Technology Transfer

The Oxford Experience

Contents

Science Research at Oxford

- 2,500 researchers in Science & Medicine
- 2,000 doctoral students
- Annual research income €300 million

  Highest UK university

The Tension

- **Knowledge Creator's priorities**
  - Create knowledge
  - Communicate discoveries
  - Publish papers

  General principle - free exchange

- **Knowledge Commercialiser's priorities**
  - Secure rights
  - Enhance their value
  - Trade them

  General principle – barter

So we can expect some tensions

So why bother to commercialise?

- Returns benefits of research to society
- Universities need the money
- Research results are one under-utilised asset
  at least from a financial point of view

- Therefore we need to address the tensions and resolve them

Ways to address the tensions

- **Personal standards**

  In the absence of institutional control individual academics make their own decisions

  - **Pro** No admin overhead
  - **Con** Not all academics play fair

Ways to address the tensions 2

- **Institutional enforcement**

  Assumes institutions control their employees and employees accept this control

  - Pro You can design an efficient system
  - Con Universities do not work this way

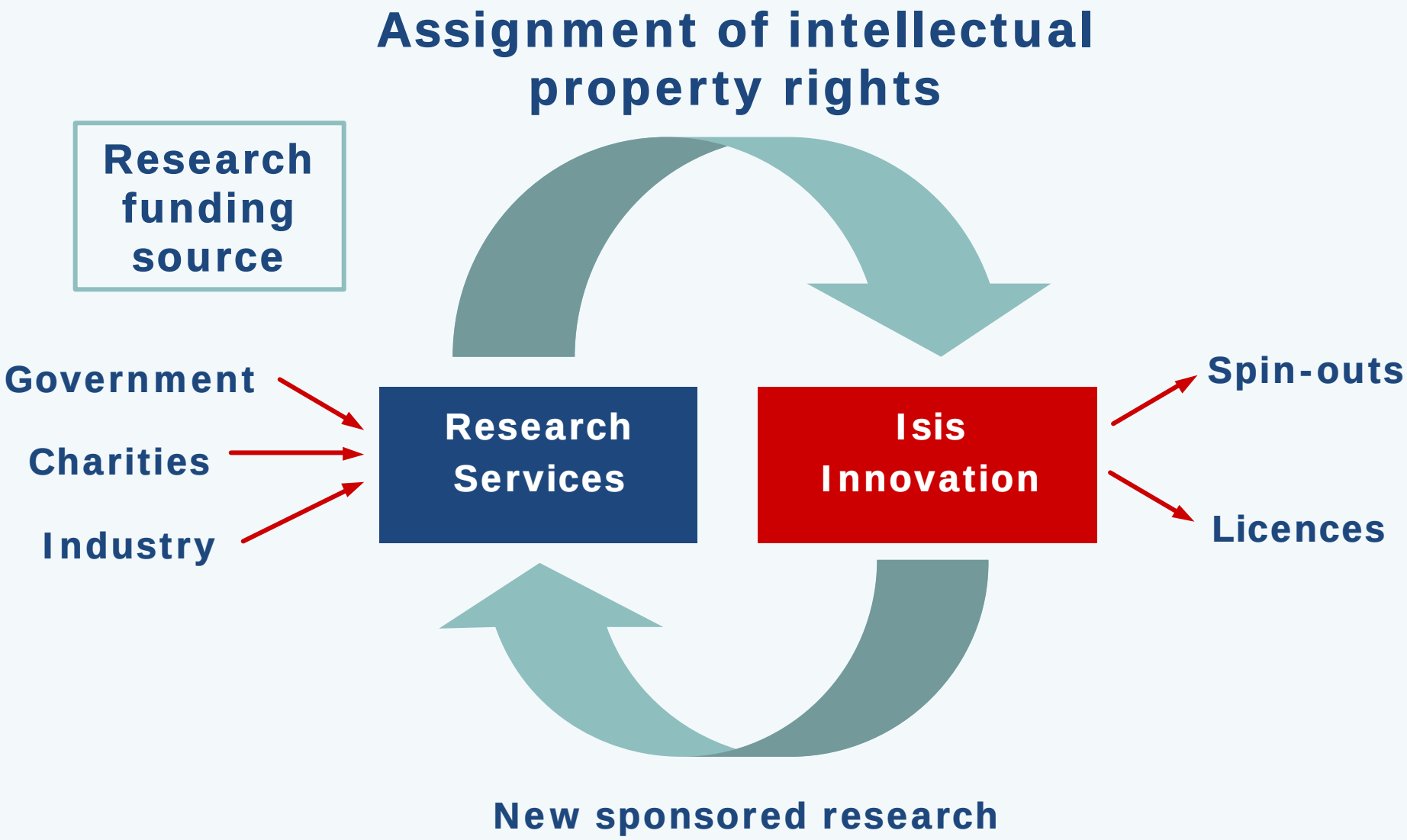
The Oxford Model

- **Highest authority in University is academics (congregation)**
  - They make the rules
  - They employ officers to apply the rules
- **There are 2 potential problems**
  - When the academics (who make the rules) do not accept the rules
  - When the officers over-interpret the rules to enhance their power base
- **Either error poses a serious threat to the operation of the institution**

The Oxford Model

- University funds Isis Innovation
- Isis support researchers who ask for it
- University statutes permit exploitation not through Isis if the researcher gets permission from Council

Research / Industry Interface



Why spin out T T Activity?

Reasons for

- Acts commercially
  - Not a Univ office
  - Salaries
- Independent identity
  - Internal benefit
  - External benefit
- Between U & commerce

Reasons against

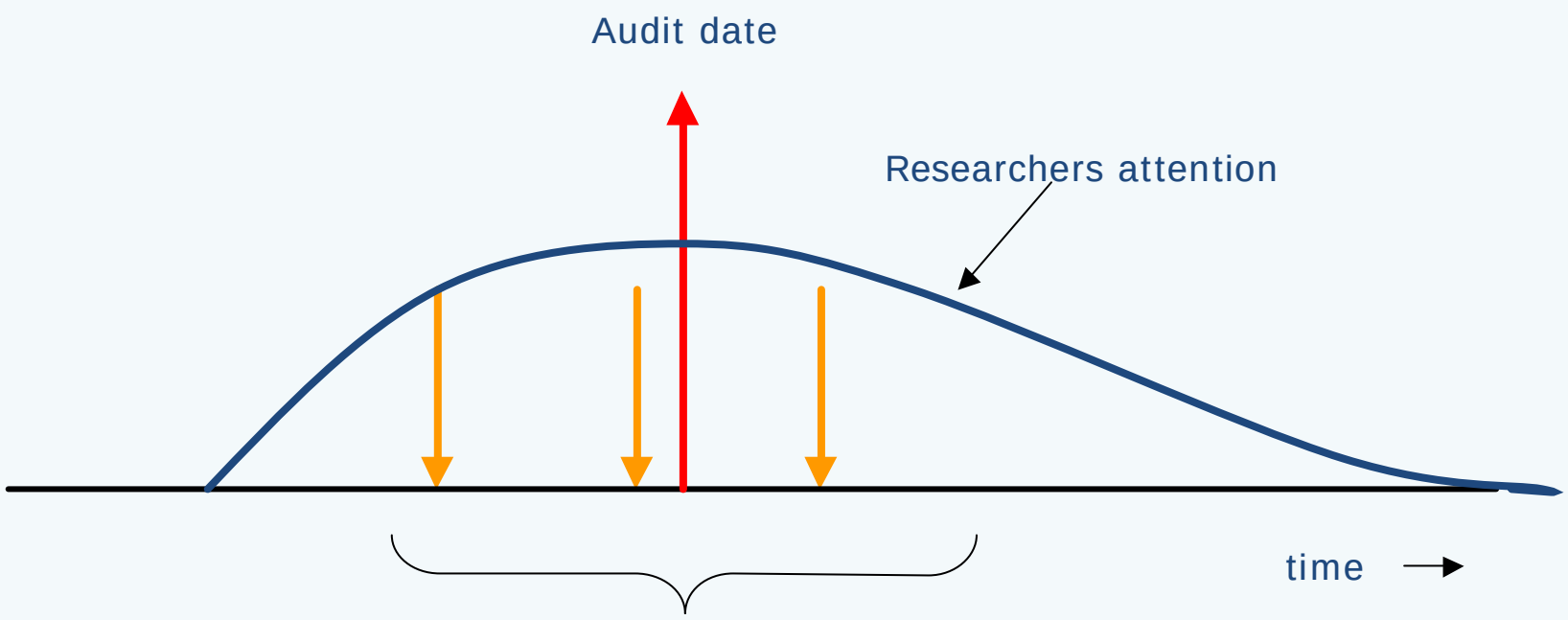
- Confrontation with Uni
- Staff don't "belong"
- Poor communications

Technology audits

- “Lets look what we have”
- Usual practice: go and talk to the researchers

  Event based technology audit

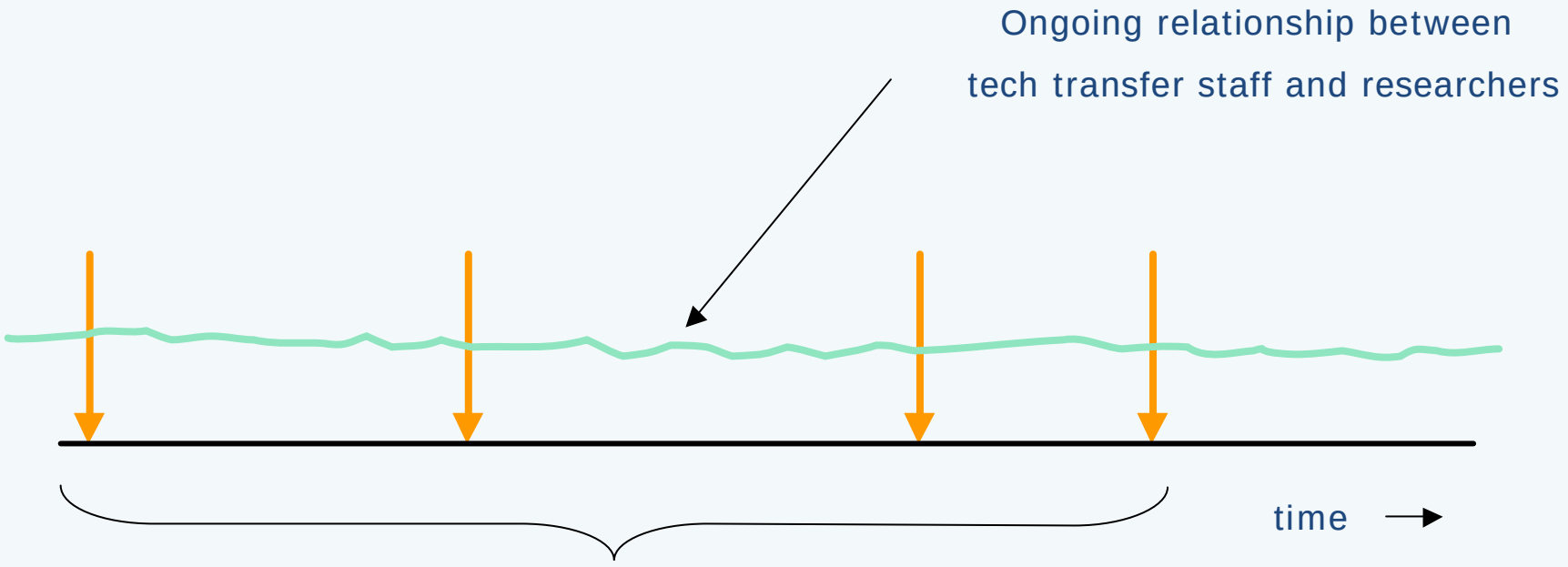
Event based technology audit



“Event based” Technology Audit

- Usual practice: go and talk to the researchers
- Result is either:
  1. take their time and find they have nothing
  2. take their time and disagree whether they have anything
  3. find some gold
- Outcomes 1 & 2 are very counterproductive for a University tech transfer office trying to establish a relationship with researchers
- There is a better way of achieving outcome 3

“Relationship based” tech audit



The Oxford Model

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

Attracting Inventions

Most attractive

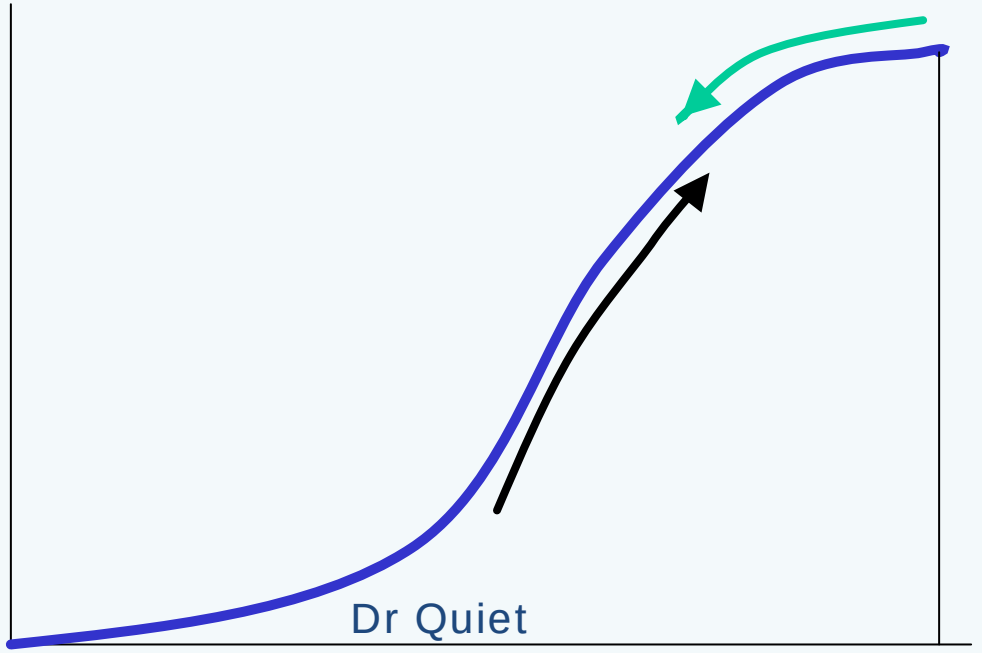
A = fn (S, C)

A = Attractiveness of project

S = Strength of science

C = Commercialisability of academic

Least attractive



All the inventions in the University

The Beeson Bank Deal

- **Bank put €28million into Chemistry building**
- **½ university share in Chemistry commercialisation for 15 years**
- **Is this a good deal for the University?**
- **How can it go wrong?**
  - **The bank may get zero**
  - **Or they may get €1billion**
  - **But if they do, so does the university**

So the University does well either way

The decision to file a patent

- A University investment
- Made jointly by academic and Isis Project Mgr
- Initial filing (generous)
- Second Year PCT (depends on year 1 work)

To file renew or kill a patent

Decision to File, Renew or Abandon a patent			
Proj No			***Inventor***
Product(s)			***Markets(s)***
	Yes	***No***	
Big Market			Small Market
Growing Market			Shrinking Market
Good market response			Poor Market response
Strong Science			Weak Science
Broad Patent			Narrow Patent
Strong Patent			Weak Patent
Inventor track record			
Group			Sole inventor
Helpful inventor			Unhelpful inventor
Spend so far			
Next spend		***Date***	
Next spend		***Date***	
Funded by			
Deals done			
Other relevant information			
Decision			
Reviewed by			
Review date			

Isis Innovation

- A company owned by the University of Oxford
- To help those researchers who wish to commercialise the results of their research

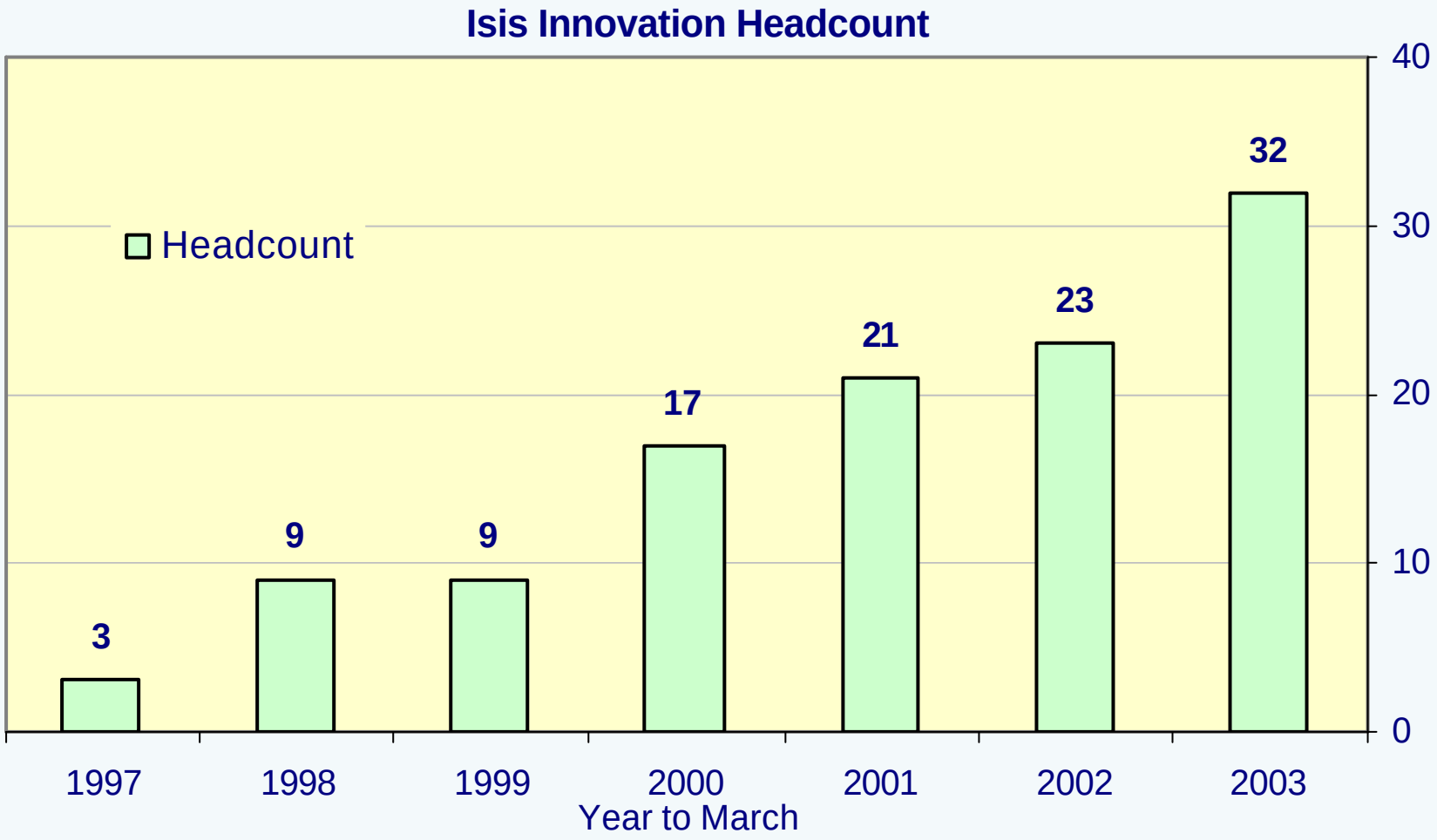
Activities

- Licensing of intellectual property
- Formation of new companies
- Offering consulting and service contracts
- Regional promotion of University activities

Isis Innovation Resources

- **University Intellectual Property Policy**
- **35 staff**
  - Mostly graduates
  - Most with industry experience
  - Half with science doctorates
- **Annual patent budget $1.5m**
- **Development fund $6m**
  - Exemplification, marketing projects
- **Isis College Fund $15m**
  - Second round spinout funding

History


Isis Innovation Headcount
Headcount
3
9
9
17
21
23
32
40
30
20
10
0
1997
1998
1999
2000
2001
2002
2003
Year to March

Isis Contacts

The University of Oxford's technology transfer company

Administration (9)

Managing Director
Dr Tim Cook

Executive Director
Tom Hockaday

Portfolio Manager
James Mallinson

Lawyer
Stephen Brett

Office Manager
Helen Coombs

Facilities Admin
Jane Tarry

Marketing
Sarah Hall

Accounts Assistant
Charles Rowe

Administrator
tba

Physical Science Group (12)

Head of Group
Dr David Baghurst

Project Managers
Dr Robert Adams
Dr David Eastham
Dr Mairi Raggatt
Dave Roberts
Dr Roger Welch
tba

Business Development Fellows
Terry Pollard
Dr Liz Kirby

Business Liaison Manager
Dr Tony Klepping

Marketing
Kim Bruty

Admin Assistant
Karina Mortensen

Life Science Group (10)

Head of Group
Linda Naylor

Project Managers
Dr Dave Brennand
Dr Chris Donnellan
Dr James Hamilton
Dr Taj Mattu
Dr Richard Middleton
Dr Goslik Schepers

Business Liaison Manager
Dr John Thompson

Patent Administrator
tba

Admin Assistant
Naz Khan

Business Innovation & Consulting (5)

Head of Group
Dr Mark Taylor

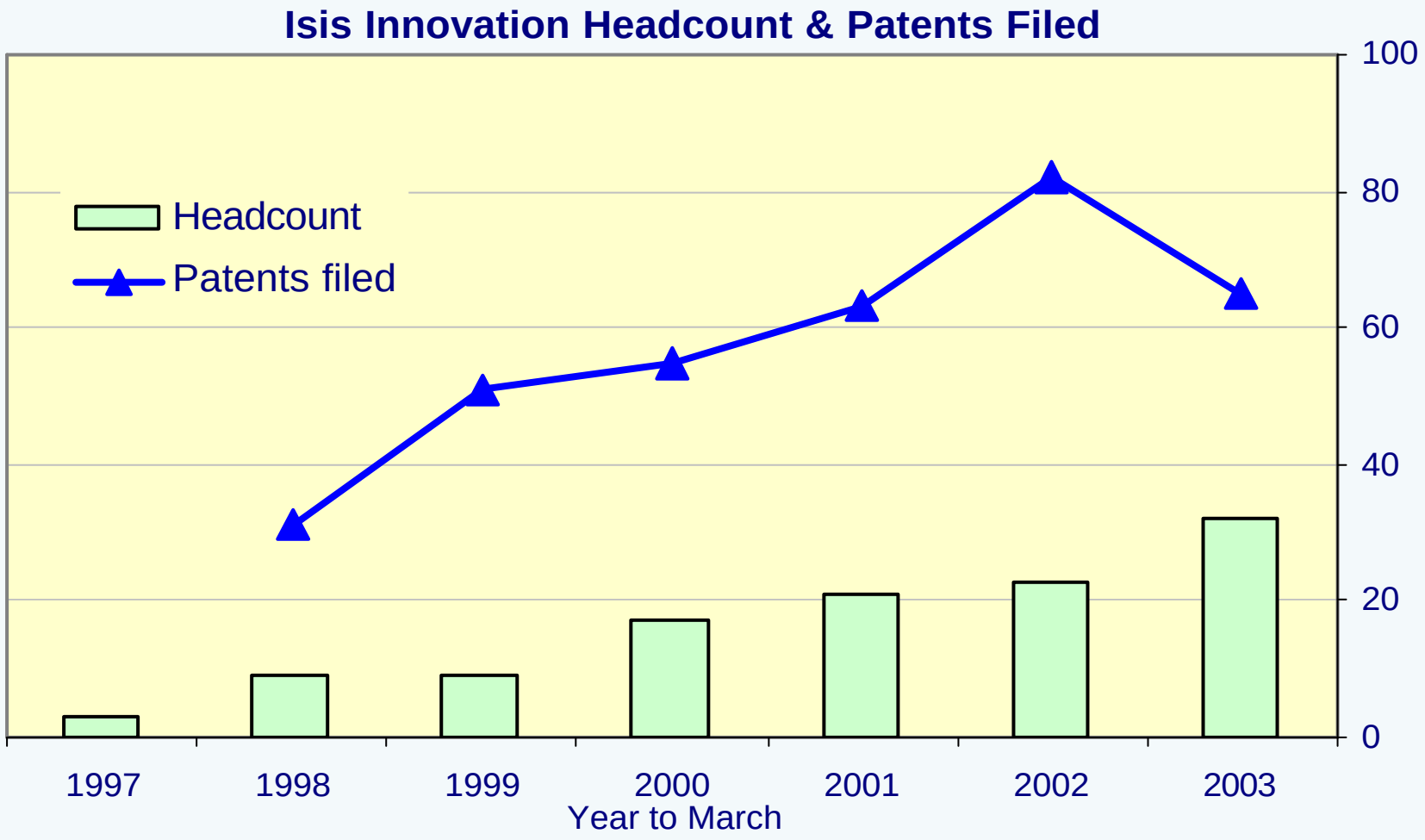
Project Managers
Dr Rick Inwood
Gill Rowe

Business Liaison Manager
Andrew Goff

Stephan Chambers

Marketing
Jo Abbott

History


Isis Innovation Headcount & Patents Filed
Headcount
Patents filed
100
80
60
40
20
0
1997
1998
1999
2000
2001
2002
2003
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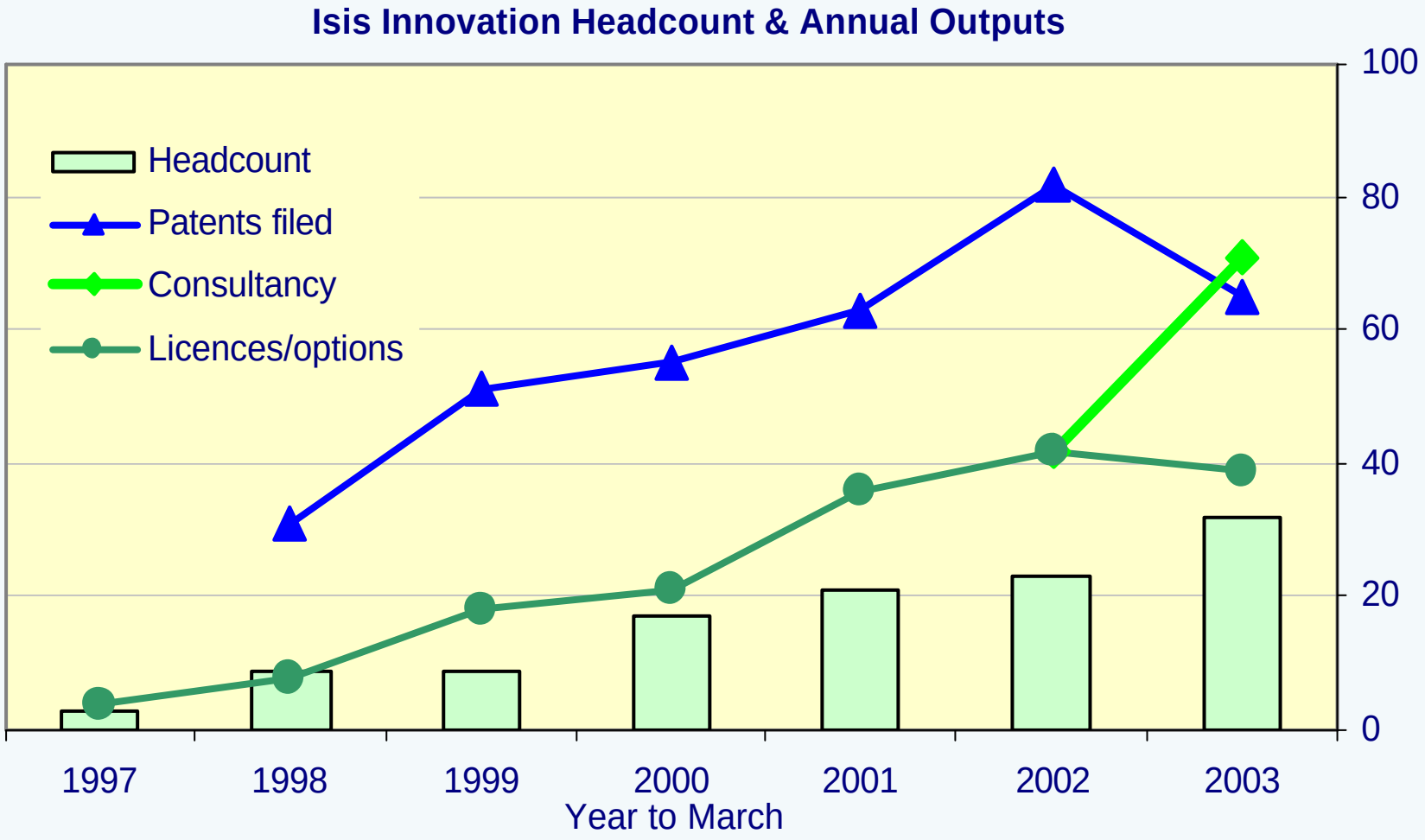
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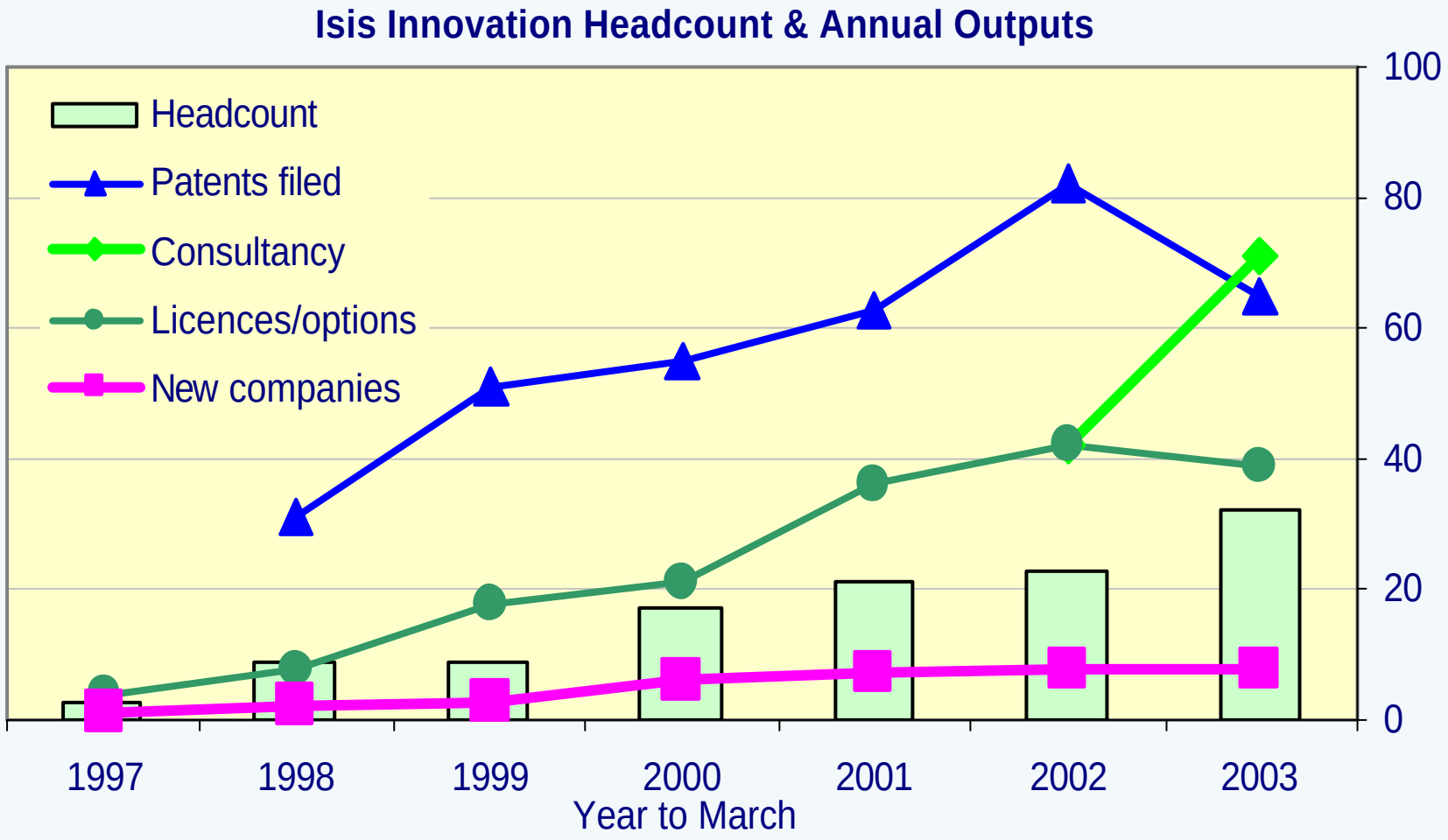
Isis Innovation Headcount & Annual Outputs
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100
80
60
40
20
0
1997
1998
1999
2000
2001
2002
2003
Year to March

Activity Level

Year ended March	1997	1998	1999	2000	2001	2002	2003
Uni investment €k	€ 55	€ 400	€ 700	€ 1,400	€ 1,400	€ 1,400	€ 1,400
Staff	3	9	9	17	21	23	34
Projects		168	243	319	415	476	627
Patents filed		31	51	55	63	82	65
Deals	4	8	18	21	36	42	71
New companies	1	2	3	6	8	8	7
Companies started with Isis' support	OGT	Opsys Synaptica	Prolysis Celoxica Avidex	Oxxon Dash Oxonica Abington OMIA ThirdPhase	Mindweavers BioSensors Biosignals TolerRx OXIVA PharmaDM OxLoc Ox Bee Co	Ox Ancestors Novarc Ox ArchDigital NaturalMotion Inhibox Pharminox Minervation Spinox	Zyentia Oxitec Ox Immunotec ORRA Glycoform BioAnalab VASTox

Investment in Isis

Patent budget € 1.4m per annum and royalties

- Isis pays patent costs, researchers get initially 63% of net royalties

University Challenge Seed Fund £4m

- University €1.4m, Treasury, Wellcome & Gatsby €4m
- Development projects, newco seed equity

Isis College Fund €23m

- Second round financing of Isis spin-outs

Licensing

Options or licences signed on 160 projects

- **Some of these will generate over €1 million in royalties**

- **Revenue will be a long time coming but the licensee takes over patent costs**

  (€ 42k for the first 5 years, € 70k for 10 years)

Royalty sharing

Total net revenue	Researchers	General fund	Dept	Isis
to € 100k	61%	9%	0%	30%
to € 1m	31.5%	21%	17.5%	30%
over € 1m	15.75%	28%	26.25%	30%

Spin-outs - The Players

Founder Researchers	INCORPORATION	Shareholder, Director, Consultant
Isis Project Manager		Univ Director ?
Investor (1) Investor (2) ?		Shareholder, Director
Manager (1) Manager (2)?		CEO, Shareholder
Lawyers		Lawyers
Accountants		Accountants
Bankers		Bankers

Shareholders

Advisers

Time

Oxford Spin-outs Pre 1998

		Capital	Equity	Main Business
1959	Oxford Instruments	£106m	-	Scientific Instruments
1977	Oxford Lasers		-	Lasers
1988	Oxford GlycoSciences	£218m	Yes	Glycobiology
1989	Oxford Molecular	£53m	Yes	Drug design
1992	Oxford Asymmetry	£343m	Yes	Chemistry
1994	PowderJect	£422m	Yes	Drug delivery
1996	Oxford BioMedica	£62m	Yes	Gene Therapy
1997	Oxagen		Yes	Genetics
1997	Oxford Gene Technology		Yes	Gene chips
Valuations (at 22/4/2002)		£1.2bn €1.7bn		

Oxford Spin-outs Post 1998

1998		
Feb	Opsys	Displays
Mar	Synaptica	Neurodegenerative diseases
Jun	Prolysis	Antibiotics
Nov	Celoxica	IT
Nov	Sense Therapeutic	Pharmaceuticals

1999		
Mar	Avidex Pharmaceuticals	Pharmaceuticals
Jun	Oxxon Pharmaccines	Pharmaceuticals
Jun	Dash Technologies	IT
Aug	Oxonica	Nanotechnology
Aug	Abington Sensors	Sensors
Dec	Oxford Medical Imaging	Image analysis

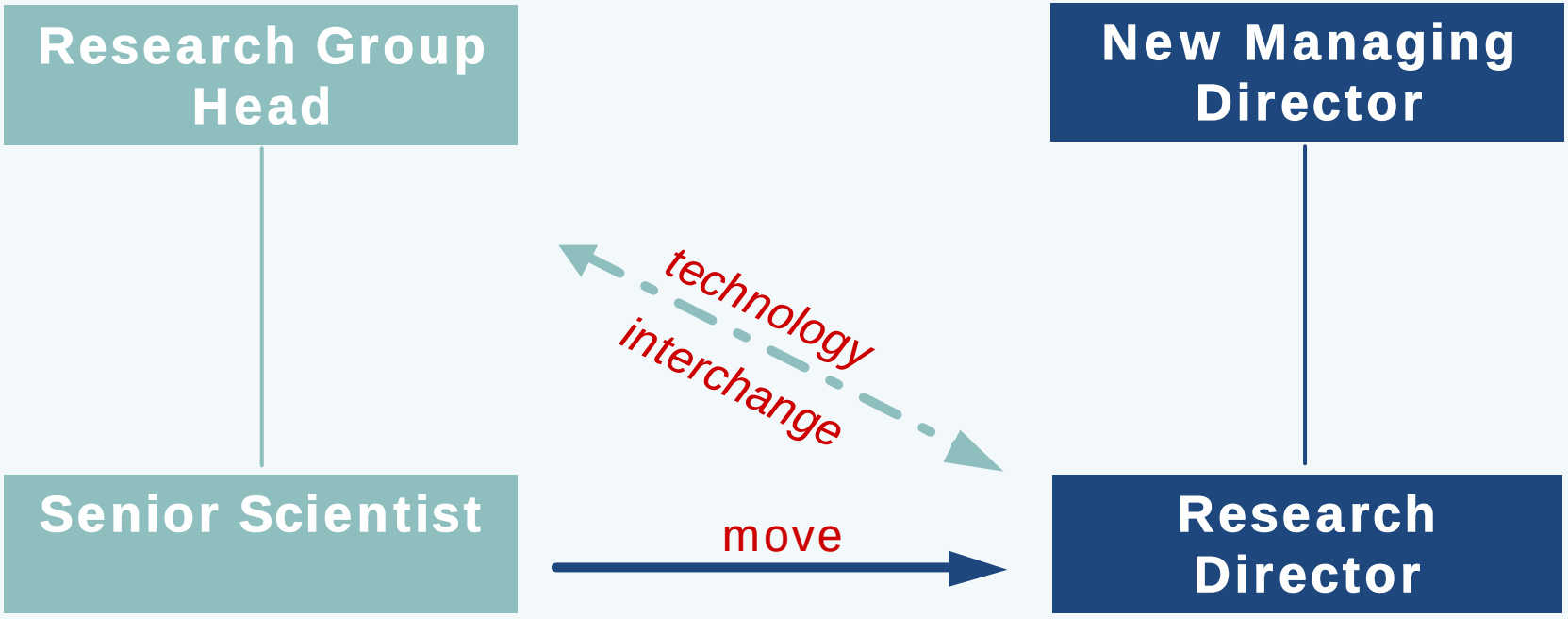
2000		
Jan	Third Phase	Clinical trials management
Apr	Mindweavers	Sensory development
May	Oxford BioSignals	Vigilance monitoring
Aug	Oxford BioSensors	Biosensors
Dec	TolerRX	Immunology
Dec	OXIVA	Medical software
Dec	PharmaDM	Drug design

2001		
Mar	OxLoc	GPS/GSM tracking
Mar	The Oxford Bee Company	Pollination
Apr	Oxford Ancestors	Genealogy
Apr	Novarc	Press tooling
May	Oxford ArchDigital	Digital archaeology
Nov	NaturalMotion	Neural networks
Dec	Inhibox	Drug searching

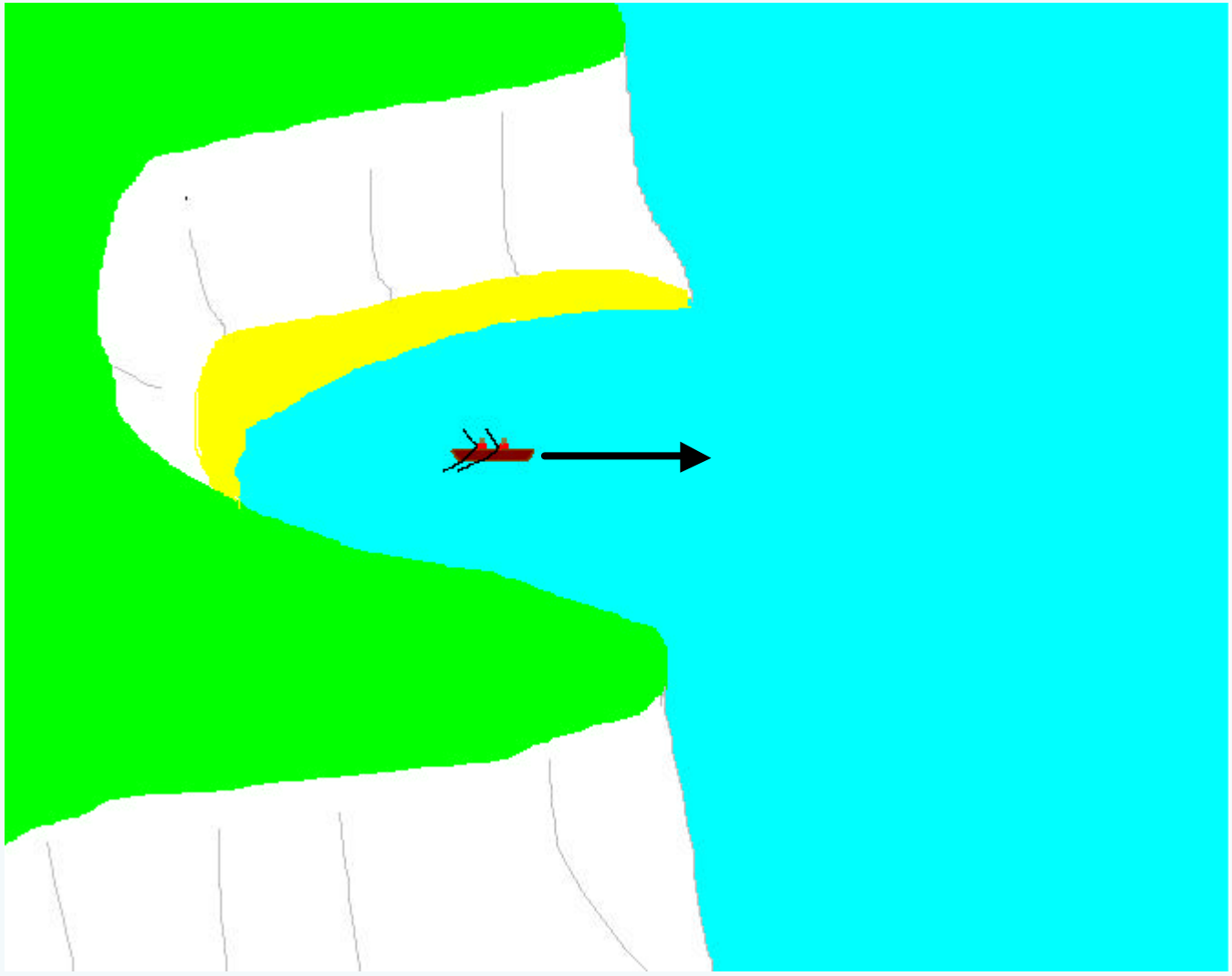
2002		
Jan	Pharminox	Cancer Drugs
Feb	Minervation	Health Information
Mar	Spinox	Artificial silk
May	Zyentia	Protein Structures
Aug	Oxitec	Insect pest control
Oct	Oxford Immunotec	TB Diagnostics
Nov	ORRA	Risk Analysis
Nov	Glycoform	Cancer drug dev't
Nov	BioAnalab	Pharma Testing

2003		
Feb	VASTox	Pharma screening
Jun	ReOx	Drug discovery
Jul	Riotech	Hepatitis drug dev.
Aug	OCSI	Social inclusion

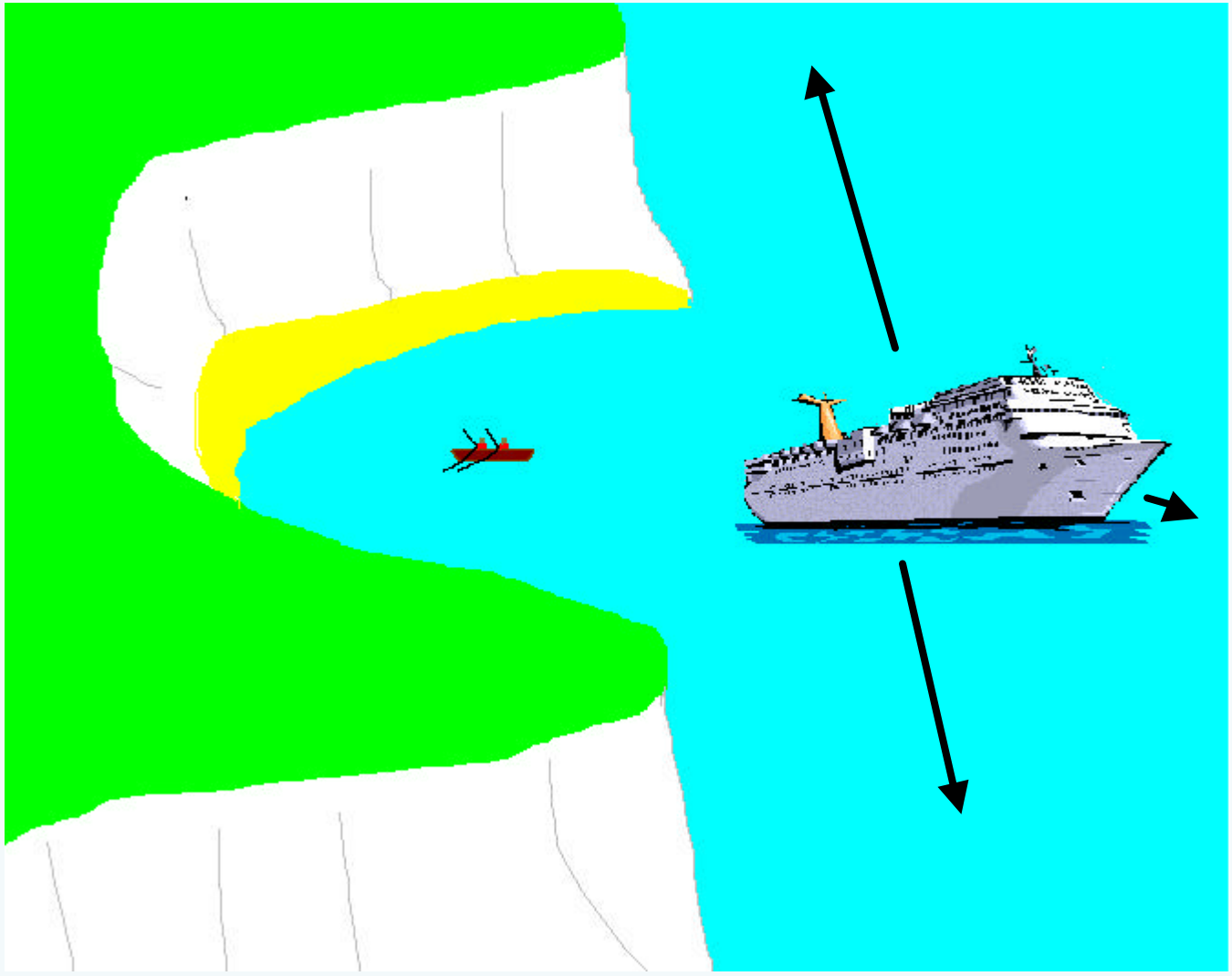
Management Strategy



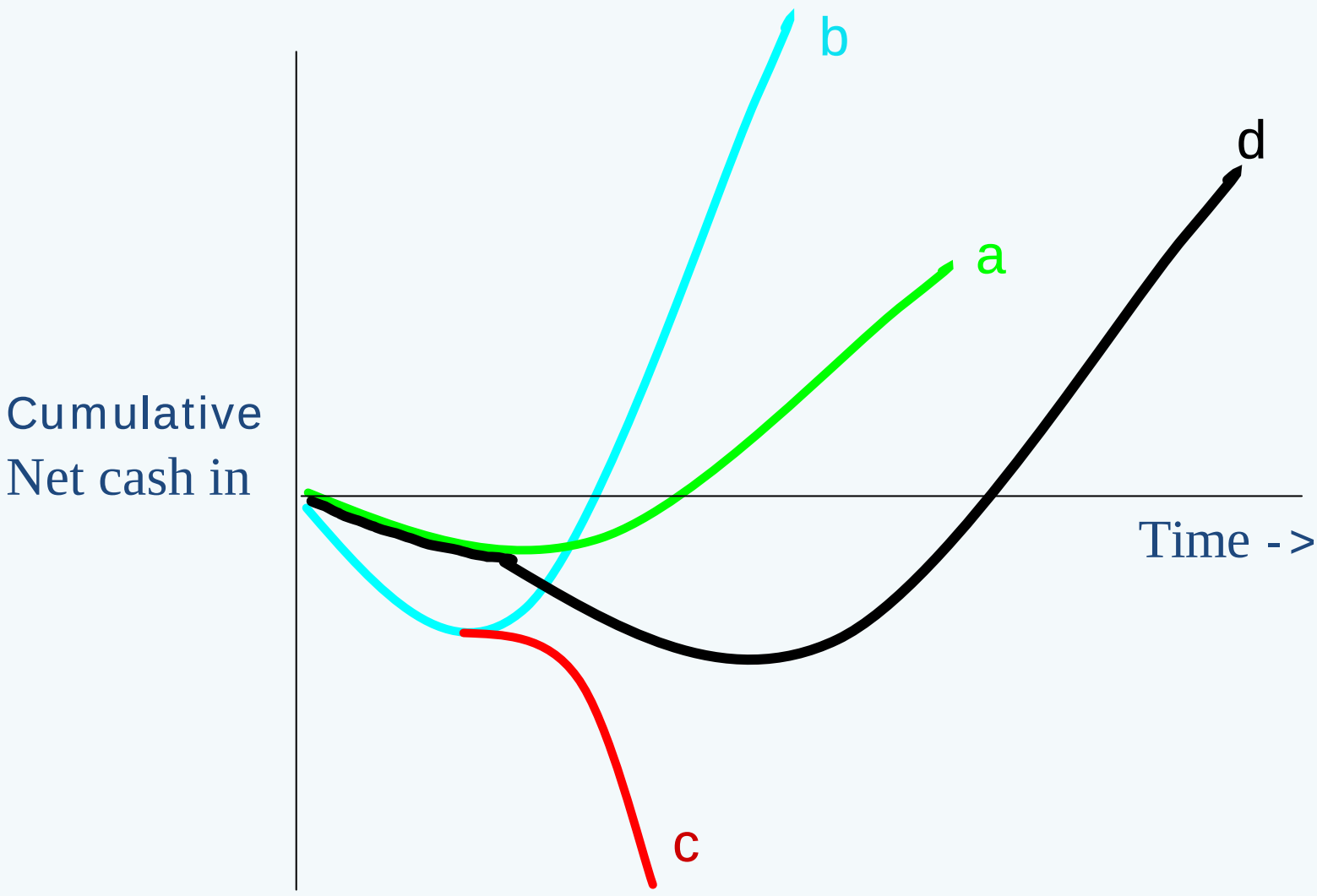
The rowing boat



The rowing boat 2



Startup cashflow profiles



Oxford Innovation Society

Established in 1990 to allow companies to gain a 'window' on Oxford science and to foster links between business and the academic community.

In the past 12 years, over 90 companies have taken advantage of this opportunity, helping to shape one of the most successful technology transfer networks.

Companies pay an annual fee of £6,800 for membership

Membership Benefits

- Ready access to the academics and technology under development at the University
- Visits by Group Heads and Business Liaison Managers - to help your company gain access to Oxford research and a variety of local businesses and services
- Advance notification of all patent applications marketed by Isis
- Invitations to thrice-yearly meetings & dinners
- Customised research presentations & seminars in your interest areas
- Regular newsletters and portfolios

OIS Meeting & Dinner

Tea / Coffee Reception

Academic presentation

Sponsor presentation

Champagne reception

Dinner in Oxford college hall

After dinner drinks

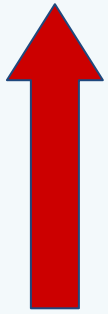
Begbroke Science & Business Park

- Owned & operated by Oxford University
- Department of Materials research labs
- Business Incubator
  - Short leases (1 month)
  - Shared Resources
    (phone, meeting rooms, copier etc)
  - Shared experiences
- Premises for new companies
  - 4 spin-outs
- Central meeting room and cafe
  - Where they all meet

Begbroke Science & Business Park

Ten Year Culture change

University entrepreneur culture



University technology transfer resource

Local professional environment

All three must develop together but the University must lead the change

Why must the University lead the change?

- The ideas are in the University
- Therefore if the university provides TT resource the change will happen faster
  - Oxford pre-Isis Innovation - 1 spinout every 4 years
  - After Isis – 8 spinouts per year
- If the University doesn't lead the change the investors and academics will do deals
  - and the University will not receive its due benefits

Conclusions

- Business/University collaboration is enhanced by resources deployed on the interface
- The intermediaries must *really* understand how both Universities and Industry work
  - They must be credible with researchers
  - They must be credible with industrialists
- Government support schemes are most effective when they are simple

Contacts

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