

Perpetuum Mobile for Scientists: Boosting Research by Securing the Intellectual Property it Creates



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COLUMN ARTICLE

Outline: “The Technology Transfer Office is the scientists’ best friend in difficult economic times”.

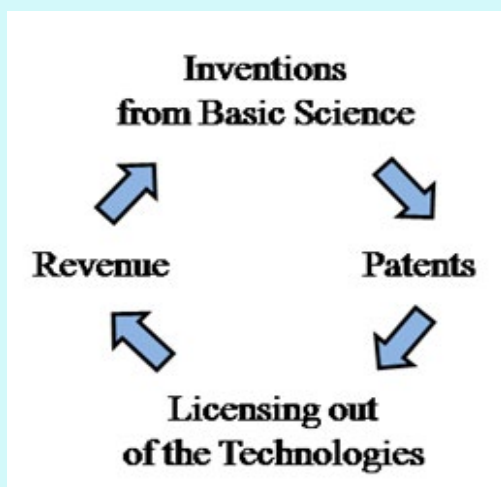


Figure 1: From Invention to Invention - perpetuum mobile for “self-funding” of basic science research.

The scientific vocation is one of the most exciting and meaningful professions. Deciphering the laws of Nature and creating tools to fight and solve diseases, environmental pollution, hunger and energy deficiency is a noble and fulfilling job. Sadly, in these current difficult economic times, severe decreases in funding, particularly for basic scientific research, have contributed to the decline in the drive

and motivation of scientists for discoveries and inventions. Although numerous non-profit organizations and private sources are very helpful, alternatives for financial boosting of research are in great demand. The goal of the current article is to provide useful information and thus help the scientific community in some of these vital financial matters.

How many of you aim for something other than writing grant proposals and publishing papers? Have you ever thought of patenting your invention (novel, man-made, shown to work in living cells and/or in rodents), so it can jump onto a development stage, reaching the market and becoming useful in your life-span? Do you know that a substantial part of the revenue from the development and marketing of novel biologics, small molecules and medical devices go back to the lab’s account, thus funding back your research? Not to mention the collaboration and sponsored-research agreements with biotechnological and pharmaceutical industries that can add a boost to the lab’s thinning budget and offer an opportunity to communicate directly with the people who might bring your next inventions to the market.

Being employees, our discoveries and inventions, i.e. the intellectual property (IP), are employer-owned by law. A very important part of every academic and research institution, where IP is created, is the Technology Transfer Office (TTO), which takes care of preparing, soliciting and maintaining patent applications, as well as further marketing and licensing out of the patented technologies to the indus-

try, in addition to handling all legal documents required for inter-institutional collaborations and all the necessary financial up-keep that is needed. Very often, new companies, i.e. start-ups, which are lead by active inventors, are created with the help of those offices. The people who work at the TTOs are highly-educated (PhD, JD, MBA) professionals, whose job is not only to provide the above-mentioned services, but also to work closely with the scientists/inventors on the entire *perpetuum mobile* of the technology transfer process (Figure 1). Those with scientific backgrounds provide a particular benefit on the patenting side by evaluating the invention disclosures professionally and being in a constant reach to the inventors, helping them strengthen their inventions to mold and grow them into patents. For the success of the latter, the most important requirement after novelty is the invention not being disclosed in a written or verbal form, before the patent application is filed with the governmental or international institution that review and grant the patents [1]. For that, talking to the TTO personnel and seeking their advice, is the first step when the results of the research conducted are promising and heading to wrapping up, always prior to any public sharing. To avoid delays in the scientific publishing of the discoveries that lead to the inventions to be patented, simultaneous filing for a patent and submission of the manuscript at a journal is a common practice. Once the patent application is secured, i.e. filed, the TTO initiates the search for potential licensees, negotiates and executes the licensing agreements, and to have the revenue streaming back to the lab as soon as possible. With that, the *perpetuum mobile* wheel (Figure 1) will keep on turning and running for years to come. A successful life-story is the small TTO at the University of Texas Medical Branch in Galveston USA, which is led by Sundee Mattamana (PhD, MBA), and has Dana Buschmann (JD) to manage the patenting, where the reported revenue from licensed technologies in 2016 is estimated to be 7 million US dollars [2].

In conclusion, having a background in microbiology and molecular biology myself, I am proud to mention a few facts related to the intellectual property arising from these fields. Numerous life science research have led to the creation of IPs and technologies, which are the basis of the current advances in human and animal medicine, agriculture, solving

environmental pollution and creating alternative biofuels. However, the fields of Microbiology and the closely related Molecular Biology have a distinguished high potential in running the *perpetuum mobile* wheel in all the above-mentioned applications. The simple explanation for their superiority is the discoveries of basic laws of Nature that are valid for all organisms and the advantage of being useful as biological tools. Logically, and as proven by years of biotechnological and pharmaceutical development, the inventions and the technologies created from research in Microbiology and Molecular Biology are dominating the market for diagnostics and therapeutics. The Polymerase-Chain Reaction [3], the numerous Next-Generation Sequencing techniques [4] and the highly-commented CRISPR/Cas9 system [5,6], are just a few examples of those breakthrough technologies. Starting with the first patented genetically modified organism, the pathogenic bacterium *Pseudomonas aeruginosa*, in 1982 [7], the United States Patent and Trademark Office [1] have reported 64,940 patents on biologics, small molecules and medical devices, all related to microbiology, for the past 20 years in the US alone. Therefore, do not fret if your research funding has been severely affected, go talk to your TTO officials. Who knows if some of the results from the blood, sweat and tears in the lab may yield hidden IP pearls that could alleviate the financial crunch in your lab, leading to a *perpetuum mobile* wheel that will keep your lab running in the years ahead.

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BIBLIOGRAPHY

1. USA: <https://www.uspto.gov/>; Europe: <http://www.epo.org/>; China: <http://english.sipo.gov.cn/>; Japan: <http://www.jpo.go.jp/>; Canada: <http://www.ic.gc.ca/opic-cipo/cpd/eng/search/number.html>; World Intellectual Property Organization: <http://www.wipo.int/portal/en>
2. <https://www.utmb.edu/facts/technology>

3. <https://www.google.com/patents/US4965188?dq=Patent+4,965,188&hl=en&sa=X&ved=0ahUKEwiz9uK-Dp7fUAhVHOiYKHfEbDLQQ6AEIjAA>
4. Lin B, Wang J. and Cheng Y. "Recent Patents and Advances in the Next-Generation Sequencing technologies".Recent Pat Biomed Eng. 2008 (1), [2008]: 60-67.
5. <http://www.google.com/patents/US8697359>
6. <https://www.google.com/patents/US20140068797?dq=CRISPR-Cas9+UC+Berkeley&hl=en&sa=X&ved=0ahUKEwiCxL6btbfUAhVE4CYKHcu8BJMQ6AEILTAB>
7. <http://www.google.com/patents/US4259444>

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