



University
of Southampton



Enterprise and ICUK at Southampton



Some facts and figures

- One of top UK research-led technology universities
- £81m research income
- £310m total income
- 20,000 students, 5,000 staff
- 80% RAE 5 or 5*



Research Centres of Excellence:

- **National Oceanography Centre**
- **Largest optoelectronics research centre in Europe**
- **No. 1 Electronics & Computer Science Department in UK, (strategic relationship with MIT, Tim Berners-Lee on staff)**
- **Europe's leading centre for sound and vibration research (Airbus and Rolls-Royce partnerships)**
- **Largest top ranked university engineering department in the UK (Microsoft High Power Computing Centre)**
- **Medical School and University Hospital (e.g. respiratory disease)**

2 examples of research impact...

Development of the Optical Fibre and Erbium Doped Fibre Amplifier (EDFA) at the Optoelectronics Research Centre

- Multi \$bn market
- Underpins the Internet



Optical fibres drawn at the University by spin-out Fibercore (owned now by Cisco) are on 95% of commercial airliners, the Hubble Telescope and the Mars Rovers

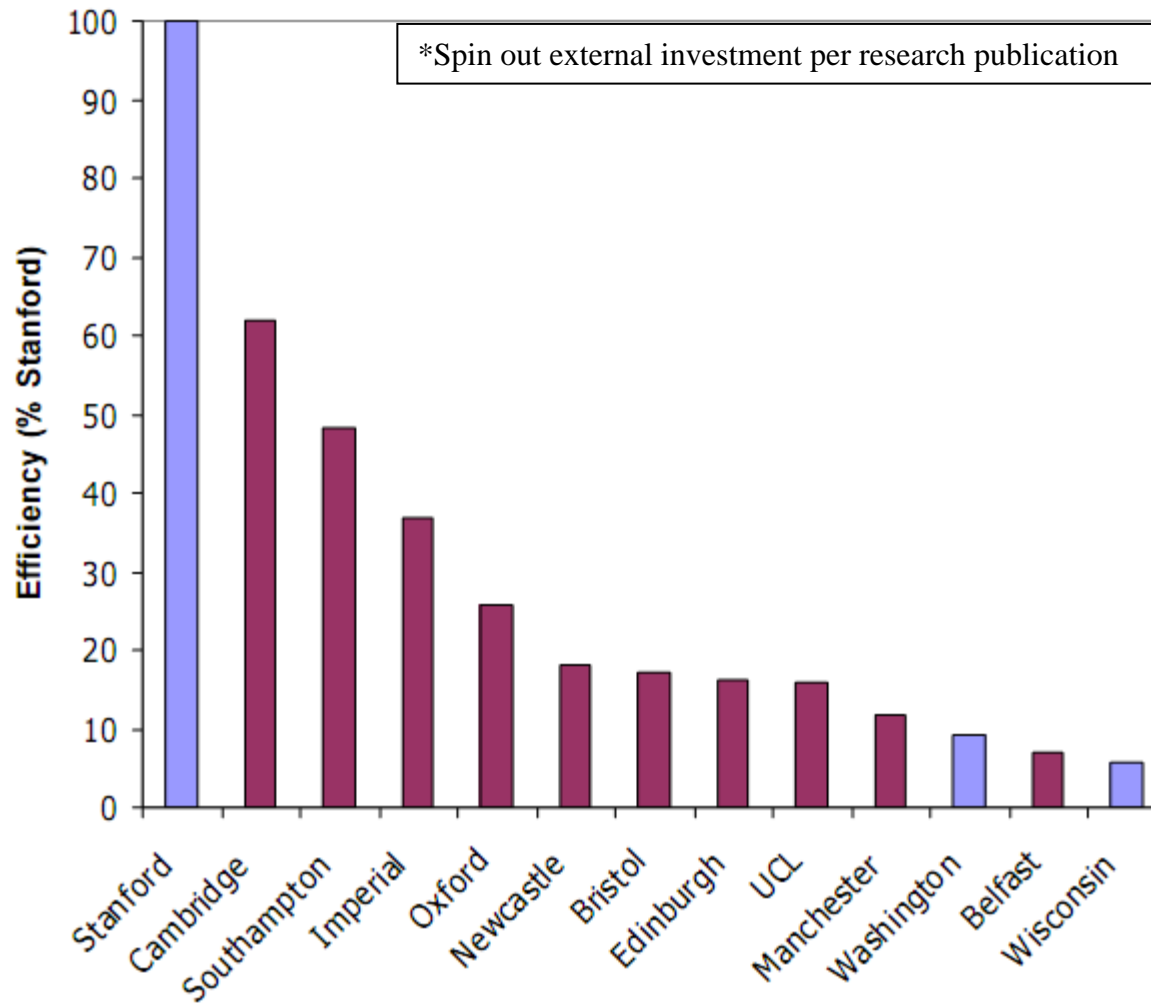
Research to commercialisation

- 11 spin-outs over 5 yrs worth £200m
- 3 AiM listings for post-2000 spin outs
- Other spin-outs are now divisions of Cisco, Lucent, Schlumberger etc.
- Over £100m of venture capital raised since 2000



- Pioneered leveraging IP assets for investment funding (now copied by 10 Universities)
- Pioneered using AiM market for spin out funding
- 52 companies located on the Science Park including BSkyB, Cisco and Merck

Ranking with the best of the US

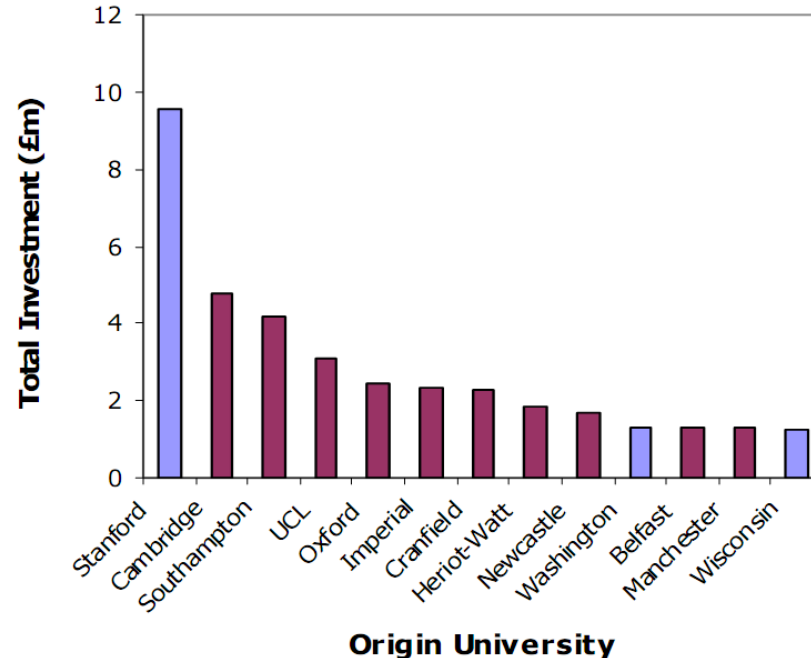


Source: Library House: Spinning Out Quality: University spin out companies in the UK (Feb 2007)

Spin Outs at Southampton

“UK universities are generating companies of a quality substantially higher than would be expected from their worldwide research ranking. Perhaps the most striking example of this is Southampton University which comes third in this analysis despite being ranked over 100 places lower than both Washington and Wisconsin in the Shanghai Jiao Tong Ranking system.”

Doug Richards, Library House, 2007





Southampton University and China

- Centre for Contemporary China (CCC)
- Member of the WUN - consisting of 16 research led universities including Nanjing and Zhejiang Universities.
- Strategic partnership with Nanjing with three joint research centres in:
 - Communicable Diseases and Public Health (JLCDPH)
 - Coastal Oceanography and Environment Dynamics (JLCOED) and Higher Education Management
- Other partnerships with Peking University, Xiamen University and Ocean University of China



Innovation China UK
中英科技创新计划



3 examples of initial ICUK projects...

→ Nanocrystalline anti-corrosion/wear coatings

Professor Frank Walsh/Dr. Shuncaï Wang and Prof. L.P. Wang, State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemistry and Physics, Chinese Academy of Sciences (CAS)

→ Blood flow monitoring to reduce strokes

Professor David Simpson, Institute of Sound and Vibration Research and Shenzhen Institute of Sciences

→ Vaginal microbicides for HIV/AIDS

Dr. Sabu Padmadas and Dr. James Brown, Social Sciences Statistical Unit and Prof. Allen Wu, Centre for Communicable Diseases and Public Health, Nanjing University



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Anti-corrosion/wear coatings

- **Project aim** = produce an optimised + functionally graded nanocrystalline coating as potential replacement of current hard chromium used in industrial plating of materials for anti-wear and anti-corrosion applications (e.g. engine components, hydraulic cylinders, machine tools)
- **Need** - Currently method of producing plating involves hexavalent chromium which is extremely toxic and carcinogenic ('Erin Brokovich'). US and EU regulations passed to limit use. Growing market for more environmentally-friendly techniques/materials for plating.
- **Markets** - New functionally-graded, multilayered coatings offer a range of market applications for industries such as automotive and aerospace.
- **Partners** – Tribology/surface engineering group at School of Engineering Sciences, Southampton and State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemistry and Physics, Chinese Academy of Sciences. Personal links exist between academics on both sides.





Anti-corrosion/wear coatings

- **IP** – the concept of applying functionally graded coatings was invented and patented at Lanzhou. Southampton have IP and expertise in deposition chemistry, assessment of corrosion properties and the optimisation of surface chemistry techniques.
- **Goals** – the partners will work on optimising the deposition chemistry so as to provide the maximum performance of the plating material for specific industrial applications identified by commercial partners.
- **Commercialisation** – Both sides have links to industrial users who will input to the project and provide a potential initial route to market via license. In China, Lanzhou work with Junchuan Group Ltd. (non-ferrous metallurgical and chemical engineering company). In the UK the link is to Poeten Industries Ltd, a world leader in surface engineering who provide anti-wear and corrosion coatings.



Software for blood flow monitoring

- **Project Aim** - To develop and test new software to better monitor blood flow within patients.
- **Need** – Impaired control of blood flow linked to number of serious neurological complications incl. stroke and premature birth.
- **Markets** – Medical equipment.
- **Partners** – Prof. David Simpson (Institute of Sound and Vibration Research, Southampton) and Dr. Jia Liu (Chinese Academy of Sciences, Shenzhen). Worked together whilst latter at Southampton doing PhD.
- **IP** – The IP lies in signal processing algorithms jointly developed by partners which will be bundled within proprietary software.





Software for blood flow monitoring

- **Goals** – Shenzhen will collect extended recordings of patients' blood flow using company hardware. Southampton will develop and test software. At end of project will decide on best algorithms for predicting blood flow.
- **Commercialisation** – A commercial partner in China has recently developed ultrasound hardware to collect prolonged recordings of blood flow data in patients. Software would complement this hardware to give more accurate data and hence better product and clinical outcomes. Next stage would be possible licence deal.



Vaginal microbicides for HIV/AIDS

- **Project Aim** – To develop an anti-HIV/AIDS microbicide that can offer dual-protection as a contraceptive product and be recognized as the best preventive method which can sustain the national family planning programme.
- **Need** - HIV/AIDS in China has grown beyond high risk groups to general population. In some areas, the epidemic has had devastating effect on local economy, household productivity and individual living quality.
- **Market** - Despite interests from government and other stakeholders, there are yet no major initiatives in China to promote microbicides due in part to the lack of effective research into take-up, effectiveness and suitable products. The team is well placed to plug this gap.
- **Partners** – Southampton University – Dr Sabu Padmadas (epidemiological/demographic research), Dr James Brown (statistical modelling, survey sampling) and William Stones (15 years of clinical experience in gynecology and microbicide research in Africa).





Vaginal microbicides for HIV/AIDS

- Nanjing University - Prof. Allan Wu (20 years of working in the field of infectious diseases and virology in the USA and China).
- Alan Stone (consultant) (microbiologist who has pioneered microbicide research across different countries in Asia, Africa and Europe and current Chairman of the International Working Group on Microbicides). WHO involved.
- **IP** – Nanjing currently developing prototype microbicide formulation. The Southampton survey design, sampling and statistical analysis work will help test this formulation and provide critical feedback for next stages of development.
- **Goals** -The proposed project will (i) undertake a population-level research to determine the feasibility of introducing vaginal microbicides in China and (ii) design a commercially viable microbicide in response to community needs and local healthcare systems.
- **Commercialisation** - The results will confirm whether the approach is viable and seek additional funding for implementing drug trials in randomly selected communities in Nanjing region in collaboration with commercial drug development partners.





The University of Southampton



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