Invention to Start-up:
Institutional Roles for Commercialisation

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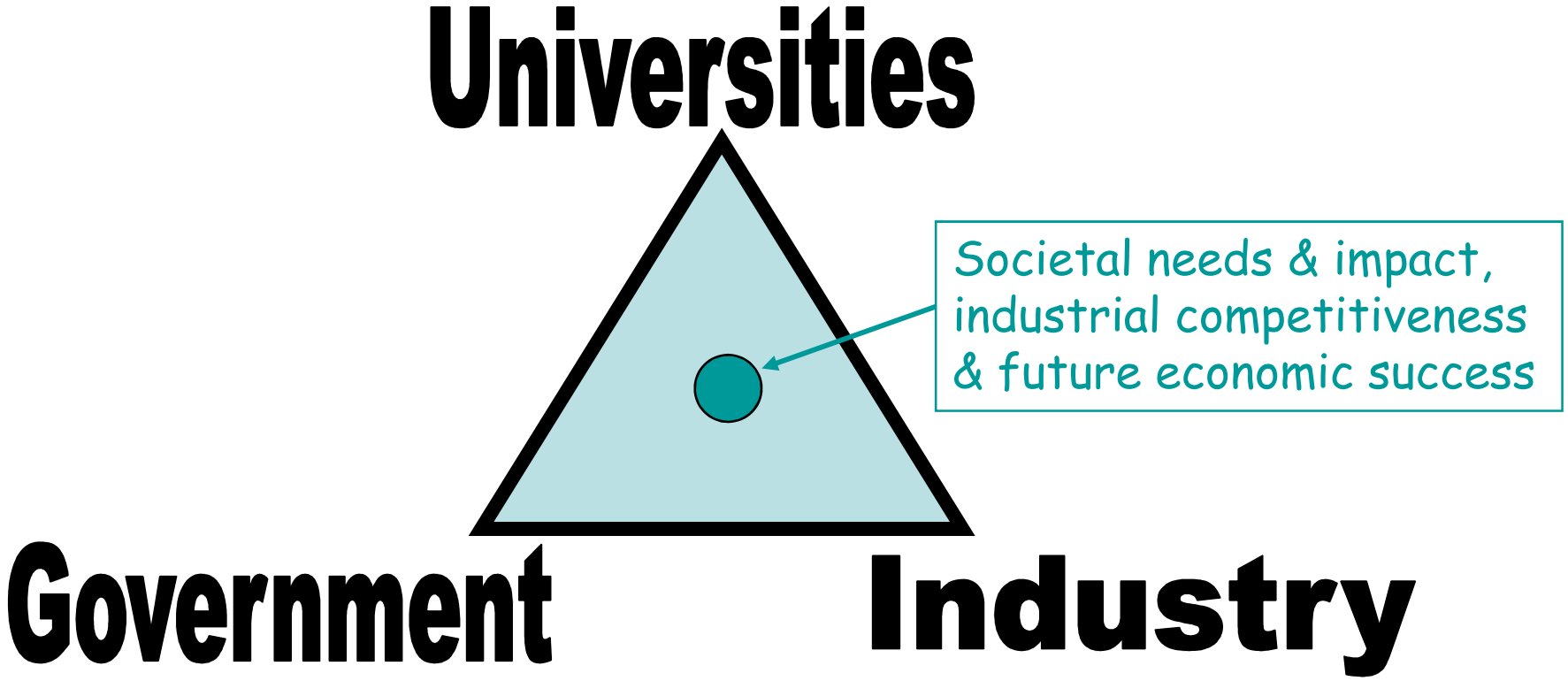
This talk

- R&D trends in developed countries
- Why commercialise?
- Models of working with industry
- The people
- The rewards
- Where to go to learn more


Universities
Societal needs & impact,
industrial competitiveness
& future economic success
Government
Industry

My background

- Academic bio-medical research
- More than 30 years in technology transfer
- R&D and product development in a small UK biotechnology company and big US pharmaceutical company
- Clinical trials in a biomedical research foundation
- University and PSRE technology transfer offices
- University research in regional economic development
- 2007 Queen’s Award for Enterprise Promotion

Economic Trends

- From manufacturing to services
- From low-tech to high-tech
- Driven by ICT
- From skills to intellectual property
- To “The Knowledge Economy”
- Outsourcing and globalisation

Economic Trends (cont'd)

- Patenting doubled 1992-2002
- 84% US Japan UK France Germany
- Growth mainly in ICT and biotechnology
- Internet sales / mobile phones

So:

- Is there a new role for universities?

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Universities are for ..

- Training priests (13th century)
  - Later: lawyers, doctors, teachers
- Teaching and research (and scholarship)
- Vocational training
- Helping industry / farmers
- Boosting economic development (21st Century)???

Why commercialise?

- Money?
- Prestige?
- Government encouragement?
- University policy?
- Social good?
- Economic impact?
- Law (Bayh-Dole, USA)

Why Stanford does it

“Why We Do It”

The mission of Stanford University's Office of Technology Licensing (OTL) is to promote the transfer of Stanford technology for society's use and benefit while generating unrestricted income to support research and education

Why license?

In 1980, the U.S. Congress passed Public Law 96-517, the Bayh-Dole Act, which provides that rights to inventions resulting from government-sponsored research at universities would be assigned to the universities.

Why Stanford does it (2)

Everyone Wins

While it is relatively easy to measure OTL's performance in direct financial terms, it is more difficult to characterize the less tangible benefits of technology licensing. Nonetheless, technology licensing has provided such valuable benefits.

Who benefits from licensing?

* Stanford
* Stanford inventors
* Industry
* Silicon Valley/Biotech Bay
* The U.S. Government
* The Public

Technology Transfer in Universities

- US 1980 Bayh-Dole Act
- UK Higher Education Innovation Fund

- Reaction to
  - Penicillin
  - Monoclonal antibodies
  - Knowledge economy
  - Global competition

What about revenue for the university from technology transfer?

Technology transfer is usually ***not a substantial source of revenue*** for the university

- And usually needs some governmental or other support for up to a decade or more

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30 years after Bayh-Dole, US Tech Transfer has matured: Fiscal Year 2008 results

- New Licenses Agreements: >**4100**
- Total Active License Agreements: >**30,000**
- New Startup Companies: >**590**
- Total Startups since 1980: >**6000**

Source: Annual Survey of the Association of University Technology Managers (AUTM)

But financial returns are limited and skewed

(AUTM survey results: FY '08 from 200 US universities and research institutes)

- Licensing revenue (including from equity ownership in spin-outs): $3.5 billion (US)

- BUT…this is on a research base (FY '08) of:

  $ 52 Billion

- Thus, Licensing revenue, after 30 years of experience averages

  only 6.7% of research expenditures

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And the distribution of income is extremely skewed

- The top 6 earners (out of 200 institutions) accounted for 50%(!) of the total income
- The average income for all the other institutions: **< 4%** of research revenue
  - (and still highly skewed)

Conclusion:

- Licensing and spin-out equity income should not be the primary purpose of tech transfer
- Financial returns are like a lottery: tech transfer should not be considered a promising business investment for the university

BUT…..

Benefits of technology transfer to the university

- Bring fruits of university research to the public who funded the research
  - New products, new cures
  - Local economic development
- Allow investigators to “make their findings real”
- Bring real world problems into the laboratory through relationships with industry
- Opportunities for graduates

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The new Mantra

Impact not income!!

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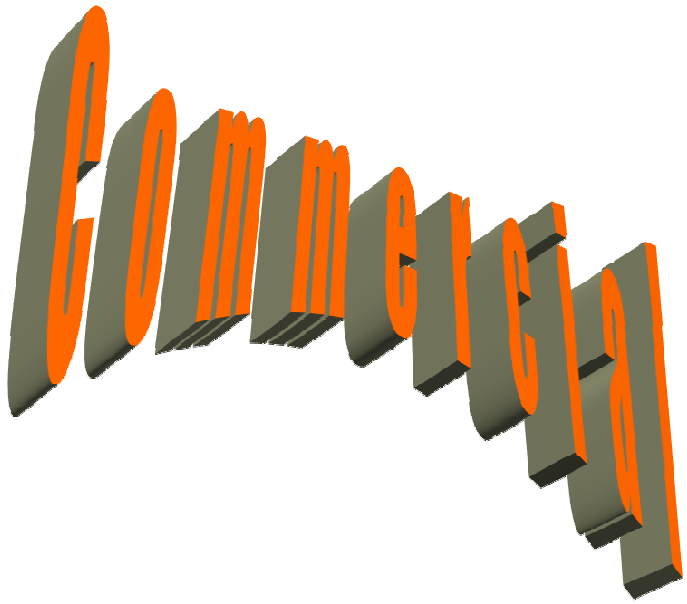
Technology Transfer via …

- Movement of people (students)
- Publication and conferences
- Consultancy
- Contract Research
- Licensing
- Spinouts

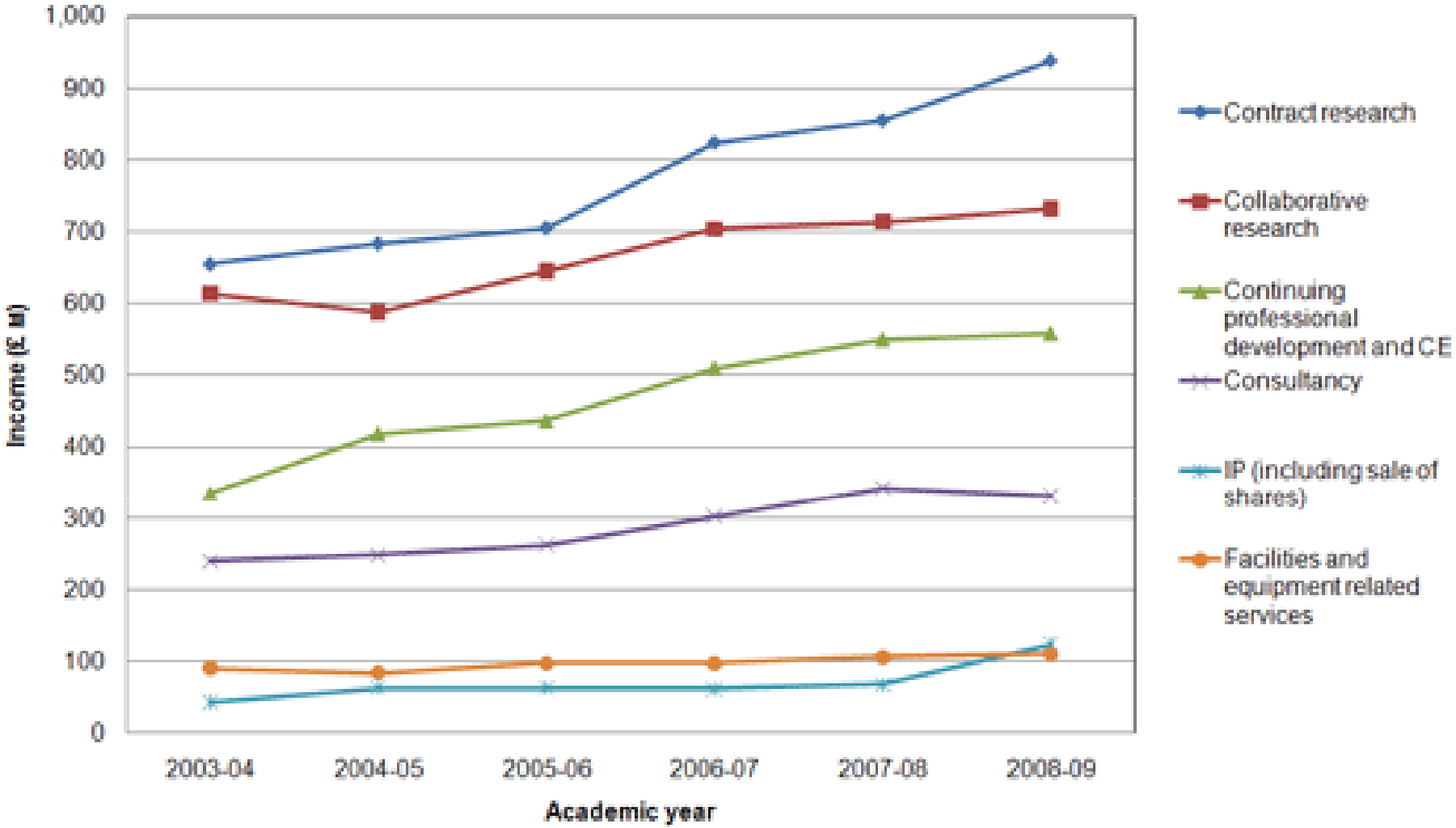


MIT

Number of Invention Disclosures	523
Number of patent applications filed	321
Licences	121
Spinouts	23
Licence income	$48.2 million
Patent costs	$11.2m
Research income	$1bn

Cambridge

Number of Disclosures	334
Number of UK priority patent applications filed	124
Licences	50
Spinouts	13
Consultancy contracts	124
Licence income	£7.2 million
Patent costs	£940k
Consultancy income	£1.58 m
Research income	£300m



HE-BCI Survey 2009

How measure success?

- Size of office?
- Number of engagements?
- Number of patents filed?
- Number of patents granted?
- Number of spinouts?
- Leveraged investment?
- Valuations in market?
  - £1.5bn in 3 years for UK universities

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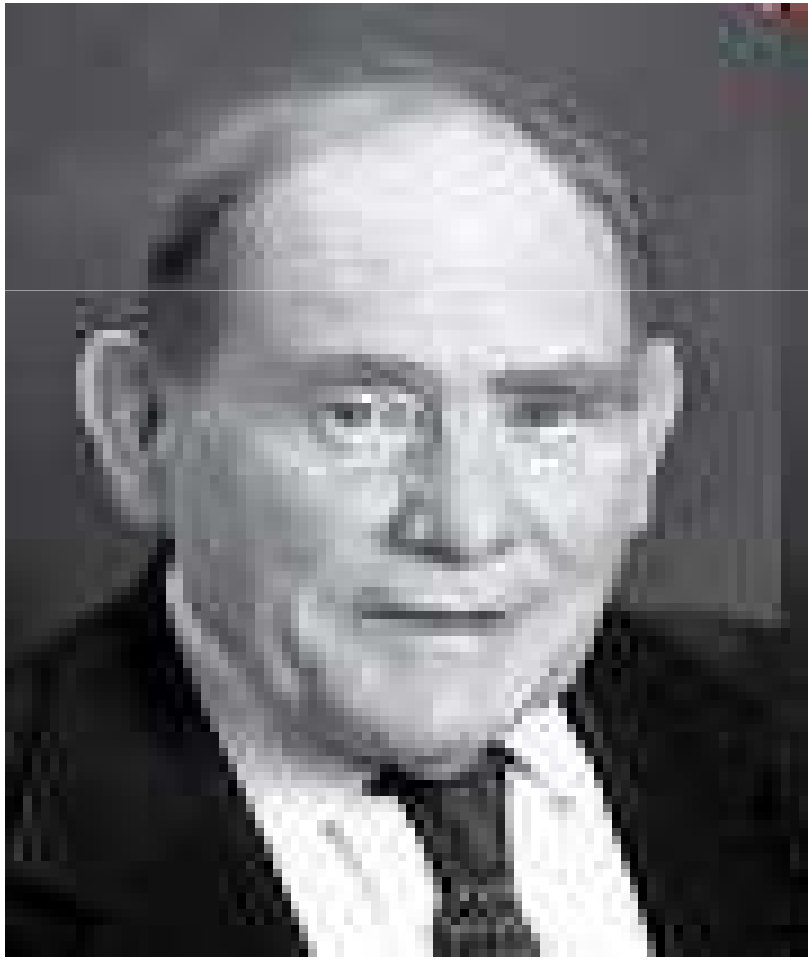
Who do you need for commercialisation?

Scientist?

Sydney Brenner



Who do you need for commercialisation?

Scientist?

Aaron Klug

or Businessman?

Scientist or Businessman??

Why important?

- Speak the “language”
- Credibility with business and entrepreneurs
- “Interpret” between two communities
- Add value to academic offering
- Catalyse cultural change
- NOT “get in the way”
- “Technology push” or “market pull”?

Bridging the Gap

What else do you need?

- Money for:
  - Networks and training
  - Travel
  - Patents
- Support of your organisation
- Clear mission
- Realistic expectations
- Time!!

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The Rewards

- For inventor?
- For colleagues?
- For institution?
- For TTO

So common model is:

1/3 - inventor

1/3 - department

1/3 – university

Sources of information

- OECD www.oecd.org
- EC europa.eu
- AUTM www.autm.org
- PraxisUnico www.praxisunico.org.uk
- Lambert www.lambertreview.org.uk
- IP Handbook www.iphandbook.org
- PIPRA www.pipra.org
- WIPO www.wipo.int