Transferring University Technology

Opportunities and Challenges

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Cambridge Python, Warsaw

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University of Cambridge

University established in 1209
Students: 16,500 (11,600 u/g, 5,000 p/g)
20% from overseas representing 100 countries
Over 100 departments, faculties and schools

World Class Ranking

(Shanghai Jiao Tong University 2006)

1. Harvard
2. Cambridge
3. Stanford
4. Berkeley
5. MIT
6. Caltech
7. Columbia
8. Princeton
9. Chicago
10. Oxford

What are Universities For?

"The mission of the University of Cambridge is to contribute to society through the pursuit of education, learning, and research at the highest international levels of excellence"

University Interactions With Industry

University

Students

Research

Collaboration

Funding

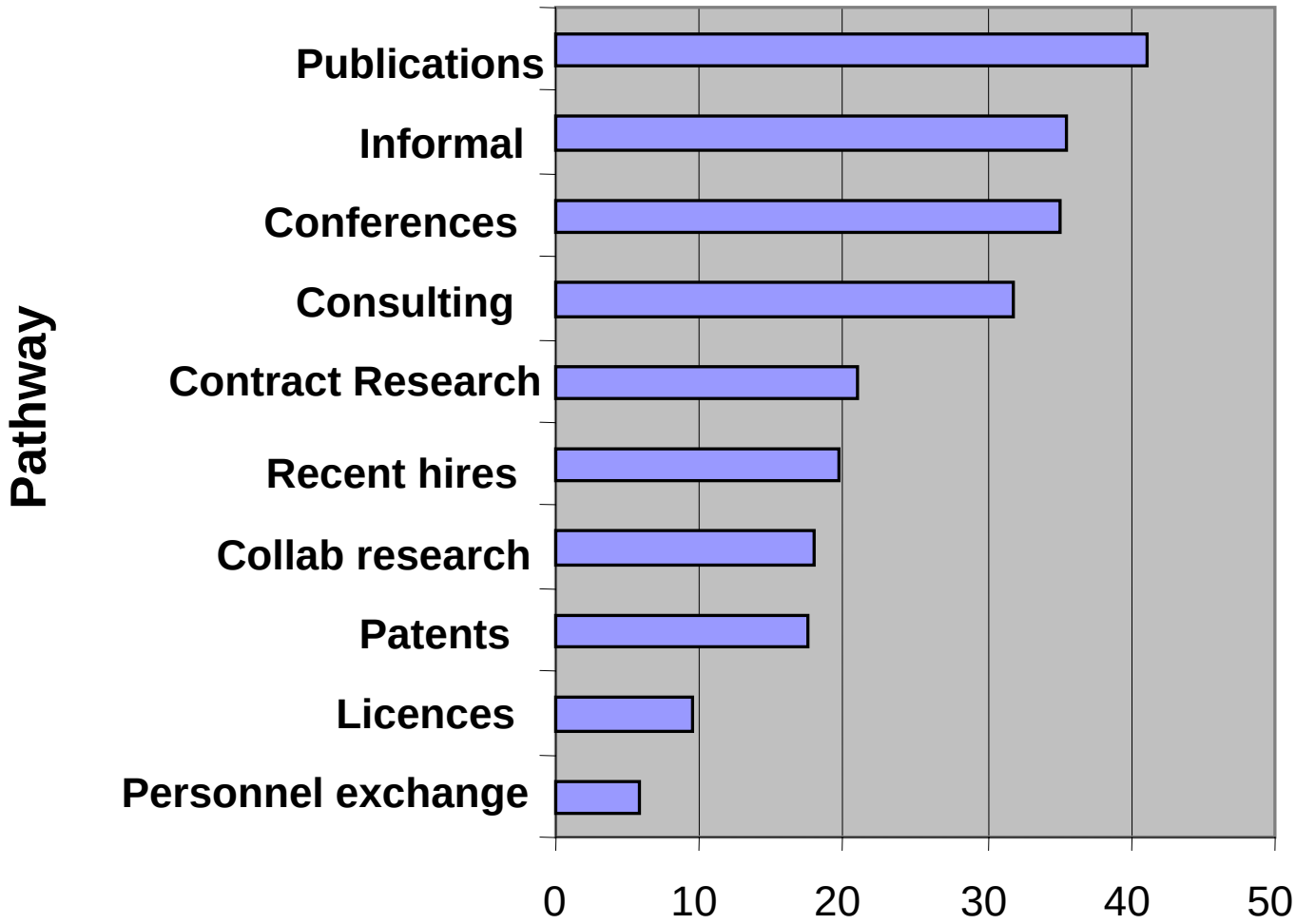
Consultants

New Companies

IP/Technology

Industry

What Does Industry Want From Universities?

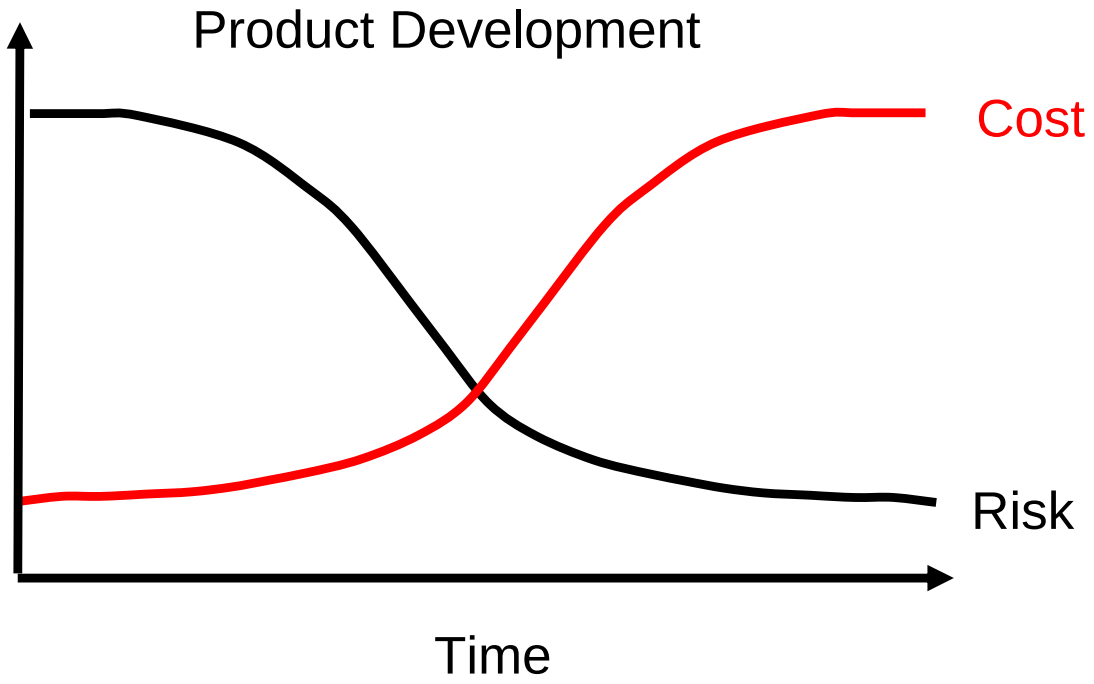


"Links & Impacts: The influence of Public Rsch on industrial R&D". Cohen, et al in Mgmt Science Vol48 #1 p1-23

Academic Innovations Change the World

• Penicillin	St Mary's, Oxford
• Monoclonal Antibodies	MRC-LMB Cambridge
• Jet Engine	Cambridge
• MRI	Nottingham, New York
• Seat belt	Minnesota
• Fluoride Toothpaste	Indiana

The Role of Commerce in Developing University Research



Biotech drugs cost $1.2 billion

Developing a biotech product today costs $1.2 billion, according to the first estimate for the category developed by the Tufts Center for the Study of Drug Development.

Nature Biotechnology **25**, 9 (2007)

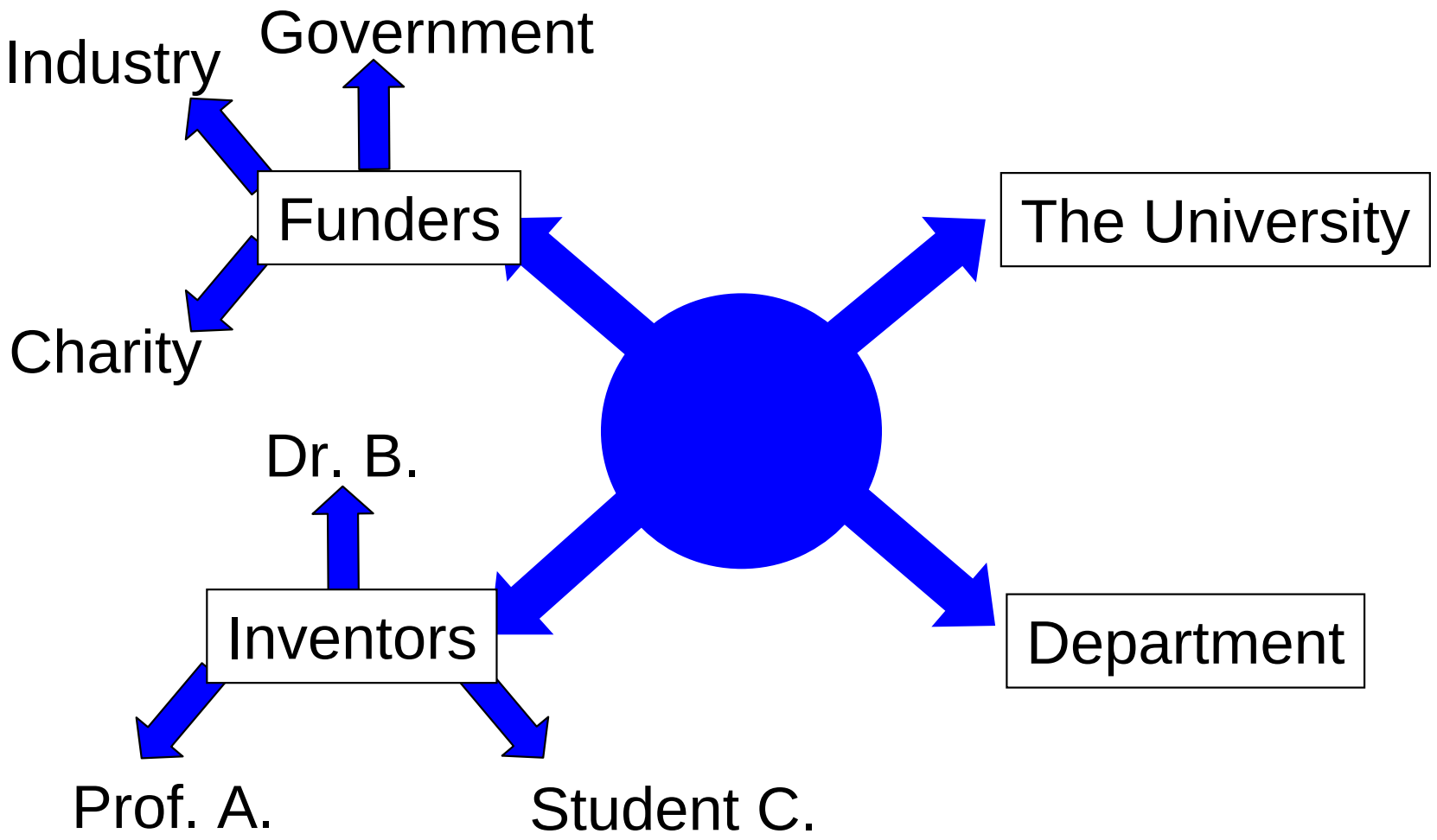
Cambridge Enterprise Mission

"Cambridge Enterprise exists to help the University of Cambridge inventors, innovators and entrepreneurs make their ideas and concepts more commercially successful for the benefit of society, the UK economy, the inventors and the University"

The Role of Intellectual Property

- Provides a limited monopoly for new inventions (patents) or other innovations (eg copyright for software)
- Promote investment in a new idea
- Provide a basis by which a return can come to the University
- **Absolutely key to University technology transfer**

University Technology Arises in a Complex Ecosystem



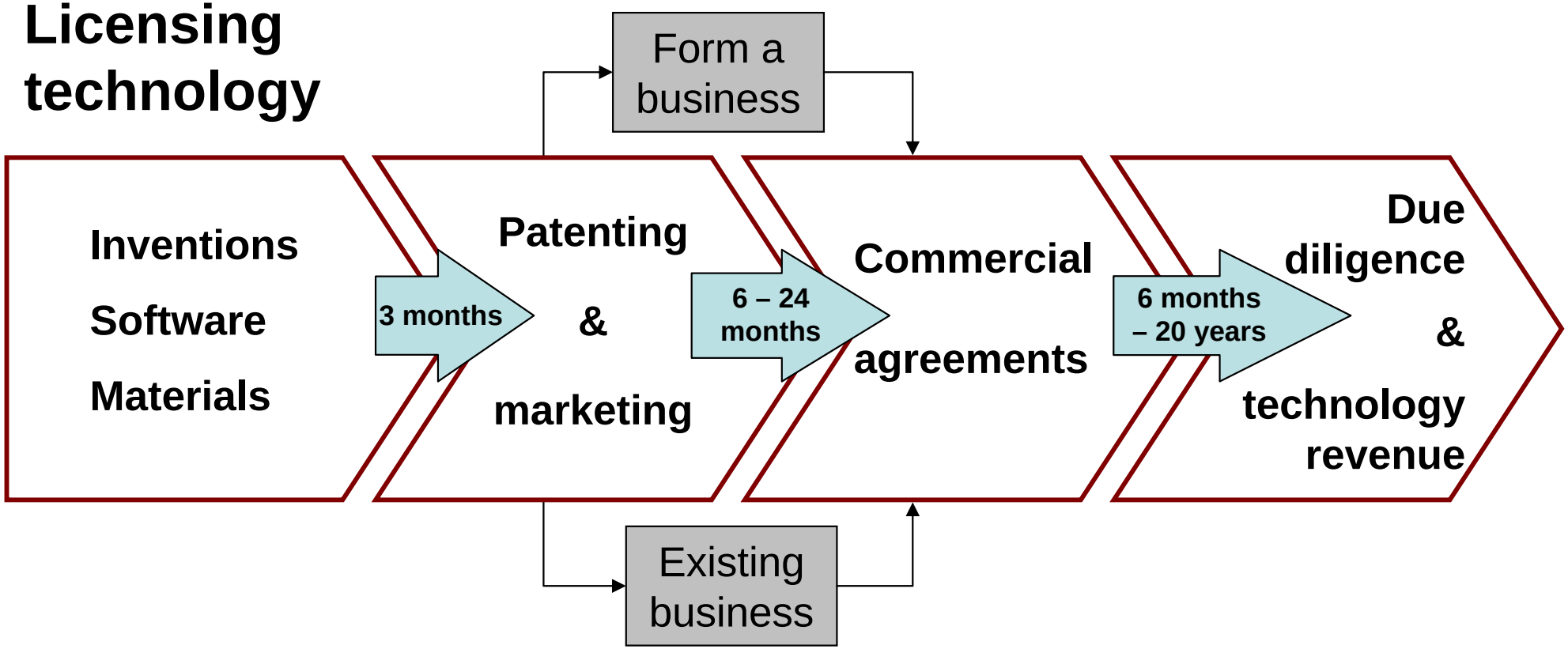
University of Cambridge Revenue Sharing Scheme

Revenue	Inventors	Department	CE
Up to £100,00	90%	5%	5%
£100,00-£200,000	60%	20%	20%
Over £200,000	34%	33%	33%

Role of the Technology Transfer Office

- Identify commercially valuable research
- Develop commercialisation route
- Put in place appropriate IP protection
- Ensure that funding conditions and University's IP policy are adhered to
- Bring in proof of concept funding as appropriate
- Identify commercial partners
- Negotiate agreements
- Reward inventors and provide return to funders and departments and institution.

Licensing technology



152 disclosures	58 new patent applications	61 agreements, inc 4 spinouts	£3.33 million

Data for 2005/6

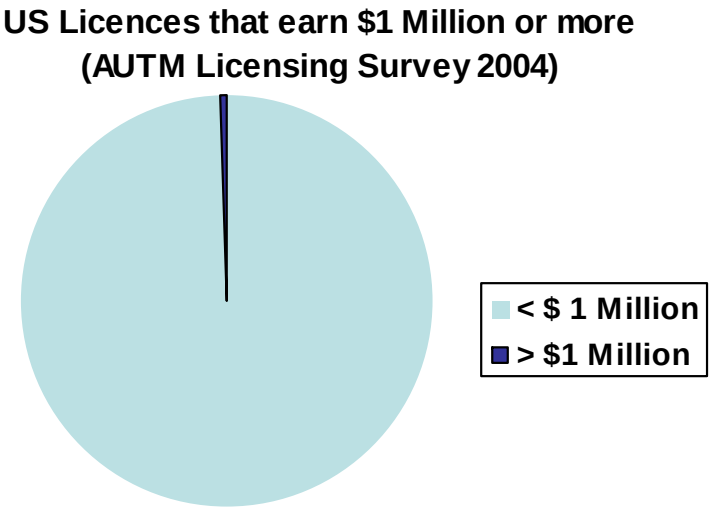
Points to Consider

- Most Revenue comes from a small number of deals (top 5 earners in Cambridge account for 75% of licensing income)

- 80% revenue comes from royalties on sales of products

- Income from equity is generally around 2% of total annual income across US offices

- Company formation requires a lot of work!



Cambridge Enterprise Principles – Before Licence

- Accept cases into the portfolio with the strongest potential to make a significant positive impact where using commercial channels is the most reasonable means to bring the idea forward.
- Take the course which supports commercialisation of the technology *and work creatively to add value (de-risk) the technology through the use of patent and proof-of-concept resources.*
- Work effectively with the inventor(s) to support their aspirations, manage conflicts and encourage synergy with the mission of the university.

Cambridge Enterprise Principles During and After Licence Negotiations

- Find the best partner (licensee or start-up senior management and investors) to take the idea forward
- Negotiate fair and reasonable terms which reflect the contribution of the assets and expertise being transferred.
- Close lots of good deals.
- Look after the deals once they are closed.

AUTM 2007 9 Points to Consider in Licensing University Technology

1. Universities should reserve the right to practice licensed inventions and allow other non-profit and governmental organisations to do so.

2. Exclusive licenses should be structured in a manner that encourages technology development and use.

3. Strive to minimize the licensing of future improvements.

4. Universities to anticipate and help manage technology transfer related conflicts of interest.

5. Ensure broad access to research tools.

AUTM 2007 9 Points to Consider in Licensing University Technology (Continued)

6. Enforcement action should be carefully considered.

7. Be mindful of export regulations.

8. Be mindful of the implications of working with patent aggregators.

9. Consider including provisions that address unmet needs, such as those of neglected patient populations or geographic areas, giving particular attention to improved therapeutics, diagnostics and agriculture technologies for the developing world.

Therapeutic antibodies Professors Herman Waldmann, Mike Clark and Geoff Hale, Department of Pathology, with University of Oxford and MRC

- Monoclonal antibodies to treat diseases of the immune system
- Work started in University in 1980
- Cell line producing Campath assigned to NRDC in 1984, improved version for BTG in 1989
- BTG licence to Glaxo-Wellcome, developed for rheumatoid arthritis, dropped in 1994
- Re-licensed to LeukoSite (Boston) for chronic lymphyocytic leukaemia
- LeukoSite bought by Millennium, joint development with Ilex. Genzyme bought Ilex in 2004
- 2001 Campath 1H (alemtuzumab) registered for use in US and Europe for chronic lymphocytic leukaemia. Now in Phase II clinical trials for treating multiple sclerosis and non-Hodgkins lymphoma
- University's contribution yielding royalties of several hundred thousand pounds

Licensing an Antibody Target

- Novel gene sequenced and characterised
- Over first year demonstrated that the gene was expressed on tumours and in tissues affected by auto-immune disease
- Interest from two companies
- Licenced to US company for significant upfront payment and as well as milestone and royalties

3D Ultrasound

- Stradwin software developed by academics over a long period of time
- Company wanted to integrate the software into their radiotherapy planning system.
- Good complimentary between company's technology and the University's.
- Research team did not want to limit the future development of the software.
- Licence granted to a specific version of the software, specific to the company's needs.

General Antibody Technology Licensing

- Antibody engineering technology with broad applicability to therapeutic antibodies
- Scientific and commercial contact made with a US biotech by one of the inventors and Cambridge Enterprise in parallel
- The inventors and CE worked closely
- Successful licensing deal concluded
  - the technology is being broadly used by pharma and biotech
  - good financial terms

Pysnova – a successful spin-out

- Broad portfolio of IP and data relating to bio-markers for psychiatric disorders
- Complex IP ownership issues
- Sophisticated IP protection needed
- CE worked with the PI to bring in advisors to assess the business opportunity
- CE completed appropriate licences and other agreements to the new venture
- New venture attracted funding from Cambridge Enterprise Seed Fund and an external Venture Capital investor

Smart Holograms

- Holographic sensors that change in response to environment
- Wide range of potential applications but no licensee waiting to take the technology on
- Company founded secured funding from Cambridge Challenge Fund and external funders
- Subsequent IP filed
- Product due imminently

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