Knowledge, innovation and technology transfer issues
Finding your way through the jungle
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Did you know? Some facts & figures

- That during the past 20 years the growing attention for entrepreneurship at the Vrije Universiteit Brussel (VUB), in combination with the support offered by the Technology Transfer Interface, has led to the creation of more than 20 spin-offs?

- That copyright was initially conceived as a way for governments in Europe to restrict printing? The contemporary intent of copyright is to promote the creation of new works by giving authors control of and profit from them.

- The VUB fully owns more than 100 active patent families (applications), and tens of patent families in co-ownership with other research organizations or companies?

- Stanford and Yamaha have a long-standing business relationship that began in 1975 when Stanford granted Yamaha a license for its Frequency Modulation (FM) synthesis, developed by a Stanford professor. With considerable investment on its part, Yamaha used FM synthesis to develop products such as the world's first fully digital synthesizer. Stanford's FM synthesis patent, which expired two years ago, was the second biggest money maker in campus history.*

- That one of Belgium's most successful biotech companies Ablynx originates from a discovery made at the VUB on the antibodies of dromedaries and camels?

- That funding for applied research, both from the government and the private sector, is increasing more rapidly than funding for fundamental research?

- That the artist Leonardo da Vinci worked on commission throughout his life and did not publish or distribute the contents of the technological innovations in his mirror-written codices? If some of Leonardo's ideas had been patented, they might have changed history and the engineering landscape of society in a much more fundamental way.**

Dear researcher,

First and foremost, congratulations on your research project, PhD or ‘other’, and welcome to the Vrije Universiteit Brussel (VUB) and Erasmushogeschool Brussel (EhB), both partners in the University Association Brussels (UAB). As research and development is one of the European Union’s priorities, the institutions of UAB foster research, education and innovation, key elements of the ‘knowledge triangle’, in an open atmosphere of tolerance and diversity. Personal growth and a wilful but constructive attitude, in addition to a sense of responsibility, lie at the heart of our academic success.

In order to meet the demands and challenges of a society and economy constantly in flux and at the same time facing stagnating government support, universities are restructuring and reshaping their mission. Research institutions have become partners in a complex and interdisciplinary network of multiple stakeholders, who expect knowledge generated to be protected and exploited in the most beneficial way. Consequently, the way in which researchers co-operate and interact is shifting. Innovation, sustainable solutions and efficient knowledge exchange demand a proactive and savvy attitude towards publication, intellectual property protection and entrepreneurship.

The Technology Transfer Interface functions as a gateway between the know-how and state-of-the-art expertise of the VUB and EhB and the corporate arena. We take care of all things related to knowledge transfer and business development. Sharing is caring, and by synchronising the supply and demand of industrial players with the academic world, and vice versa, we try to advise, mediate and support the creation of constructive partnerships between all stakeholders.

As the world of knowledge, innovation and technology transfer covers a vast and dense area of technical, legal and economic discourse, rules, regulations and collaboration formats, you will be needing some guidance on your research itinerary. This booklet is intended as a rough guide to know-who, know-how and know-where at crucial moments during your research project. It is an invitation to get to know us better and the services we provide, and to ignite your entrepreneurial spirit. Enjoy reading!

Kind regards,

The Technology Transfer Interface team
What is knowledge transfer?

Knowledge transfer in general is the flowback of knowledge and discoveries to the general public. At a university, knowledge transfer typically occurs through publications, science communication events, educated students finding a job, exchanges at conferences, and so on. The following pages, however, focus on some key aspects in the valorization process of research results. Valorization can be done through partnerships with industry and/or society, different kinds of research collaborations, licensing, the creation of spin-off companies and consulting services.

But let’s not get ahead of ourselves. The process of technology and knowledge transfer starts with observations and experiments leading to discoveries and inventions. An invention is any useful process, machine, composition of matter, or any improvement of the same. Often multiple researchers may contribute to the invention. Inventions form the basis of new products and processes and by transferring these research results to society and industry, the university plays an essential role in the development of society.

Research results are typically transferred through an agreement in which the university grants a license to a third party to use or further develop these results into a commercial product or service. Of course your research results should be different from existing products or any documented ideas. Your research results should offer the potential to provide clear technical or commercial advantages that existing products or other ideas do not offer. Last but not least these advantages should have the potential to be strongly protectable by law. Inventions can be protected by applying for a patent or another form of intellectual property (IP), such as design rights and trademarks. Without strong IP protection few companies or investors will be interested to engage into a licensing agreement.

However, knowledge transfer doesn’t necessarily imply a technological output product or service. It can also refer to a qualitative partnership between applied research and society in various ways. Depending on the target group, the Science Communication unit of the R&D Department offers educational projects for youngsters, knowledge debates for the wider public or research projects assigned by civil society organizations. The Science Shop, for instance, provides scientific support, in the form of research or advice, to organizations that have insufficient funds to conduct research or have little access to scientific information. For more information on science communication services, visit www.wtchnschp.be. This kind of free knowledge transfer aims at getting youngsters enthusiastic about science in order to close the knowledge gap between research institutions and the wider public.
Decisive moments in a research and knowledge/technology transfer process intertwine and should therefore be considered simultaneously, rather than separately. The following timeline depicts a ‘typical’ research/technology transfer project. The upper part shows the various research milestones, while the lower part shows some common issues/pitfalls with regard to technology transfer. Respecting the right chronology is of utmost importance. For example, sign a non-disclosure agreement (NDA) prior to any disclosure and not the other way around!

**From research to knowledge transfer**

- **Typical research project**
  - Begin research
  - Initial results
  - Discovery / invention
  - Publication or any other form of disclosure
  - Final research results
  - Funding (cf pp. 9-12)
  - Invention disclosure form (cf p. 16)
  - Review existing literature (cf pp. 13)
  - Keep accurate laboratory notebook (cf p. 13)

- **Issues to pay attention to**
  - Protection of IP and ideas (cf p. 14)
  - NDA (cf p. 18)
  - Subsequent funding (where relevant) (cf pp. 9-12)
  - Creation of visibility (cf pp. 21-22)
  - Loss of rights & other issues (cf p. 17)
  - Valorization (cf pp. 23-27)
  - Return (monetary and/or otherwise)
Technology transfer and valorization of research results cover a very wide range of interactions between the university and society. The Technology Transfer Interface is the gateway between the university's research & expertise and industry.

The Technology Transfer Interface consists of a multidisciplinary team of experts on technology transfer, business consultancy, contract negotiation, scientific funding, legal and IP issues, event organization and communication. They provide follow-up and advice to researchers at every phase of a collaboration with third parties.

The premium mission of the Technology Transfer Interface is to develop a sustainable business policy at the university and to support individual technology transfer dossiers based on interdisciplinary knowledge and daily life experiences.

As such, the Technology Transfer Interface can be your gateway to an industrial contact, but also your personal contact point for assistance and more information on many aspects of technology transfer, which will be addressed in more detail in the following chapters.

- **Finding the right funding for your applied research project**
  > See 'Types of research funding', pp. 9-12

- **Protection and publication of knowledge & IP strategy**
  > See 'Before you take off', p. 13
  > See 'Obtaining intellectual property rights', p. 14
  > See 'Alternative ways of IP protection', p. 18
  > See ‘Some thoughts and guidelines on publishing’, p. 22

- **Professional support for industrial valorization, contract research and negociations**
  > See 'Collaborating with third parties and contract research', p. 24

- **The creation of spin-off companies**
  > See ‘Starting a spin-off company’, pp. 27-28
  > See ‘Funding (the preparation of) spin-offs’, p. 29
  > See ‘With a little help from our incubators…’, p. 30

- **The organization of events focused on knowledge exchange and education**
  > See ‘Sharing is caring: Technology Transfer Interface events’, p. 31

The TTI's functioning is described in the VUB regulation on Technology Transfer, available on the TTI website www.vubtechtransfer.be
Contact details of Technology Transfer Interface are listed on page 32 of this booklet.
Types of research funding

There are many ways to fund research, depending on the content, academic discipline, duration, scale and purpose of your research project.

**BASIC RESEARCH** or **FUNDAMENTAL RESEARCH** is carried out to increase understanding of fundamental principles. The main aim of this kind of research is not to create or invent something. In many cases the end results have no direct or immediate commercial benefits: fundamental research can be thought of as arising out of curiosity. However, in the long-term it can be the basis for many commercial products and applied research.

At the University Association Brussels (UAB) this kind of research is typically funded by the 'Fonds Wetenschappelijk Onderzoek/FWO' (pre- and postdoctoral mandates, research projects, travel grants, visiting postdoctoral fellowships, scientific research networks,...), different academies, 'Federaal Wetenschapsbeleid'...

The research council of the VUB also decides upon internal financial support for fundamental research ('Bijzonder Onderzoeksfonds/BOF'). The researchers of the Vrije Universiteit Brussel and Erasmushogeschool Brussel can also apply for financial support for fundamental research from the 'Bureau voor Onderzoek Associatie Brussel/BOAB'.

**STRATEGIC BASIC RESEARCH** is high-level basic research with an emphasis on risk, inventiveness and innovation. The strategic importance and the dimensions of the valorization perspectives on the mid-long term (3 to 10 years) of this kind of research are set out from the beginning. This kind of research is still generic; it doesn’t focus on one single industrial sector but has clear possible applications, of which a large group of possible end users recognizes the potential economic and/or societal value. This kind of research is often carried out by large consortia of research groups.

At the UAB, this kind of research is typically funded by the 'Instituut voor de aanmoediging van Innovatie door Wetenschap en Technologie in Vlaanderen/IWT' (strategic basic research, predoctoral grants) or The Brussels Institute for Research and Innovation/Innoviris (Prospective Research for Brussels, Impuls programme) or the 'Federaal Wetenschapsbeleid'. In its most recent call for projects, the IWT puts more emphasis on the importance of the valorization perspectives and the active involvement and/or (ongoing) interactions with economic and social stakeholders.

The researchers of the Vrije Universiteit Brussel and Erasmushogeschool Brussel can also apply for financial support from the 'Industrieel Onderzoeksfonds/IOF' and BOAB. The UAB recommends consulting the TTI when drafting project applications related to strategic basic research.

* For more information, visit the R&D webpage http://rd-ir.vub.ac.be/en_GB/counsel/show/id/336
The primary purpose for **APPLIED RESEARCH** is to discover, to interpret and to develop methods and systems for the advancement of human knowledge on a wide variety of scientific matters. There is a lot of competition between different players on the market; end users clearly steer this type of research. Collaboration with industrial partners is typical for this kind of research.

At the UAB applied research is mainly funded by the IWT (TeTra, R&D projects, applied biomedical research) and Innoviris (R&D projects). The EhB has special means at its disposal to introduce more practice-based research in professional Bachelor programmes (PWO).

### Technology transfer & the Industrial Research Fund

A special type of government funding gave rise to the **Industrial Research Fund** (‘**Industrieel Onderzoeksfonds/IOF**’) in 2004. Trying to meet the overall academic demand for a more attractive and flexible research environment and more diverse types of researchers, this fund enables the development of a more devised long-term policy for strategic and applied research programmes at universities.

The Flemish universities receive funding according to their output performance, such as the amount of contracts with industry, publications, the share in the European Framework Programme for R&D, the number of patents and spin-offs.

Characteristic for an IOF-group is that the lab clearly exceeds the average scale of a standard university's research unit. IOF-groups are able to conceive a detailed long-term roadmap and vision and have strongly motivated how the extra IOF-funding might contribute to their proprietary valorization strategy.

To know what groups are receiving IOF-funding, take a look at [http://vubtechtransfer.be/for-companies/industrial-research-fund-iov-knowledge-centers/](http://vubtechtransfer.be/for-companies/industrial-research-fund-iov-knowledge-centers/)
The IOF-means are allocated to GEAR-programmes: projects for Groups of Expertise in Applied Research, focused on building a portfolio of application-oriented knowledge for economic purposes and their effective valorization. These groups have to prove their existing track-record in valorisation activities, as demonstrated by their revenues from industry/license revenues, patents and spin-offs.

These GEAR’s will receive a project funding for **5 years**. Each year, a report on the evolution of the work will be filed. The IOF council may end the funding if serious deficiencies are detected. The GEAR-financing consists of a budget of **170.000 Euro/year**, for a period of 5 years, typically to finance a senior mandate holder with operating funds. The IOF council may deviate from this amount between 120.000 to 220.000 Euro/year, based on the application and provided a thorough motivation.

The Industrial Research Fund also funds **proof-of-concept projects**, e.g. research projects that are in the transition phase from proof-of-principle to proof-of-concept. All possible activities pursuing the acceleration of the valorization process can be financially supported by means of this ‘PoC-financing’ (such as prototype development, the collection of additional research results in order to properly prepare for a patent dossier, preclinical experiments, writing a business plan, hiring of consultants, market research and analysis). The proof-of-concept financing consists of a budget of minimum **50.000 Euro/year**, for a minimum period of 1 year and a maximum of 2 years.

The coaching and support of mandates and projects financed by the IOF is the responsibility of the Technology Transfer Interface. All legal information about the industrial research fund can be found in the ‘Besluit van de Vlaamse Regering betreffende de ondersteuning van de Industriële Onderzoeksfondsen en de interfaceactiviteiten van de associaties in de Vlaamse Gemeenschap’.

The TTI also assists in the preparation and follow-up of research projects aiming at industrial research activities, projects for industrial development activities, and projects for strategic basic research of industrial relevance in collaboration with and funded by the IWT and Innoviris.
### Schematic overview of research funding

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<th>Fundamental Research</th>
<th>Strategic Basic Research</th>
<th>Applied Research</th>
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<td>Internal</td>
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<td>BOF (OZR)</td>
<td>Industrieel Onderzoeksfonds (Industrial Research Fund)</td>
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<td>For EhB only: PWO</td>
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<td>External</td>
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<td>FWO</td>
<td>Belgian Science Policy (FOD)</td>
<td>EU</td>
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<td>Academies</td>
<td>EU</td>
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<tr>
<td>Foreign Policy</td>
<td>IWT - SBO (Strategic Basic Research)</td>
<td>IWT - O&amp;O</td>
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<td>Belgian Science Policy (FOD)</td>
<td>IWT - Innovation Mandate</td>
<td>IWT - Tetra</td>
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<td>EU</td>
<td>IWT - Baekeland Mandate</td>
<td>Innoviris (O&amp;O)</td>
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<td>Innoviris - Impuls &amp; Platform</td>
<td>Innoviris - ATTRACT - Brains for Brussels</td>
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<td>Innoviris - ANTICIPATE - Prospective Research</td>
<td>Innoviris - DOCTIRIS - University &amp; Industry</td>
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<td></td>
<td>IWT - Innovation Mandate</td>
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<td>Innoviris - LAUNCH - Brussels spin-off</td>
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<tr>
<td>Clinical Research</td>
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<td>Artistic Research</td>
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The most important funding bodies and programmes within the UAB are integrated in this schematic overview. Special means for valorization purposes are distributed by the IWT (innovation mandates) and Innoviris (Spin-off in Brussels programme). Next to these general types of funding, special funds were created to support the purchase of research infrastructure (Hercules Fund), the return of Flemish scientists to Flanders (Odysseus), etc.

For a complete overview of all possible funding possibilities, please visit the R&D-webpages at http://rd-ir.vub.ac.be. Your VUB user name and password are necessary to consult the page ‘Research Funding’.
Literature study

Before spending significant amounts of time (and money, e.g. upon filing patent applications) starting or applying for a research project you must perform a thorough literature study.

Scientific literature can be searched by using the universities’ library catalogue (ADB - www.vub.ac.be/BIBLIO). A lot of researchers make the mistake of only checking the scientific literature they are very familiar with. However, another important source of information is the worldwide patent system. A study by OECD estimates that of the published technical knowledge globally available, 80% is published only in patent specifications. How to find valuable information in patent databases is further discussed in the following pages.

Another useful tool is Google Scholar, which provides a simple way to broadly search for scholarly literature. From one place, you can search across many disciplines and sources: peer-reviewed papers, theses, books, abstracts and articles, from academic publishers, professional societies, preprint repositories, universities and other scholarly organizations.

Lab notebook

From the very beginning of your research activities, it is important to keep a laboratory notebook. This is necessary for a number of reasons. First of all, it will help you to keep a complete and chronological track record of your experiments. Furthermore, it will provide a person who will continue your research work with all necessary information to allow him/her to repeat (or not) and extend (or focus) your work.

Correct record keeping of all your original work is essential to allow Vrije Universiteit Brussel and Erasmushogeschool Brussel to defend their intellectual property rights. When properly kept, a laboratory notebook is a permanent record that can be referred to in order to prove what was done during the course of a project and particularly what inventions were made by whom and when.

The TTI provides free laboratory notebooks to any interested researcher. A notebook will be delivered to you upon the receipt of a registration form, available on www.vubtechtransfer.be/for-researchers/downloads/forms-templates/
At university, the pressure to publish interesting research results is huge. However, obtaining intellectual property (IP) rights and publishing research results can be combined perfectly. The main thing to remember is to apply for IP rights first and to publish later. The dangers of disclosure, especially in an academic context, are real and need to be taken seriously as soon as you start to think about your research results as a technology valuable to industry or society.

IP is the result of your creativity and the hard work you invest in your research, enabled by the VUB and/or the EhB or in collaboration with third parties (e.g., industry). Some basic knowledge about the most common forms and concepts in IP protection will enable you to disclose it safely, be recognised as the inventor, profit from its commercial exploitation, and prevent (or discourage) unauthorised use by others. There are several forms of IP rights. Usually, the best way is to combine these strategically.

**Invention disclosure form**

Deciding on all these matters is often very difficult and subject to argument. The TTI can help you with this and will evaluate your dossier with you and/or a patent attorney. The university obliges its researchers (see 'Regulation on valorization, p. 25) to disclose their inventions to the TTI prior to any form of publication (paper, presentation, abstracts, books, workshops and conferences, technical reports, public meetings, website,...) in order for the TTI to assess the need for protection. The invention disclosure form can be found on www.vubtechtransfer.be/for-researchers/downloads/forms-templates

For ownership issues, see p. 18 (Master students) and p. 24 (Researchers).

**What you need to know about patents**

The most well-known – but certainly not the one and only – form of IP protection is patenting, 'octrooieren' in Dutch. A patent is an exclusive right granted by a country for an invention, allowing the inventor or its assignee to exclude others from making, using or selling his invention in that country during the lifetime of the patent. Patent protection is granted for a limited period, generally 20 years from the filing date of the application. In return for this exclusive right technical information about the invention must be disclosed to the public. Therefore the patent application is published at the latest 18 months after filing.
A patent does not give the inventor (or its assignee) the right to use the invention since the inventor (or its assignee) is subject to any patent rights that others may have obtained to related inventions ('freedom to operate').

VUB owns the right to any invention created by researchers within the framework of their contractual relationship with VUB. Consequently, inventors assign their rights to VUB according to VUB's regulation on valorization (cfr p. 25).

In case a third party is interested to use a patented invention VUB negotiates the terms to a license. Alternatively, VUB may consider selling the patent. As such VUB may generate a financial return that can be reinvested in research. Patent protection may be key in order for third parties to invest in the further development of the invention into a commercial product. Careful consideration is key to weigh the costs of patenting against the potential commercial benefit.

Once a patent expires, the protection ends, and an invention enters the public domain; that is, anyone can commercially exploit the invention without infringing the patent. Careful consideration is the key. A patent lasts for 20 years (after filing) but only if the annual renewal fees are paid. In order to obtain a patent a maximum number of conditions have to be met.

Some key conditions are (although there are substantial differences in patent legislation across different countries / regions):

- The invention (as claimed in the patent application) must be novel; that is, may not have been made (by yourself or third parties) publicly available prior to the filing of the patent application. The body of publicly available knowledge in a technical field is called "prior art".
- The invention must also involve an "inventive step" or "non-obvious", which means that it could not be obviously deduced based upon the prior art by a person having ordinary skill in the relevant technical field.
- The invention must be capable of industrial application, meaning that it must be capable of being used for an industrial or business purpose beyond a mere theoretical phenomenon, or be useful.
- Its subject matter must be accepted as "patentable" under law. In many countries, scientific theories, aesthetic creations, mathematical methods, plant or animal varieties, discoveries of natural substances, commercial methods, methods for medical treatment (as opposed to medical products) or computer programs are generally not patentable.
- The invention must be disclosed in an application in a manner sufficiently clear and complete to enable it to be replicated by a person with an ordinary level of skill in the relevant technical field. (ref. WIPO)

**Prior art**

To evaluate the patentability of an invention, a thorough prior art study must be performed. Prior art might be anything that proves that your invention (or a crucial part of it) is already known. It is
sufficient that anyone, anywhere, at any time has previously described or shown or made something that contains a use of technology that is similar to your invention. A prehistoric painting can be prior art as well as a drawing in a comic.

A prior art search may take a few minutes or many hours or even days. You must however be prepared to spend all the time it takes to be confident that you have done a proper search. The mission is to find evidence that disproves the novelty of your idea, invention, research results. Your hope is that you’ll fail, but try to be your own biggest critic and do not ignore evidence you may not like. Don’t just scratch the surface! Keep records of everywhere you look and everything relevant that you find. Also, update your prior art searches periodically as you develop your idea/invention.

Espacenet

Thanks to the Internet and to the international classification system used to organize inventions by subject, it is quite easy for inventors to do their own patent searching. The European Patent Offices' free database Espacenet (http://worldwide.espacenet.com) contains over 80 million documents worldwide.

To maximise your chances of finding relevant information, spend some time thinking of keywords or search terms which best describe your invention/idea. Obvious key words or general terms will be unhelpful. The most productive search terms may be specialist technical terms that you do not know. Being an expert in your field of research will allow you to identify these terms. It may also take a few preliminary searches to find better keywords. When you have listed the relevant keywords, prepare strings of up to four keywords (four is the maximum number when using, for example, Espacenet) in different combinations. Find plurals and variants and use truncations to cover them (in Espacenet one can use ‘*’).

In patent searches it is very helpful to use the patent classification system. Try to find out by a number of preliminary searches or by browsing in the list of patent classes (Espacenet provides a separate search function to find the proper patent class) the classes relevant to your invention/idea. It is important not to think too narrowly.

Patents as strategic tools

It is possible to use a patent application for purely temporary advantage and to decline substantive examination and abandon the application at some later stage. You might want to use it for long enough to attract potential customers and business partners, e.g. until publication of the application. Your published application will also be prior art, which could prevent competitors from patenting the same or a similar idea in the future. This might leave you with sufficient freedom to operate even if your application is not subsequently granted.
Note that patenting doesn’t necessarily exclude publishing, as long as you file the patent application before you publish.

Nevertheless, the almost certain outcome of abandoning a patent application is that it becomes much more difficult to license your invention to a company. A (granted) patent may also help to persuade investors that your idea is worth backing (in case of sufficient freedom to operate). Patents are usually crucial when spin-offs are looking for financing. Think of a patent as an instrument to generate licenses, research partnerships with industry, investment and funding, more than a means of protection.

The period between filing the patent application and substantive examination in various countries where you want to obtain patent protection, should be used to seek opportunities to exploit the invention. Many companies delay filing for patents until products are almost ready for market in order to gain as much profit as possible in the maximum patent term of 20 years. The disadvantage of early filing is that you may incur substantial costs before you know whether your idea is commercially viable and to have a license deal in sight. The disadvantage of late filing is that someone may file a very similar idea before you or that your idea becomes available to the public thereby ruining the novelty of your invention.

Ideally you have a good understanding of the exploitation options before you even file a patent application. You don’t want to spend thousands of euros on an invention that is eventually left with no exploitation options.

**Freedom to operate (FTO)**

Prior to initiating a new line of research that may lead to the development of a new product, it is important to ensure that the commercial production, marketing and use of the new product (or process or service) does not infringe the intellectual property rights of others. A freedom to operate analysis starts with a proper description of the product. From this, an FTO begins by a search of patent literature for (granted) patents and obtaining a legal opinion on whether the product may be considered to be infringing these patents owned by others. It is important to bear in mind some of the limitations of patents, such as: limited territorial patent protection, limited duration, limited scope of protection, legal status,… If the FTO analysis reveals that there are one or more ‘blocking’ patents one might consider the following strategies:

- purchase or in-license the blocking patent;
- cross licensing: exchanging license to use certain patents owned by two institutions;
- inventing around an existing patent;
- patent pools.
Enforcement of IP, infringement and litigation

Once a patent has been granted, the patent owner acquires the right to determine who can use his patented invention and under which terms and conditions. This exclusive right will last for up to 20 years from the filing date provided that all maintenance and renewal fees are paid. The exclusive right has two important consequences. Firstly, it allows the patent owner to license or sell the rights to the invention. Secondly, it allows the patent owner (or its licensee) to litigate anyone who infringes those exclusive rights.

An infringement is defined as the unauthorized making, using, selling, importing or otherwise of any product or process as outlined by any one of the claims of a patented invention. It needs to be enforced through court in the country where the patent was obtained. This is usually very complicated, expensive, unpredictable and lengthy.

To establish whether an infringement has taken place, the patent owner or a licensee of the patent needs to prove the following:

- that an infringing act has taken place;
- that the infringing act has taken place after the patent application has been published;
- that the prohibited act took place in a country where the patent has been granted;
- that the prohibited act was in relation to the monopoly found within any one of the claims of the patent.

Confidential information and non-disclosure agreements (NDA)

A major alternative to patent applications for protecting your invention is to keep the invention confidential. Confidential information is regarded as intellectual property; however it is not covered by a statutory IP right. To keep an invention confidential depends largely on your own common-sense measures, which you should take from the day you first have an idea. You should be safe when disclosing details of your idea to people whose professions require them to keep confidentiality when dealing with clients. These include TTI staff, patent attorneys, IP advisors, public servants at funding agencies,... When dealing with anyone else – companies in particular – you should disclose nothing without at least a signed non-disclosure agreement (NDA) and free forms of legal protection in place, such as copyright or unregistered design rights (for advice on this, contact the TTI). You should however try to avoid obsessive secrecy or a demand for payment before disclosing any detail.
Therefore, before talking to companies or individuals not bound by confidentiality, decide exactly how much you can tell them without describing the crucial parts of your invention. Focus rather on what it is and how good (or how much better) the invention performs than on what makes it novel and on how it works. Don’t discuss the technical aspects in too much detail but instead discuss the competitive advantages (cheaper, more reliable, easier to use,...). Furthermore, try to be diplomatic but firm on the need to restrict disclosure. Insist on signing an NDA (see p. 16) and if they refuse, walk away. Even if protected by an NDA, be very careful what you reveal to experts in your field. Prior to discussing your invention with third parties consider registering your invention by a notary or i-depot (for more information, contact TTI or check the Benelux Office for Intellectual Property (BOIP) website, www.boip.int). Registering your invention does not however provide any protection. It only provides evidence that somebody has infringed an NDA.

Confidentiality of a Master’s thesis

One needs to make a distinction between research results obtained by Master students and results obtained by researchers within the framework of an employment contract or grant. The IP rights to results obtained by Master students are not the property of the university. The following guidelines are important to take into account.

1) Students who in the course of their Master’s thesis research gain access to confidential information belonging to the university, are obliged to treat this information as confidential. Therefore, a confidentiality agreement needs to be signed, preferably at the start of the research project.

2) In case a student is involved in a research project in collaboration with third parties and the concluding research results are subject to valorization, the student has to transfer his intellectual property rights to the university in order to enable the university to comply with its technology transfer obligations. Anyhow, for any internal VUB project, the Master student is strongly advised to sign a confidentiality agreement and an agreement comprising a waiver of rights in order to safeguard the university’s ‘freedom to operate’ and IP. A model of such an agreement is available from the Technology Transfer Interface.

3) Concerning the defence of a Master’s thesis, it might be necessary to provide a confidential version of the thesis and/or a defence behind closed doors. The thesis student’s promotor is the best placed person to judge this. Both internal and external reviewers involved in evaluating the thesis need to sign a confidentiality statement, which is available from the TTI.

In each of these cases it might be necessary - before disclosure of any kind - to inform the Technology Transfer Interface about possible valorization opportunities that might arise from the Master’s thesis research results in order to take valorization possibilities into careful consideration with the Master student, the promotor and the TTI.
Trade secret

A trade secret is undocumented information known only to you. Without it, others may find it difficult or unrewarding to exploit your idea. This information is often commercially valuable and included in licensing agreements. There is however no way of registering it and it can be hard to establish. Be very careful about marking information as know-how and leaving information out of a patent application.

Copyright

Copyright protects you for many years against the unauthorized copying or adapting of drawn, written or photographic descriptions of your idea. It does not protect the idea itself. Copyright arises automatically and is free. With regard to copyright ownership issues: make descriptions, drawings, photos, etc, of your idea and copy them on a CD/DVD, place your documents/CD/DVD in a secure sealed envelope and have it registered (e.g. via i-depot).

In the case of software code (as is, not its implementation) copyright is the only protection available for computer programs in Europe since the European Patent Office (EPO) does not grant patents for computer programs as such. However, the EPO does grant patents on computer implemented inventions (CII). A CII is defined as an invention that works by using a computer, a computer network or other programmable apparatus. The technical effect of a CII must go beyond the inherent technical interactions between hardware and software.

Design right

A design right protects the outward appearance of a product including its shape, pattern, texture, decorations, etc. Unregistered design rights are free and are similar to copyright and allow you to prevent unauthorised copying. Use an i-depot to register your designs. Registered design rights provide a more robust protection and can last for up to 25 years. Applications can be made to most national IP offices, or to the Office of Harmonization for the Internal Market (OHIM) where a single application can be registered for the whole of the European Union. To be validly registered the design must be new and have ‘individual character’. You can take legal action against anyone who makes, sells, uses, or imports articles that look like what you’ve registered. The application is fast and relatively cheap but only makes sense when the outward appearance is a strong selling argument for your product.
**Trademark**

A trademark can be any sign that distinguishes your product from that of others. Trademarks can be valid indefinitely. A trademark associated with a popular brand name may be of enormous value to its owner. Trademarks do not protect ideas or products per se but link your product to your company. It is important that your trademark is sufficiently distinguishing. Therefore a trademark should not be descriptive of your product/service or contain generic terms. When you refer to your product, always mention the correct trademark and avoid using your trademark as a verb or in plural. This might lead to the dilution of your trademark. For example, a Kodak does no longer refer to the specific product of one company but refers more and more in general to a camera.

**Defensive publication**

A defensive publication is helpful in minimizing the risk of unwanted patent applications by third parties and in ensuring future freedom to operate. Once published, the invention described can no longer be patented by competitors. Publication will also help to promote your inventions. Therefore, it is recommended to mention in your publications that the invention described is patented. You can either refer to the publication number of the patent or (when the patent has not yet been published) you can mention that the invention is 'patent pending'.

Sources pp. 13-21
- MIT - Massachusetts Institute of Technology. An Inventors Guide to Technology Transfer at the Massachusetts Institute of Technology. web.mit.edu/tlo
Some thoughts and guidelines on publishing

The number of publications from the Vrije Universiteit Brussel steadily increases year by year. This not only yields better publication and citation ‘scores’ for the university, but also higher funding. Research performance, measured by publications, citations and PhDs, is indeed an important parameter in Flemish government policy, aiming at increasingly internationally competitive universities.

Optimal visibility of your research results is crucial for good communication towards colleagues in the field, and thus for the ‘impact’ of your research. All researchers are therefore strongly encouraged to actively participate in a good research publication culture.

**Generating maximal visibility & impact**

- Publish your research results in media that are read by as many researchers as possible in your domain (and if possible also in other areas), including a selection of international journals with a peer review system.¹
- Publish your research results in media that are easily accessible (in any case its contents) to a large part of the academic world, for instance in open access journals or in journals included in the citation-indexes of Thomson Scientific.²
- Provide as much as possible openly available full text versions of your publications, for instance in an institutional repository, on your own website or in a database organized by your research domain (always respecting rules set by editors or confidentiality agreements!).
- Enhance your and your team’s visibility in the international research community by collaborating with other research teams (in publications, projects, networks,...) and by referring to your partners and their work (in your publications, on your website,...).
- Take care that your correct and complete affiliation is mentioned in publications, in particular those that are finalized by co-authors. Mention the full university name ‘Vrije Universiteit Brussel’ or ‘Erasmushogeschool Brussel’ in Dutch, preferably accompanied by the abbreviation VUB or EhB and the address.

¹ Publications listed in category ‘C’ in the VUB Academic Personnel regulations and R&D-Net.
² While Thomson Scientific’s citation-indexes are a well-established data source for bibliometric studies, they do not represent all disciplines equally well, which is a well-known problem. Access through Web of Science: http://www.vub.ac.be/BIBLIO/, follow ‘SNEEL NAAR’ Web of Knowledge. Info on journal selection process: http://isiwebofknowledge.com/benefits/essays/journalselection/
VUB Pure Research Information System

For years, VUB researchers registered all publications in the VUB R&D-Net database on http://rednet2.vub.ac.be/vubrandd/. It provided a complete overview to colleagues in the field and was an important source for publication data and associated funding at university level.

In the first quarter of 2015, the Vrije Universiteit Brussel will start using a new Research Information System, Pure.

1) Pure is the source for mandatory information on research activities requested by the government as basis for its policy. Completeness and accuracy are therefore essential and is achieved by extensive validation. Furthermore, Pure is used to legitimate funding from the Ministry of Education.
2) The university makes use of Pure for policy-supporting research.
3) Pure is used as a source for the annual report of the Research Council.
4) Pure contains a curriculum vitae of every researcher, which forms the basis for academic personnel evaluations. Researchers can easily generate their personal CV at a click of the button.
5) Pure will also serve as a repository, allowing researchers to grant the general public access not only to information about their research, but also to the actual research outputs.

To get more information about the new system or to book a training session, contact svdbergh@vub.ac.be or check rd-ir.vub.ac.be.

Enhance the quality of your research results...

...by presenting them to peers reviewing your manuscripts for publication. It is good practice to aim as high as possible and publish in the most authoritative media for your domain. Established researchers know which these are through experience and are expected to assist junior researchers in building up a respectable publication portfolio in view of their future careers. Regarding journals, a rough idea of the most influential ones in a particular domain can be obtained by consulting their impact factors 1), or their category in international journal lists 2).

1) By ‘impact factor’ one is usually referring to the one calculated by Thomson Scientific, available through the Web of Science. Other variants also exist. An impact factor is linked to a journal and describes how often an average article is cited. The citation impact of an article depends on its quality, but also on its visibility to the right audience.

2) The European Reference Index for the Humanities (ERIH), an initiative of the European Science Foundation (ESF), involves lists of journals arranged in large categories per domain. These journal lists are to an important extent a reaction to the limited representation of disciplines from the Humanities in the Web of Science.
Collaborating with third parties and contract research

Collaborating with third parties

The Vrije Universiteit Brussel supports all R&D activities throughout the entire process, from scientific discovery and exploration of new knowledge, to invention and development. These activities touch a yearly research budget of more than 70 million euro, provided by project financing of different governments (45%), Flemish government support for fundamental research (13%), the university’s own funding sources (18%) and income from the private sector (24%). Because collaboration results in more value and creativity for all the partners involved than an individual investment of resources, the university establishes alliances with regional and worldwide economic players, the non-profit sector, policy makers and governments.

In this network of synergies, it’s not always easy to align the interests of all stakeholders. The handbook ‘Responsible Partnering’* issued by the European Commission highlights maximum beneficial use of public research and responsible use of public research and proposes a set of actionable guidelines to implement them. This for instance involves treating collaboration strategically, organizing lasting relationships and establishing clear intent. It is a must read for any researcher planning to interact with the industry.

In the context of a research collaboration or when providing scientific services, the university is subject to a legal and regulatory framework when collaborating with companies and other third parties. The provisions thereof are set by:

- the Flemish Decree of February 22, 2005 with regard to the scientific or social services by universities or university colleges and with regard to relationships of universities or university colleges with other legal entities;
- the Flemish Decree of June 12, 1991 with regard to the universities in the Flemish Community (in particular article 169 ter);
- the Regulation on scientific and social services;
- the Regulation on overheads;
- the Regulation on valorization.

Regulation on valorization

The transfer of knowledge from university to industry generates financial return to the university which subsequently can be reinvested in research. The Vrije Universiteit Brussel has developed a policy and code on the transfer of these research results to industry. These rules on technology transfer (see http://vubtechtransfer.be/for-researchers/downloads/codes/) can be summarised as follows:

- all research results obtained by researchers within the framework of their relationship with the VUB/EhB (so no master students!) are the property of VUB/EhB;
- all research results capable of commercialization or social implementation must be notified to the TTI prior to publication in order to assess the need for protection. (-> invention disclosure form);
- researchers shall provide all due assistance to the VUB/EhB during the technology transfer process;
- the VUB/EhB organizes the transfer of research results by a primary or a secondary procedure. The primary procedure denotes the procedure financed by the patent fund of the VUB or the EhB. The decision to initiate the primary procedure is taken after receipt of the disclosure form. If the VUB/EhB decides not to start or to stop the primary procedure, the research team is authorized to continue the secondary procedure autonomously at their own expense;
- all income acquired during the primary valorization procedure is distributed as follows:

1) one third of the net income (income after deduction of central management costs, overheads, and technology transfer costs, including costs for IP protection) is for the VUB/EhB patent fund;
2) two thirds, minus a possible deduction of a personal fee to the inventors, shall be awarded to the research team(s) to finance further scientific research;
3) a personal fee can be paid to the researchers and can’t exceed a total of more than one third of the net income.

Contract research

Every – however small – collaboration must be formalised in an agreement in order to confine legal risks. When negotiating a collaboration agreement, you should inform and consult the legal advisors of the Technology Transfer Interface in time. While preparing your deal setup, keep the following issues in mind.

Task description
A detailed description of the tasks to be performed by the VUB/EhB is essential, in particular with regard to the definition of the results.
Financial provisions
The total cost for the execution of a research project comprises the following elements:

1) all costs with regard to personnel, working, equipment and any other cost related to the project;
2) overheads (see regulation on overheads);
3) 21% Value-Added Tax (VAT)
   The financial department of the VUB/EhB is responsible for the invoicing, but this needs to be initiated by the promoter.

Intellectual property rights
Background knowledge of the VUB/EhB (already existing knowledge of the VUB/EhB which was not generated in execution of the project) remains at all times the ownership of the VUB/EhB and user rights can be granted under conditions to be agreed. The results generated in execution of the project can be made available under different forms (transfer of ownership, granting an exclusive/non-exclusive license, co-ownership, etc...). To be agreed on a case by case basis!

Publication
The right to publish has to be safeguarded and can be made subject to conditions to be agreed (when necessary for protection of confidential information or the research results).

Fair financial return
In case the results can be valorized, a fair financial return needs to be granted to the university. The distribution follows the previously described valorization procedure.

Warranties – Liability
The execution of a project can only be done on a 'best effort' basis. No warranties whatsoever can be granted. A limitation of liability of the VUB/EhB is essential.

Applicable law – Dispute resolution
Belgian law and the courts of Brussels have jurisdiction.

Screening and signing of contracts
Each contract needs to be screened by the TTI. Only the rector (VUB) or managing-director (EhB) is authorized to sign contracts! Promotors and co-promotors can co-sign.

Regulations on scientific and social services, valorization, and overheads can be found on www.vubtechtransfer.be/for-researchers/downloads

Contract templates with regard to the delivery of services by the VUB can be downloaded at: www.vubtechtransfer.be/for-researchers/downloads/forms-templates/
Starting a spin-off company

The establishment of spin-off companies (sometimes called 'spin-outs') is increasingly becoming a key mechanism of technology transfer. Spin-offs are start-up companies whose main activities are based on the formal transfer of research results originating from the university or university college. This transfer can take different forms (e.g. a license agreement or share capital participation) depending on the specific case.

In recent years, more than 20 of these start-up companies have been formed from within the Vrije Universiteit Brussel. For a documented overview, please visit www.vubtechtransfer.be/for-companies/vub-spin-off-portfolio/

A privileged relationship between a lab and a spin-off company is beneficial to the growth of the company, and certainly in its early stages. These agreements can refer, for instance, to rights on future results generated in the lab, the use of equipment and technical support, and the financial conditions for the use of these facilities.

Setting up a spin-off is an iterative process, during which one has to constantly (re-)evaluate earlier decisions based on new information. Nevertheless, some fundamental steps have to be taken and intermediary milestones reached in order to successfully progress towards incorporation, as depicted in the figure below.

Preparing for a spin-off: some reflections

If you're interested in establishing a spin-off, contact the Technology Transfer Interface to talk about your idea. It is an adventurous and complex process, during which you'll need the support and advice of as many skilled professionals as possible.
**Drop by @ TTI:** Every researcher who is considering a spin-off is welcome, even if the project is just at an idea stage. TTI loves to act as a sounding board even at the very beginning of the process. Just send an e-mail for an appointment.

**Know thy business:** It is not sufficient to have a unique technology. Being a business implies that you produce something for which people are willing to pay. Stop thinking only about technology and start asking: who are our customers? What is their problem? How do they solve their problem today? Why is our solution better? Many more questions will need to be answered as we move along.

**Know thyself:** Entrepreneurship is not for the timid. It will require drive, intelligence, perseverance, willingness to learn, nerves of steel,... But it is worth it.

**Team up:** Researchers must be aware of the fact that starting a spin-off requires a far wider skill set than is traditionally needed in research environments: business strategy, finance, sales and marketing, human resource management, negotiation skills, to name but a few. Most often a team of people from varied backgrounds (scientific, business) is required to bring together the required skill set.

**Get business training, now!** If you are a science/engineering researcher you will need some business training. Do it as soon as possible, to widen your horizons early on. The VUB offers a wide variety of educational programmes on entrepreneurship. TTI strongly encourages potential spin-off entrepreneurs to (have) follow(ed) some form of business training. More information is available at [www.vub.ac.be/lernenondernemen](http://www.vub.ac.be/lernenondernemen)

**TTI and you:** TTI is there to help you throughout the process of starting up a venture. But that is where we stop. You and your team will need to make it effectively happen: write the business plan, get the funding, run the business,...

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In collaboration with the educational team 'Technology Entrepreneurship' the TTI organizes yearly 'Starter Seminars' aimed at introducing business and entrepreneurship to young professionals. In eleven 3-hour sessions students and researchers are introduced to the main dimensions of entrepreneurship: defining a viable strategy in a complex business world, finance, marketing, IP rights, HR,... Recent graduates may have followed this programme during their studies, as it is now part of a range of Master programs at the VUB.

More information is available at [www.vubtechtransfer.be/partners/](http://www.vubtechtransfer.be/partners/)

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Sources p. 26-27
- GIELEN, Frank. 2007. 'Financieringsmechanismen voor starters'.
- NDONZUAU, Frédéric N. et al. 2002. 'A stage model of academic spin-off creation'. Technovation.
- U.S. Department of Energy. Industrial Technologies Program. 2007. 'Stage Gate Innovation Management Guidelines (V. 1.3)'.
Funding (the preparation of) spin-offs

Funding a start-up is yet another challenge entrepreneurs will face. TTI can show the way to different funding schemes offered by public authorities and commercial investors.

INNOVIRIS SPIN-OFF IN BRUSSELS
The aim of the LAUNCH programme (before ‘Spin-Off In Brussels’ (SOIB)) is to turn scientific research results into concise applications through start-up businesses in the Brussels Region. Every project’s finality is the economic valorization of research results by finetuning and launching a market proof product, procedure or service. Support lasts for two years and can be prolonged for a period of two years. During the first two years, financial support covers the researcher’s salary, working costs, education and business support. During the last two years additional funding is foreseen for economic assistance. More information: www.innoviris.be

INNOVATION MANDATES (IM)
IWT Innovation Mandates allow experienced, high-level researchers to significantly contribute to the industrial valorization of scientific research results. Both the relevance of the project for Flanders' economic tissue and the candidates' insights into valorization matters are crucial. Innovation Mandates exist in three different types, of which type 1 is specifically geared towards the preparation of a spin-off. Candidates are expected to show both strong scientific expertise and an entrepreneurial spirit, as well as prior knowledge of spin-off creation. More information: www.iwt.be

FINANCIAL RESOURCES
Depending on the required amount (which itself depends on the planned activities), one can choose from various sources of funding:
- the so-called 3F’s: family, fools & friends;
- Business Angels;
- venture capitalists (a.o. QBIC Fund);
- financial institutions;
- government initiatives.

QBIC FUND
QBIC Fund is the first inter-university seed capital fund. Its aim is to finance the technological spin-offs of three university associations - Ghent University Association, Brussels University Association and the Association Antwerp University & Antwerp Colleges (Associatie UGent, Universitaire Associatie Brussel and the Associatie Universiteit & Hogescholen Antwerpen). The new QBIC Fund is the successor of the Baekeland II-Fund of UGent and the BI3-fund of VUB. The two institutions pooled the expertise of their respective tech transfer services to improve the success of risk companies through economies of scale and further professionalization. Through the alliance, the promoters succeeded to achieve more than a doubling of the capital, resulting in an order of magnitude of 30 million in start-up, possibly even increasing in the second closing.
Besides the university associations, investment banks and public companies also invested in the new fund. Thus ARKimedes, the lever with which the Flemish government encourages fast-growing SMEs with venture capital, through the Participation Company Flanders (Participatiemaatschappij Vlaanderen (PMV)), committed to 12 million. The QBIC Fund recruited experienced investment managers in the field of venture capital to provide an international standing. The opportunities offered by the QBIC Fund will hopefully give a new dimension of dynamism to the community of researchers to upholster the pipeline of new spin-off projects. Due to the size of the fund, more capital-intensive spin-offs and inter-university ventures will be supported better and more easily. The fund will also support industrial spin-outs if they are based on substantial cooperation with the universities. They may also call upon funds from the business accelerator which aims, in parallel with IOF-funds for example, to deepen business aspects even before the spin-off is incorporated. More information: www.qbic.be

With a little help from our incubators...

The VUB co-manages two business incubators: IICB in Flanders and ICAB in the Brussels Region. They provide office space and a broad range of support.

**ICAB**
The 'Incubatiecentrum Arsenaal Brussel' (ICAB) became fully operational in October 2009. ICAB is located in the charming Arsenaal site next to the VUB campus in Etterbeek. ICAB is a business and service centre for entrepreneurs who want to launch a company in ICT or engineering. In order to offer start-ups logistic and operational support and a strategic service package, ICAB can rely on a multileveled network of technical, legal and financial expertise. ICAB operates in close collaboration with 'Gewestelijke Ontwikkelingsmaatschappij voor Brussel' (GOMB), 'Brussels Agentschap voor de Onderneming' (BAO), 'The Brussels Institute for Research and Innovation' (Innoviris), Agoria and Sirris. ICAB is a multistakeholder initiative of Vrije Universiteit Brussel, the Brussels Capital Region, the GOMB, with the participation of IMEC, Palladium Group, KBC Bank, Ethias and the BI3 Fund. More information: www.icabruessel.be

**IICB**
The 'Innovation & Incubation Centre Brussels' (IICB) offers young and dynamic enterprises, active in or planning to enter the market of high-technology products or services, the possibility to grow in an environment stimulated by the presence of other enterprises already active in similar fields. It is located in the Research Park of Zellik, close to the VUB University Hospital of Brussels. More information: www.iicb.be
ENTREPRENEURSHIP AND STARTER SEMINARS
For young researchers, starting up a business or simply getting in touch with the corporate world is not that obvious. For over ten years, the Technology Transfer Interface has been organizing seminars to raise awareness within the university about entrepreneurship, start-ups and research contracts with industry. In 2008, the TTI and the VUB department of Business Economics and Strategic Policy started a strategic alliance in order to organize a completely renewed and high-quality seminar series with renowned speakers from inside and outside the university. These seminars provide basic education on entrepreneurship and company management and treat different topics such as developing a business plan, finance, marketing, the complex issues surrounding patenting,... These seminars are especially targeted at students and researchers, but are open to anyone interested.
For more details:

TECHNOLOGY DAYS
Know-how and technology scouting form part of the TTI's daily functioning. Expertise acquired through academic research is not always brought to the outside world and as such valuable technologies and ideas, although not always developed for a specific purpose, are lost for innovative application. The TTI aims to bridge the gap between research at the university or university college and the industrial landscape. Always probing for new synergies and interaction formats with industry, the TTI regularly sets up matchmaking events and technology days in order to expose the latest state-of-the-art technologies to the outside world.

CROSSTALKS
Increasing complexity at many levels of the scientific realm demands for a strategic long-term approach based on more shared responsibility, a more efficient knowledge exchange and the establishment of common goals. CROSSTALKS, the university and industry network of the VUB operates as a neutral platform with a bottom-up and interdisciplinary approach. Through thematic encounters - congresses, workshops, publications, campustalks and Pecha Kucha Nights - CROSSTALKS aims at creating an open and constructive exchange between all stakeholders in society, beyond institutional and societal borders. Academics as well as CEOs, creative entrepreneurs, politicians, artists, architects and non-profit organizations are engaging in the CROSSTALKS networking concept.
For more details: crosstalks.vub.ac.be
Contact details and useful websites

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Technology Transfer Interface - rd.interface@vub.ac.be
www.qbic.be

**VIN-Het Vlaams Innovatienetwerk**
www.innovatienetwerk.be

**TTO Flanders**
www.ttoflanders.be
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