Maximising Malaysia's Role in the Global Biopharmaceutical Value Chain

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EU-Malaysia Biotechnology
Business Partnership 2007

Cambridge
Healthcare & Biotech

Malaysia intends to become a global biotech hub and significant biotech R&D centre by the year 2020.

- The areas of focus are:
  - Agricultural biotechnology development
  - Healthcare biotechnology development
  - Industrial biotechnology development
  - R&D and Technology Acquisitions
  - Human Capital Development
  - Financial Infrastructure Development
  - Legislative & Regulatory Framework Development
  - Strategic Positioning
  - Government Commitment

  Source: Malaysian Biotechnology Corporation (MBC).

Can Malaysia learn from the successes of other countries?

Some statistics taken from a CH&B report commissioned by UKTI

Contains details of 507 products in development from 87 companies

a fraction of the c350 active UK biotech and pharma companies

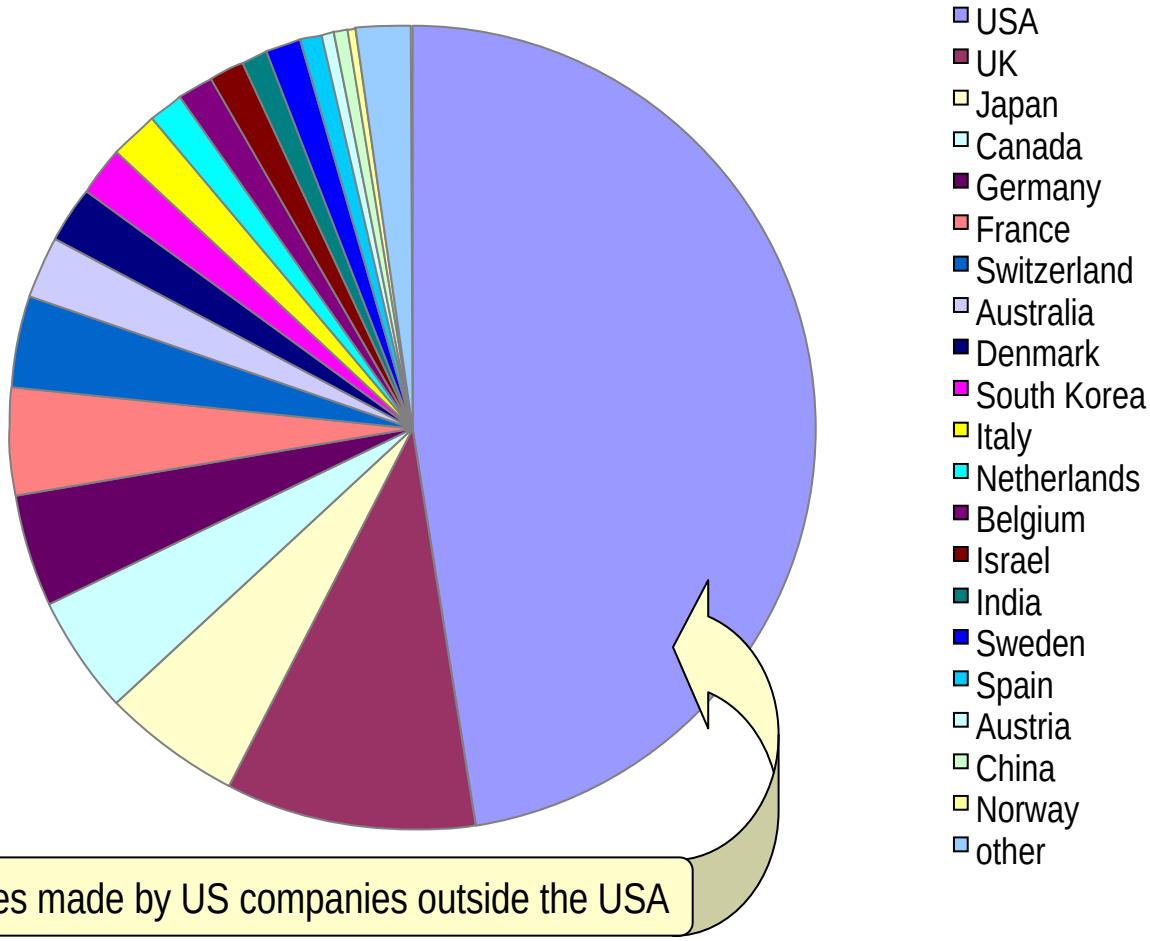
Electronic copies available by email to UKpipeline@chandb.com

Which countries are most successful in therapeutics research?

World ranking

- Output from US biotech and pharmaceutical companies dwarves all others, but the UK has the number two R&D pipeline in the world - approximately twice as big as that of Japan, the third largest

There are 8,642 products in active development worldwide as at 7 October 2007



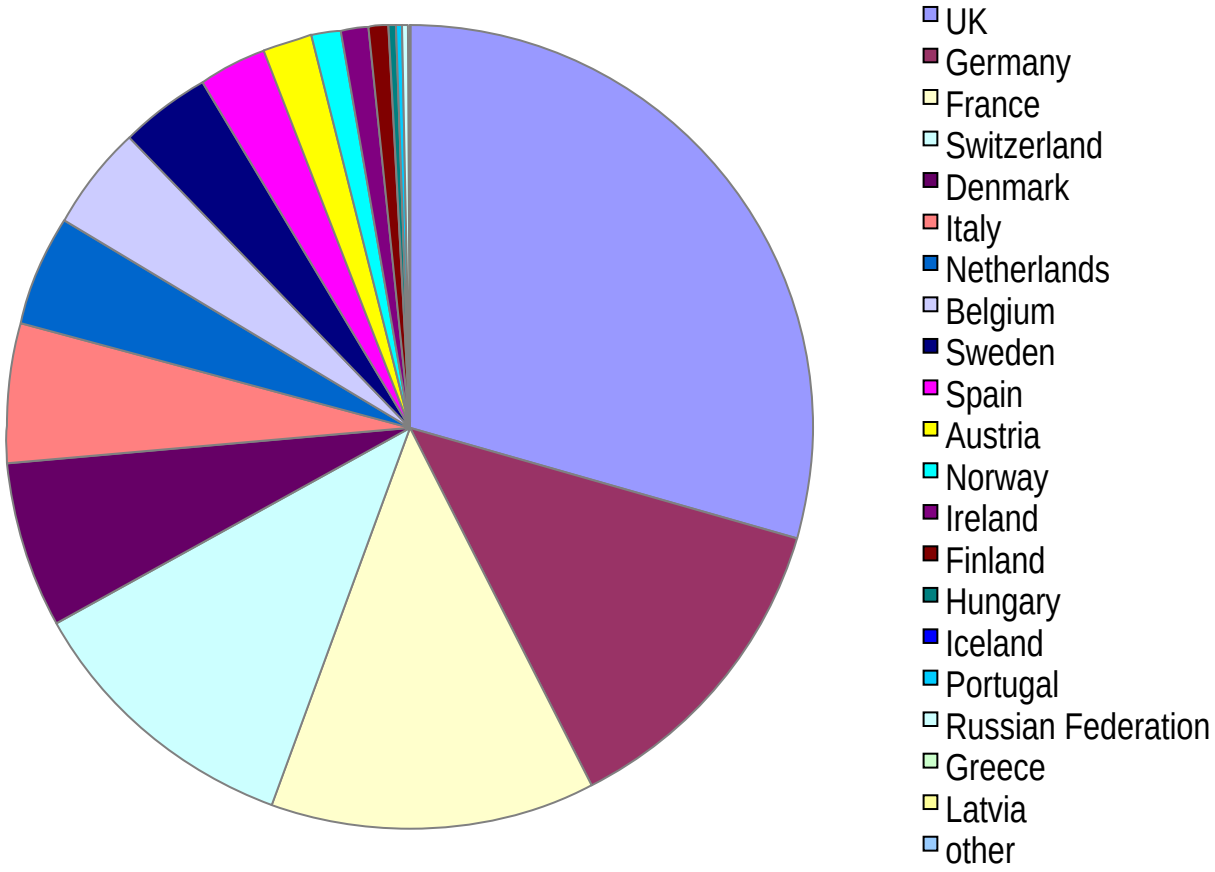
Source: CH&B and Pharmaprojects

European ranking

- The UK has the largest life science R&D pipeline in Europe. Producing 30% of all pharmaceutical products discovered in Europe, more than twice as many as Germany, the second most important country in Europe for drug discovery.

There are 8,642 products in active development worldwide as at 7 October 2007

2,888 of these are from European companies



Source: CH&B and Pharmaprojects

Why has the UK outperformed its European neighbours?

Perhaps it's because UK Universities are so good

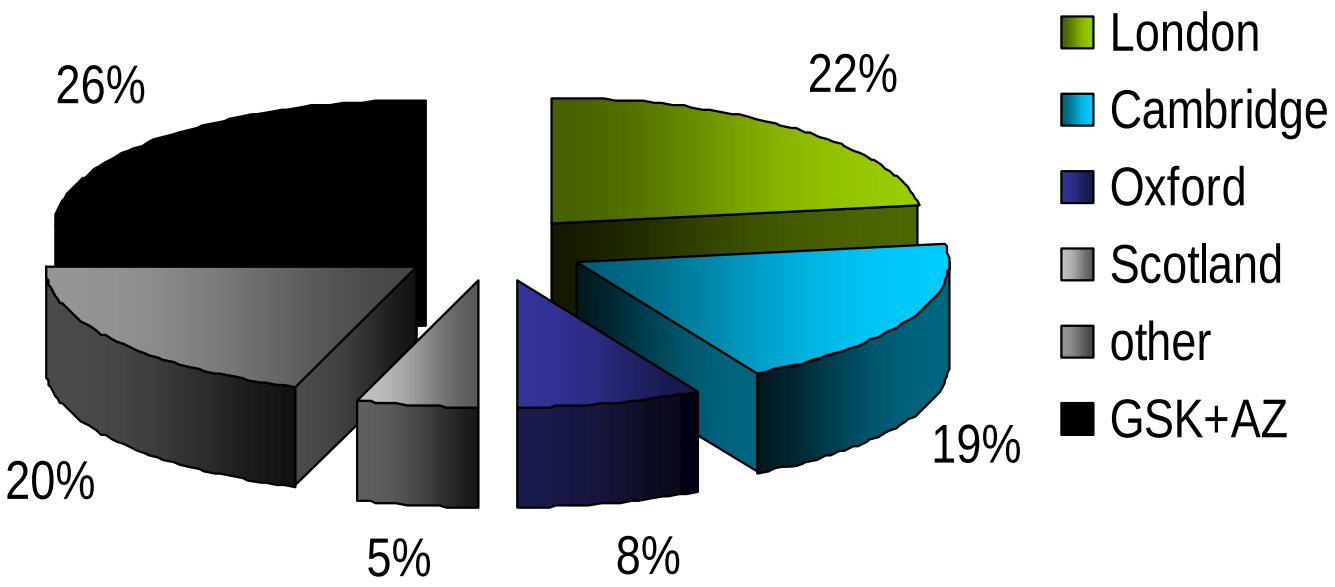
Academic ranking of European Universities

European rank	*Institution*	*Country*
1	Univ Cambridge	UK
2	Univ Oxford	UK
3	Imperial Coll London	UK
4	Univ Coll London	UK
5	Swiss Fed Inst Tech - Zurich	Switzerland
6	Univ Utrecht	Netherlands
7	Univ Paris 06	France
8	Karolinska Inst Stockholm	Sweden
9	Univ Manchester	UK
10	Univ Munich	Germany
11	Univ Edinburgh	UK
12	Tech Univ Munich	Germany

Source: Institute of Higher Education, Shanghai Jiao Tong University

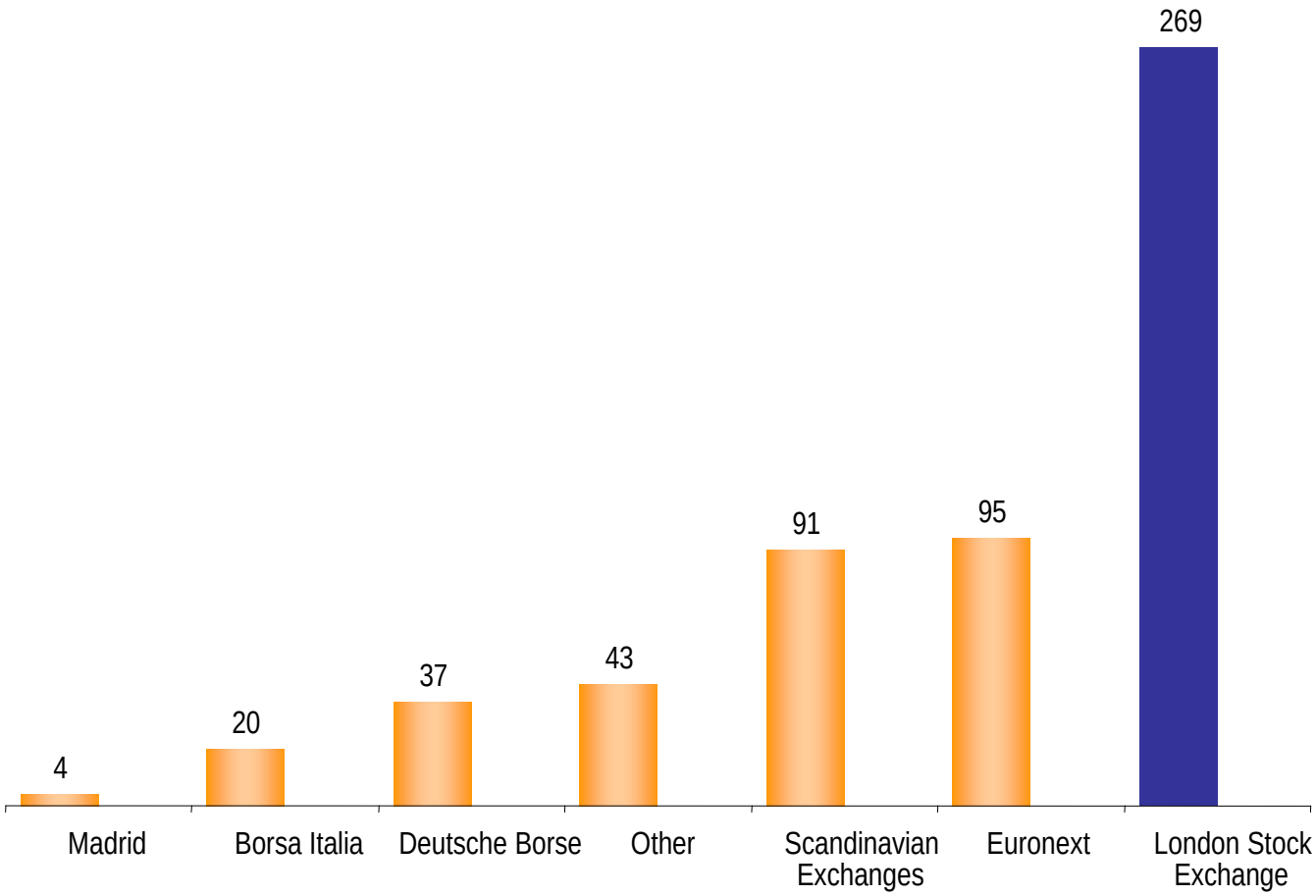
Perhaps it's because the 3 main biotech clusters are so close together

UK pipeline:
Number of projects by location of originator company



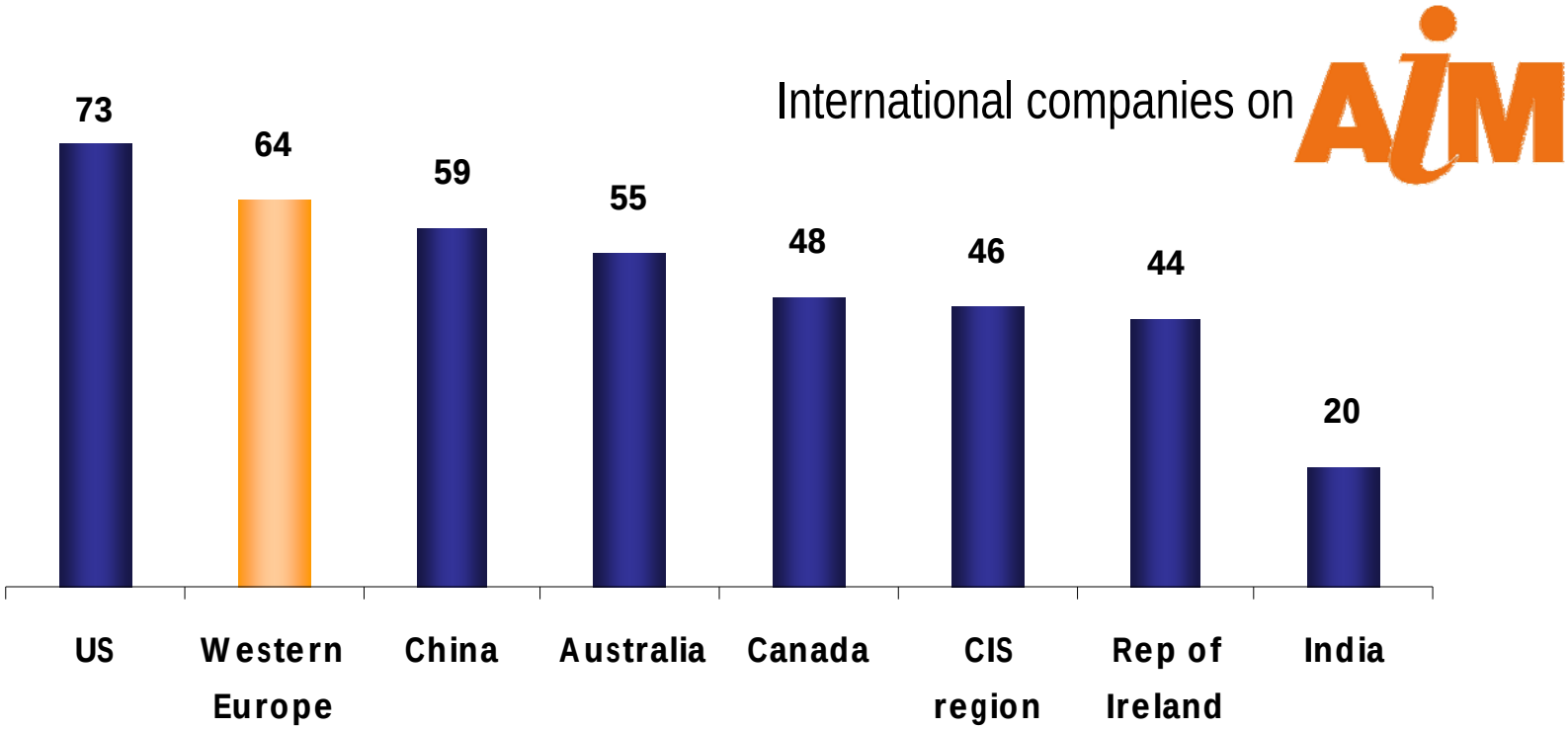
Source: Cambridge Healthcare & Biotech

Perhaps it's because it has such a successful bourse for flotations



Western European IPO market by number of companies – calendar year 2006

… and has been very successful at attracting overseas companies

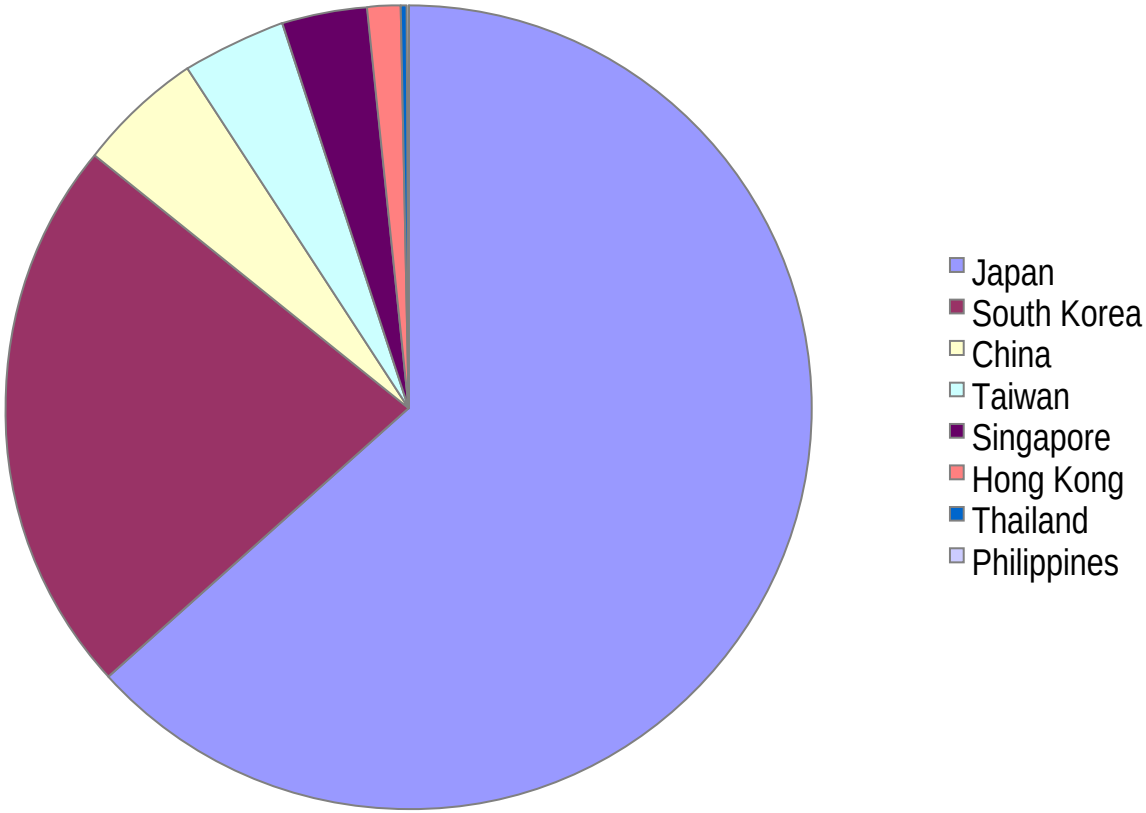


International companies by country of operations as at end of August

.. How well have South and East Asia performed in Bio-healthcare research?

East Asia ranking

- South Korea has been the most successful SE Asian country, followed by Cina and Taiwan.
- To date, there are no therapeutic products in active development from Malaysian companies in the public domain



Source: CH&B and Pharmaprojects

What is necessary for the creation of a successful biotech cluster?

CH&B view

- Excellent science
  - Universities
  - Teaching hospitals
  - Research institutes
- Finance
  - Grants or seed funds for start ups
  - Availability of venture capital
  - Willingness of corporations to invest
  - Access to public markets for VC exit
- Government support
  - Regulatory frameworks
  - Tax concessions
- Business support services
  - Corporate finance advice
  - Specialist law firms (corporate deals, intellectual property, etc)
  - Specialist consultants
- Assets
  - Human resources
  - Natural resources
- Good global communication links

Academic ranking of universities in SE Asia: The top 25

Tokyo Univ	Japan
Kyoto Univ	Japan
Osaka Univ	Japan
Tohoku Univ	Japan
Nagoya Univ	Japan
Tokyo Inst Tech	Japan
Hokkaido Univ	Japan
Natl Univ Singapore	Singapore
Technion Israel Inst Tech	Israel
Tel Aviv Univ	Israel
Tsukuba Univ	Japan
Kyushu Univ	Japan
Natl Taiwan Univ	Taiwan
Seoul Natl Univ	South Korea
Tsinghua Univ	China
Chinese Univ Hong Kong	Hong Kong
City Univ Hong Kong	Hong Kong
Hiroshima Univ	Japan
Hong Kong Univ Sci & Tech	Hong Kong
Keio Univ	Japan
Kobe Univ	Japan
Korea Advanced Inst Sci & Tech	South Korea
Nanjing Univ	China
Peking Univ	China
Shanghai Jiao Tong Univ	China

Unfortunately no Malaysian universities are currently in the top 50 in SE Asia. This could limit the opportunities for the creation of spin-off companies from local academic research. It also means that "ideas", as well as human talent, will need to be imported

Source: Institute of Higher Education, Shanghai Jiao Tong University

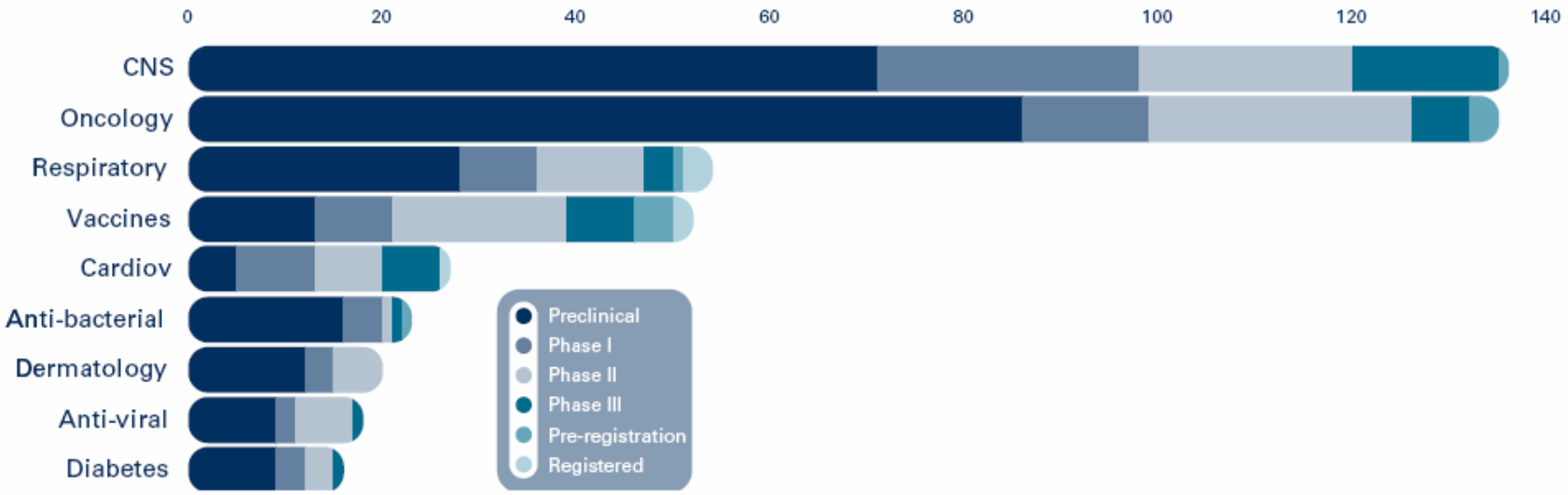
Attracting partnership opportunities

Potential focus areas for Malaysia?

- Biodiversity as source of lead compounds
  - *one of 12 mega biodiverse tropical rainforests*
- Vaccine development,
- Medical devices,
- Diagnostics,
- Drug delivery systems,
- Biosimilars
  - *A potential short-cut into European (and soon US) pharmaceutical markets.*
  - *Already a focus area for India, with China also showing great interest*

Could the UK provide opportunities for Malaysia?
UK Pipeline- key therapy areas

- The UK has Europe's leading pipelines in several key therapy areas, including particular strengths in the CNS, Oncology and Respiratory areas.



Source: Cambridge Healthcare & Biotech

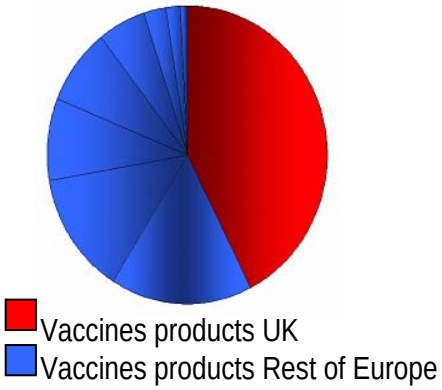
UK Key Therapy Areas – Vaccines as an example

- There are currently 52 vaccine products in active development in 7 companies in the UK

Acambis is a leading biotechnology company targeting infectious diseases with novel vaccines.
Acambis currently has 7 vaccine products in active development:

- ACAM2000 smallpox vaccine
- ChimeriVax JE vaccine
- ChimeriVax West Nile vaccine
- ChimerVax Dengue vaccine
- Clostridium difficile vaccine
- Influenza vaccine
- Herpes vaccine

42 % of the European vaccine pipeline was discovered by UK companies

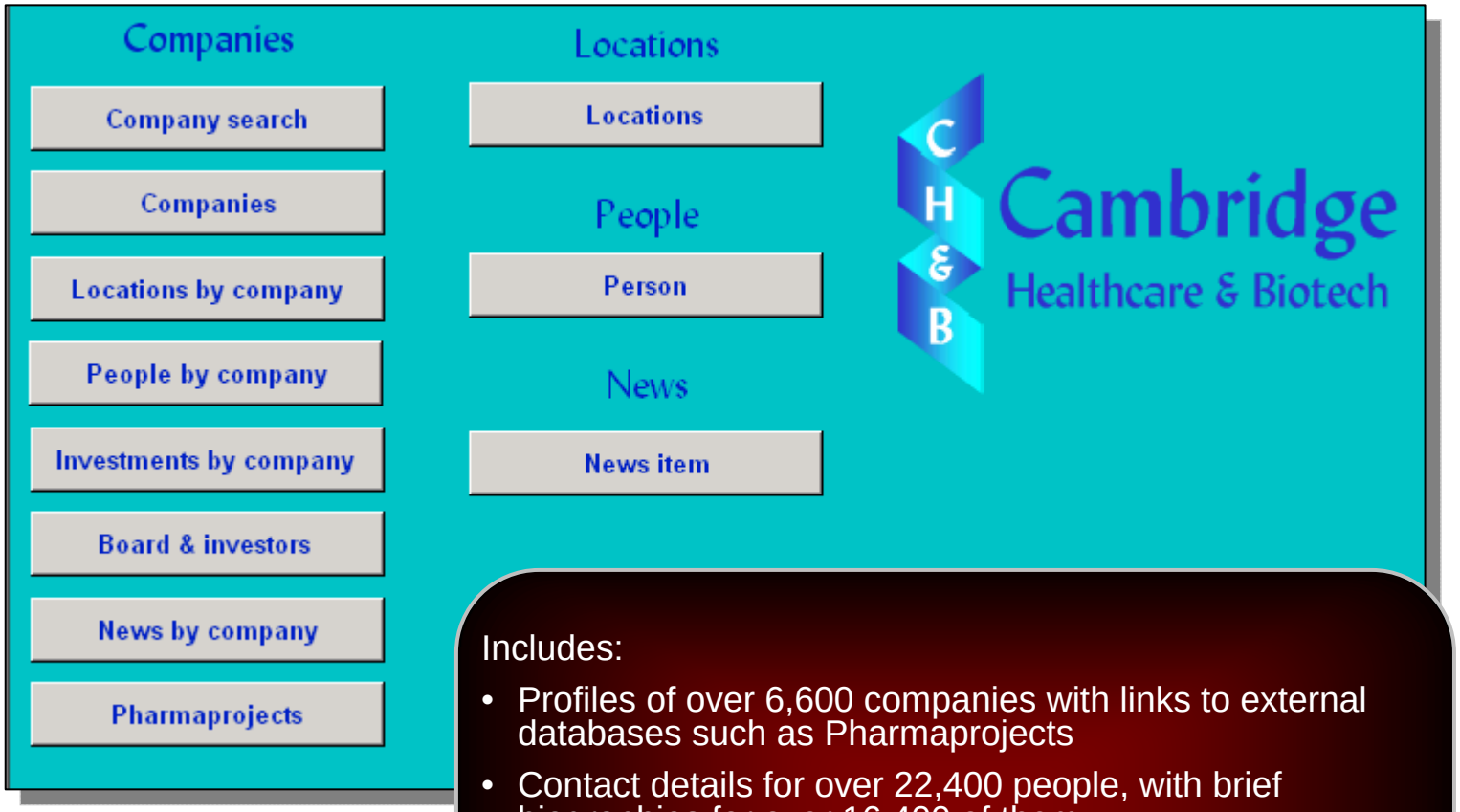


Other key UK vaccine companies include Allergy therapeutics, Oxxon Therapeutics (now part of Oxford Biomedica) and Lipoxen.

Genvax, a subsidiary of Medical Marketing International Group (MMI), is developing DNA vaccine products based on the work of Professor Freda Stevenson and colleagues.
Genvax currently has 7 vaccine products in active development:

- Lymphoma vaccine (idiotypic)
- Myeloma vaccine (idiotypic)
- CMV vaccine
- Prostate cancer vaccine
- Broad spectrum cancer vaccine
- Influenza vaccine
- Tuberculosis vaccine

Possible partner companies from the CH&B database



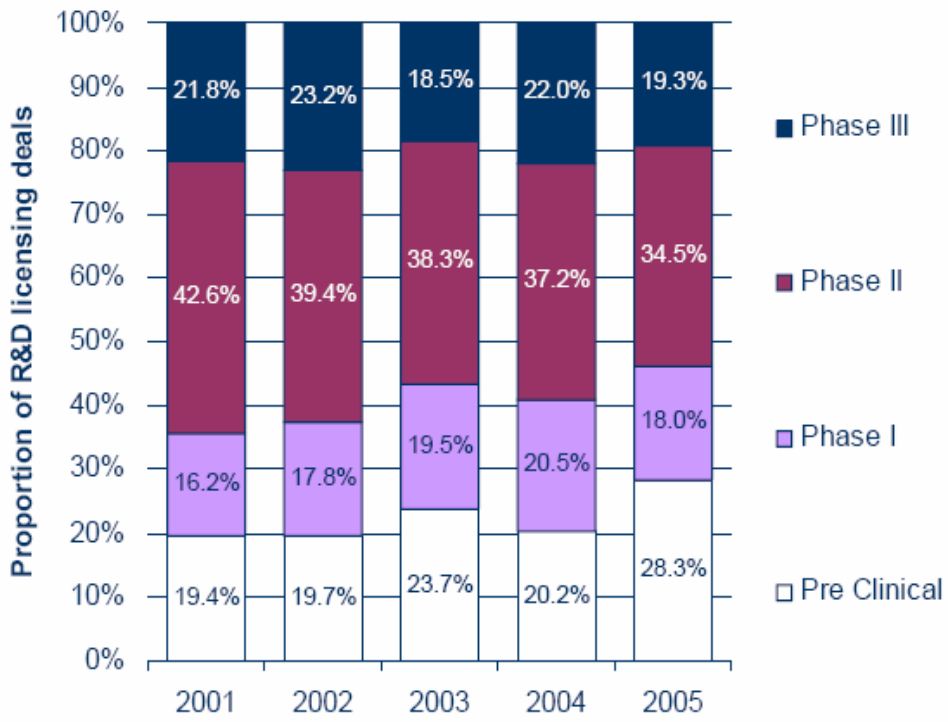
Includes:

- Profiles of over 6,600 companies with links to external databases such as Pharmaprojects
- Contact details for over 22,400 people, with brief biographies for over 16,400 of them
- Portfolios for over 400 investors cross linked to 4,400 specific investments
- Company information cross-linked to over 8,200 recent news items

To license ….

- Accepted wisdom states that biotech should out-license their projects to big pharma around Phase II of clinical development, but there have been an increasing number and value of early stage licensing deals

- The value of licensing deals has reached a point that many potential acquirers value the company at less than the NPV of the licensing deal and are acquiring the entire company rather than cherry picking the most promising drug candidates or technologies. This then gives the acquirer the option of asset-stripping or maintaining the purchased company as a going concern. The last year or so has seen a great deal of this sort of activity.



Source: Business Insights

… or to buy?

Extracted from Scrip 3232, Feb 9th

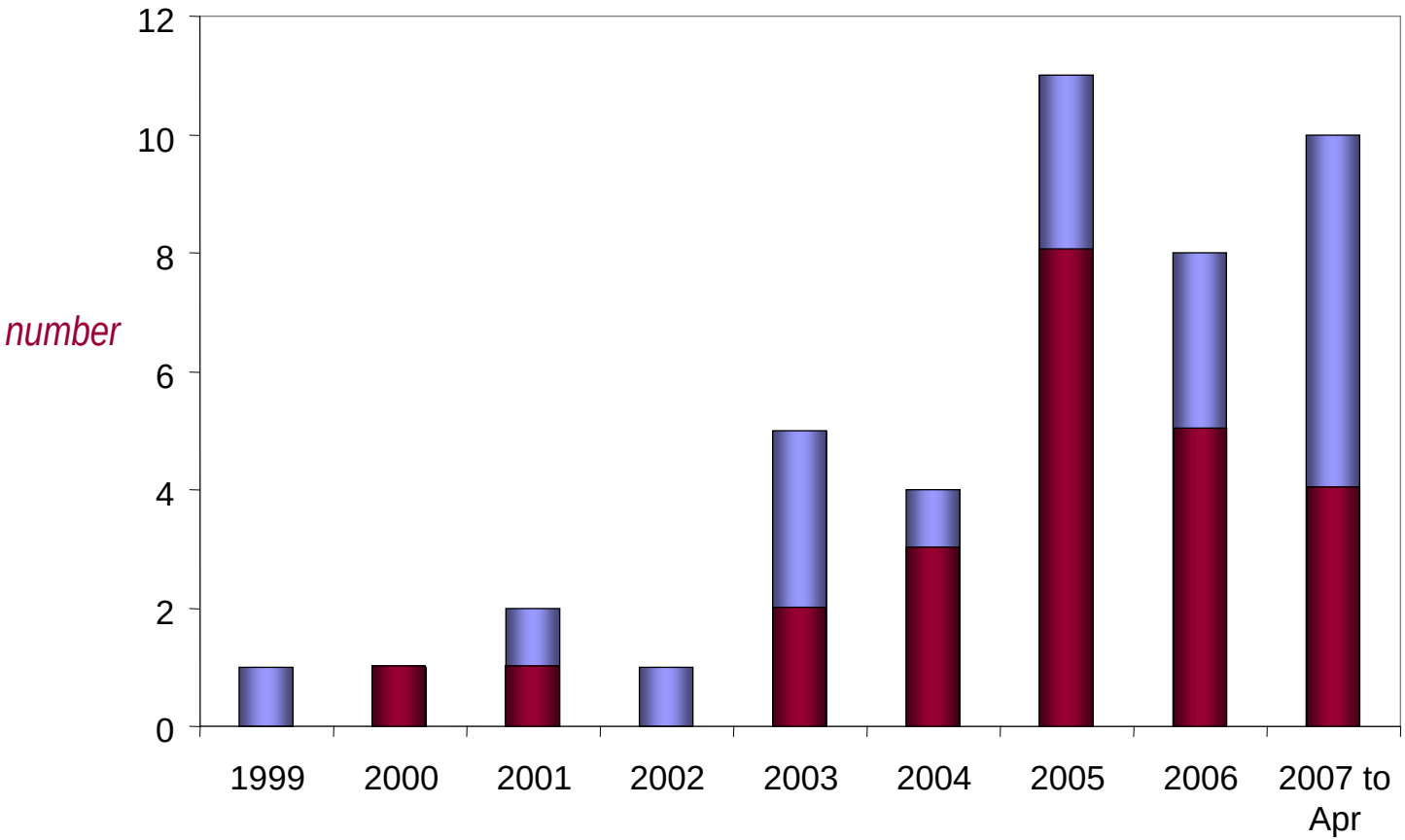
From where we sit in Cambridge it seems that pharmaceutical companies are falling over themselves to purchase local talent. We just have to look out of the windows of our offices in Chesterford Research Park to see that Arakis has now become part of Sosei, BioFocus has become part of Galapagos and last week Solexa became part of Illumina.

It is highly likely that the current biotech acquisition frenzy is not only driven by the increasing values ascribed to high quality licensing deals (even early stage deals) compared with the low values ascribed to pharmaceutical companies in Europe. In many cases it has become cheaper to buy the company than license the product.

It is, of course, a great complement to the quality of UK research, and Cambridge research in particular, that so many pharmaceutical companies are camped out in hotels in our vicinity trying to prise these gems from the clutches (mainly) of VC investors – a task made easier by the difficulties that these investors have had over the past few years in effecting an exit through public markets.

The strength of UK based research has also led to an acceleration of acquisitions of UK biotech companies

Acquisitions of UK biotech companies



Nationality of acquirer

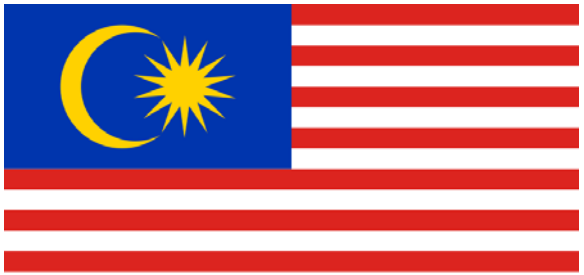
UK	18
USA	12
Belgium	3
Japan	2
Austria	1
Bermuda	1
Denmark	1
Germany	1
India	1
Ireland	1
Sweden	1
Switzerland	1

Can Biotechs go all the way?

- Quote from an Executive Director of one of Europe's leading private biotech companies:
  - *"Given the current environment, the chances of any European biotech company evolving all the way to become an integrated pharmaceutical company before being acquired is about the same as all the planets lining up"*

Conclusion

- There is no reasons that, given time, Malaysia shouldn't outperform its neighbour Singapore in the creation of a globally important biotech cluster
- Malaysian government commitment seems to be in place (eg, Malaysia had the largest overseas contingent at this year's prestigious Bio convention in the USA)
- Malaysia also has something no other committed player in the region has – a hugely important source of biodiverse natural products
- However, Malaysia needs to look for short cuts where possible. This will mean attracting or acquiring companies, technologies and talent from overseas



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