



ONS and Intellectual Property

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This post is an excerpt from my dissertation which can be found here [via figshare](#).

Note: The contained information pertains strictly to the US legal system, and is based on information I (Anthony Salvagno) alone researched. I am in no way a lawyer and offer no legal advice, but thought it would be foolish to not share basic copyright and patent law policy for scientific consideration.

One of the biggest arguments I hear against open research is the fear about not being able to protect your intellectual property, also known as the fear of being scooped. The biggest oversight in that argument is that IP violations occur in traditional scientific culture both accidentally and maliciously. In an open environment, however, there is a greater risk of attracting this behavior if only because scientific research is made publicly available. With that said, there is nothing about being open that is any more inviting of harmful activity than in the traditional system. In fact, because of the current US legal system, being open may be more beneficial to protecting scientific information.

With regards to the US legal system, there are two primary protections available to scientists: (1) copyright law would protect recorded scientific information, for example data and ideas, while (2) patent law would protect scientific processes, production, procedures, etc.

Despite what is commonly believed, in no way does open notebook science prevent either protection from applying to scientific intellectual property. Open notebook science can actually stake your claim on IP and provide immediate protection. For patent law, patent protection is granted for one year once a work is publicly disclosed. If a patent is not filed, the IP becomes public domain and a patent can never be filed. In the case of copyright law, copyright applies from the moment of fixation (the moment scientific information is documented). In both cases, open notebook science can be used either as a defensive tactic to protect IP, or as an offensive tactic to prevent others from profiting from scientific IP.

COPYRIGHT LAW

Copyright law is essentially very simple, and has been made increasingly simple since it was originally expanded upon in the [US Constitution](#). The most recent addendum to this statute came about in the [1976 Copyright Act](#), which defined rights to copyright holders (exclusive rights), how copyright is achieved, and even what does/does not constitute infringement (fair use).

While the law is simple in principle, copyright infringement is not necessarily black and white. In some instances it is questionable as to what is even copyrightable. In others, the matter of fair use is debatable. Even when there is infringement, it can be tough to prove because there are varying degrees of copying or “borrowing.”

The bare-essential rules of copyright law can be seen in Table 1:

Copyright is applied immediately from the moment any work is tangibly recorded, both publicly and privately.

To be protected a work needs to be original (not novel) and there needs to be a minimum element of creativity (known as expression).

The exclusive rights provided to copyright holders are reproduction, distribution, derivation, performance, and display.

Copyright infringement is a federal offense!

Even though copyright is applied immediately, in order to file suit for infringement a copyright needs to be registered with the US Copyright Office.

A copyright is not violated if it has been determined that the infringer has a fair use of the material. Fair use is a broad definition and is only created as a defense in infringement suits.

Table 1: Bare-essentials of copyright law.

Rule 2 from Table 1 may reveal that copyright law doesn't apply to most of science intellectual property, because it is fact based and process driven. Patent law was developed for this very reason. While there are no statutes against having dual protection in the form of patents and copyrights, it is not likely to receive copyright protection if there is patent protection since the copyright lasts much longer than the patent. But that's not to say none of science is copyrightable.

In fact, journal articles are in fact copyrighted. It can be interpreted that there is creative expression in organizing scientific discoveries (which are fact based) and that would make them copyrightable. Journals hold the copyrights for publications and have exclusive right to copy and distribute the articles any any material contained within. And there are cases where they've tried to **enforce it**.

In that link, the author tries to distribute (via publishing in her blog) figures from a publication and receives a cease and desist letter. Unfortunately it will never be known if there was a violation because the infringement never went to trial. She made an argument for fair use, which probably has some grounds, but skirted around the issue by recreating the figures using the original data (which is NOT copyrightable), thus making her own original figures which are therefore copyrightable. There is a chance that she has no fair use argument since her reuse (even through attribution) is a clear violation of distribution rights and can be viewed as falling within the same scope of the original publication.

In the case of publications, scientists waive their copyright upon submission and acceptance for publication and dissemination, and grant that copyright to the journal. Not all scientific output is formatted for publication, or released at all. In that case, it would greatly benefit scientists to publish their figures via an open notebook to provide copyright protection for their research (if that is in fact the goal).

With regards to the traditional science system, scientists are offered protection from the moment they record their data and create figures based on that data. They are even protected at conferences where they present their research (either via an oral or poster format). This is specifically useful in the case of scientific scooping, which isn't as rampant as we make it out to be but is still a major fear in the community. If there is a case of potential copyright infringement, you have the right to file suit (once you apply for copyright). If you can prove there was access to your research findings and there is substantial copying you may even win your case.

If you are an open scientist, in that you publish your research findings online before peer reviewed publication, you may be in an even better position. You are granted the same rights as a traditional scientist. In the open case, however, the proof of access is much easier to demonstrate since a simple Google search can turn up your findings. The burden is then that you prove there is evidence of copying, which is hard enough as it is.

Because of all the possible interpretations of copyright application to science, I highly advocate the use of the **Creative Commons licenses**. The CC0 (public domain), CC-BY (use with attribution), and CC-BY-SA (use with attribution and share alike) afford the copyright owner the ability to share their research findings with the community and in turn allow the community to share, use, and reuse those findings without fear of retaliation. It is incredibly important to note that using the CC licenses (with the exception of the CC0) does NOT waive all exclusive rights as a copyright holder. They allow you to waive your rights as long as the reuser of the original work attributes, shares, etc (per terms of the license) in turn. If those stipulations are infringed, you are free to take action. In fact, there is **legal precedence of such action**.

The licenses provide a means for others to use information and data without worrying about moral ambiguities, legal issues, and in turn promote a culture of sharing and attribution. With the CC licenses there will be more societal pressure to do the right thing. When credibility is involved social pressure can work wonders.

For more information, please refer to the US Copyright Office **website**.

PATENT LAW

The **America Invents Act** was initiated in 2011 and institutes some new changes to patent law. The newest inclusion to the law is that now patents are given based on a first-to-file system, whereas previously they were given through a first-to-invent system. This change was implemented on March 16, 2013 as a way to conform to international policy, but also to decrease the burden of the **US Patent Office** in identifying first-inventor which can be extremely complicated and arduous.

In a first-to-file system, a patent will be granted to the first person to file a patent for a given invention. While the system is as simple as it sounds, it tends to give advantages to larger entities with the resources and efficiency to file patents for every invention conceived. It is outside the scope of this writing to argue the merits of a first-to-file or first-to-invent system, but this is mentioned because there are a couple of workarounds to the first-to-file mandate. The first is through the filing of a **provisional application**, and the second is through **public disclosure**. In both cases, there is a one-year grace period under which a patent must be filed lest it become public domain.

The provisional application is a low cost option that grants an inventor protection from competitive patent filings. **The fee** is \$125 for small entity inventors, such as individuals, and \$250 for large entities like corporations. The intellectual property remains a secret during the provisional period until patent. Public disclosure is a free alternative to the provisional patent, in the sense that there is nothing to file with the patent office. With this method, the details of an invention become public information, but no competitor may file a patent.

Scientifically speaking, patentable items include processes, designs, and technology of all sort (although computer programs are hard to patent or copyright). It is usually advantageous to maintain secrecy when dealing with intellectual property, and this culture is especially prevalent in science. As such many universities and institutions have legal services that aid scientists in patent filings. In an effort to maintain confidentiality, it is highly suggested by these services to file provisional applications for all inventions.

Much like copyright, the ultimate goal of a patent is to prevent competitors from stealing and reproducing a work without the inventor benefitting. It is little known fact that patents become public information after filing, generally **18 months after the earliest filing date**. It is entirely possible for competitors to analyze a patent and create a "**non-obvious**" derivation of the work that can then be patented. In this scenario the benefit of the patent application is essentially lost.

Open notebook science can be a major benefit to the new patent process. Since it does cost money to file a provisional application, ONS (or other web disclosure) would provide a free alternative to the provisional application. The only difference between the two routes is that through ONS, the patent is

immediately public information, while the provisional application maintains invention secrecy. Because the patent will eventually be public domain, the incentive to innovate is delayed a bit through the provisional process.

While ONS publicly discloses a scientific creation and encourages potential modification, it does not promote/encourage stealing the idea. Scientists are still protected from patent infringement. Now, if a competitor sees the notebook entries and makes non-obvious changes to the idea, then they can be granted a new patent, if filed. That is no different from how the patent process currently operates, it simply speeds up the process.

Filing a provision for every idea ever produced and paying \$125 every time is a waste of money and resources. It is highly unlikely that every idea/invention will come to fruition. It also gives the US patent office a lot of unnecessary paperwork, and could actually stifle innovation and creativity. ONS would in turn allow a researcher to disseminate their ideas and protect the best ones for the original creator. Resources could be better used to fight for the best ideas and allow others to develop the ideas that won't necessarily get the same level of attention or ever be produced.

In this way ONS could be used as a defensive tactic to protect a scientist from losing his/her best ideas. It is also possible for open notebook science to be used as an **offensive tactic**. In this maneuver, the documentation of ideas born from discussions or other endeavors creates **prior art** (which is essentially the same as public disclosure). An invention disclosed in prior art is exempt from patent protection. So in the case of public disclosure via ONS inventions would be blocked from filing for patent. Hypothetically, a researcher could publish any and all ideas, techniques, or technologies and prevent all competitors (and peers) from filing for patent.

In the interest of sharing research information, open notebook science may be the best protection against impediments in the scientific process.