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COPYRIGHTING DNA: AN OFF-LABEL USE

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POST *ASSOCIATION FOR MOLECULAR PATHOLOGY V. MYRIAD GENETICS* (“MYRIAD”) EVENTS ARE VIEWED FROM AN APPROACH WHERE CDNA IS DEEMED COPYRIGHTABLE SUBJECT MATTER. THE BASIC ANALYSIS SHOWS THAT THE IMPACT OF THIS PRONOUNCEMENT WILL BE FELT CONSIDERABLY IN AREAS OF INTELLECTUAL PROPERTY, NOTABLY PATENTS. THIS BASIC ANALYSIS MERITS CLOSER SCRUTINY AND PRESENTS AN EXTRAORDINARY CHALLENGE TO ESTABLISHED CONCEPTS, SUCH AS IDEA EXPRESSION DIVIDE, ABSTRACTION FILTRATION COMPARISON (“AFC”), MERGER DOCTRINE, AND FUNCTIONALITY DOCTRINE. THEREFORE, THE STRATEGIES USED IN FILING CLAIMS AND DEFENSES, ALONG WITH THE CHALLENGES THAT ACCOMPANY THEM, PRESENT RARE OPPORTUNITY FOR THE STUDY OF LAW AND ITS THEORIES.

THE ACTUAL HAPPENING OR NON-HAPPENING OF SUCH BOLD INCIDENT “CLAIM OF COPYRIGHT,” THOUGH UNCERTAIN, IS ENTIRELY DEPENDENT ON CHOICES MADE BY AN INDIVIDUAL. NEVERTHELESS, THE EFFECT OF SUCH APPLICATION, WHETHER IT RESULTS IN GRANT OR DENIAL OF COPYRIGHT, SHALL CERTAINLY LEAD TO LOSS OF PATENT.

I. INTRODUCTION

The momentum generated by the United States Supreme Court’s decision in *Myriad* has generated extensive discussion.¹ Additionally, this decision has led to substantial changes in researchers’ consideration of available intellectual property protection.² The United States Supreme Court unambiguously held that DNA, *merely isolated*, does not generate patent rights, when the court at length discussed the issue:

Myriad did not create or alter either the genetic information encoded in the BCRA1 and BCRA2 genes or the genetic structure of the DNA.

....

Groundbreaking, innovative, or even brilliant discovery does not by itself satisfy the §101 inquiry. . . . Myriad found the location of the BRCA1 and BRCA2 genes, but that discovery, by itself, does not render the BRCA genes “new . . . composition[s] of matter,” that are patent eligible.

¹ Jorge L. Contreras, *Narratives of Gene Patenting*, 43 FLA. ST. U. L. REV. 1133, 1134 (2016).

² MICHELE WALES & EDDIE CARTIER, *THE IMPACT OF MYRIAD ON THE FUTURE DEVELOPMENT AND COMMERCIALIZATION OF DNA-BASED THERAPIES AND DIAGNOSTICS 2* (2015), <http://perspectivesinmedicine.cshlp.org/content/5/12/a020925.full.pdf+html>.

Indeed, Myriad’s patent descriptions highlight the problem with its claims. . . . Myriad seeks to import these extensive research efforts into the §101 patent eligibility inquiry. But extensive effort alone is insufficient to satisfy the demands of §101. . . .

. . .
cDNA does not present the same obstacles to patentability as naturally occurring, isolated DNA segments. As already explained, creation of a cDNA sequence from mRNA results in an exons-only molecule that is not naturally occurring. . . . [T]he lab technician unquestionably creates something new when cDNA is made. cDNA retains the naturally occurring exons of DNA, but it is distinct from the DNA from which it was derived. As a result, cDNA is not a “product of nature” and is patent eligible under §101. . . .³

These words elucidate the position with abundant precision and also opened a forum to debate ‘cDNA and kind protection available for such. Even prior to this seminal decision another debate was already occurring, focused on copyrighting the DNA itself.⁴

This concept is supported by the legal theory of copyright as well as the Copyright Act of 1976.⁵ Before proceeding further, an inquiry has to be made as to what the *Myriad* decision provided and what it will lead to as well.

II. RATIONALE

Copyright as a concept and theory was borne to specifically protect an author’s art.⁶ “Art” originally meant writings.⁷ Over the years the definition expanded to include photographs as well as movies.⁸ It has

³ Ass’n for Molecular Pathology et al. v. Myriad Genetics, Inc., 569 U.S. 576, 590–95 (2013).

⁴ Irving Kayton, *Copyright in Living Genetically Engineered Works*, 50 GEO. WASH. L. REV. 191, 201 (1982).

⁵ *Id.*

⁶ *Copyright Timeline: A History of Copyright in the United States*, ASS’N OF RES. LIBRARIES, <http://www.arl.org/focus-areas/copyright-ip/2486-copyright-timeline#.W7vhfi-ZORs> (last visited Oct. 8, 2018).

⁷ See *The Statute of Anne – 1710*, HISTORY OF COPYRIGHT L., http://historyofcopyright.org/pb/wp_ff342f50/wp_ff342f50.html (last visited Oct. 16, 2018) (explaining the Statute of Anne was the first major copyright law and it provided protection to written works such as books).

⁸ See *Art*, ENG. OXFORD DICTIONARY (2d ed. 1989).

continued . . .

further evolved to include computer programs as basic elements of copyrights.⁹ These expansionist tendencies prove that the definition is flexible, and both courts and lawmakers may be willing to expand the definition further.

This question came to visit us again in 2013.¹⁰ The conundrum continues as the supposed articulation of a definition is still missing.¹¹ However, the U.S. Supreme Court has made it clear that natural DNA sequences are not patentable.¹²

The corollary of this decision is that synthetic or man-made DNA sequences are potentially patentable.¹³ This restatement does bring some clarity, but that clarity also brings problems. The resulting action is now going to be a scramble to get man-made DNA copyright protection. To some extent it will mean undoing work that willfully put considerable information into the public domain, such as the map of the human genome.¹⁴

A feature that needs to be understood is that copyright is one of the three most utilized intellectual property rights and is comparatively easier to obtain than a trademark or patent.¹⁵ This ease is shown mainly by comparing monetary costs, effort, and technical hurdles in cases of patent applications.¹⁶ The difference in difficulty is partly due to the fact that the primary test for patentability is substantial novelty. While originality is required for copyright, it is a diluted form of novelty, thus making filings for copyrights comparatively easier.¹⁷

An aspect that makes copyrights a very interesting phenomenon is the Berne Convention for the Protection of Literary and Artistic Works (“Berne Convention”) and the Universal Copyright Convention

⁹ *What Does Copyright Protect?*, COPYRIGHT.GOV, <https://www.copyright.gov/help/faq/faq-protect.html> (last visited Oct. 17, 2018).

¹⁰ *Ass’n for Molecular Pathology et al. v. Myriad Genetics, Inc.*, 569 U.S. 576 (2013).

¹¹ *Id.* at 579.

¹² *Id.*

¹³ *Id.*; see Kayton, *supra* note 4, at 199–200.

¹⁴ See Kayton, *supra* note 4, at 192–94, 210 (explaining that an inventor derives value from copyrighting an invention, however, it may be more advantageous for an inventor to keep invented material out of the public domain).

¹⁵ See *Copyright Basics*, COPYRIGHT ALLIANCE, https://copyrightalliance.org/ca_faq_post/difference-copyright-patent-trademark/ (last visited Oct. 3, 2018).

¹⁶ See, e.g., Lucas S. Osborn, *Of PhDs, Pirates, and the Public: Three-Dimensional Printing Technology and the Arts*, 1 TEX. A&M L. REV. 811, 835 (2014).

¹⁷ James L. Buchwalter, *Construction and Application of Copyright Act – Supreme Court Cases*, 24 A.L.R. FED. 3D ART. 6 § 10 (2017).

(“UCC”).¹⁸ These international treaties give published works universal protection.¹⁹ This trait is entirely missing when one deals with a patent application.²⁰ Unlike patent protection, which has jurisdictional limits, in the case of copyrights jurisdictional limits are mitigated due in part to the two abovementioned international treaties.²¹ It would likely be difficult for any intellectual property law practitioner to come across a case where a copyright has been denied under either the UCC or Berne Convention, unless of course publication took place in a non-member state.²² While in the case of patents, despite the presence of the Patent Co-operation Treaty (“PCT”), which allows one single application to be transmitted to all the signatory countries, the complexity of actual prosecution of patent application remains.²³ An applicant has to satisfy the novelty test in all jurisdictions.²⁴ Each country applies its own tests.²⁵ This is the case even when countries do share and have a

¹⁸ The Berne Convention for the Protection of Literary and Artistic Works, 828 U.N.T.S. 221 Sept. 9, 1886, *amended* Sept. 28, 1979 [hereinafter The Berne Convention]; Universal Copyright Convention, 6 U.S.T. 2731, 216 U.N.T.S. 132 Sept. 6, 1952.

¹⁹ See *Universal Copyright Convention*, ENCYCLOPEDIA BRITANNICA (July 20, 1998), <https://www.britannica.com/topic/Universal-Copyright-Convention>; see also *Berne Convention*, ENCYCLOPEDIA BRITANNICA (Apr. 12, 2018), <https://www.britannica.com/topic/Berne-Convention>.

²⁰ See *International Patent Protection*, FURMAN IP L. & STRATEGY, <https://www.furmanip.com/ip-law/patents/international-filing-options/> (explaining that patent protection is limited to the country where the patent is granted). *But see International Patent Cooperation*, USPTO (Dec. 8, 2017, 10:10 AM), <https://www.uspto.gov/patents-getting-started/international-patent-cooperation> (describing the Office of International Patent Cooperation intent to improve the international patent system by increasing certainty of international patent protection).

²¹ *International Patent Protection*, *supra* note 20 (“A patent only protects your invention in the country in which it is granted.”); see *Universal Copyright Convention*, *supra* note 19 (outlining how the Universal Copyright Convention expanded copyright protection beyond jurisdictional limits); see also *Berne Convention*, *supra* note 18 (outlining how the Berne Convention also expanded copyright protection beyond jurisdictional limits).

²² See Steve Schlackman, *Is My Copyright Internationally Protected?*, ART L. J. (Sept. 15, 2013), <https://alj.artpreneur.com/copyright-internationally-protected/>.

²³ *Patent Cooperation Treaty*, U. S. PAT. AND TRADEMARK OFF., <https://www.uspto.gov/patents-getting-started/international-protection/office-policy-and-international-affairs-patent> (last visited Oct. 8, 2018).

²⁴ *Id.*; see also *Patent Cooperation Treaty* art. 33, June 19, 1970, 28 U.S.T. 7645, 1160 U.N.T.S. (“The objective of the international preliminary examination is to formulate a preliminary and non-binding opinion on the questions whether the claimed invention appears to be novel. . . . For the purposes of the international preliminary examination, a claimed invention shall be considered novel if it is not anticipated by the prior art as defined in the Regulations.”)

²⁵ Jeffrey M. Kaden, *Patent Protection and the Novelty Requirement*, GOTTlieb, RACKMAN & REISMAN, P.C., <https://grr.com/publications/patent-protection-novelty-continued> . . .

common group like a combined European Application.²⁶ Even if you are in a European Patent Convention country, you are still limited within the group.²⁷

For a copyright applicant this is not the case.²⁸ What the applicant publishes in one convention country is accepted without discussion worldwide.²⁹

When we link these features together, we get a copyright system that can effectively bypass jurisdictional limits set under patent mechanism, while also providing an enormous term of protection with a low entry threshold.³⁰ This same logic can be applied to cDNAs. First, once a sequence-whole or snippet is published either in hard copy or online in a UCC or Berne Convention country, the author gets universal protection which would otherwise be hard to get.³¹ Second, this universal protection is obtained at an exceptionally small or near zero cost.³² Third, the requirement threshold for such is abysmally low, but the effectiveness is the same.³³

A plus-point for the author is there is no inventiveness test required.³⁴ This system presents a major benefit for the author and an unimaginable headache for the other researchers and authors. The benefits mentioned above are just a few, but there is one more benefit known as “spiking the guns” of your competitors.³⁵

In essence, publication destroys the concept of novelty which is

requirement (last visited Oct. 12, 2018).

²⁶ *European Patents – The Basics*, MEWBURN ELLIS, <http://mewburn.com/resource/european-patents-the-basics> (last visited Oct. 12, 2018).

²⁷ *Id.*

²⁸ The Berne Convention, *supra* note 18 at art. 6.

²⁹ *Id.*

³⁰ *Id.* at art. 7 (life of author plus 50 years minimum, signatory Countries are free to provide extended term).

³¹ LEXISNEXIS & SQUIRE SANDERS, INT’L ASPECTS OF COPYRIGHT 3 (Oct. 2012), <https://www.squirepattonboggs.com/~media/files/insights/publications/2012/10/international-aspects-of-copyright/files/international-aspects-of-copyright-practice-note/fileattachment/international-aspects-of-copyright-practice-note.pdf> (“Berne and the UCC create a system of reciprocity of copyright enforcement.”)

³² *See id.* (stating that a copyright owner covered under Berne or the UCC would not have follow particular formalities “such as registering their copyright in that country.”)

³³ *Fesit Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 362 (1991) (“The standard of originality [for copyright] is low, but it does exist.”)

³⁴ *Alfred Bell & Co. v. Catalda Fine Arts, Inc.*, 191 F.2d 99, 103 (2d. Cir. 1951) (explaining that unlike a copyrightee, a patentee must be the “first inventor or discoverer”).

³⁵ *Spike Someone’s Guns*, MERRIAM-WEBSTER DICTIONARY (11th ed. 2016).

continued . . .

central to a patent.³⁶ Once novelty, the most essential part of a patent, is lost then the entire endeavor of research is a worthless journey. As mentioned earlier, copyright does not demand novelty in the same breath and breadth as demanded by patent.³⁷ Copyright's lowered standard provides the first mover with a tremendous advantage.³⁸ For patents, the effect of publication is the same whether it is intentional or unintentional.³⁹ This is true regardless of the means of communicating with the public, whether it is by patent application,⁴⁰ as a research article, or as a book. Once published, it is published forever.⁴¹ But the very fact that it is published has the opposite effect on copyrighted works as it does on patents.⁴²

Publication means obtaining a copyright, while publication of a patent means permanent loss of said patent.⁴³ In this race of publish or perish, the meaning takes a really sinister connotation when one deals with patents.

Another aspect one needs to deal with is the differing terms these two protections offer.⁴⁴ Such differences shall become impossibly harsh when DNA is viewed as a copyright. One more thing that allows intellectual property rights to become even more effective is having one right does not preclude an applicant from having another right for the same work.⁴⁵

³⁶ 35 U.S.C. § 102 (2012).

³⁷ *Mazer v. Stein*, 347 U.S. 201, 218 (1954).

³⁸ Kathryn McMahon, *Interoperability: Indispensability and Special Responsibility in High Technology Markets*, 9 TUL. J. TECH. & INTELL. PROP. 123, 130 (2007).

³⁹ See ROBERT CALVERT, PATENT PRACTICE & MANAGEMENT FOR INVENTORS AND EXECUTIVES 95 (1950).

⁴⁰ See, e.g., Zbinden's Patent Application, [2002] RPC 13.

⁴¹ See *id.* at 318.

⁴² See SUBCOMM. ON PATENTS, TRADEMARKS AND COPYRIGHTS, COMM. ON THE JUDICIARY, 86TH CONG. COPYRIGHT LAW REVISION 2 (Comm. Print 1960).

⁴³ Compare 17 U.S.C. § 104(b) (2012), with 35 U.S.C. § 181–82 (stating that abandonment of the invention is a possible consequence for unauthorized disclosures or publications).

⁴⁴ Compare 17 U.S.C. § 106, with 35 U.S.C. § 271.

⁴⁵ See, e.g., *Mazer v. Stein*, 347 U.S. 201, 217 (1954) (“Neither the Copyright Statute nor any other says that because a thing is patentable it may not be copyrighted.”) (interpreting the Copyright Act of 1909, which was amended in 1976); *Oracle Am., Inc. v. Google Inc.*, 750 F.3d 1339, 1380–81 (Fed. Cir. 2014) (stating that the Supreme Court has made it clear that a work may be patentable and copyrightable in declining to hold that software programs are solely protected under patent law). See also Andrew Beckerman-Rodau, *The Problem with Intellectual Property Rights: Subject Matter Expansion*, 13 YALE J.L. & TECH. 35, 73 (2010) (“Simultaneously protecting the same aspect of a product – as opposed to different aspects of the product – under different bodies of intellectual property law” was historically rejected by courts, however, modern case law “has allowed such

continued . . .

While this may sound strange, taking a deeper look at the timelines required easily supports this conclusion.⁴⁶ This supposed oddity is possible if the applicant is willing to time his or her moves and act accordingly.⁴⁷ Such bidding of time enables the applicant to obtain twin protections from both patent and copyright.⁴⁸

This timeline allows an applicant to be the holder of patent and copyright simultaneously.⁴⁹ This is also the case regarding DNA, specifically cDNA.⁵⁰ U.S. Supreme Court's decision in *Myriad* expressly prohibited patent protection for naturally occurring DNA, but the opinion left out synthetically prepared DNA and cDNA.⁵¹ This means artificially prepared genes, synthetic genes, are protectable.⁵² Synthetic genome is nothing new to biology.⁵³ Similarly, it also includes strands and or snippets.⁵⁴

Post the judicial pronouncement in *Myriad*, an inquiry needs to be undertaken as to whether such protection is possible.⁵⁵ To achieve this end, one needs to take a close look at decision already made when the Copyright Act of 1976 ("Copyright Act) was amended in 1980.⁵⁶

The words in the Copyright Act refer to computer program only.⁵⁷ But if we use an expansionist view and read the same words in a broader sense, a qualitatively different result shall be obtained.

Current wording of the Copyright Act does limits scope. Section

simultaneous protection.”)

⁴⁶ See, e.g., Kayton, *supra* note 4 at 216 (discussing the sequencing of simultaneous copyright and patent protection as it applied to inventors of genetic works).

⁴⁷ See *id.*

⁴⁸ See *id.*

⁴⁹ See *id.*

⁵⁰ See *id.*; Ass'n for Molecular Pathology et al. v. Myriad Genetics, Inc., 569 U.S. 576, 594 (2013).

⁵¹ Ass'n for Molecular Pathology, 569 U.S. at 595 (“cDNA retains the naturally occurring exons of DNA, but it is distinct from the DNA from which it was derived. As a result, cDNA is not a ‘product of nature’ and is patent eligible under § 101. . .”)

⁵² See *id.*

⁵³ Stephen M. Maurer, *Symposia: End of the Beginning or Beginning of the End? Synthetic Biology's Stalled Security Agenda and the Prospects for Restarting it*, 45 VAL. U.L. REV. 1387, 1391 (2011).

⁵⁴ See, e.g., Stuart Fox, *First Live Organism with Synthetic Genome Created*, LIVE SCI. (May 20, 2010, 8:06 AM), <https://www.livescience.com/6486-live-organism-synthetic-genome-created.html>.

⁵⁵ Ass'n for Molecular Pathology, 569 U.S. at 596 (“Scientific alteration of the genetic code presents a different inquiry, and we express no opinion about the application of § 101 to such endeavors.”)

⁵⁶ Evan Finkel, *Copyright Protection for Computer Software in the Nineties*, 7 SANTA CLARA COMPUT. & HIGH TECH. L.J. 215, 215 (1991).

⁵⁷ 17 U.S.C. § 101 (2012).

continued . . .

101 of the Copyright Act states “a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.”⁵⁸ If just one word is replaced a different and broader meaning is possible. Replacing “computer” with “cell” would make the same section applicable to DNA/cDNA.⁵⁹

A synthetic biologist and biotechnologist/geneticist will confirm that there is no better way to describe role of either computer code and/or DNA code.⁶⁰

The question becomes if these two are so equal then why deny protection to one that is granted to another? The issues officially remain unresolved; however, there may be an unofficial resolution. Simply file cDNA details as printed per requirements of the Copyright Act and affix a copyright notice.⁶¹

This possibility is often overlooked because copyrights are looked at as applying to only serious works of art, best-sellers, and most certainly computer programs.⁶² However, the Copyright Act does not forbid an individual from being a publisher.⁶³ Any person can file his or her own work or get it published because upon completion of certain formalities copyright automatically attaches.⁶⁴ Plus if the work is published in either the UCC or Berne Convention countries, then the author gets world-wide protection.⁶⁵

The question then becomes whether an amendment to the Copyright Act is required to make copyright law cDNA/DNA friendly? The current form of the Copyright Act is very much copyright friendly, even though it is not explicitly stated.

As, the Copyright Act does not expressly or implicitly reject or forbid cDNA status as copyrightable material, the presumption is that it is copyrightable material.⁶⁶ In the absence of a clear no from the act,

⁵⁸ *Id.*

⁵⁹ See *Deoxyribonucleic Acid (DNA)*, NAT'L HUM. GENOME RES. INST., <https://www.genome.gov/25520880/> (last updated June 16, 2015) (defining DNA); see also 17 U.S.C. § 101.

⁶⁰ Matt Swayne, *Turning Biologists into Programmers*, PA. ST. U. NEWS (Oct. 14, 2013), <http://news.psu.edu/story/291323/2013/10/14/research/turning-biologists-programmers>.

⁶¹ 17 U.S.C. § 106.

⁶² See Lior Zemer, 4 *What Copyright Is: Time to Remember the Basics*, BUFF. INTELL. PROP. L.J. 54, 64 (2006).

⁶³ See 17 U.S.C. §§ 106, 201.

⁶⁴ *Id.*

⁶⁵ See *International Copyright*, COPYRIGHT.GOV, <https://www.copyright.gov/fls/fl100.html> (last visited Oct. 17, 2017) (explaining that there is no “international copyright,” but most countries offer protection to foreign works under the Berne Convention and the Universal Copyright Convention (UCC)).

⁶⁶ See Kayton, *supra* note 4 at 198–99 (explaining that the Copyright Act of

the presumption can be made that cDNA is copyrightable material.⁶⁷

Further developments of cDNA as copyrightable material will be straightforward as far as the Copyright Act is concerned. Still, an applicant should be aware that such use of cDNA is still a grey area. There is no official statement or pronouncement particularly denying or accepting described usage of the Copyright Act or its application. In terms of patent law, it may be denoted as an off-label use of the legislation. It is proposed that such use is possible by simply having a wider reading of the same provision of the Copyright Act by either registration authorities or judicial authorities.

III. OBSERVATIONS

As the Copyright Act does not clearly refuse the grant of protection to cDNA, we can move forward with the premise that cDNA qualifies for copyright protection. Consequently, the prospect of facing copyrighted cDNA is real. Thus, the problems that shall arise and will be faced are serious. Least of the problems is the term of protection that is the life of the author plus 70 years.⁶⁸

Copyright law was chiefly designed to protect artistic expression in form of writings, works of authors, paintings, etc.⁶⁹ These expressions have a built-in commercial value and support active trade and commerce.⁷⁰ Nonetheless, the subject copyright protects from depredations is of a different nature than cDNA. Copyright is more closely associated with paintings or sculptures that are one-of-a-kind when produced.⁷¹ While licensing the use of a book is a rather novel concept, it is not so for pieces of art.⁷²

Similarly, copyright protects the owner's right in form of expressions or writings.⁷³ Copyright does not prevent some other author from expressing that author's own creativity.⁷⁴ The second

1976 provides copyright protection from the moment a literary work is created and genetically engineered works, such as those that make up DNA, are literary works).

⁶⁷ *Id.*

⁶⁸ 17 U.S.C. § 302(a).

⁶⁹ Diane L. Kilpatrick-Lee, *Criminal Copyright Law: Preventing a Clear Danger to the U.S. Economy or Clearly Preventing the Original Purpose of Copyright Law*, 14 U. BALT. INTELL. PROP. L.J. 87, 93 (2005).

⁷⁰ *Id.* at 94.

⁷¹ See Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction*, in ILLUMINATIONS (Schocken Books ed., 1969).

⁷² *United States Copyright Office a Brief Introduction and History*, COPYRIGHT.GOV, <https://www.copyright.gov/circs/circ1a.html> (last visited Oct. 8, 2018) (describing the role and history of the U.S. Copyright Office).

⁷³ *Id.*

⁷⁴ *Feist Publ'n, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991) (stating that originality requires "only that the work was independently created by the author

continued . . .

author may write upon the same topic, use basically the same plot line, but treatment may still be different.⁷⁵ The second author also gets protection for the copyright for the work produced.⁷⁶ Likewise, a third author and fourth and so on and so forth may acquire rights.⁷⁷ Regardless, all the subsequent authors' works qualify for copyright protections.⁷⁸ For example, the specifics of the subsequent authors' written literary works can be similar, but cannot be worded the exact same way as the original copyrighted work.⁷⁹ This is the point where copyright diverges from patent. In patent, no additional application is possible on the same piece by a different applicant, unless the applicant shows further innovation.⁸⁰

(as opposed to copied from other works), and that it possesses at least some minimal degree of creativity”).

⁷⁵ See e.g., *Duffy v. Penguin Books USA, Inc.*, 4 F. Supp. 2d 268, 273 (S.D.N.Y. 1998) (“Although the books discuss the same subject matter in these passages, [the purported infringing book] does not mimic either [earlier book] sufficiently to amount to improper appropriation.”)

⁷⁶ Cf. *Sheldon v. Metro-Goldwyn Pictures Corp.*, 81 F.2d 49, 54 (2d Cir. 1936) (“[I]f by some magic a man who had never known it were to compose anew Keats’s Ode on a Grecian Urn, he would be an ‘author,’ and [could] copyright[] it.”)

⁷⁷ 17 U.S.C. § 101 (2012) (defining “derivative work”); 17 U.S.C. § 103(a) (providing copyright protection to compilations and derivative works); see generally *Twin Peaks Prods., Inc. v. Publ’ns Int’l, Ltd.*, 996 F.2d 1366 (2d Cir. 1993) (holding a book based on television scripts was a “derivative work” based on copyrighted work, where the book contained a substantial amount of material from the teleplays, merely transformed from one medium into another); *Polygram Records, Inc. v. Legacy Entm’t Grp., LLC*, 205 S.W.3d 439 (Tenn. Ct. App. 2006) (holding the copyright in a derivative work extends only to the material contributed by the author of such work).

⁷⁸ 17 U.S.C. § 103(b) (providing further that the copyright in such work is independent of, and does not affect or enlarge the scope, duration, ownership, or subsistence of, any copyright protection in the preexisting material); see generally *Stewart v. Abend*, 495 U.S. 207 (1990) (granting copyright protection to aspects of a derivative work added by the derivative author, but the element drawn from the preexisting work remains on grant from the owner of the preexisting work); *Rand McNally & Co. v. Fleet Mgmt. Sys., Inc.*, 591 F. Supp. 726 (N.D. Ill. 1983) (granting copyright protection over the preexisting material employed in a derivative work to a derivative author only when he contributes additional matter to the preexisting work that constitutes more than a minimal contribution to it).

⁷⁹ U.S. CONST. art. I, § 8, cl. 8; 17 U.S.C. § 107 (setting forth a list of factors to be considered in determining whether the use made of a work in any particular case is a “fair use”); see generally *Castle Rock Entm’t, Inc. v. Carol Pub. Grp., Inc.*, 150 F.3d 132 (2d Cir. 1998) (deciding whether an author had infringed the copyright of a television series, held that the author’s taking had crossed the de minimis threshold); *Warner Bros. Entm’t Inc. v. RDR Books*, 575 F. Supp. 2d 513 (S.D.N.Y. 2008) (holding the fair use doctrine is designed to fulfill Copyright Act’s purpose of promoting the progress of science and useful arts by balancing the simultaneous needs to protect copyrighted material and to allow others to build upon it).

⁸⁰ See 35 U.S.C. § 102(a)(1) (prohibiting a patent where the claimed invention

continued . . .

Conversely, in the case of cDNA, the expressions would be the same.⁸¹ Thus, making anything similar in existence is nearly impossible as the only possible expression is presented and published. This reduces any possibility of competing expression from a different author-researcher. Such expressiveness makes it ironclad; with no more room for maneuvering.

This aspect transforms copyright into that of patent.⁸² But such conversion of status was not what the legislators had in mind.⁸³ This is an unintended fall out of off label use of the Copyright Act. Furthermore, though copyright transforms into patent, but for the effects of application it remains copyright. The result is loss of convenience of various patent doctrines that are completely missing since these concepts are specially meant for patents 'lex specialis'.⁸⁴

With this as background, a researcher is faced with considerable hardship. He is facing copyright protected research with an enormous term of protection where working around the barrier is impossible.

This level of protection is something that makes a mockery of the intention behind the Copyright Act.⁸⁵ This happens because the first applicant gets patent protection; essentially it is a novel form of copyright that offers the protection of a patent without having the same strict requirements of a patent.⁸⁶

The patent process includes not only a novelty requirement, but also an extensive application.⁸⁷ Recall that the Copyright Act does not demand an application for protection.⁸⁸

Such ease of entry and impenetrable armor of protection will allow

was patented previously).

⁸¹ See Megan Krench, *New Supreme Court Decision Rules That cDNA Is Patentable What It Means for Research and Genetic Testing*, SCIENTIFIC AMERICAN (July 9, 2013), <https://blogs.scientificamerican.com/guest-blog/new-supreme-court-decision-rules-that-cdna-is-patentable-what-it-means-for-research-and-genetic-testing/> (explaining that allowing patents for cDNA will allow the patent holder to control certain field of research).

⁸² Compare 35 U.S.C. § 102(a)(1) (requiring novelty for patent registration), with 17 U.S.C. § 102(a) (requiring that a copyright feature an original work of authorship rather than novelty).

⁸³ Evan H. Tallmadge, *Patenting Natural Products After Myriad*, 30 HARV. J.L. & TECH. 569, 589 (2017).

⁸⁴ *Id.* at 590.

⁸⁵ *Id.*

⁸⁶ RICH GOLDSTEIN, ABA CONSUMER GUIDE TO OBTAINING A PATENT: A PRACTICAL RESOURCE FOR HELPING ENTREPRENEURS & INNOVATORS PROTECT THEIR IDEAS 34 (2016).

⁸⁷ DEBORAH E. BOUCHOUX, PROTECTING YOUR COMPANY'S INTELLECTUAL PROPERTY: A PRACTICAL GUIDE TO TRADEMARKS, COPYRIGHTS, PATENTS & TRADE SECRETS 162-63 (2001).

⁸⁸ *Id.* at 108.

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a lot of speculative publication.⁸⁹ In the modern era, satisfaction of the Copyright Act only demands that published matter be affixed with notice.⁹⁰ This is a very easy and inexpensive requirement to fulfill.⁹¹ However, the case of acquiring such new protection creates several new problems.

IV. DISCUSSION

The applicant/author of cDNA/DNA should take notice that the idea expressed above are easier said than done. If and when an author-researcher-applicant takes such steps and posts the grant of copyright to another who wishes to or undertakes the challenge, then the following dialogue shall demand a closer look. It presents certain defenses to the challenger who faces a daunting task of reversing grant of copyright post publication—a rare-event.⁹²

Any discussion about cDNA in the purview of copyrights, requires us to deliberate all the aspects that need to be raised when a challenge is issued to a cDNA copyright grant.

Comparing cDNA to computer programs is beneficial because the two have an equivalent subject matter of copyright. The applicant must face the same tests and requirements that govern the grant of copyright to computer programs when seeking protection of cDNA.⁹³ Therefore, cDNA shall be graded according to the same set of principles: the literal copying is prohibited along with non-literal work, but subject “to the extent that they incorporate authorship in programmer’s expression of original ideas, as distinguished from the ideas themselves.”⁹⁴

⁸⁹ Kayton, *supra* note 4 at 198.

⁹⁰ *Id.*; 17 U.S.C. § 102(a) (2012).

⁹¹ See Kayton, *supra* note 4 at 198 (stating that “[a]lthough most genetic works cannot be seen, the 1976 Act does not require visual perception. . . . Because genetic works are not visually perceivable, the genetic engineer is free from the burden of copyright marking in almost all instances.”).

⁹² 37 C.F.R. § 201.7 (2018).

⁹³ Christopher M. Holman, *Charting the Contours of a Copyright Regime Optimized for Engineered Genetic Code*, 69 OKLA. L. REV. 399, 431–32 (2017) (comparing the standards of copyright between cDNA and between software programs).

⁹⁴ *Computer Assocs. Int’l, Inc. v. Altai, Inc.*, 982 F.2d 693, 703 (2d Cir. 1992) (quoting H.R. REP. NO. 94-1476, at 54 (1976)).

A. Idea-Expression Divide

Clear separation between the idea regarding what the material is and the expression as to how to implement that idea is an accepted feature.⁹⁵ The same issue exists in patents as well, where ideas are non-patentable, but expression of the idea through invention is patentable.⁹⁶ Here the specifics of the expression are to be identified and separated from the rest of the clutter. In short specifics are protected, but wide-angle omnibus protection is not.⁹⁷ Such protection is available only to the extent of specific expression.⁹⁸ It limits the amount of protection the code has.⁹⁹ This policy has been a guiding beacon while dealing with software copyright applications.¹⁰⁰ As a result, the same is likely to guide cDNA copyright. Therefore, the limitation to absolute protection of a program's **structure, sequence and organization** is already present.¹⁰¹ The same guiding hand is the methodology that shall govern cDNA copyright and its relevant applications.

B. AFC- Abstraction Filtration Comparison

Already courts in both the United States and European Union have drawn sufficient distinction between their earlier concepts. We have a clear statement from the Fifth Circuit stating “we decline to embrace Whelan”¹⁰² Similar approaches in recent times have been taken by the

⁹⁵ *Id.*

⁹⁶ *General Information Concerning Patents*, U.S. PAT. AND TRADEMARK OFF., (Oct. 2015), <https://www.uspto.gov/patents-getting-started/general-information-concerning-patents>.

⁹⁷ *Computer Assocs. Int'l, Inc.*, 983 F.2d at 703.

⁹⁸ *Mazer v. Stein*, 74 U.S. 460, 470 (1954).

⁹⁹ U.S. CONG., OFFICE OF TECH. ASSESSMENT, INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION 61 (“For patents, the boundaries of ownership in an invention encompass only the novel features of that invention.”)

¹⁰⁰ Edward Samuels, *The Idea-Expression Dichotomy in Copyright Law*, 56 TENN. L.J. 321, 355 (1989).

¹⁰¹ *Computer Assocs. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 701–02 (2d Cir. 1992).

¹⁰² *Plains Cotton Co-op Ass'n v. Goodpasture Comput. Serv., Inc.*, 807 F.2d 1256, 1262 (5th Cir. 1987); *see generally*, Cary S. Kappel, *Copyright Protection of SSO: Replete with Internal Deficiencies and Practical Dangers*, 59 *FORDHAM L.R.* 699 (1991) (citing *Whelan Assocs., Inc. v. Jaslow Dental Lab., Inc.*, 797 F.2d 1222 (3d Cir. 1986) (discussing the internal issues within the case). In *Whelan* the court introduced Structure Sequence Organization (SSO), a concept to deal with matters pertaining to computer programs and copyright. By this decision protection to computer program was extended beyond actual code and also to structure sequence and organization of the program itself. This case ushered an era what many

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European Court of Justice (“ECJ”) in dealing with application programming interface.¹⁰³ The ECJ specifically stated: “neither the functionality of a computer program nor the programming language and the format of data files used in a computer program in order to exploit certain of its functions constitute a form of expression. Accordingly, they do not enjoy copyright protection.”¹⁰⁴

This position has generally limited the breadth of various claims and the follow-up verdicts have also provided incentive on a case by case basis regarding equally important fair use concepts.¹⁰⁵

The Abstraction Filtration Comparison (“AFC”) is now a kind of standard for specific expression, which a cDNA application will be subject to as well. The AFC tests clearly limit the breadth by distinguishing between a mere idea and its expression.¹⁰⁶ The next level filters out whatever is dictated by efficiency and expression mandated along with whatever is taken from public domain.¹⁰⁷

The opinions from courts both in the United States and ECJ are resolute as to what is protectable and what is not.¹⁰⁸

The problem that shall be faced is of a different variety and nature as cDNA which, by its very class, is a definite expression.¹⁰⁹ It will not

criticized as of excessive protectionism and suppressing innovation. *Whelan*, 797 F.2d at 1222. The SSO was replaced by the AFC test which was first introduced in 1992 by the Second Circuit. *Comput. Assocs. Int’l, Inc., v. Altai*, 982 F.2d 693 (2d Cir. 1992).

¹⁰³ Rachel King, *Programming Languages ‘Do Not Enjoy Copyright Protection’ EU Court Says*, CNET, (May 3, 2012, 5:01 AM), <https://www.cnet.com/news/programming-languages-do-not-enjoy-copyright-protection-eu-court-says/>

¹⁰⁴ Dan Farber & Rachel King, *Oracle v. Google Jury Returns Partial Verdict, Favoring Oracle*, CNET (May 7, 2012, 11:30 AM), <https://www.cnet.com/news/oracle-v-google-jury-returns-partial-verdict-favoring-oracle/>.

¹⁰⁵ See generally Matteo Mancinella, *Copyright Subject Matter and A “Light” for Designers’ Rights*, 29 SANTA CLARA COMPUT. & HIGH TECH. L.J. 523, 533–38 (2013) (discussing the ECJ’s position when dealing with application programming interface).

¹⁰⁶ See *Country Kids ’N City Slicks, Inc. v. Sheen*, 77 F.3d 1280, 1284–85 (10th Cir. 1996) (“At the abstraction step, we separate the ideas (and basic utilitarian functions), which are not protectable, from the particular expression of the work. Then, we filter out the non-protectable components of the product from the original expression. Finally, we compare the remaining protected elements to the allegedly copied work to determine if the two works are substantially similar.”).

¹⁰⁷ *Computer Assocs. Int’l, Inc. v. Altai, Inc.*, 982 F.2d 693, 707 (2d Cir. 1992).

¹⁰⁸ See Saby Ghoshray, *Interpreting Myriad: Acquiring Patent Law’s Meaning Through Contemporary Jurisprudence and Humanistic Viewpoints of Common Heritage of DNA*, 10 J. MARSHALL REV. INTELL. PROP. L. 508, 538 (2011).

¹⁰⁹ See Cary S. Kappel, *Copyright Protection of SSO: Replete with Internal Deficiencies and Practical Dangers*, 59 FORDHAM L. REV. 699, 704 (1991).

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be something taken from either public domain or anywhere else, and as mentioned earlier cDNA is a very specific expression.¹¹⁰ Therefore, having another bit/piece of cDNA doing exactly the same thing in a similar or identical fashion will be stretching it too thin.

At this stage copyright shall transform or mutate into patent, but may still have protection claims under the Copyright Act. Due to such transformation, the need arises to review the application for copyright protection using the multiple tests designed for this purpose.

C. Merger Doctrine- Functionality Doctrine

cDNA is purely functional, a totally synthetic creation operationalizing precise ideas of the researcher-applicant,¹¹¹ thereby making idea-expression separation impossible. An impasse is then reached as separation between the idea and expression is going to be difficult with cDNAs. Mirroring of one over the other is so complete that they become fused. One can't isolate the idea from its expression. The resulting position makes idea-expression separation impracticable, as what is one is the other.

This is parallel to “Scènes à faire” where certain characters are essential characters and are therefore non-protectable.¹¹² An issue arises when all of the characters are considered essential.

The Tenth Circuit¹¹³ addressed the question when it held: “hardware standards and mechanical specifications, software standards and compatibility requirements, computer manufacturer design standards, target industry practices and demands, and computer industry programming practices were un-protectable ‘scènes à faire’ for computer programs.”¹¹⁴

The resulting position makes revisiting certain aspects of assertion to protection necessary. Even if a challenger is successful, he may be left without a meaningful remedy. While reversal of a copyright may be possible, it is impossible to reverse the effects of what has been published and entered into public consciousness.

¹¹⁰ See *supra* text accompanying note 106.

¹¹¹ Richard Weinmeyer & Tobin Klutsy, *Supreme Court to Myriad Genetics: Synthetic DNA is Patentable, but Genes Are Not*, 17 AMERICAN MED. ASS'N J. OF ETHICS 849, 851 (2015) (defining cDNA as “synthetically created DNA”).

¹¹² See *Gates Rubber Co. v. Bando Chemical Indus., Ltd.*, 9 F.3d 823, 838 (10th Cir. 1993).

¹¹³ *Id.*

¹¹⁴ *Id.*

V. CONCLUSION

[cDNA's] road to copyright as proposed earlier is not a frequented road. With the passage of time authorities have come up with newer approaches or modifying existing responses to meet challenges thrown by newer obstacles in form of technology.¹¹⁵ This has led to reanalysis of existing thoughts and also modified existing responses, either in form of fresh look at regulations or amendments from the legislature.¹¹⁶

Whether in the form of modern theories like the AFC test or adapting older concepts like idea-expression theory or scènes à faire,¹¹⁷ the distance travelled will be considerable and is going to make tackling the issues difficult.

The complexity from standpoint of an applicant is in challenging existing or established set of order and from legislature's a likely well-reasoned and well balanced response. The author-researcher-applicant and the legislature are going to have to face this difficulty together. The applicant by challenging the existing set of order and the legislature by determining how to qualify/model the response. Every applicant shall have to find answers to tests and modify their application accordingly. The response cannot be that one accepts or repudiates it as a whole, but must be a reasoned reply.

The jury of peers is still out and the match is yet to begin. But one thing is certain, whether we shall see a bold move or not, the act of publication automatically grants protection.¹¹⁸ Undoing the act of publication and the ensuing effect on intellectual property is going to be a challenge!

¹¹⁵ *Id.*

¹¹⁶ *Cf.* Edward Samuels, *The Idea Expression Dichotomy in Copyright Law*, 56 TENN. L. REV. 321, 355–370 (1989) (analyzing how copyright theories could be applied to computer programs).

¹¹⁷ *Id.*

¹¹⁸ Rich Stim, *Copyright Protection: What it Is, How it Works*, STANFORD COPYRIGHT AND FAIR USE, <https://fairuse.stanford.edu/overview/faqs/copyright-protection/> (last visited Oct. 8, 2018).