Features of Intellectual Property

Intellectual property (IP) is knowledge which is structured and presented in particular forms which allow it to be the subject of certain legal rights and to be tradeable.
Categories of IP are:

a) Patents
b) Copyright
c) Know how
d) Domain names
e) Trademarks
f) Designs
g) Breeders' rights

Before we discuss specific aspects which scientists and technologists can expect to encounter let us look briefly at some common features and differences between the main types. The table shows in outline the main features.

	Lifetime of IP protection / monopoly	**Costs/fees**	**Registration?**	**By whom register?**
Copyright	Normally life of creator plus 70 years	None	Not required	Not applicable
Domain names	Renewable	Low	Yes	Directly or through services of service providers
Trademarks	Normally 10 years, renewable	Modest, affordable for most entities	Required, by country or region. Normally fairly easy	Layman for simple marks, trade mark attorney otherwise
Patents	20 years, not renewable	Significant, an important factor especially for public research institutes	Required, by country or region. Can be complex and lengthy	Patent attorney

a) Patents

Patents are the most powerful and important form of intellectual property for scientists working on innovations.

A patent can be applied for to cover a new composition, product or process. It must be new (not previously known in the public domain), not obvious to skilled persons, and useful in the sense of solving some practical problem or generating something valuable to society.

Patent applications need to be made with adherence to certain logical structures (claims, delineating the scope of what rights can be claimed, description and examples). Drafting patent applications is almost inevitably work for patent attorneys specialized in the field. Great care must be taken to ensure that the description and structure of the patent application is correct and defensible, that the scope of claims is appropriate, and that the inventors are correctly listed as well as the legal entity applying for patent protection.

Patent applications only proceed to become granted patents after they have survived examination by the national patent offices. This generally takes several years and can involve considerable expense. A granted patent confers in principle a commercial monopoly (but be aware that third party patent rights may also be involved in exploitation, see below). The monopoly lasts for 20 years from the date when the patent application was first filed in the first country or region chosen.
The decision in which countries/regions to apply for patent coverage can be delayed up to 30 months from the date of first filing, but no longer. This time period allows more information to be gathered as to the value of the patent, taking account of the expense of filing, examination (separately in different countries or regions!) and maintenance during the life.

It is often said that patents are necessary to secure “freedom to operate”, but to practice the invention may be dependent on third party patent rights in addition. This can arise, for example, if the patent applied for is an improvement of a basic concept or idea patented earlier by another party. The holder of the original basic patent right may then blocks exploitation of the improvement or require compensation via a royalty or other form. The holder of the improvement patent may similarly exercise its rights if the owner of the basic patent would wish to apply the improvement.

Patent rights can be transacted (licences granted) and are thus an important feature of technology transfer arrangements. The existence of valid patents is often essential for start-up companies, being an aspect of value for investors and for offering licences to industry partners. Patent rights also provide a basis for valuation of developments and for providing rewards to inventors.

The patent literature is vast but fortunately good, searchable data bases exist which anyone can use with only a little instruction. The European Patent Office ESPACENET data base[1] is an excellent search engine for patents and published patent applications worldwide.

Some Perceptions and Issues with Patents

- Filing patents takes too much time and delays publication unacceptably.

  Scientists often make this claim. Some avoid patenting altogether for this reason. In practice, a patent filing can usually be submitted within days or weeks of the first conception of an invention. (The US patent office (USPTO) even has an online submission procedure available

[1] http://www.epo.org/searching-for-patents/technical/espacenet.html#tab1

to everyone at minimal cost (the so-called US provisional application), although care should be taken to have an experienced patent attorney formulate the text or the patent claims may be non-optimal). Whichever country or region is selected for a first filing, good preparation and discussion with a patent attorney are important in the process. With good planning delays can be avoided in publication and defence of PhD theses.

The issue is not really about time but about quality. The best patent application may depend on more research being done and early filing may therefore be disadvantageous. Individual patents from academic institutions may anyway have limited value if competitors dominate the patent landscape in the chosen field. Conversely, there are examples of cutting edge science from which patents emerge with enormous value in exploitation by industry or start-ups. There are also, regrettably, some examples of scientific breakthroughs which should have been patented but were missed.

These issues need to be evaluated case by case.

- Patents block innovation by complicating the sharing of data and resources.

  Within big, open access, pre-competitive sharing communities, intellectual property can sometimes be a block. Within the BMS infrastructures there are some good examples of networks based on working with such models where there are no intellectual property rights, or where these are not applied within the context of the collaboration.

  Such models ("open access", "expert centres" etc.) generally apply to pre-competitive research among a large network of participants.

  In other cases business models frequently depend on the existence of robust patents, and this should be appreciated in many instances of public-private collaboration.

CORBEL thoughts

CORBEL offers innovation assistance to 11 biomedical science infrastructures, spanning a whole range of different business models from open access data sharing to bilateral licensing and research collaboration deals involving intellectual property. The Innovation Office is aware of this diversity and will try to offer creative and tailor-made solutions appropriate to the various situations arising.

The Help Desk can give advice on IP issues but often such advice is readily available from the local technology transfer office (TTO).

In addition to help with specific cases, the CORBEL innovation initiative is also exploring wider cooperation in Europe in the areas of:

- Large consortia for sharing of data and resources to further accelerate innovation, making use of large scale European networks and initiatives (e.g. the EU Open Science Initiative, perhaps across a number of BMS infrastructures).
- Patent pools/incubators across a wide scope and infrastructure. These could avoid the problems of sub-optimal, fragmented patent filing thereby opening up the path for Open Innovation models and improving the chances for successful application of knowledge to society.

Information sources for patents

For more information visit the websites of the European Patent Office[2], the US patent and Trademark Office (USPTO)[3] and the World Intellectual Property Organization (WIPO)[4].

b) Copyright

Copyright is arguably the most widespread and pervasive form of intellectual property. Everyone comes into contact with copyright issues and certainly for research scientists it is an essential aspect of their work.
Written works (but also music, creative art and software) are protected by copyright, which prevents others from making copies.
Copyright is established in most countries without the need for formal registration. Publication in the public domain will establish it, and the copyright notices often attached to written works serve to emphasize and remind people but are not strictly required.
Copyright is free of charge. The legal right lasts much longer than for patents, in many countries for the lifetime of the creator plus 70 years. Copyright is therefore often passed down by inheritance, and can be the subject of family (inheritance) feuds!
As the rights restrict only the **reproduction** of a work the scope of protection is thereby limited in comparison with other forms of IP such as patents. Copyright is nonetheless licensable, as anyone seeking publication through a publishing house will know.
An important category for science is **software licensing**. Here the software code is protected, often in situations where patent protection is not possible. This can be an important issue in biomedical science if rights to use software need to be obtained from a third party.

c) Know-how

Know-how which is kept secret may be considered a category of intellectual property. There are examples of products which are protected from being copied by strict enforcement of trade secrets. Coca Cola is the best known example.
More generally, a product or process may depend critically on know-how elements which are difficult to embody in patents or perhaps tactically better kept secret. Although know-how is different from other IP categories in that it is not publicly disclosed, it can be the subject of license agreements.
In the context of publicly-funded research, keeping knowledge permanently out of the public domain is contrary to the principle of open publication. Increasingly there is a trend towards open access sharing of knowledge and underlying data, perhaps after patents have been filed but as soon as possible and making optimal use of on line facilities. Know-how as an IP instrument is therefore unlikely in public-private collaborations unless it comes from the private party.
Academic researchers may be confronted by know-how if this is an element of secrecy undertakings they are required to adhere to. As this may impede freedom to carry out research

[2] https://www.epo.org/index.html
[3] https://www.uspto.gov/
[4] http://www.wipo.int/portal/en/index.html

or to apply it commercially, this should be carefully assessed before secrecy undertakings are agreed to.

d) Domain Names

Domain names are important to (start-up) companies and to businesses in general. They are regulated by country or region, so that uniqueness is maintained. The fees for maintaining domain names are low. A registered domain name can be renewed and maintained indefinitely. To register a name it must be available, not having been previously claimed. This has led to some speculation by domain name "pirates" claiming names they expect will be in demand and can be profitably sold.
It is therefore important to take steps to establish if a desired domain name is available and to register it without delay. This can be done easily through the domain registration authorities.

e) Trademarks

Trademarks are a recognized way to brand a product, service or entity. They can be registered through the European Trademarks Office[5] or the World Intellectual Property Organization (WIPO)[6].
Registration is for a country or region and fees are payable to maintain the marks. Trademarks are renewable indefinitely but a condition is that they must remain in use.
The fees are less than for patents and are normally affordable for companies. The choice by country or region means that a company or entity can apply for marks in accordance with its geography, thereby containing costs.
Application for trademark protection can sometimes be done online, without the help of skilled professionals, for word marks or simple designs, but more elaborate marks require the help of trade mark attorneys. Marks must give differentiation and meet certain criteria.
As trademarks stand for quality, reputation and recognisability, they can accrue immense value e.g. for multinational enterprises, and can therefore be the subject of litigation if infringement is claimed. Trademarks are licensable.
Research scientists in public institutes are unlikely to be involved with trademarks except in the case of start-up companies or occasionally a product or service line for widespread use which will benefit from branding.

f) Designs

Design rights can be protected in the same way as patents but the scope of protection is limited to the design itself (as given by a drawing or such like) and is therefore much less powerful than protection offered by a patent (the embodiments and principles of a working product or device or process).

[5] https://euipo.europa.eu/ohimportal/en
[6] http://www.wipo.int/trademarks/en/

Design rights are encountered sometimes in combination with other forms of intellectual property. For example, the various features of a product may be protected by patents, designs, trademarks and copyright in tandem.

g) Breeders' Rights

This is a specialized area in respect mainly of protection for plant species obtained by breeding. It is unlikely to be relevant outside this field. More information can be found here: http://www.cpvo.europa.eu/

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Acknowledgment
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