct as of March 2016

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For a similar analysis of the Cambridge Biopharma cluster and associated map please visit www.bidwells.co.uk/research

#2

University of Oxford overall world ranking

\$1.83bn

The combined market cap of 9 publicly traded companies

152

Companies in the therapeutic supply chain

"Current decade on track to be most prolific in terms of number of companies established; almost a third of companies established in the last 5 years."

Bidwells property market overview

The refocusing of our business around the 'Golden Triangle' of Cambridge–London–Oxford has received a further boost from the recent Centre for Cities Report, which identifies Cambridge and Oxford as amongst the fastest growing cities in the UK.

Cambridge continues as the major focus for the UK's innovation sector, whilst London and Oxford are also centres for the new tech businesses that are beginning to act as a major driver to the UK's economic success.

Prime headline rent

Prime office rents are up in most locations, with record highs set in Cambridge, Oxford and Milton Keynes

Location	Prime headline rent (£psf 12/2015)
Cambridge	35.00 ▲▲
Cambridge Labs	32.50 ▲▲
Oxford	26.50 ▲
London (West End)	125.00 ▲

Take up

Take up is down in most markets due largely to supply constraints

Location	Take up (000's sq ft 12/2015)
Cambridge	552.2
Cambridge Labs	657.3
Oxford	204.7
London (West End)	4.3m

Demand

Demand is forecast to drive rental growth over the next 12 months with London, Oxford and Cambridge growing by 8%, 4.7% and 4.3% respectively

Location	Demand (000's sq ft 12/2015)
Cambridge	1,432.3 ▼
Cambridge Labs	492.0 ▼
Oxford	183.0
London (West End)	N/A

Availability

Supply has continued to tighten, with only 600,000 sq ft of grade A space across Bidwells major locations (excluding London)

Location	Availability (% total sq ft 12/2015)
Cambridge	10 ▲
Cambridge Labs	5 ▼
Oxford	9 ▼
London (West End)	5 ▲

Prime Yield

Prime office yields have hardened as rental growth has returned to provincial centres

Location	Prime yield (% 12/2015)
Cambridge	5.0 ▲
Cambridge Labs	6.0 ▼
Oxford	5.75 ▼
London (West End)	3.75 ▲▲

Take up (000's sq ft 12/2015) for London (West End)

4.3m

Prime Yield (% 12/2015) for Cambridge, an increase on previous years

5%

FINDINGS

The cluster

246 companies

2 universities (University of Oxford; Oxford Brookes University)

1 (non-university) research institute (STFC Rutherford Appleton Laboratory)

NHS Foundation Trusts (Oxford Health NHS Foundation Trust, Oxford University Hospitals NHS Foundation Trust)

QUESTIONS ARISING FROM THE STUDY

What is the optimum size geographically for an area to function as a successful biopharma cluster as defined by Michael Porter?

How important is it for companies to be, or to be seen to be, part of the Oxford cluster in terms of attracting investment, staff or establishing credibility?

At what distance beyond Oxford would companies consider themselves to be part of the "Oxford cluster"?

246

companies in cluster

Type of companies

20% (52) therapeutic product companies

61% (152) therapeutic supply chain companies

19% (46) business service providers

Ratio of therapeutic product companies to supply chain companies approximately 1:3

Note – some companies are both therapeutic product companies and supply chain companies

Is there an optimum ratio of therapeutic product companies to suppliers in a biopharma cluster to ensure sustainability?

How does the ratio in Oxford compare with clusters in the US and Europe?

How much business is transacted between the therapy companies and suppliers in Oxford?

How would a reduction in the number of therapy companies affect the supply chain companies?

How important are the universities and research institutes to the companies?

How important is it to have major pharma in the cluster?

To what extent are companies undertaking their clinical trials at the hospitals in Oxford?

Company size

97% (239) employ 250 or fewer people

85% (209) employ <50 people

4% employ >250 people (large companies)

3 of the large companies are British; 3 therapeutic supply chain companies, 1 business service provider

What are the barriers to growth e.g. availability of suitable or affordable premises; lack of investment or skills; lifestyle choice for people working as freelance consultants?

To what extent are companies operating a "virtual" model e.g. outsourcing activities to contract research organisations outside the cluster rather than undertaking projects in-house?

97%

(239) employ 250 or fewer people

Nationality/ownership

83% (204) British

17% (42) foreign*

73% (180) global HQ

21% (52) owned by a single corporate entity

5% (12) owned by a holding company

16% (40) Oxford University spin-outs

4% (8) subsidiary of a British company

*Of the 42 foreign companies:

74% (31) are the UK HQ; 52% (29) United States; 33% (14) Europe; 14% (6) Asia Pacific

Is there an optimum ratio of native to foreign-owned companies in a cluster?

How does the ratio of native to foreign companies in Oxford compare with other clusters?

Historically what market entry strategy was deployed by foreign companies e.g. M&A, and has this led to increased investment or closures/asset stripping?

What are the potential threats in having almost a fifth of the companies in foreign ownership?

In the future, will foreign direct investment from Asia, particularly India and China, increase as these countries seek to acquire innovation?

83%

British ownership

FINDINGS

Age of companies

28% (70) established in last 5 years; compares to 45% (110) in the previous decade

17% (42) in the 1990s

5% (13) in the 1980s

4% (10) before 1980

35% (18) of all therapeutic product companies established in the last 5 years

Main activity

39% (97) involved in R&D

10% (24) engaged in process development, production or manufacturing

9% (22) technical consulting

18% (39) scientific services or products

29% (71) distribution, sales, marketing

Listed companies

9 companies* traded on a stock exchange; 7 therapeutic product companies and 2 supply chain companies

6 IPOs took place in the last 5 years

5 listed on AIM; 2 LSE; 3 NASDAQ; 1 dual AIM & NASDAQ

1 company market cap = \$1bn+ (Circassia)

*excludes pharma

Therapeutic product companies

21% of all companies (52) are therapeutic product companies

2 of the world's top 10 pharmaceutical companies have a presence in the cluster i.e. Sanofi/Genzyme, J&J (virtual partnering office)

100% SMEs

24% (12) in foreign ownership

78% (41) developing product pipelines in Oxford

50% (20) pipeline companies have clinical stage products

55% (22) developing small molecules;

15% (7) biologics; 12% (5) immuno-therapies

Anti-cancer drugs most prolific area of discovery (40% of pipeline companies)

QUESTIONS ARISING FROM THE STUDY

If space in incubator or innovation centres continues to be constrained what are the implications for new companies?

Will there be sufficient grow-on space for the companies that were established in previous decades?

If space is constrained in Oxford, will companies be prepared to move out of Oxford e.g. along the M4 corridor?

What is the optimum balance of activity in a cluster to secure sustainability?

How could more large-scale manufacturing plants be attracted to Oxford?

How does this compare with other clusters?

How does it compare with the broader technology sector in Oxford?

What are the barriers to stock market flotations?

What are the opportunities and challenges associated with being listed on a stock exchange?

Given that most biotech companies license their drugs to pharma, what constitutes success for them e.g. a highvalue trade sale?

Why has Oxford failed to grow companies equivalent in size to companies in the US e.g. Amgen or Gilead?

Is Oxford essentially an R&D laboratory for the pharmaceutical industry? If so, is that "bad" for the cluster?

28%

(70) companies established in last 5 years; compares to 45% (110) in the previous decade

39%

(97) involved in R&D

9

companies* traded on a stock exchange; 7 therapeutic product companies and 2 supply chain companies

21%

of all companies (52) are therapeutic product companies

FINDINGS

Supply chain companies

68% (152) companies

86% British; 14% foreign-owned

98% SMEs; 87% employ <50 people

14% in foreign ownership

29% established in last 5 years

Instrumentation/equipment largest segment (17% of suppliers); 14% clinical/regulatory products or services; 15% technical consulting; 13% diagnostics/patient monitoring; 12% platform technologies; 10% reagents/kits/antibodies

Business services

19% of cluster (48 companies) of which:

61% specialist consultants

7% publishers

17% investment firms/funds

7% industry-specific business network

4% technology transfer offices

Location

8 science/research/technology parks including 2 incubators/innovation centres plus 1 relevant business park

57% of all companies located on a park

Milton Park ranked #1 in terms of number of companies – home to 33% of park-based companies (18% of all companies); followed by Oxford Science Park (23% of parkbased companies) and Harwell Science and Innovation Campus (10%)

Management

91% of CEOs are male

76% of CEOs are over 50

Accolades/achievements

University of Oxford world rankings:

2 overall

1 in life sciences

1 in clinical, pre-clinical and health

(Times Higher Education World University Rankings 2015-2016)

2 companies listed in "FierceBiotech's Fierce 15" in the last 5 years – AdaptImmune (2014) and Immunocore (2013); both are developing immuno-therapies

Finance

25% of companies have attracted equity finance

QUESTIONS ARISING FROM THE STUDY

What are the gaps in the supply chain?

How could companies operating in these areas be attracted to the cluster?

How might Oxford's academic scientists be encouraged to set up companies to address these gaps?

How can Oxford exploit the convergence of technologies e.g. information communications technology, engineering, software, physics, astronomy etc?

68%

(152) supply chain companies

How much business is transacted between the companies and business service providers in the cluster?

61%

specialist consultants out of 48 companies

What are the benefits of locating on a park?

Is there an advantage to being on a dedicated bio park as distinct from a mixed-use park?

Is the demand for space outstripping supply and if so, how can this be addressed?

To what extent are private sector property developers competing for occupiers with government-owned parks?

What are the barriers to women becoming CEOs and how can these barriers be addressed?

Once the current group of middle aged CEOs retire, will there be a cadre of leaders with the skills and experience to replace them?

How competitive are Oxford companies globally?

What are the health-related benefits resulting from the cluster?

#2

University of Oxford overall world ranking

A detailed examination of investment in the cluster will be published later this year in a separate report.

Bidwells

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