



Dr Paul Whyte  
Managing Consultant Isis Enterprise

## What I am going to talk about

- Introduction to Isis Innovation
- The University Business Interface - differences
- ELEMENTS for successful Technology Innovation
  - University
  - Business
  - Government
- It is difficult - but not impossible
- How it works (we think)

# Isis Innovation Ltd

A company 100% owned by the University of Oxford



Oxford Technology Transfer  
IP, Patents, Licences, Spin-outs,  
Material Sales, Seed Funds,  
Isis Angels Network



Oxford Expertise  
Consulting, Services



Isis Consulting Business  
Technology Transfer and  
Innovation Management

# Isis Innovation Staff

## Administration (11)

### Managing Director

Tom Hockaday

### Business Support

#### Accounts

Gemma Allnutt

#### Marketing

Renate Krelle

Jen Sheffield

Dr Fiona Story

#### Legal

Paresh Jasani

### Central Administration

#### Office Manager

Jenny Bailey

#### Systems Administrator

Nelson Sa

#### HR Assistant

Alex Allan

#### Facilities

Jane Tarry

#### Reception

Isabel Lavis

## Technology Transfer Group (30)

### Head of Group

Linda Naylor

### Project Manager Teams

Evert Geurtsen

Roy Azoulay

Dr Jamie Ferguson

Dr Rakesh Roshan

Dr Mike Gilbert

Brendan Spillane

Dr Colin Story

Dr Dina Chen

Dr Angela Oldacres

Dr Brijesh Roy

Andy Self

Dr Weng Sie Wong

TBA

### Seed Investment Manager

Andrea Alunni

### Project Manager Teams

Dr Carolyn Porter

Dr Mairi Gibbs

Chim Chu

Dr David Churchman

Dr Emma Sceats

Dr Stuart Wilkinson

Dr Adam Stoten

Dr Sarah Deakin

Dr Christine Whyte

Dr John Wilson

Dr Ruth Barrett

TBA

### Patent & Licence Admin Manager

Steven Bayliss

### Post-Deal Admin

Ridi Faruque

### Patent Administrator

Laura Wilkins

## Oxford University Consulting (6)

### Head of Group

Steve Lee

### Project Managers

Susan Clark

Andrew Goff

Dr Fatima Kranc

Gurinder Punn

### Administrator

Kerry Antcliffe

## Isis Enterprise (14)

### Head of Group

Dr David Baghurst

### Consultants

Dr Chris Moody

Dr Sarah Macnaughton

Dr Roger Welch

Elena Andonova

Ya-hsin Shen

James Lye

Dr Paul Whyte

Dr Costas Chryssou

Dr Sam Gallagher

Terry Pollard

Robert Swerdlow

Dr Suzy Wood

### Administrator

Emily Shirtcliff

Staff: 61

PhD's: 29

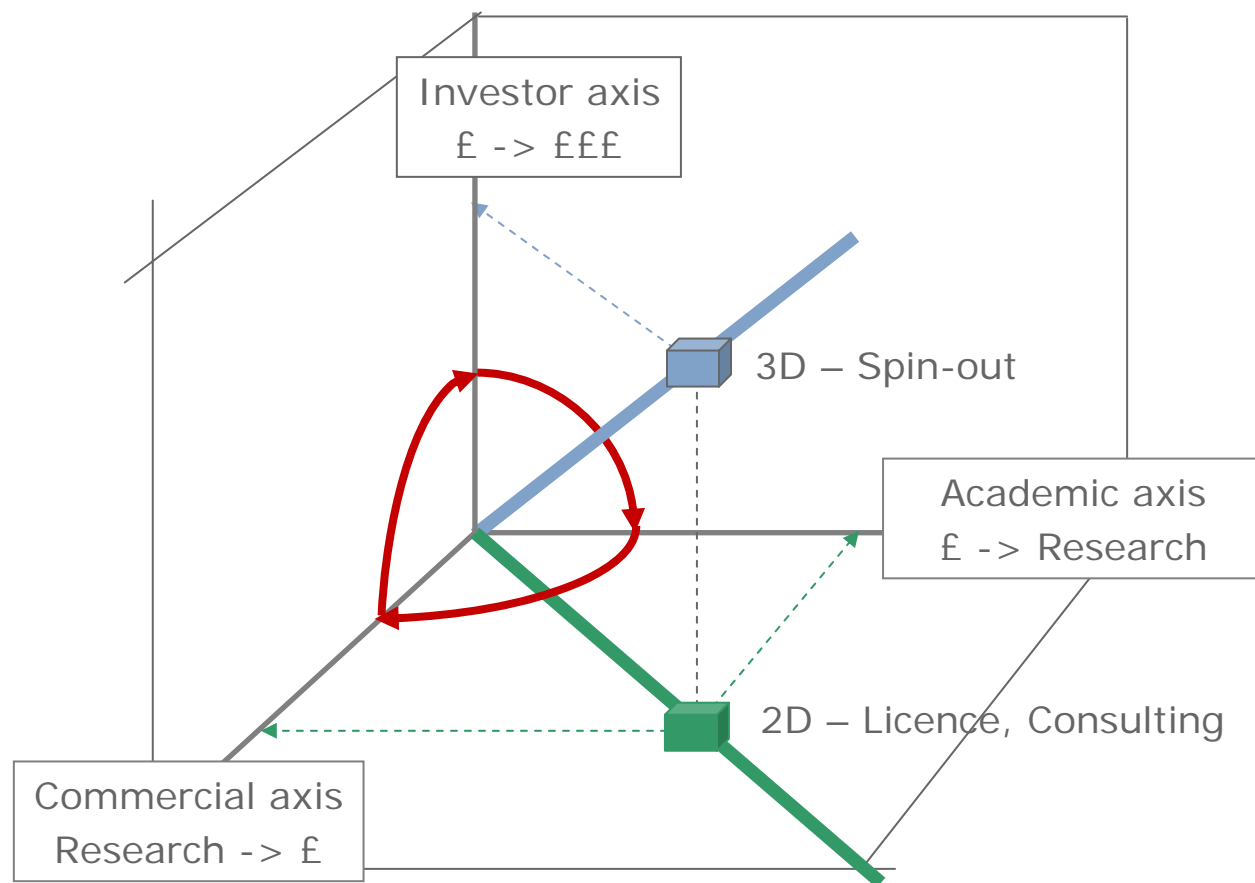
MBA's: 17

[isis-enterprise.com](http://isis-enterprise.com)

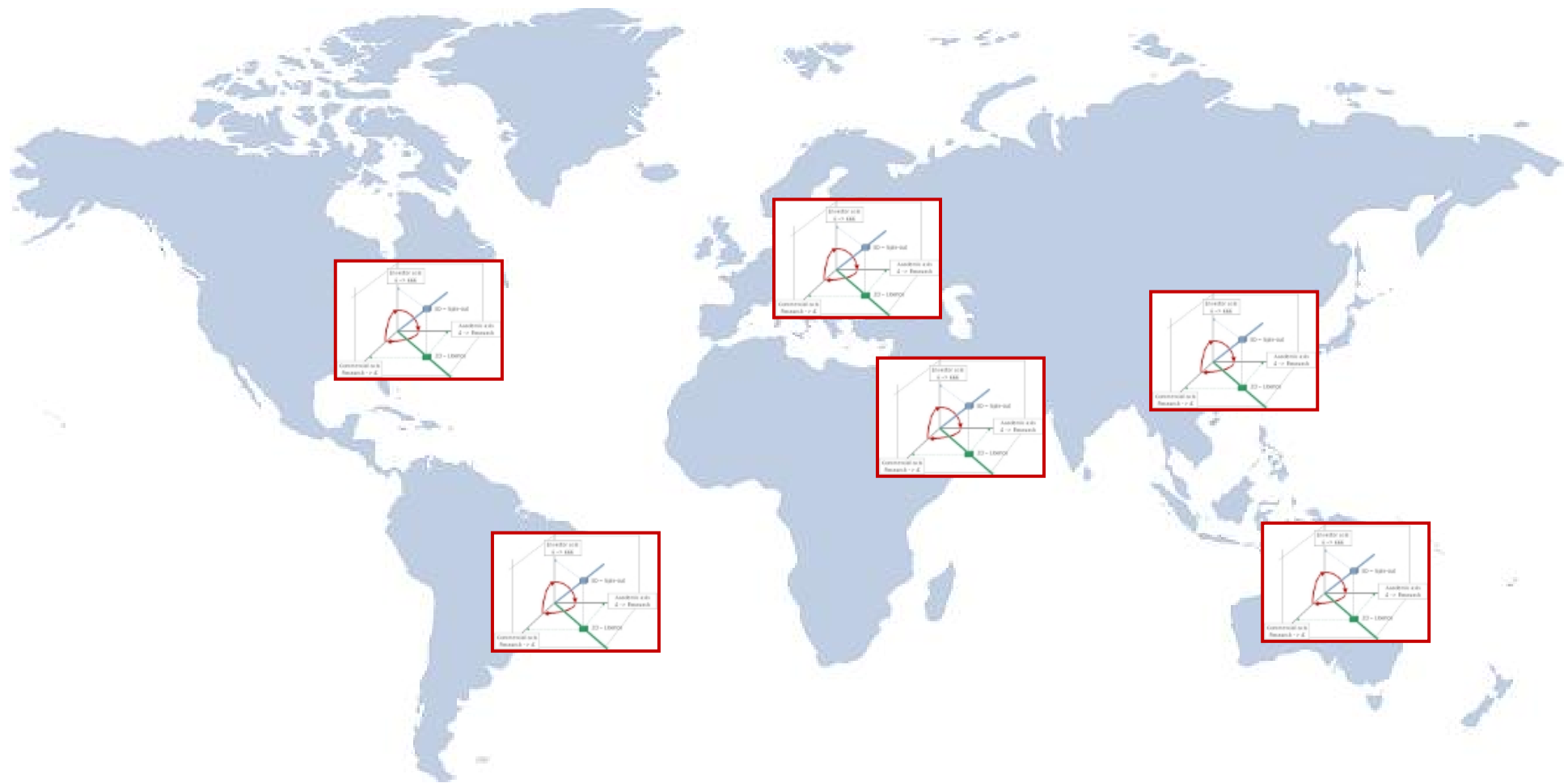
## Isis Enterprise

- Isis Enterprise offers consulting advice in technology transfer and innovation, based upon the success of Isis as Oxford University's technology transfer company
- Isis Enterprise clients and services:
  - Governments:  
Policy and benchmarking studies
  - Companies:  
Out-licensing support, in-licensing support, technology scouting, interim management, open innovation partnerships
  - Universities and research institutes:  
Training, secondments, long-term partnerships, project specific support
  - Investors:  
Investment readiness, technical and market due diligence
- Last year Isis delivered work for clients from 30 countries and established an overseas presence in Singapore

## Acting as Multi-dimensional Intermediaries



# Intermediaries - International



## University Role

- Dissemination of new knowledge
- Teaching & Research
- Generally - open, free disclosure, to anyone
- And sometimes also through commercial routes
- But - Universities do not exist to commercialise research
- So - It is not sensible to commercialise research  
*inside* a University



# Universities as a Source of Technology

## Oxford University

- £346 million Research Spend (2006/2007)
  - Highest University in UK
- Research Spend by UK Companies, Oxford ranked 12th
  - GSK, AZ, BAE, BT, Unilever, Ford, Shell, Airbus, RR, RBS, Pfizer (DTI R&D Scoreboard)
- Isis is 4th highest UK filer of PCT patent applications WIPO
  - (after GSK, Unilever, BT)
  - 100th US patent granted in 2007
  - 400 Patent families

## Technology is a Cost

- Oxford spends £346m pa on research
- Isis spends £1.3m on patenting
- You don't make money out of technology – you make money out of a business that successfully commercialises technology



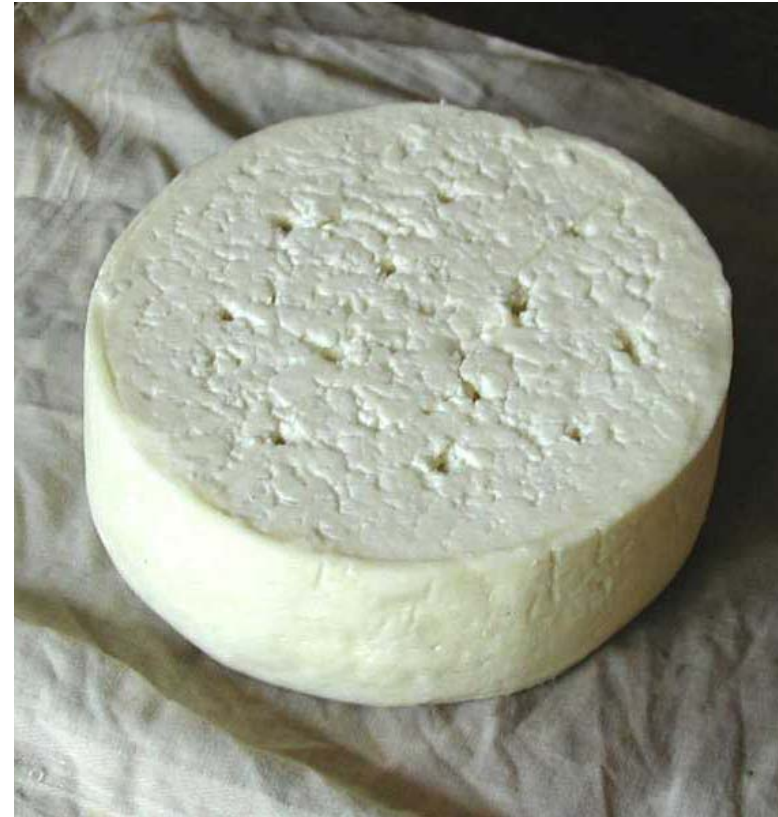
## Business Role

- Businesses exist to make money for their shareholders (almost exclusively)
- Some choose to do this by commercialising technology
- This can be a really profitable plan

## Universities and Business

- So it makes sense for Universities to work with Businesses so that Businesses can commercialise University research
- Universities do this in a number of different ways:
- Licensing to existing business
- Setting up new businesses (spin-outs)
- And others, e.g:
  - Research collaborations
  - Consulting

## Chalk and Cheese



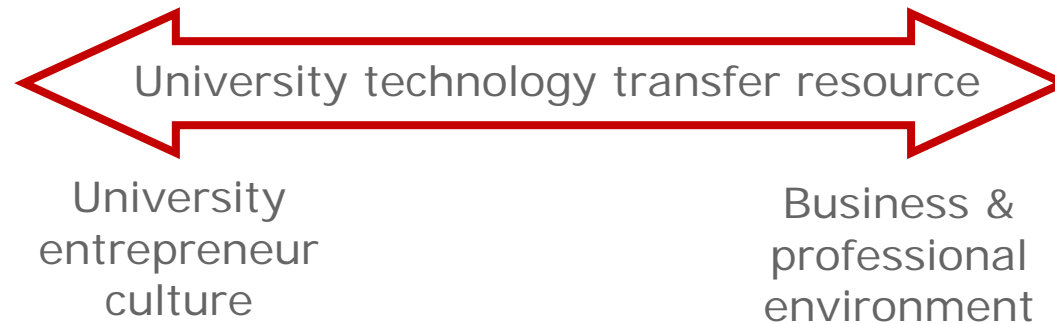
## Chalk and Cheese

- Universities and Businesses are very different
- A university is not meant to be like a company
- A company is not designed to be like a university
- Remembering this really helps when trying to get them to work together





## Summary - Culture Change & Making Connections



- Universities and Businesses are very different; a university is not meant to be like a company, nor a company designed to be like a university; remembering this helps when trying to bring them together
- The ideas are in the University; if University provides strong TT resource, the cultures can be connected and ideas transferred
- If the University doesn't lead, the University may not receive its share of the benefits
- Technology is a cost; you don't make money out of technology; you make money out of a business that successfully commercialises technology

## Why do technology transfer/ commercialisation?

- Why?
  - To transfer knowledge (incl. technology) from the research base, out into business so that better products and services are developed for the benefit of the health and wealth of society
- A good thing?
  - New ideas are developed
  - Economic impact
    - Within the research organisation
    - More widely
    - Job creation – in new spin outs, in established industry
    - Wealth creation and efficiency savings



## Who wants it?

- Who wants Technology transfer to happen?
  - Governments
    - Who is this? Civil servants, General Public?
    - Wider European legislators
    - Why?
      - Job Creation
      - Company creation and technology base
      - External Investment
      - Economic Growth from Innovation
  - Business
    - Local, international
  - Universities
    - Getting your research out to the public and used

## What it can encompass

- Technology transfer
- Innovation of Technology (€)
  - Technology
  - IP or Protection
- Knowledge exchange/transfer
  - Sharing of knowledge, Ideas or experience
  - Collaborative Problem solving
  - Network Building to foster innovation
  - Business, Governments, Universities

## What can you get out of it?

- Funding up-front
  - Capital investment
  - 'Third stream funding'
  - Industry investment – including own spin-outs
- Returns to your Institute
  - Royalties from licenses
  - Equity from spin-outs
  - Income from consultancy
  - Relationships and networks
  - Good PR from research for the public good

# Elements of University Technology Transfer

Requires a wide range of elements in place

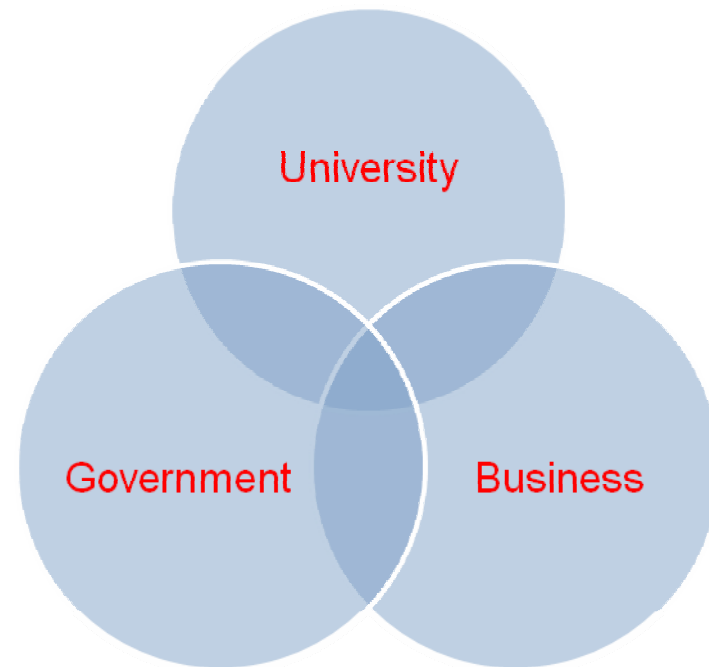
In three Groups

- **University**
- **Business**
- **Government**

These elements are universal

Some are essential; some just help

It is difficult; no-one said it was easy



Oxford & Isis provide one example of how to do it – there are many models

## Elements – University

### Supportive Vice-Chancellor & Senior Researchers

Research Activity

High volume & quality

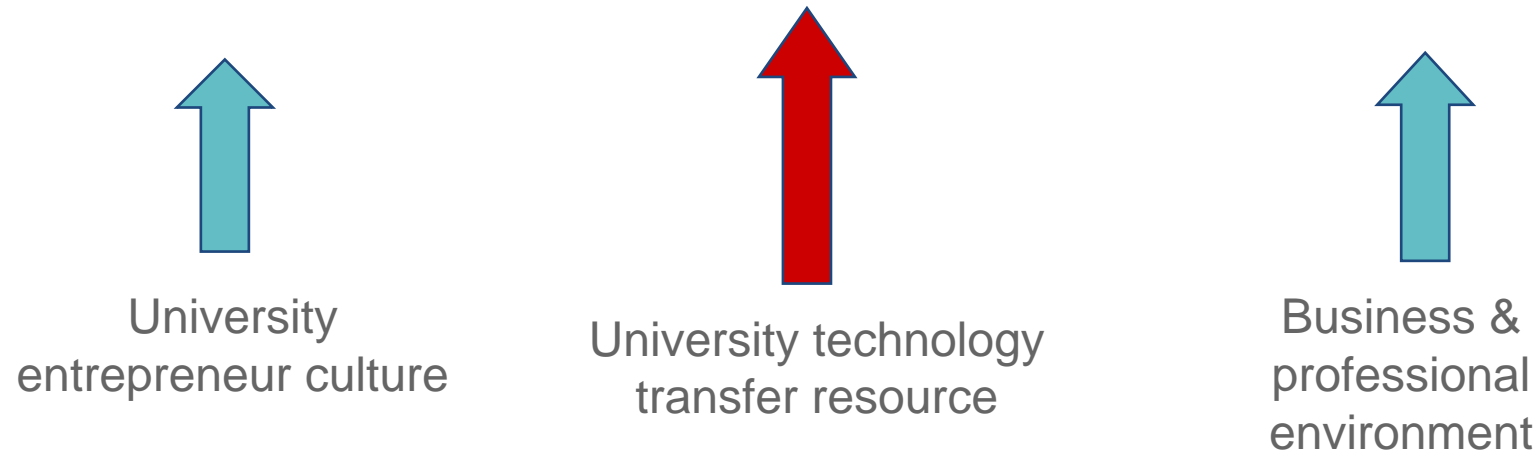
University IP Policy

Ownership

Revenue sharing

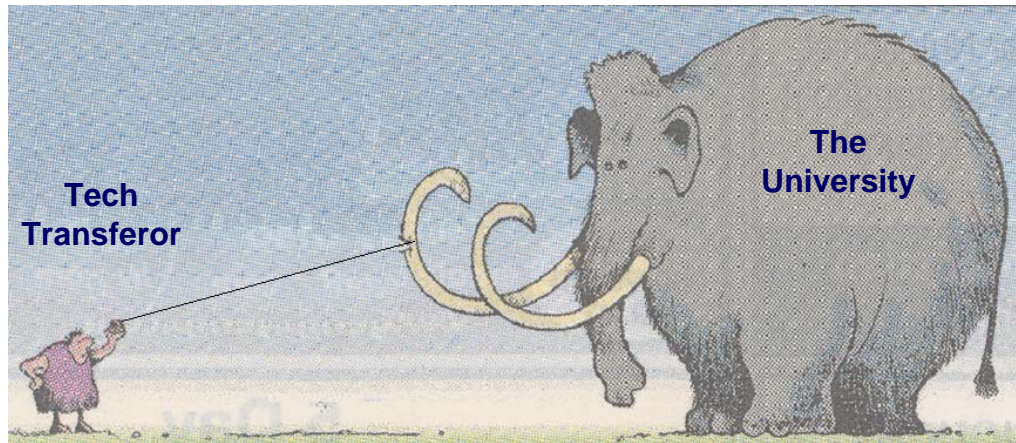
Disputes

## Culture Change



- All three must proceed together but the University must lead the change because..
- The ideas are in the University
  - If University provides TT resource, change will happen faster
  - Oxford pre-Isis 1 spin-out every 4 years, post Isis 6 per year
- If the University doesn't lead, the University may not receive its share of the benefits

## “Managing” a university



Like leading an elephant with a thin rubber band

Walk along with the elephant

- In whichever direction it chooses to go
- Until it gets used to you

Start to pull gently on your rubber band

If you pull too hard or too suddenly

- You will break your rubber band and
- Have no further influence over the elephant



But...

- Don't think you will ever have complete control





# Isis Return on Investment to the University

- University Investment in Isis for Patenting
- Financial Returns
  - Distributions back to University
  - Research Funding from spin-outs to University
  - Research Funding from Translation Awards to University
  - Hefce Third Stream Government Funding
  - Spin-outs Cash
  - Spin-outs Value
  - Oxford University Challenge Seed Fund
  - New Patents
  - Strategic IP Deals eg: Chemistry, IBME
- Other, non-financial, benefits to the University
  - Transferring technologies to improve lives
  - Promoting good news stories from University
  - University staff recruitment & retention
  - Managing Oxford Innovation Society



## Elements - University

- Supportive Vice-Chancellor
  - & Senior Researchers
- Research Activity
  - High volume & quality
- University IP Policy
  - Ownership
  - Revenue sharing
  - Disputes

## Oxford University & Isis Innovation Ltd

- Oxford University is the oldest university in the English-speaking world (founded c.1188), and a leader in learning, teaching and research
- Today - Most Powerful UK Research University
  - Research Fortnight, December 2008 Research Assessment Exercise
- Highest University Research Spend in UK
  - £451 million (2008/2009)
- Isis Innovation Ltd is a company 100% owned by the University of Oxford, established in 1987
- Isis *helps* researchers *who wish to* commercialise the results of their research
- A world-class Technology Innovation business
- Isis 5<sup>th</sup> highest British PCT patent applicant
  - WIPO Data, 2002-2008 composite; behind Unilever, GSK, BT, Qinetiq



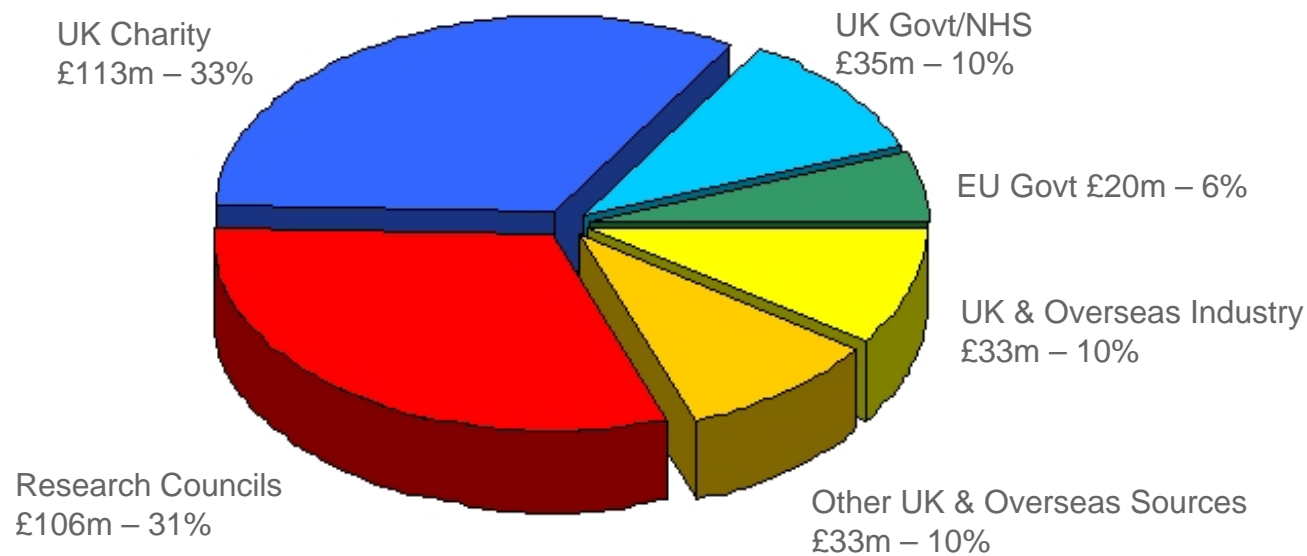
Christ Church, Oxford



Ewert House, Oxford

## Oxford Research Funding 2008-2009 £451million

- Highest University Research Spend in UK
- 4,400 researchers and 8,000 postgraduate students
- R & D Spend by UK Companies, Oxford would be ranked 9th 2009 EU Industrial R&D Investment Scoreboard
- Most Powerful UK Research University - 2008 Research Assessment Exercise Research Fortnight







<b>Total</b>	<b>£341m</b>
<b>+ HEFCE</b>	<b>£110m</b>

### University Divisions:

Medical Sciences	£217m
Mathematical, Physical & Life Sciences	£80m
Social Sciences	£31m
Humanities	£9m
Other	£3m
Total	£341m

## University of Oxford: Research Themes

Medical Sciences	Maths, Physical & Life Sciences	Social Sciences	Humanities
Cancer	Chemistry for Biomedicine	Global Governance	World Religion
Infectious Diseases, Immunology, Pathogens	Computational Biology	Global Public Health Issues	Applied Ethics
Diabetes, Endocrinology, Metabolism	Climate Prediction, Science of Energy & Environment	Energy: Policy and Society	Post-Colonial Literature
Cardiovascular Disease	Biomedical Engineering	Environment and Business	Latin America: Culture, Language and Literature
Genomics	E-Science	Politics & International Relations	Oriental Studies: Korea, Japan, India, Middle East
Musculo-skeletal Science (joint & bone)	Bio-Nanotechnology	Area Studies: China, South Asia, India	Modern Chinese & South Asian Studies
Neuroscience	Quantative Finance	Evolutionary & Cognitive Anthropology	Philosophy of Cognitive Science & Neuroscience
Reproduction & Development	Quantum Information Processing	Poverty & Refugee Studies	Ethnomusicology
			

# Resources to Support Commercialisation

## Four Academic Divisions

### Medical Sciences Division

Biochemistry  
Physiological Sciences  
Psychology  
Dunn School of Pathology  
Pharmacology  
Physiology, Anatomy and Genetics  
Anaesthetics  
Cardiovascular Medicine  
Clinical Laboratory Sciences  
Clinical Medicine  
Clinical Neurology  
Clinical Pharmacology  
Human Genetics  
Medical Oncology  
Molecular Medicine  
Obstetrics and Gynaecology  
Ophthalmology  
Orthopaedic Surgery  
Paediatrics  
Psychiatry  
Public Health and Primary Health Care  
Radiation Oncology and Biology  
Surgery



Begbroke Science Park

### Maths, Physical & Life Sciences Division

Chemistry  
Computer Science  
Earth Sciences  
Engineering Science  
Materials  
Mathematics  
Physics  
Plant Sciences  
Statistics  
Zoology



Research Services

## UNIVERSITY COUNCIL

Intellectual Property Advisory Group

### Humanities Division

Chinese Studies  
Classics  
Comparative Philology  
Ruskin School of Drawing  
English Language & Literature  
History  
Medieval & Modern Languages  
Modern Middle Eastern Studies  
Music  
Oriental Studies  
Philosophy  
Theology

### Social Sciences Division

Anthropology  
Archaeology  
Area Studies  
Development Studies  
Economics  
Educational Studies  
Environment  
Internet Institute  
Law

### Saïd Business School

Politics  
Social Policy and Social Work  
Sociology

### Administration

Regional  
Liaison



Isis Innovation Limited



Centre for Entrepreneurship  
& Innovation



## Elements - University

- Supportive Vice-Chancellor
  - & Senior Researchers
- Research Activity
  - High volume & quality
- University IP Policy
  - Ownership
  - Revenue sharing
  - Disputes

## Intellectual Property Policy (from October 2000)

- University claims ownership of all employees' and students' IP rights resulting from University research activities
- The University ***assists*** those researchers ***who wish to*** commercialise their research
  - by patenting, licences, spinout companies & consultancy
- Researchers share the benefits
  - Royalty shares from licences
  - Equity in spinout companies
  - Income from personal consultancy



## Policy

### Technology Licensing

Total net revenue	Researchers personally	University General Fund	Department Funds	Isis Innovation
to £72k	61%	9%	0%	30%
to £720k	31.5%	21%	17.5%	30%
over £720k	15.75%	28%	26.25%	30%

- Spin-outs
- Share ownership
- Share Proceeds

Spin-out shares are owned by the University, not Isis

Proceeds allocated:	Department	25%
	John Fell Fund	10%
	Capital Fund	50%
	'Isis'	15%

## Elements - University

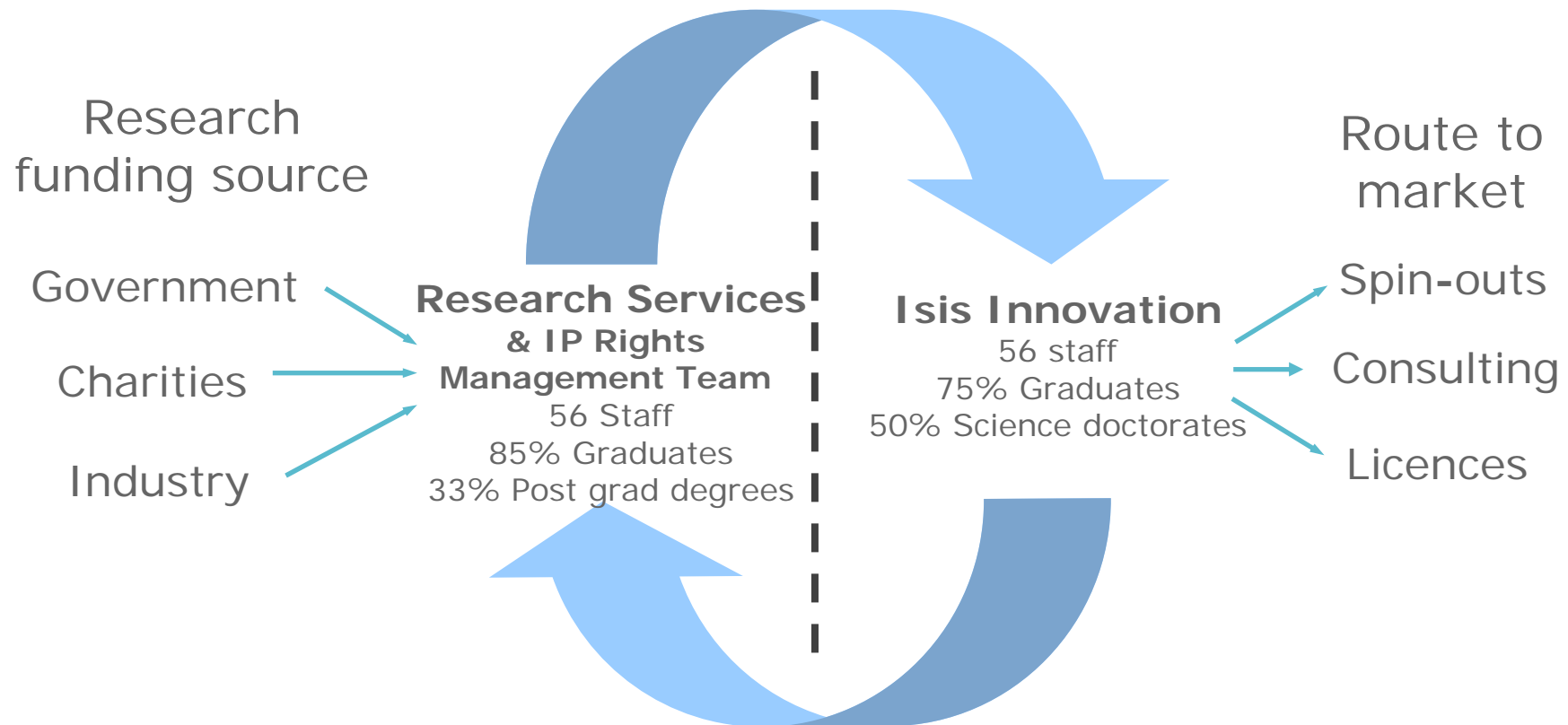
- Supportive Vice-Chancellor  
& Senior Researchers
- Research Activity
  - High volume & quality
- University IP Policy
  - Ownership
  - Revenue sharing
  - Disputes
- Research Services Office
  - Research funders

# Transfer of Intellectual Property

## Assignment of intellectual property rights

*Inside the University*

*Outside the University*



## Elements - University

- Supportive Vice-Chancellor
  - & Senior Researchers
- Research Activity
  - High volume & quality
- University IP Policy
  - Ownership
  - Revenue sharing
  - Disputes
- Research Services Office
  - Research funders
- Access to Proof of Concept / Seed funds

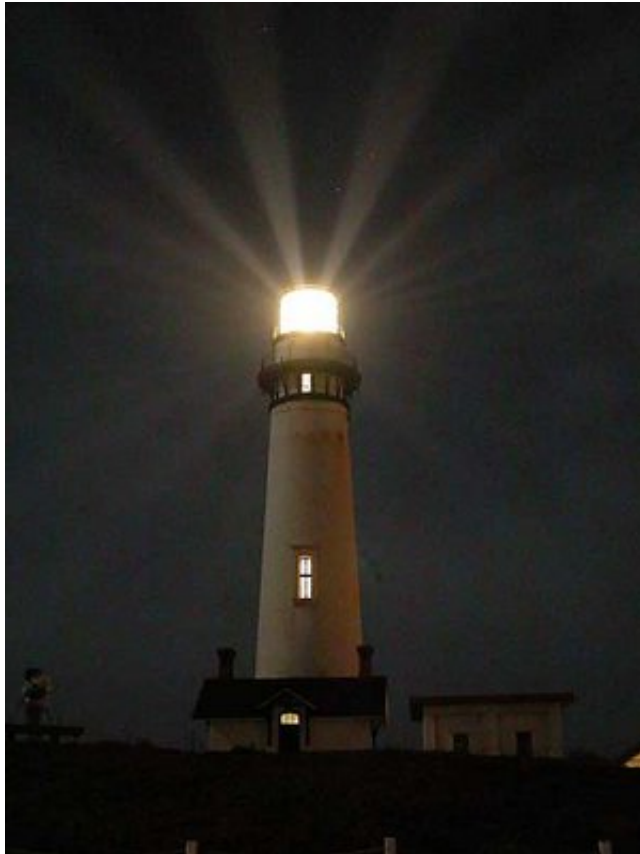
### Oxford University Challenge Seed Fund £4m

- Launched in 1999 University £1m Treasury, Wellcome, Gatsby £3m
- Development projects, spin-out seed equity; in a total of 83 projects
- £4m investment has resulted in Equity stakes in 22 spin-outs, 7 completed licensing deals & 33 active technology projects
- These 21 spin-outs have attracted £40m seed/venture investment

## Elements - University

- Supportive Vice-Chancellor
  - & Senior Researchers
- Research Activity
  - High volume & quality
- University IP Policy
  - Ownership
  - Revenue sharing
  - Disputes
- Research Services Office
  - Research funders
- Access to Proof of Concept / Seed funds
- Technology Transfer Office

# Lighthouse



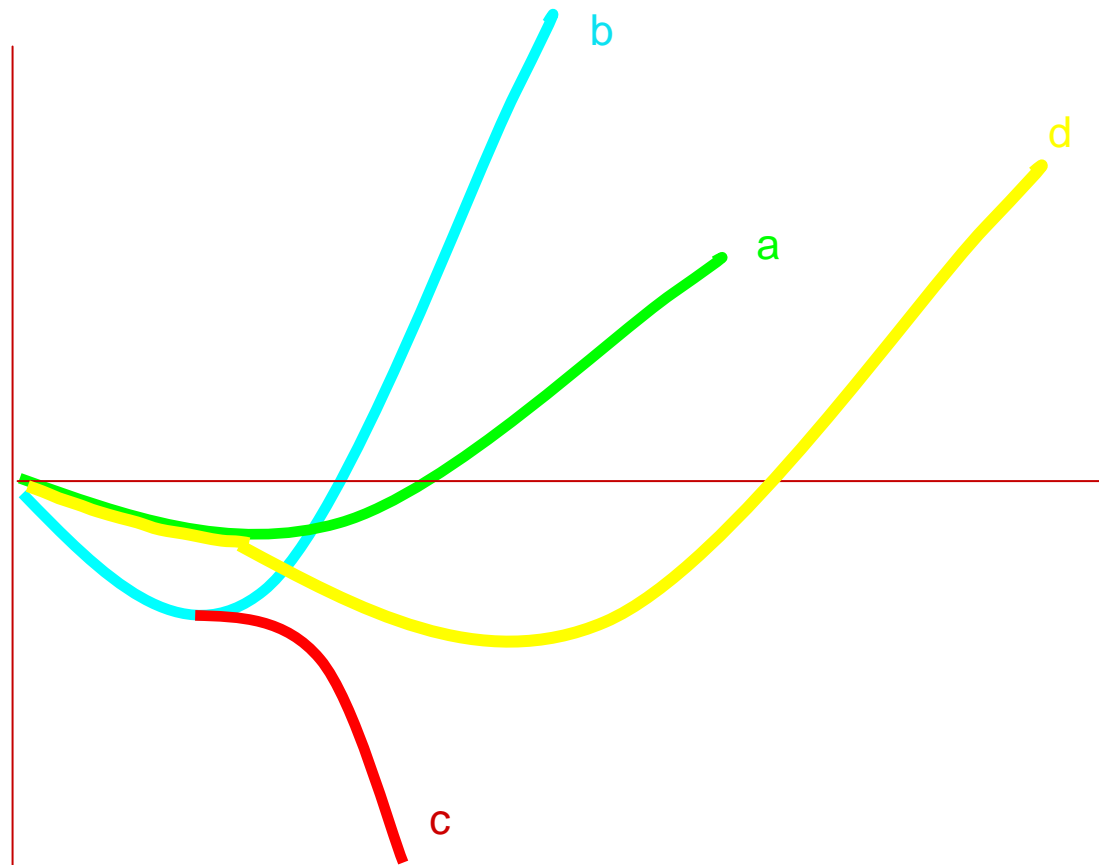
- Set up a lighthouse to attract researchers
- Tech transfer office spends a lot of time and effort on p.r. directed inside the university
  - Mailshots, newsletters, magazine articles, www, lectures, handouts, IP training, local radio, local TV local newspapers, national media etc.
- Tech transfer staff attend department seminars, college lunches, parties, pubs, shops, cinemas etc.
  - In other words they live in the same world as researchers

# Isis Innovation 2000 - 2009

Year Ending Mar:	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
University Investment £m	£1m	£1m	£1m	£1m	£1m	£1.2m	£1.2m	£1.2m	£1.2m	£2.5m
Staff	17	21	23	34	36	36	36	37	44	54
Open Projects	319	415	476	629	725	764	784	841	978	1112
Patents filed (pa)	55	63	82	65	52	55	57	49	68	64
Licence Deals (pa)	21	36	42	37	31	38	45	50	74	69
Consultancy (pa)				34	50	48	59	89	102	151
Spin-outs (pa)	6	8	8	7	3	4	6	7	4	4
Annual T/O £	£0.9m	1.2m	1.7m	2.0m	2.3m	2.7m	2.9m	3.6m	4.8m	5.6m



## Cash flow profiles

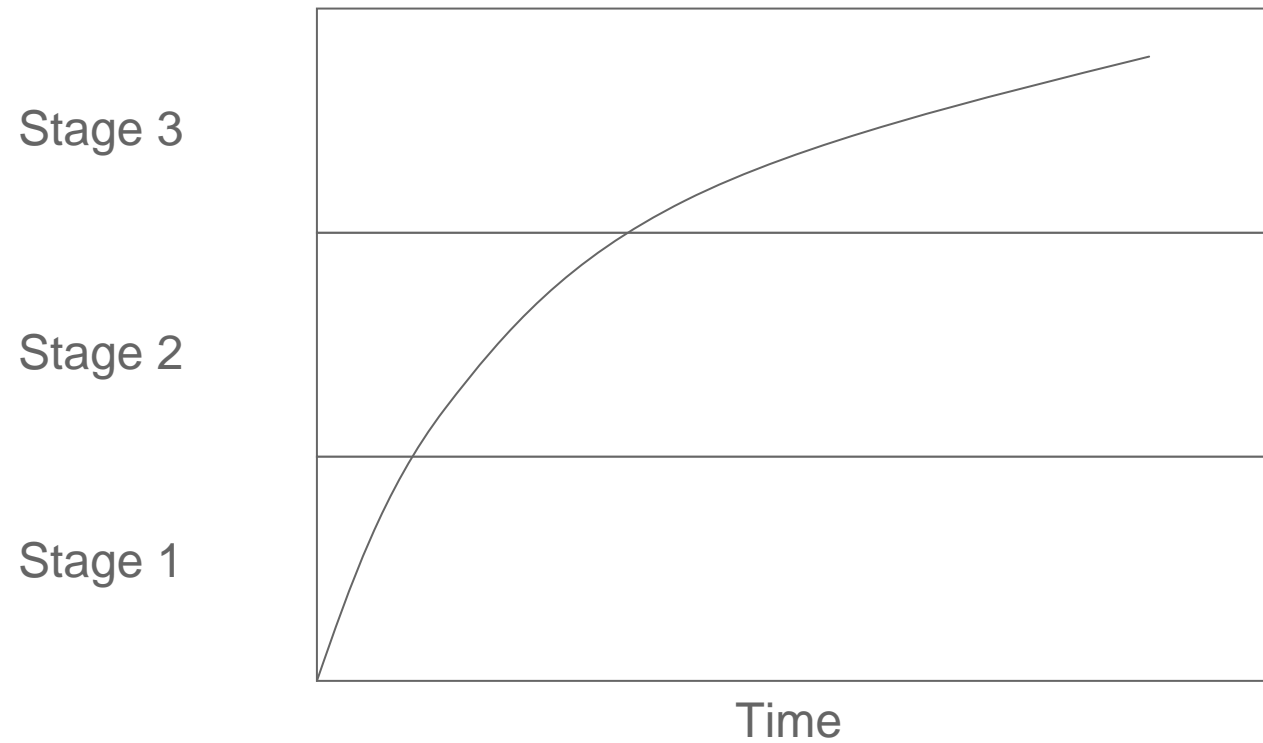


# The Characteristic Stages of a Technology Transfer Office

- Stage 1 Funding and resource driven
  - Seeking critical mass and need for success stories
  - Funder metrics are critical
- Stage 2 Deal driven
  - Seeking to cover costs
  - Need to sustain networks
  - Profit and loss are an increasingly important metric
- Stage 3 Market consideration driven?
  - Driven by investor concerns or protectable market positions rather than 'chance'?

# The Learning Curve

■ The duration of each stage is dependent on many factors



## Key Factors in Progressing through the TTO stages

### Stage 1

- Quantity of research
- Quality of research
- Buy-in of academics
- Buy-in of investors
- 'Loose' money around
- National framework support
- Entrepreneurs available
- Successes

**KPIs driven by funders**

### Stage 2

- No of proposals in system
- Strength of developing networks
- Quality of TT staff
- Deals done
- Costs, sales and margins
- Culture change occurring
- Strength of TT model

**KPIs driven by organisation**

## Popular KPIs in Progressing through the TTO stages

### Stage 1

- Patents
- No. Spin-outs
- Licence income
- Consultancy income
- Pipeline agreements signed

### **KPIs driven by funders**

Measurable, externally auditable

### Stage 2

- No. academics involved
- Proposal development pipeline
- Partnership agreements
- Deals done
- Costs, sales and margins

### **KPIs driven by organisation**

Sustainable business

## Elements - Business

- Seed & Venture Capital
- Business Angels

## Investment Sources

### Oxford University Challenge Seed Fund

- Launched with £4m in 1999
- University provided £1m; and HM Treasury, Wellcome, Gatsby £3m
- Total of £5.7m invested in 102 projects – development, seed equity
- Resulting in Equity stakes in 31 spin-outs, 4 completed licensing deals & 33 active technology projects
- These 31 spin-outs have attracted £80m seed/venture investment

### Isis Angels Network

- Business Angels
- Seed/Venture Capital
- Private Equity
- 100 members
- Events
- No Charges



## Oxford Spin-outs (pre 2000)

1959		Oxford Instruments *
1977		Oxford Lasers
1988		Oxford Glycosciences *
1989		Oxford Molecular *
1992		Oxford Asymmetry *
1994		PowderJect *
1995		Oxford Gene Technology
1996		Oxford Biomedica *
1997		Oxagen
1998	5	Opsys, Synaptica, Prolysis, Celoxica *, Sense Therapeutic
1999	6	Medigene(Avidex) *, Oxxon Pharmaccines, Dash, Oxonica *, AuC Sensing, OMIA

\* Stock Exchange Listing

## Oxford Spin-outs (post 2000)

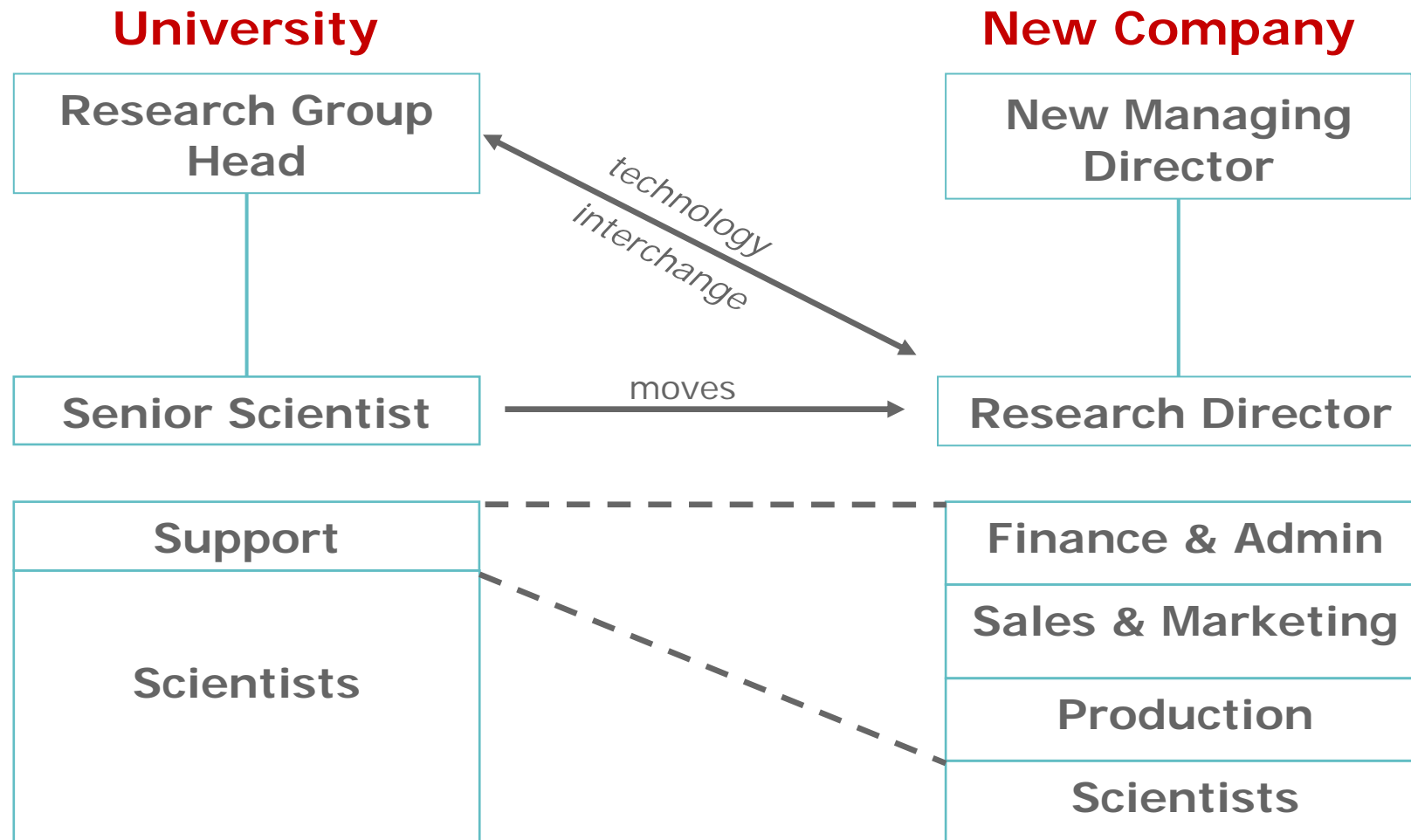
2000	7	Third Phase, Mindweavers, Oxford BioSignals, Oxford BioSensors, TolerRx, OXIVA, Pharma DM
2001	7	OxLoc, Oxford Bee Co, Oxford Ancestors, Novarc, Oxford ArchDigital, Natural Motion, Inhibox
2002	9	Pharminox, Minervation, Spinox, Zyentia, Oxitec, Oxford Immunotec, ORRA, GlycoForm, BioAnalab
2003	4	Summit (Vastox) *, ReOx, Riotech, OCSI
2004	4	Avacta(OMD) *, G-Nostics, Surface Therapeutics, EKB Technology
2005	5	Oxford Nanolabs, Oxford RF Sensors, Oxbridge Pulsars, Celleron, Oxford Catalysts *
2006	7	TDeltaS, Oxford Medistress, Particle Therapeutic, Aurox, Oxford Advanced Surfaces *, Cyttox, OxTox
2007	4	Eykona Technologies, Clinox, Oxford Biodynamics, Crysalin
2008	4	Semmler, Oxford-Emergent TB Consortium, ISE, Organox
2009	3	Oxford Financial Computing, Zyoxel, Oxford Yasa Motors

Total external investment to date in spin-outs since 2000: **£266m**  
 £36m 1st round Seed/Business Angels – average amount invested £850k; 1/3<sup>rd</sup> > £1m invested.  
 £230m follow-on Venture/Institution Capital \* stock exchange listing

## Elements - Business

- Business Angels
- Seed & Venture Capital
- Entrepreneurs

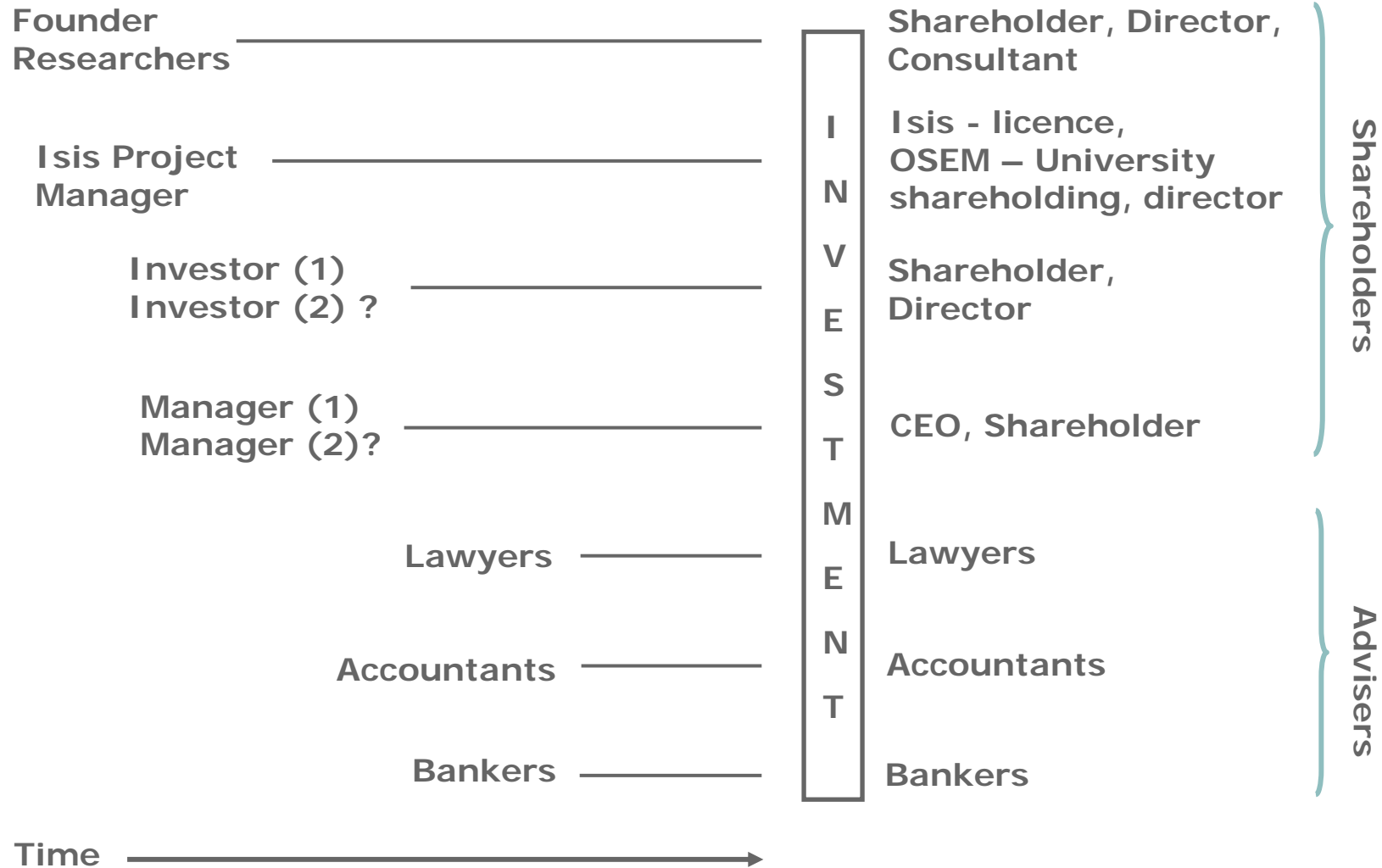
# Spin-out Strategy



## Elements - Business

- Business Angels
- Seed & Venture Capital
- Entrepreneurs
- Professional Advisers
  - Banks
  - Accountants
  - Lawyers
  - Property

## Spin-outs – The Players



# Begbroke Science Park



University Departments  
of Engineering Science &  
Materials

Centre for  
Innovation  
& Enterprise

- Spin-outs on site:
- Prolysis/Biota Europe
- Oxford Gene Technology
- Oxonica
- Oxford Advanced Surfaces
- Oxford Biodynamics
- Particle Therapeutics

- Owned & operated by Oxford University, 5 miles west from the city centre
- University research labs;
- University Supercomputer operated by e-research centre
- Business incubator & premises for new companies
- Central meeting room and café



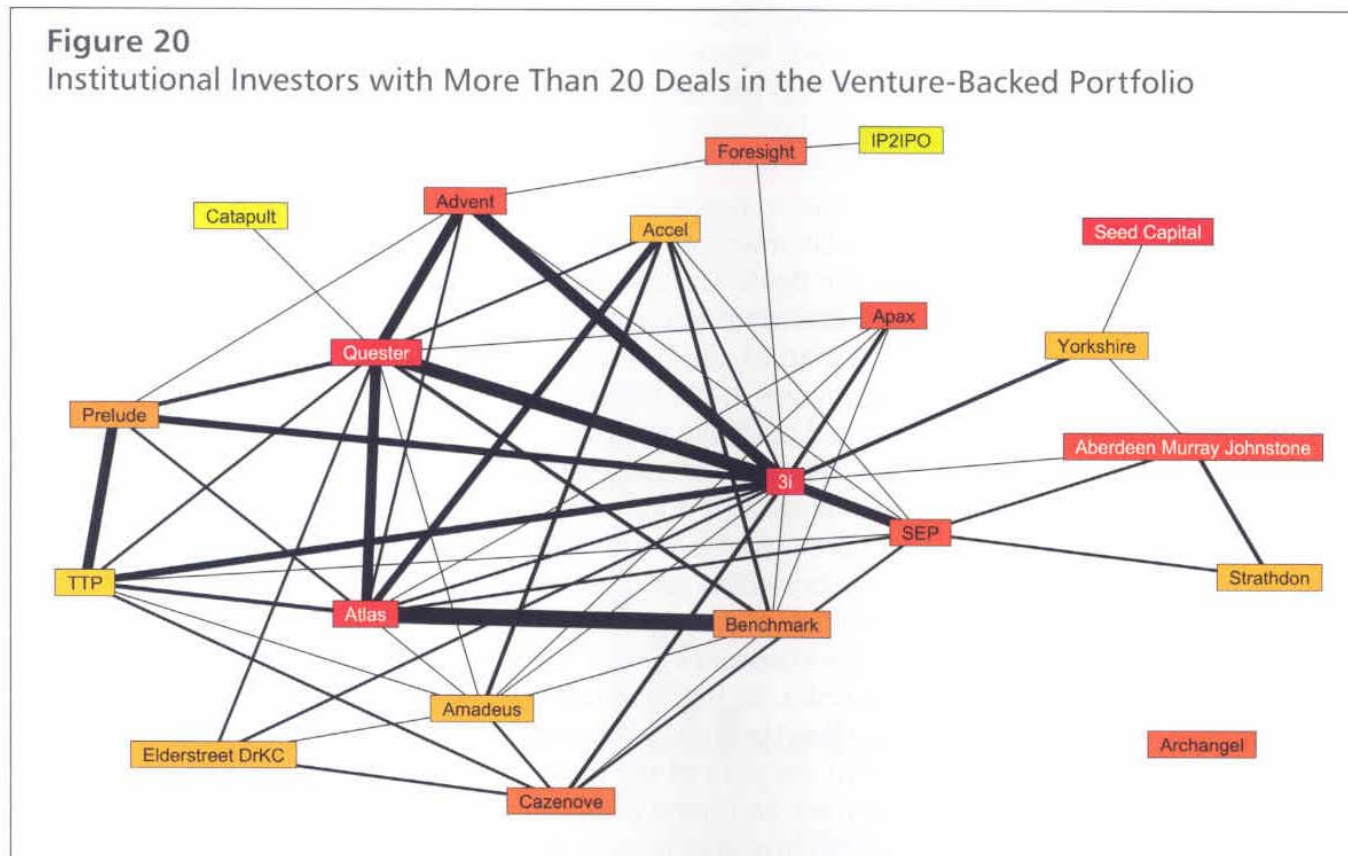
## Elements - Business

- Business Angels
- Seed & Venture Capital
- Entrepreneurs
- Professional Advisers
  - Banks
  - Accountants
  - Lawyers
  - Property
- Innovative Technology companies
  - As Licensees
- Business Networks

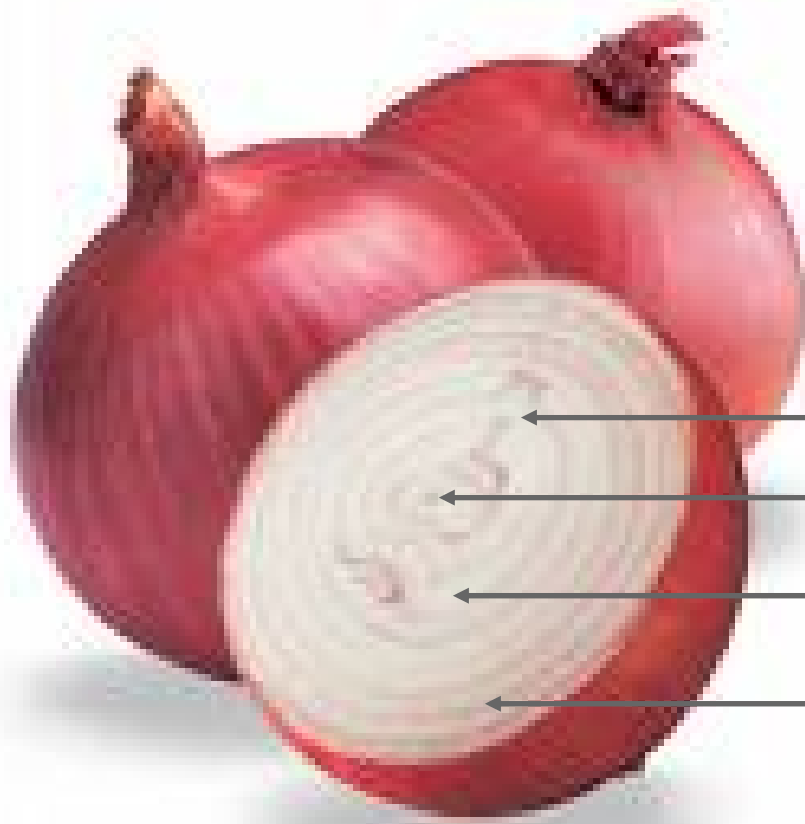
## OIS Meeting & Dinner



- Tea & coffee reception
- Academic presentation
- Sponsor presentation
- Champagne reception
- Dinner in College
- After dinner drinks



## Layers in the Innovation Ecosystem



← Innovative companies, investors, entrepreneurs,

← University People – Researchers, TTO, Administrators

← Professional advisers – patent attorneys, lawyers,  
accountants, banks, commercial property managers,  
pr, head-hunters, consultants, students, journalists

← Other universities

## Elements – Government “Charitable eg Welcome Trust”

- Tax incentives
  - SME Benefits
  - CGT & Income Tax
  - Tax credits & Tax relief
- Grant programmes
  - Technology Transfer
  - Businesses
  - Eg Welcome Trust Translational Awards “Bridging the Gap”
- Government Policy

## Different legislative approaches comparison: US and UK

- United States – Bayh – Dole (1980)
  - Grants Universities, small business and 'Not for Profits' ownership of IPRs from Federally funded research, incl. joint funded.
  - In exchange, among other requirements:
    - Report all disclosed inventions, file for patent protection, and actively attempt to commercialise
    - Grant the Fed. Gov. a non-excl, non-transferable, irrevocable license.
    - Share royalties with inventors; Use remaining income on research and education
  - Funders have - 'March In' Rights.
    - To date no government agency has exercised its rights.
    - NIH has been more active and 'big pharma' is aware
- No centrally funded TT support programme
- Other countries have adopted a similar approach, e.g. Japan (1999), China, Brazil, Malaysia and others with India reviewing policy



## United Kingdom

- No United Kingdom equivalent to Bayh-Dole
  - But: In mid1980s Universities granted the rights to exploit publicly funded IP (formally held by British Technology Group - BTG).
  - ❖ No impact on Industry funded IP
  - No formal legislative requirement for inventions disclosure, patenting or commercialisation of IPRs.
  - Although:
    - Government 'requires' publically funded research to show economic and societal impact and benefit
  - From 1997 - Government provides centrally funded support to University TT offices and Public Sector Research Establishments for:
    - Higher Education Innovation fund; PSRE funding; Central funding for TT training



## Activity since the 1970s

### • US

- Active TTOs since 1970s
- Greater clarity on law post Bayh- Dohl
- This spurred the development of TTOs
- Evidence suggests inventions get 'hidden' or not disclosed
- Also prompting debate on the value of patenting when commercialising
- Not universally popular with US private funders!

### • UK

- Earliest TTOs in late 1980s, increasing in late 90s with additional development funding
- UK IP Office guidelines first issued in 2002
- Government consulted on, did not introduce B-D 'style' legislation.
- Private and public sector did not welcome the possibility
- When collaborating on US federally funded research, required to largely follow B-D

## Comparing some KPIs\* - per \$100 million research investment – 2004

### US

- Invention disclosures – 40.4
- Patent Applications – 25.5
- Patent grants – 8.8
- Licenses executed – 11
- Start-ups/ Spin-outs – 1.1
- Licensing income as a share of research revenue – 2.9%

### UK

- Invention disclosures – 48.3
- Patent Applications - 16.3
- Patent grants – 6.6
- Licenses executed – 13.5
- Start-ups/ Spin-outs – 3.5
- Licensing income as a share of research revenue 1.1%

**Irrespective of legislation – people (incl. Academics and TTO staff), competitive products/ ideas from research', the 'right environment', funding, and links to markets are key**

\*From: Developing internationally comparable indicators for the commercialisation of publicly-funded research, 2006



Requires a wide range of elements in place

In three Groups

- University
- Business
- Government

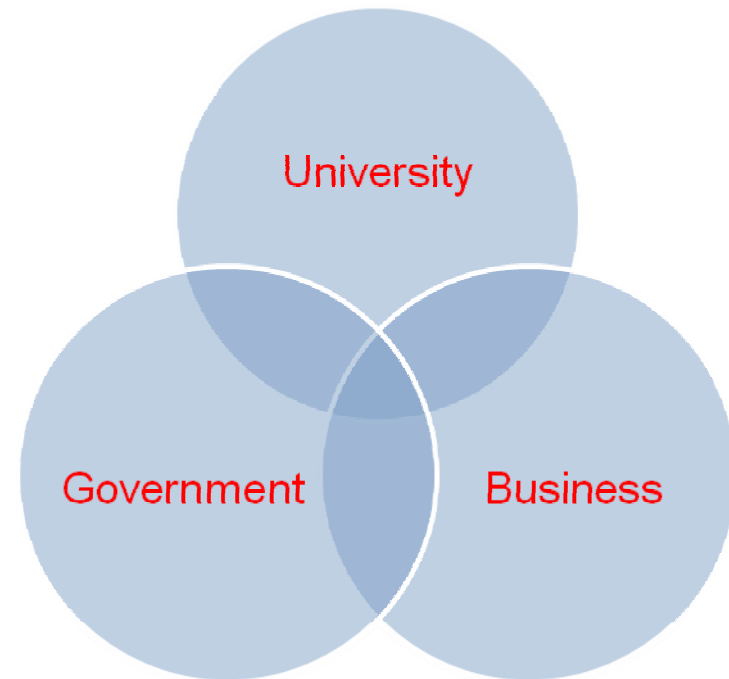
These elements are universal

Some are essential; some just help;

Leadership... Stories... Resources

It is difficult..

But then no-one said it was easy.



## Conclusions – How Isis Works

- Universities
  - Technology Transfer is a good thing
    - Part of University purpose; may make money for University and researchers
  - It does not happen on its own
    - You need to invest resources in People, Patent budget, Proof-of-Concept
  - You need a policy framework
    - Who owns the inventions; who shares the rewards
  - It takes a long time ... So start and do not stop.
- Business
  - Access to technologies, resources and expertise
  - Help understand universities
  - Help your business innovate
- Investors
  - Source of investment opportunities
  - Home for entrepreneurs
- Government
  - Stimulates innovation and enterprise
  - Improves society

## Vision for Isis

- Technology
- Innovation
- For People
- From Oxford and elsewhere
- Successful exploitation of new ideas
- Health & Wealth of Society



Greener Emission Fuels  
Silent & Clean Power  
Energy from Waste  
A New Steam Revolution



A Gambian infant is inoculated as part of a previous MRC study with the MVA85A vaccine.



www.isis-innovation.com



The screenshot shows the Isis Innovation website. At the top left is the Isis Innovation logo, which includes a circular emblem with a book and the text 'ISIS INNOVATION'. To its right is the text 'TECHNOLOGY TRANSFER FROM THE UNIVERSITY OF OXFORD'. A search bar with a red double arrow icon is in the top right. Below the header is a navigation menu with links: 'About Isis', 'Isis News', 'Licensing Opportunities', 'Spin-out Companies', 'Material Sales', 'Oxford University Consulting', 'Isis Enterprise', and 'Information for Oxford Researchers'. The main content area features a large quote from Professor Sir Mike Brady: "I have had much satisfaction from all my published academic papers, but nothing compares to the incredible satisfaction of seeing my research out there being used in daily life." Below the quote is his title: 'Professor Sir Mike Brady, Professor of Information Engineering, University of Oxford, Non-executive Director, Isis Innovation Ltd.' To the right of the quote is a 'LATEST NEWS' section with three items: 'Isis and Cosmos Technology To Accelerate Technology Transfer in Bulgaria', 'Isis Innovation Annual Report 2009', and 'Electric Motors Spin-out Secures Funding'. At the bottom of the main content area is a paragraph stating 'Isis Innovation is a wholly-owned subsidiary of the University of Oxford, founded to exploit know-how arising out of research at one of the World's premier research institutions'. Below this are logos for 'ISIS ENTERPRISE Technology Transfer Consulting' and 'OXFORD UNIVERSITY CONSULTING Experts from Oxford'.

**ISIS INNOVATION** TECHNOLOGY TRANSFER FROM THE UNIVERSITY OF OXFORD

Search:

About Isis | Isis News | Licensing Opportunities | Spin-out Companies | Material Sales | Oxford University Consulting | Isis Enterprise | Information for Oxford Researchers

**LATEST NEWS**

**Isis and Cosmos Technology To Accelerate Technology Transfer in Bulgaria**  
» A new venture has been established to identify, commercialise and secure funding for the most promising technologies for Bulgaria.

**Isis Innovation Annual Report 2009**  
» The latest Isis Annual Report is now published, describing Isis' tenth consecutive year of annual growth.

**Electric Motors Spin-out Secures Funding**  
» Oxford Yasa Motors Ltd has secured £1.45 million in investment to take lightweight electric motors developed at the University of Oxford to market.

**Isis Spin-outs in Telegraph High Growth Index**  
» Two Isis spin-outs have featured in Telegraph High Growth Index

**Isis Insights**  
» Thought-pieces on technology

"I have had much satisfaction from all my published academic papers, but nothing compares to the incredible satisfaction of seeing my research out there being used in daily life."

Professor Sir Mike Brady  
Professor of Information Engineering, University of Oxford  
Non-executive Director, Isis Innovation Ltd.

Isis Innovation is a wholly-owned subsidiary of the [University of Oxford](#), founded to exploit know-how arising out of research at one of the World's premier research institutions

**ISIS ENTERPRISE** Technology Transfer Consulting

**OXFORD UNIVERSITY CONSULTING** Experts from Oxford

Isis Innovation Ltd, Ewert House, Ewert Place, Summertown, Oxford OX2 7SG  
T 01865 280830 F 01865 280831 E [innovation@isis.ox.ac.uk](mailto:innovation@isis.ox.ac.uk)  
Register to receive Isis E-News at: [www.isis-innovation.com/news/enews](http://www.isis-innovation.com/news/enews)



Dr Paul Whyte  
Managing Consultant Isis Enterprise



## Technology Transfer Models: Examples

- Cambridge model
- In-house
- A limited company
- External incubator
- The pipeline or contracted out model

## TTO Models: The Cambridge Model – academics own their IP

- Quoted by economists in ‘hindsight’ as best practice economic development
- Based on individual academic’s energy and drive
- Early ‘laissez-faire’ model
- Spreads reasonably quickly in best cases
- But does the research organisation benefit and can it be replicated?

## The In-House Model – Departments within the University TTO + BDO

- A service provided and managed as part of the research organisation (often seen at modern PROs)
- Based on the body corporate approach
- Tends to concentrate on licensing and consultancy and tends to remain small
- Possibly most appropriate where organisational research capacity is more limited.
- The research organisation benefits?

## Example: Oxford Brookes University – some recent figures

- A Research and Business Development Office – RBDO
  - Development of research/ increase in consultancy
  - Increase KE/TT – activities & income
- Research support – 4 FTE: ~£5m research funding
- KE support – £2.4m in HEIF funding for projects across OBU
  - Engagement with business
  - Development of enterprise skills
  - Income generated - £3.67m
  - Supporting Knowledge Transfer Partnerships – 6 ongoing
- TT support – 2 FTE + consultancy
  - ~£600K revenue 2005-06
  - PoC funds for 12 projects - ~£350K
  - 2 Patents, 2 licenses, progress on 2 spin-outs

## The limited company model

- A growing reputation in the field
- Based on expert dedicated resource
  - E.g. KUIL - Kingston University Innovations Ltd
  - SUEL – Sheffield University Enterprises Ltd
  - Isis Innovation Ltd - 1987
  - Cambridge Enterprise Ltd – 2006
- Arms-length company with freedom to operate
- Replicable – more and more UK universities are following this approach in
- Works best with a ‘critical mass’ of research.

## The external incubator model

- Favoured by many UK funding bodies as 'transparent'
- Based on expert dedicated resource
- Can suffer from lack of ownership among academic community
- Very replicable

## The pipeline or contracted out model


- A model of Private Public Partnerships (and hence a favourite of government)?
- Service from an expert resource but with many variations, e.g.:
  - Biofusion – serves Universities of Sheffield and Cardiff
    - Pipeline agreements with Universities
    - Working with the TTO within the University
    - Selecting IP for spin-out
    - Investing or finding investment for Spin-outs
  - The IP group – relationships of various forms with 10 Universities in UK
- The Research Organisation benefits?
  - Still early days
  - Readily available investor on hand - but can tie down direction of activity

# Isis Impacts

- The impact of Isis activities is seen through the take-up of new technologies and ideas that form the basis for new products and services.

### Isis Success Stories – Outcomes Questionnaires

- PDQ-39
- Oxford Health Outcomes Questionnaires developed at the University's Health Services Research Unit
- PDQ-39 is a "Gold-standard" measure of health status for Parkinson's Disease
  - Widely validated and translated into over fifty languages
  - Isis has licensed the questionnaire to 17 pharmaceutical companies for use in clinical trials
- Knee, Hip, Shoulder and Elbow scores also licensed.




isis-innovation.com

---

### Isis Success Stories – Consulting

- The NAO is a long term strategic customer of Oxford University Consulting (OUC)
- The relationship has developed since 2004 and has had two main facets:
  - Reviewing NAO Value For Money (VFM)
  - Conducting specific investigations commissioned by the NAO as one of its strategic partners
- The review of VFM reports, which assess how well Government departments and other public bodies have spent their resources, commenced in 2004. Since that time OUC has quality assured over 180 such reports, leading the NAO to comment – "...OUC has impressed us with its efficiency and high professional standards. We value the access to a wide range of expertise..."
- Specific investigations conducted under the strategic partnership, which started in 2006, have focused on social and user issues relating to internet use in the public sector, e.g.:
  - Assessing the user experience of the DWP website
  - Reporting on the social impact of digital exclusion




isis-innovation.com

OXFORD UNIVERSITY CONSULTING

### Isis Success Stories – Spin out

- OXFORD IMMUNOTEC
- 1995 – Spun out by Isis
- Developing new ways to diagnose and monitor infection and disease
- Lead product is a TB diagnostic, T-SPOT.TB
  - In August 2008 successfully gained pre-market approval from the United States Food and Drug Administration
  - Also able to track the change in a person's immune status over time, and can be used to monitor disease progression.

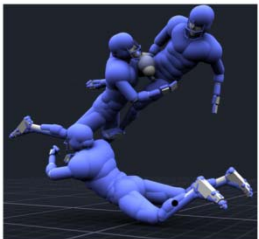


isis-innovation.com

---

### Isis Success Stories – Spin Out

- NATURAL MOTION
- Euphoria software enables characters to interact and respond to their virtual environment
  - Used in films including *Poseidon* and *Troy*
  - Video games *Grand Theft Auto IV* and *Star Wars: Force Unleashed*
- Based on algorithms developed by founder & CEO, Torsten Reil and Colm Massey
- University Challenge Seed Fund grant in 2000 provided funding to get first programme started
- Spun out from Isis in 2001
- Based in Oxford and San Francisco

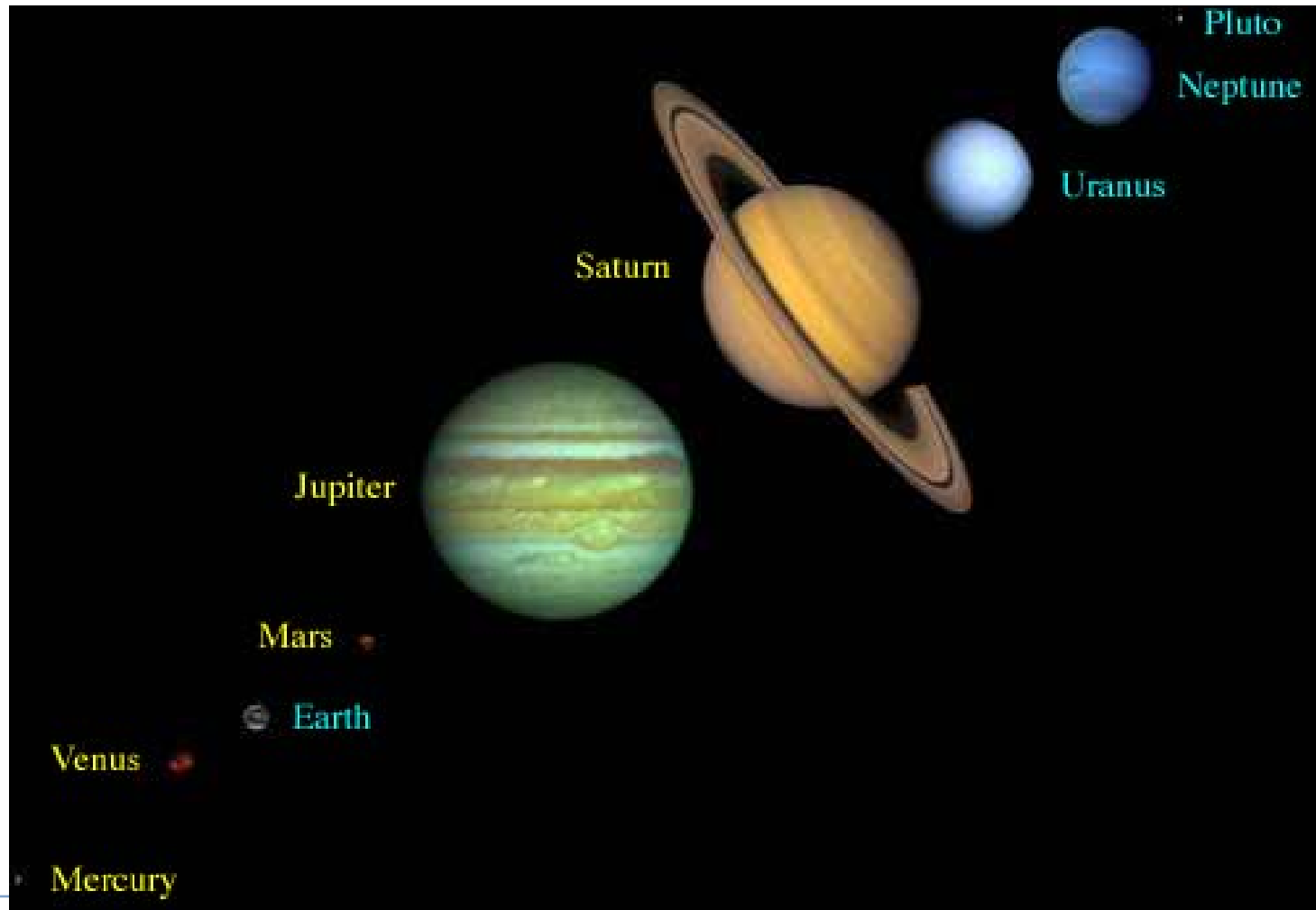


isis-innovation.com

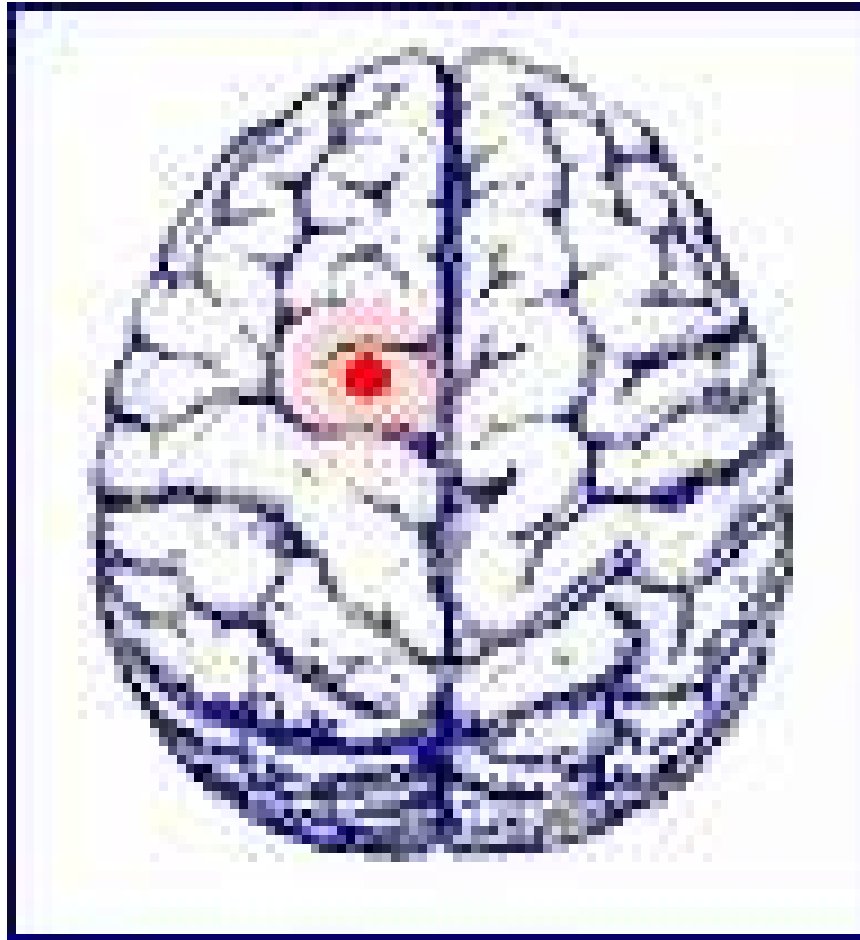
ISIS INNOVATION



# Interplanetary Alignment



# Intellectual Property



# Oxford Spin-out Equity Management

- Formed in August 2008
- To manage the University's interests in its spin-out companies
- Two executives
  - Director – Dr Chris Towler
  - Portfolio Manager – James Mallinson
- Mission: “To add value to Oxford University's stakes in its spin-outs”
- Modus Operandi
  - Working closely with Isis Innovation
  - Maintaining relationships with the companies and their Boards
  - Understanding their business models, aspirations and challenges
  - Creating transparent processes by which University can effect its aims
  - Implementing chosen course of action
  - Reporting to University (balanced analysis of upsides and downsides)
- Shareholding Returns to University:
  - University 50%, Departments 25%, Research Fund 10%, Isis 15%



## Oxford University Consulting

The consulting arm of Oxford University; a division of Isis Innovation

### Purpose:

To provide clients access to the full breadth of research expertise available at the University of Oxford, in a way which protects the interests of clients, researchers and the University.

### Benefits:

- Timely sourcing of specialist expertise...
- Single & professional contact point for all project/contractual matters throughout the lifecycle & beyond
- Contracts to protect all parties regarding: commercial confidentiality & IP ownership, conflicts of interest & PI

World-class expertise to enhance innovative capability...

## OUC Helping Clients

- Identifying & sourcing world-class specialist expertise for:
  - Discrete problem solving
  - Providing an innovative challenge & new ideas
  - External review & assessment (e.g. advisory boards, due diligence)
  - Technical/professional coaching & development
  - Open innovation
  - Blue sky visioning, future thinking
- Providing testing services and scientific facilities to third parties using equipment owned by or based in the University
- Protecting the client's background IP and ensuring they own the arising IP
- Ensuring the consultants are covered by PI insurance & have no conflicts of interest

## Clients Across All Sectors...

OUC counts amongst its clients:

- AstraZeneca
- BASF
- Bayer Schering Pharma
- BBC
- Becton Dickinson
- Capgemini
- GlaxoSmithKline
- Microsoft
- National Audit Office
- Novartis
- Sharp Laboratories of Europe
- UN Development Programme
- Unilever

## Isis Enterprise and the Carbon Trust

- In December 2006, Isis became a Low Carbon Incubator in partnership with the Carbon Trust.
- Isis offers support for early stage low carbon projects to anyone in the UK involved in developing low carbon technologies with commercial potential.
- We work with:
  - Individuals
  - Companies
  - Universities
  - Research Institutes



Making business sense  
of climate change

## Oxford Innovation Society

- Established by Isis in 1990 to foster University/business links
- An open innovation network
- Since 1990 over 100 companies have joined
- Companies pay an annual fee of £6,800 for membership
- Membership Benefits:
  - Ready access to the academics and University
  - Interactions with other Members, leaders in technology innovation
  - Advance notification of all marketed patent applications
  - Invitations to thrice-yearly meetings and dinners
  - Customised research presentations and seminars
  - Regular newsletters and portfolios

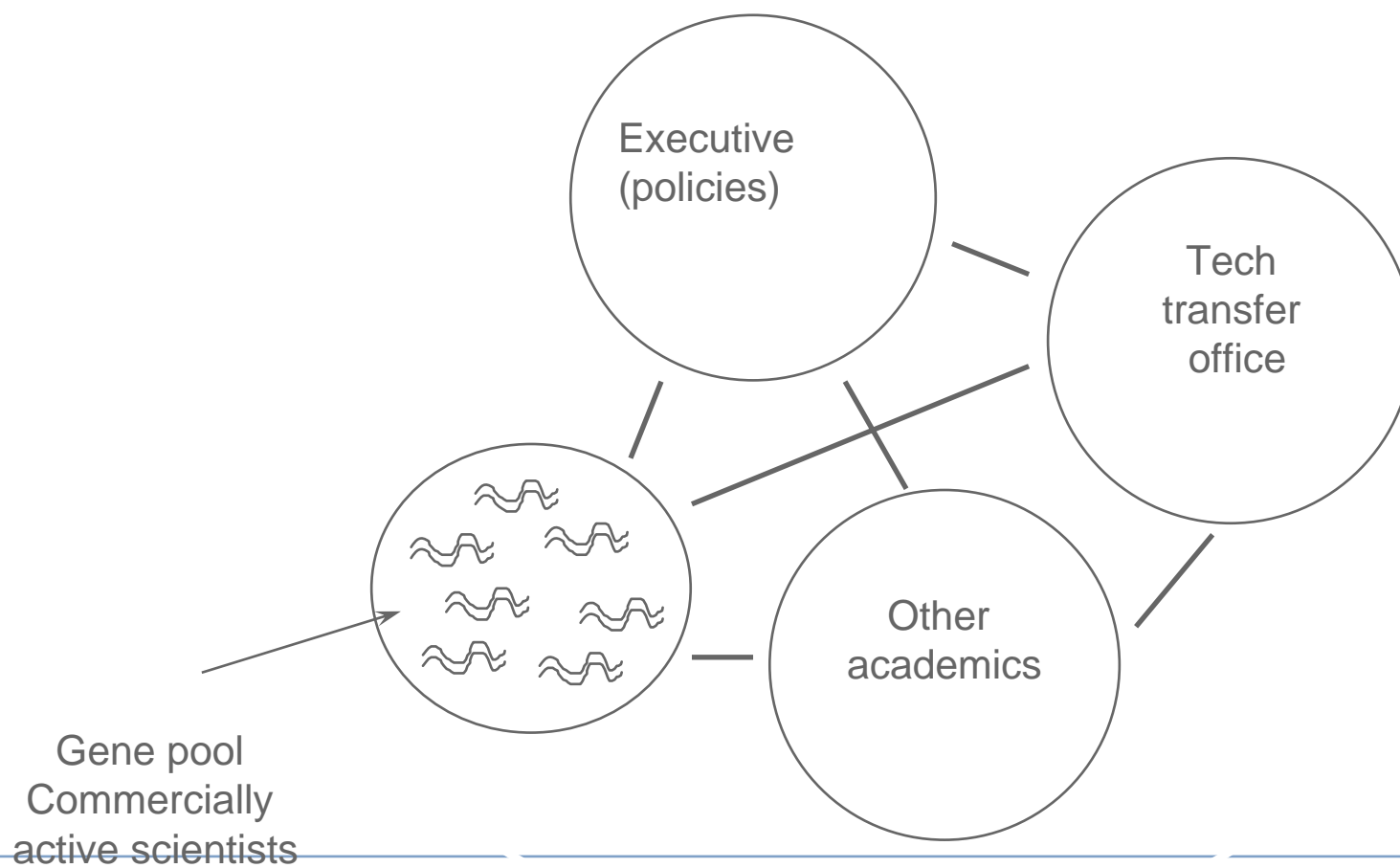


# Oxford Centre for Entrepreneurship & Innovation

- Within the Saïd Business School
- Development of the Oxford Science Enterprise Centre, est. 2000
- Brings together innovators from across the world, as well as the high-tech companies based around Oxford
- Programmes
  - Building a Business
  - Medical Innovation
  - Oxford at Saïd – Research in a Nutshell
- Activities
  - The SBS Venture Fund
  - ‘Idea Idol’ competition
  - ‘Start a Company’ Scheme
- Supports student society  
Oxford Entrepreneurs

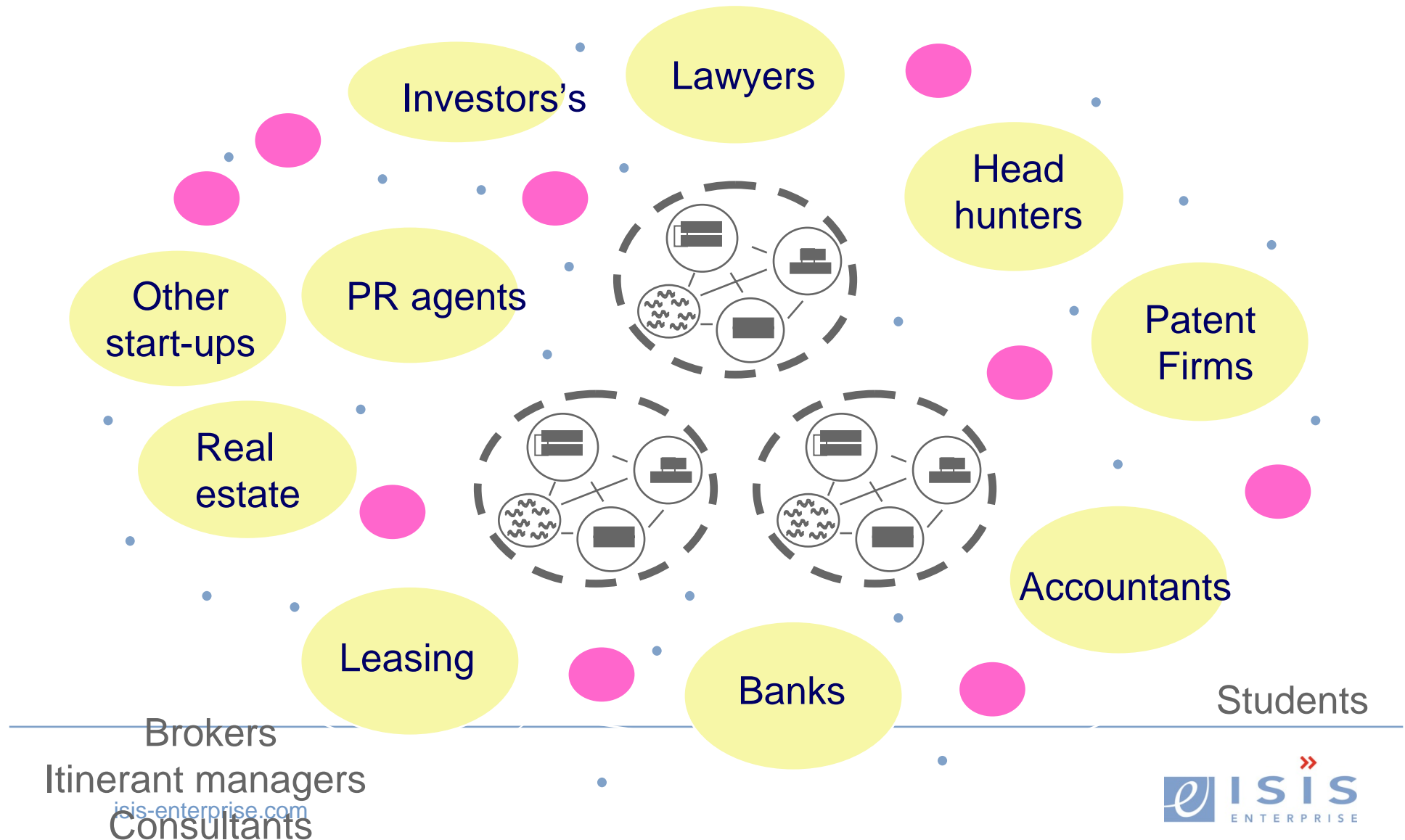


oxford | centre for  
entrepreneurship  
and innovation



# The Network culture

[Thanks to Jeff Skinner, UCL]



## Oxford spin-outs – Funds raised

