

Issues on Technology Transfer University-Industry

The European Commission, determined to break the “European Paradox”, has launched the *Innovation Union*, a Europe 2020 flagship initiative whose financial instrument, Horizon 2020, will run from 2014 to 2020 and tackle societal challenges by helping to bridge the gap between research and the market. This means doing the technology transfer effectively. Technology Transfer (from now on, TT) is, in this context, the process of transferring skills, knowledge, technologies and processes from universities and research centres to the market.

TT is not easy. Barry Bozeman, professor of Public Policy in the University of Georgia and expert in TT (http://padp.uga.edu/people/faculty/bozeman_barry-1/), states that when talking about TT the difference between an experienced person and a neophyte is very easy to see: the neophyte is the one that sees TT as something simple.

To improve the current TT from university to industry, there are two main and complementary paths to be considered:

1. Enforcing the role of the existing Technology Transfer Office (TTO) of universities and research centres.
2. Identifying best practices for Effective Technology Transfer in the different research areas, including Biotechnology, in order to improve local and regional policies.

Enforcing the role of TTOs

TTOs are increasingly becoming a key factor for technology transfer from the university to the market. The evolution of the role of the TTOs in the research-intensive universities emphasizes this growing importance.

Figure 1 shows the evolution of the TTOs in the universities. This figure has been taken from the document “*The TTO, a university engine transforming science into innovation*”, (http://www.allea.org/Content/ALLEA/IPR/att_7b_LERU_TTO_paper.pdf), authored in 2011 by Koenraad Debackere, with the collaboration of the TTOs of the 21 Universities members of The League of European Research Universities (LERU).

Before 1995, the TTOs worked as “island” of technology transfer; from 1995 onwards, TTOs have become a centrepiece to fulfil the transfer of technology from the University to the industry (the so-

called “third mission” of the University). This second stage has resulted in TTOs operations to be more professionalized; in the third stage, now gearing up, TTOs activities are fully embedded in the value chain of the university (research and education) and producing, both, cognitive and financial spill overs.

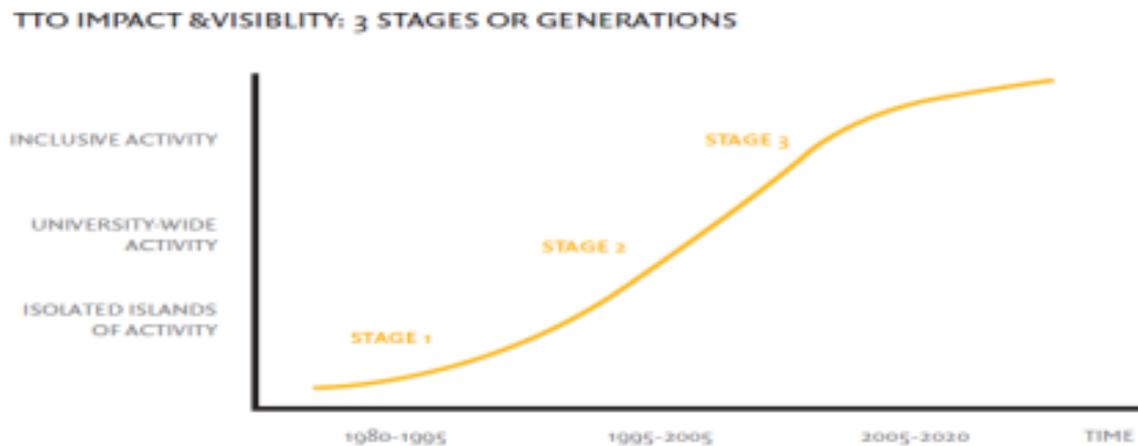


Figure 1: the evolution of the TTOs according to the League of European Research Universities

To be able to operate in this third stage, Mr. Debackere establishes in his paper 10 critical success factors for TTOS to operate as an effective platform of innovation and transfer. These success factors relate to aspects of governance, autonomy and certain degree on financial and managerial independence and constitute fundamental issues for the effective operation of TTOS. This third stage is expected to have its impact visible along the next decade.

Identifying best practices for Effective Technology Transfer and the case of the biotechnology sector

Complementary to TTOs becoming more professionalized and inclusive in the university value chain, effective TT will benefit of clearly best practices in their activities. For any given TT process, different activities will be necessary depending on the sector and maturity, but three stages common to all process of TT could be defined and be undertaken by the TTOs:

1. **Evaluation:** consists in the verification of the novelty of the research results and the possibility of protecting the invention (e.g., patents).
2. **Valorisation:** it is also known as the “Proof of Concept” and consists on the additional developments and testing to verify that the invention can be translated to the market.
3. **Commercialization:** meaning the cession, transfer and/or sale of the invention to the companies that will commercialize it.

The case of the biotechnology sector, the three stages listed above are also applicable but they have some specific barriers to TT:

- The gap (in time and effort) from quality basic research to market in the biotechnology is bigger than in most sectors. This gap makes researchers to lack a clear market perception of their work. This might make that their stimulus and incentives weaken. To solve this problem, evaluation must be done for each stage of the research. In each stage, TTOs should look for companies interested in the results of that phase.
- Different perspective between the researchers and the industry. In many ways, this is due to the prevalence of “market push” over “market pull” initiatives. TTOs should emphasize the second approach (promote valorisation programs connected to market needs) and work to optimized the cultural difference of academia and industry.
- Changes in national intellectual property laws in recent years and lack of specific regional policies and practices to boost technology transfer in biotechnology has made difficult to establish methods in TT in the sector.

The European Commission is well aware of these barriers to bring research results to market and is financing several initiatives to flatten them. The BIOCHEM project is an excellent example: BIOCHEM is designing tools for start-ups (and TTOs) in the industrial biotechnology sector (but mostly applicable to other biotechnology areas) to evaluate and booster the viability of companies (and projects). Other EC- financed project is the ETTBio - Effective Technology Transfer in BIOtechnology (<http://ettbio.eu>), which will create a catalogue of comparative assessment criteria for technology transfer in biotechnology in order to identify best practices with analysis reports of various specific cases to identify regional challenges.

Hopefully, the results of both projects will facilitate greatly the time-to-market of qualitative biotechnology research projects.