IMPACT

Koen Verhoef,
director Tech Transfer office
Netherlands Cancer Institute, Amsterdam

Structure of this presentation

- What is Impact?
- How is it measured?
  - Inside academia
  - Outside
- Increasing focus on impact of research outside academia: implications for funding
- What the Impact agenda means for PRO's and TT

Impact

“ an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia”

from: Higher Education Funding Council for England (HEFCE)

Measuring Impact in academia

…is all about bibliometric data

Bibliometric data for Academic Impact

- Impact factor of journal in which an article is published
- Number of times papers are cited by others
- Number of online views/downloads of paper/abstract
- Social media activity as a result of publication

Measuring Impact outside academia

Metrics

AUTM/ASTP-Proton surveys:

– Collection of measurable metrics:

- Patents: # applications filed, granted
- Licenses: # deals, licensing income
- # of new venture-backed companies
- Volume of collaborative research with industry
- Etc.

Metrics

Few metrics with clear Impact relevance:

- Number of licenses generating running royalties
- Number of new products on the market
- Number of FTEs created by spin-offs

Focus on numbers emphasizes economic impact and ignores other forms

Beyond Numbers: storytelling

Academic research output applied in novel products and services that are successfully put on the market

- Focuses on societal rather than economic Impact
- Remembered much better

AUTM started a US-wide initiative called “Better World Report” in 2005

Association of University Technology Managers®

The Better World Report

Respond, Recover, Restructure: Technologies Helping the World in the Face of Adversity

2011 Edition
www.betterworldproject.net

Impact Report for Europe

Impact stories

- Help make the case for continued/further investment in research.

For PROs as well as for politicians!

Rise of the Impact agenda

Bibliometric data underpinned most impact assessments until the end of the last decade.

Then:


100 EURO

Impact outside academia

Value for money?

Impact agenda in the Netherlands

Changing landscape:

Impact is interpreted in economic terms only by the Dutch government

Definition of 9 economic ‘Top sectors’ in 2010.

Research spending neutral, but re-allocation of 45% of the budget of the main public funding body towards support of the ‘Top Sectors’, mainly through PPPs.

Impact agenda in the Netherlands

Major government research funding bodies include section on ‘valorization’ in grant application forms

- Applicants must describe potential socio-economic utility of project outcomes
- Applicants must describe the road to realizing that potential
- Valorization aspects for now play second fiddle to research excellence as an assessment criterium

Impact agenda in the Netherlands

Other research funding bodies: Charities

- Dutch Cancer Society (100M€+/year)
- The Heart Foundation
- Children's Cancer Foundation

- Strongly start to build out their own Impact agenda focusing on societal Impact (patient benefit)

Impact agenda in the Netherlands

Charities:

- Spend majority of donations on research.
- Under increasing pressure to demonstrate Impact of spending
- Have a poor view of the fate of research lines after their funding stops
- Now want to be more closely involved/informed

Impact agenda in the Netherlands

Charities: some undesirable side-effects

Some charities have started to demand ownership rights in IP from research projects they fund

Most charities have now backed down but desire instead to share income from IP commercialisation

Impact agenda in the Netherlands

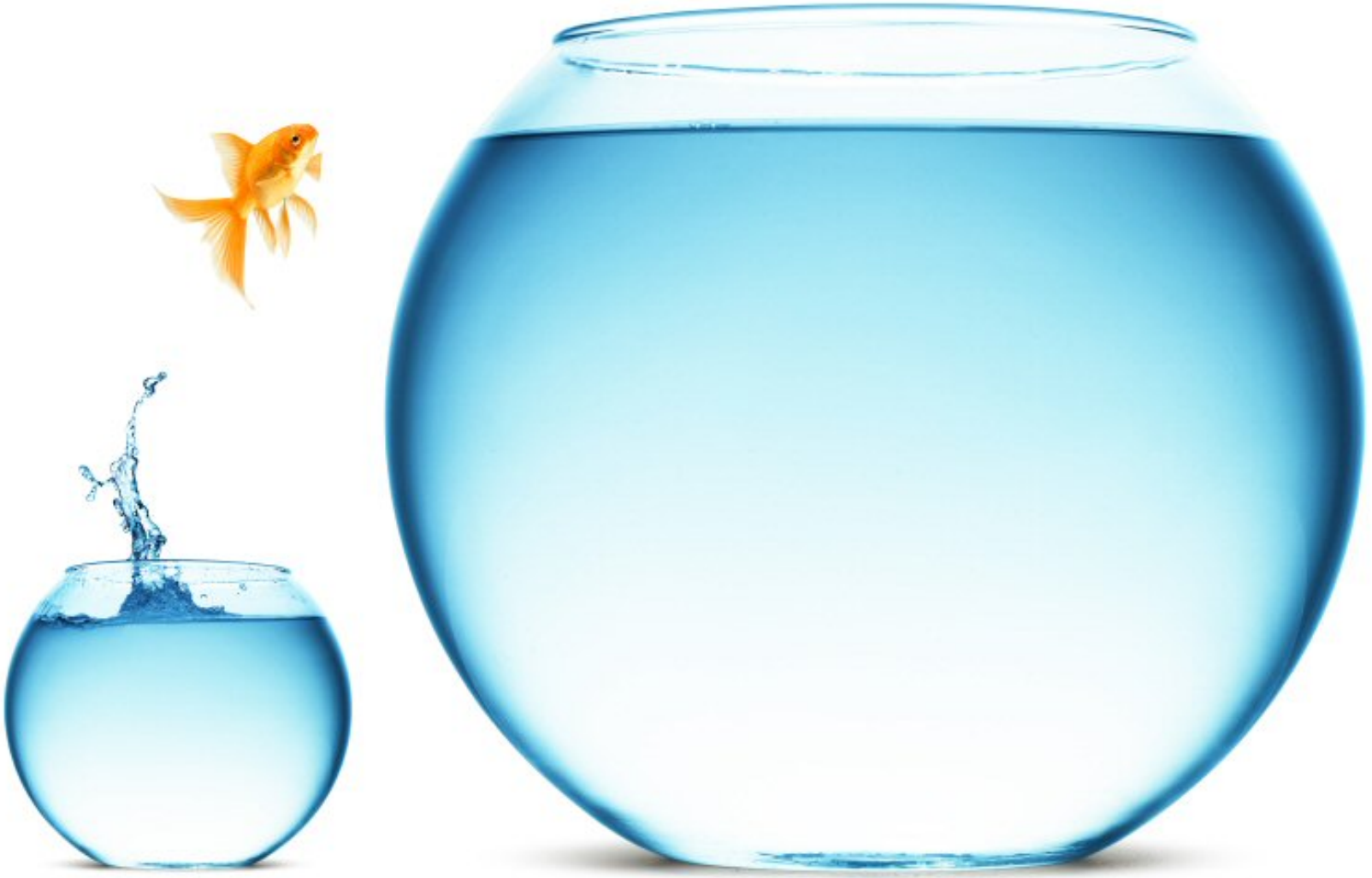
Negatives from viewpoint of universities and other PROs:

- Academic disciplines without immediate connection to a ‘top-sector’ will suffer

- Too much focus on economic Impact threatens to erode funding for fundamental research in Top-sector fields

- Matching industry investment in R&D doubtful

Impact agenda and Tech Transfer



Impact agenda and Tech Transfer

Goal of Tech Transfer?

- Maximizing the chances of academic research results having an Impact in society

Relevance of TT to academics

Current:

- Relevance for academics: research-related contracts mainly

Usefulness of TT office perceived by many academics as limited

Relevance of TT to academics

Impact agenda will help TT gain additional relevance:

- Impact-related aspects of grant applications (forward-looking),
- Impact-related aspects of scientific assessments (retrospective analysis)

Impact assessment

PROs face key challenges:

– Identification
  - Especially of impacts where key players departed
  - No systematic organizational memory

– Verification
  - Assembling credible supporting evidence including getting beneficiaries to acknowledge Impact

Relevance of TT to academics

The Tech Transfer office should be well-placed to provide additional, valued support for dealing with the Impact agenda:

- Assisting in writing the Impact section of grant applications
- TT should have best view/records on Impact of the PRO's research outside academia

Impact assessment

- Can highlight the role of tech transfer (professionals)

University Technology Transfer

Benefits People, Society and the Economy

Universities substantially contribute to the creation of new technologies, new companies, new industries ... and new jobs.

Highly specialized university employees known as **technology transfer professionals** manage the complex process of protecting discoveries that will become products and services. This is done by **securing patents**, so that a discovery can be licensed and further developed by an existing company or a startup to produce the new product.

University research sometimes yields a discovery that has commercial potential or the potential to improve—even change or save—lives.

From 1996 to 2013, the economic impact of university and nonprofit patent licensing was

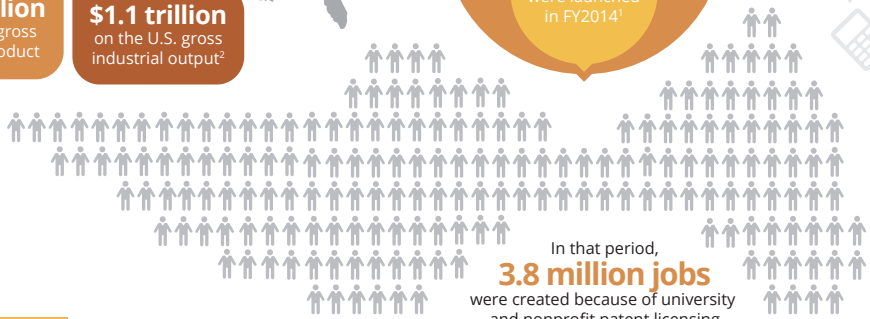
$518 billion on the U.S. gross domestic product

$1.1 trillion on the U.S. gross industrial output[2]

Since 1980, universities in the U.S. have spun off

nearly **5,000** startup companies

914 were launched in FY2014[1]



In that period,

3.8 million jobs

were created because of university and nonprofit patent licensing

= 20,000 jobs

965 new products based on university discoveries were introduced to the market by companies in 2014

Over the past 20 years,

more than 80,000 U.S. patents

were issued to research institutions[3]

1 AUTM *U.S. Licensing Activity Survey Highlights* FY2014.

2 Biotechnology Industry Organization: The Economic Contribution of University/Nonprofit Inventions in the United States: 1996-2013; March 2015.

3 *Ibid.*

To learn more about technology transfer, visit the Association of University Technology Managers at **www.AUTMvisitors.net**

To read stories about innovations developed at universities, visit **www.betterworldproject.org**

AUTM
Association of University Technology Managers®
Advancing Discoveries for a Better World®

Branding

Branding

Impact stories help convey a message of quality of your PRO to an audience outside academia

➔ Can be used to increase the PRO brand value!

Easy Access IP:

- license contains no monetary terms, but requires acknowledgement of university's role in the creation of a product

Branding

…. does not come naturally for many PROs….

Example:

Netherland Cancer Institute
Centennial anniversary 1913 – 2013

Mammaprint

Preventing unnecessary chemotherapy with Mammaprint

Up to half of all women suffering from breast cancer receive chemotherapy although they do not need it. Agendia's Mammaprint can reliably predict whether a tumour will return or not and thus, if a patient needs chemotherapy.

- **Product:** Mammaprint, a microarray breast cancer recurrence test
- **Research institute:** Netherlands Cancer Institute (The Netherlands)
- **Marketed by:** Agendia (The Netherlands/ United States)
- **On the market since:** 2004
- **Noteworthy:** The world's first diagnostic microarray test

mammaprint® decoding breast cancer. agendia® decoding cancer.

Although medical science has improved over the years, cancer remains a terrible disease. It often requires demanding chemotherapy. This therapy is one of the most effective ways to treat cancer, despite the severe side effects it often causes. Yet, not all tumours have a malignant nature. Early-stage breast tumours, for instance, do not always require chemotherapy. Often, hormone therapy following removal of the tumour by surgery is enough to cure the disease. The crucial question remains: how does a doctor correctly identify such a tumour?

Presently, Amsterdam-based company Agendia sells Mammaprint, a molecular diagnostic test, based on microarray technology. With great certainty, the test classifies the prognosis of early stage breast tumours as good or bad, thus showing whether the tumour will ever return. If the risk of recurrence is high, chemotherapy will be required, but women with low-risk tumours can receive a less demanding therapy instead.

'Traditionally, we rely on a few coarse parameters to estimate the chance of a tumour's recurrence,' says internist-oncologist Peter Nieboer of the Wilhelmina Hospital in the Dutch city of Assen. Nieboer often requires Mammaprint for his patients. 'Even when traditional analysis shows low probability for a returning tumour, we are used to prescribe chemotherapy. This means that we unnecessarily treat a large group of women. By using Mammaprint, we can stop this unnecessary treatment.'

Good prognosis

Mammaprint is an invention of professor René Bernards and his colleague Laura van 't Veer of the Netherlands Cancer Institute at the Antoni van Leeuwenhoek hospital in Amsterdam. They both analysed the DNA in tumour cells in early-stage breast tumours and discovered differences in gene expression between tumours with a good prognosis and those with a bad prognosis. Bernards explains, 'The activity of its genes completely determines the behaviour of any type of cell. If you know the activity of all twenty thousand genes in a cell, you can understand the behaviour of that cell. A liver cell for instance, differs in its behaviour from a kidney cell. The pattern of gene activity in the liver cell thus differs from the pattern in the kidney cell. If you extrapolate this knowledge to cancer cells, you can assume that the gene activity in a tumour cell that does recur differs from the gene activity in a tumour cell that will not recur.'

Bernards and Van 't Veer analysed the activity of all genes in early stage breast tumours that they retrieved from the archives of the Netherlands Cancer Institute. The archive contained samples from breast tumours at the time of diagnosis. Moreover, Bernards and Van 't Veer retrieved patient data from the computer from the time of diagnosis until ten years later. Through this, both researchers knew if the tumours had returned or not. They found differences in gene expression between recurring and non-recurring tumours. These differences showed whether the tumour did or did not return.

This discovery paved the way for a molecular genetic test that differentiates early stage breast tumours in a group with low or high chance of recurrence. Bas van der Baan, Agendia's Vice President Clinical Affairs explains the success of Mammaprint using the results of a clinical study, 'Between 2004 and 2006, 427 women suffering from early stage breast cancer all received a Mammaprint test. Of all women whose tumour had a low risk of recurrence, 85% waived chemotherapy. Five years later, almost all women, 97% of them, lived free of cancer. In the group of women with breast tumour with high risk of recurrence, 80% chose to receive chemotherapy. Five years later, 91.2% of those women lived free

René Bernards

Laura van 't Veer

individual Mammaprint has paved the way for individual cancer therapy.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8ºC
2010-05
2Cº
CEpartner4U,3951DR;13.NL.
tel : +31(0)6.516.536.26
DIAGNOSTIC AUTOMATION, INC.
23961 Craftsman Road, Ste E/F,Calabasas, CA 91302 U.S.A.
Tel: 1 (818) 591-3030 Fax 1 (818) 591-8383
Website: http://www.rapidtest.com
Email: onestep@rapidtest.com
Made in USA
IVD
23961 CRAFTSMAN ROAD, SUITE E/F • CALABASAS, CA 91302, USA
•TEL (818) 591-3030 • FAX (818) 591-8383.
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Closing observations

- The Impact agenda now has a firm foothold in different European countries.

- Though it certainly poses risks in some areas, the Impact agenda can:
  - help make the case for investment in R&D
  - help increase the brand value of our PROs
  - help us tech transfer professionals to achieve our goals while being more relevant to academics

Questions/discussion