

Cellular Agriculture and Intellectual Property Law

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Abstract

Intellectual Property (IP) rights have been inextricably intertwined with the emergence of transformative technologies as means to reward intellectual creation since the beginning of human ingenuity. Cell-cultivation technology to produce food for human consumption is no exception. From trade secrets to patents and trademarks, the production of food for human consumption using cell-cultivation technology confronts innovators, manufacturers, regulators and consumers with an array of challenges. What we understand as IP, and how we engage with it, will shape the contours of academic discourse, public policy debates and entrepreneurial success. Equally, encountering IP law at a multiplicity of levels, cellular agriculture as an emerging field of enquiry appears to challenge Lockean approaches to IP as a legal monopoly, questioning their limits to promote social progress. This chapter explores IP rights in cellular agriculture to elucidate the extent to which they are deployed to generate optimal public welfare. The central tenet of the proposition in this chapter, that ‘open science’ may be a critical element in a flourishing innovation ecosystem, reflects on the significance of calibrating IP rights to display societal benefits, and on the potential to construe cell-cultivation technology as a ‘technology of abundance’. Here, the argument is not that IP rights necessarily have to be operationalised as scarce resources to enable innovation. Rather, this long-held presumption of exhaustion is explored through a public interest lens, contending that IP law has the ability to invigorate multiple tonalities in new, sustainable global economic governance mechanisms, while being mindful of, and in fact amplify, a variety of seemingly unrelated elements uniting to address complex social challenges. It also offers reflections on reconciling diverging jurisdictional approaches to regulating IP that takes account of emerging legal risks in a post-scarcity economy.

Key words

- **Intellectual Property (IP):** refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce (WIPO 2022).
- **Trade secret:** type of intellectual property right on confidential information which may be sold or licensed (WIPO 2022)
- **Patent:** type of intellectual property right granted for an invention, which is a product or a process that generally provides a new way of doing something, or offers a new technical solution to a problem. To get a patent, technical information about the invention must be disclosed to the public in a patent application (WIPO 2022)
- **Trademark:** type of intellectual property right that affords protection to any word, phrase, symbol, design, or a combination of these things that identifies and distinguishes goods or services
- **Public interest:** theory of regulation positing that government regulation acts as enabler and warrantor of social welfare rather than the interests of well-organized stakeholders

- **Open science:** unencumbered access to scientific data from collaborative research to enable discovery (OECD 2021)
- **Technology of abundance:** an emerging concept that understands technology as eradicator of scarcity to ensure equality and equity (Kop 2022)

List of chapter objectives

- To examine the role of intellectual property in enabling cellular agriculture to display its potential societal benefits.
- To engage in IP strategic debates about the use of IP rights to promote the field of cellular agriculture, including trade secrets, patents and trademarks.
- To highlight complexities about the role of national regulatory frameworks in accommodating or hindering fast-paced biotechnological developments to solve pressing global challenges.
- To raise awareness about potential legal challenges to cellular agriculture products that use trademarks containing words with protected legal meaning in diverging domestic regulation, and its implications for the global food supply chain.
- To demystify intellectual property as inherently opposed to open science.

1. Demystifying IP in Cellular Agriculture

1.1. A Legal-Philosophical Approach to IP rights

Intellectual Property (IP) rights have been inextricably intertwined with the emergence of transformative technologies as means to reward intellectual creation since the beginning of human ingenuity. Cell-cultivation technology to produce food for human consumption is no exception. From trade secrets to patents and trademarks, the production of food for human consumption using cell-cultivation technology confronts innovators, manufacturers, regulators and consumers with an array of challenges. What we understand as IP, and how we engage with it, will shape the contours of academic discourse, public policy debates and entrepreneurial success in cellular agriculture.

Cellular agriculture as an emerging field of enquiry confronts IP law at a multiplicity of levels and appears to challenge traditional approaches to IP protection as a legal monopoly, questioning its limits to promote social progress. In other words, are IP rights always exclusive and excluding? A closer look at modern understandings of property through a legal-philosophical lens might shed light in the quest to demystify IP. More specifically, across the philosophical spectrum, we could locate a common denominator in the premise that, at its core, the main goal of IP protection is to grant incentives to innovate by awarding a legal monopoly. For example, Locke understood property as available for all those willing to exert labour for the creation of value – legitimising, in a way, both public and private property (Locke 1698). This understanding of the ‘commons’ lends itself well to suggest a state of abundance, rather than exhaustion or scarcity, even in legal fictions like IP protections. Conversely, Hegel proposed the idea of property as an extension of one’s personality, as means for self-realisation,

and hence worthy of legal protection (Hegel 1896). Here, the main premise is located in personality rights, and one could question to what extent personal rights could become public. This is a debate that often takes place within copyright discussions about moral rights (for example, celebrities and retention of image right). If intellectual property is a constitutive element of personality, it stands to reason that such an ‘exclusive monopoly’ can only be surrendered if, and only if, it enters the public domain.

In turn, the public domain, as an intangible territory for the commons, provides fertile ground for open access in science. At its core, ‘open science’ is a noble idea that seeks to mitigate the relentless commoditisation of information and knowledge societies. In this light, increasingly robust arguments advocating for ‘open science’ in cellular agriculture appear to run contrary to the fundamental rationale of IP protection. While the central tenet of the proposition here considers ‘open science’ as a critical element in a flourishing innovation ecosystem, this chapter also reflects on the significance of calibrating IP rights to display societal benefits. In other words, if the foundation of cellular agriculture lies in cell-cultivation technology construed as a ‘technology of abundance’ (Kop 2022), what are the legal implications, if any, for IP rights to promote ‘open science’? Here, I argue that IP rights do not need to be operationalised as scarce resources so as to enable innovation incentives. Rather, the presumption of exhaustion that underlies IP rights is explored through a public interest lens, contending that IP law has the ability to invigorate multiple tonalities in new, sustainable global economic governance mechanisms, while amplifying a variety of seemingly unrelated elements that unite in addressing complex societal challenges.

What this proposition is arguing for is that, so long as there is sufficient margin for the calibration of IP rights that take due account of public interests and policy imperatives, there is no need to curtail or abolish IP protection. Quite to the contrary, the (largely negative) role attributed to IP in egalitarian post-scarcity societies (Keynes 1932, Beebe 2019) could be restored, indeed reimaged, to solve complex global problems by taking account of the general welfare. As a result, this proposition situates IP as an enabler of both private and public interests, aiding the efficient allocation of resources to achieve an optimum in social progress (Tushnet 2018). View in this light, the initial allocation of IP rights to private parties is essential to ensure the display of public benefits from innovation and, rendering claims of ‘regulation by IP’ for cellular agricultural products (Johnson 2021) obsolete.

1.2. Cellular Agriculture and IP Regulation

At present, there is consensus among relevant stakeholders that the successful upscaling and manufacturing of commercial cell-cultivated foods, in particular meat, will require high-volume cell production in industrial bioreactors that use a serum-free medium (Post 2014). However, commercial success for cultivated meat, and arguably its ability to generate societal benefits, will only be possible in cases where levels of consumer acceptance are high (Bryant and Dillard 2019), and regulatory approval mechanisms are available (Stephens et al. 2019). In turn, regulatory responses will vary depending on the idiosyncratic environments they operate (de Amstalden 2022). While some jurisdictions may opt for a regulatory paternalistic approach (Dworkin 2013) to supporting the transformation of food systems, others are inclined to pursue

alternative paths to the same end -among others, ‘nudges’ (Sunstein 2014). This chapter does not address the depths of regulatory diversity and its impact on emerging (bio)technologies. While regulatory responses to cellular agriculture continue to be tested in a variety of jurisdictions at the time of writing, particularly in Singapore and most recently in the United States (US), this chapter will not deal with such considerations -which are best addressed in other chapters in this book. Instead, it will focus on examining whether and to what extent IP rights can be operationalised as part of a regulatory strategy to contribute to the successful development of cellular agriculture as a distinct field to the benefit of all societies.

Novel food safety and quality are not discrete issues in cellular agriculture; they constitute the pinnacle upon which the future effectiveness of global food systems can operate. As a result, this chapter explores the extent to which IP law has the ability to invigorate these multiple tonalities in new global economic governance mechanisms, while being mindful of, and in fact amplifying, a variety of seemingly unrelated elements uniting to address complex social challenges -like climate change mitigation, food security and animal welfare. Most prominently, it examines whether and to what extent the current legal architecture for trademark protection plays a role in determining trajectories that identify successful pathways to market for cell-cultivated foods. It also offers reflections on reconciling diverging jurisdictional approaches to regulating IP that takes account of emerging legal risks in a post-scarcity economy, and asks whether we are witnessing a paradigm shift, not only in our food systems, but also in our IP regulatory structures. This chapter proceeds as follows. Section 2 illustrates the initial cycle in the life of IP rights, that is, from trade secrets to patents. Section 3 focuses on the role of trademarks in obtaining market access and consolidating market share. Section 4 examines in detail how trademark rights are being applied, litigated and interpreted under the rules of the World Trade Organisation, revealing the interdependencies of global supply chains and regulation. Section 4 concludes with reflections on IP law as vector for social progress and proposes a modest, but forward-looking research agenda.

2. Trade Secrets and Patents: From Innovation Flourishing to Capital Investment

The right ecosystem needs to be in place for innovations to flourish. At the inception of any disruptive technology, spaces that allow for experimentation are key in promoting the flow of ideas that will ultimately result in products or services that benefit society. This first stage of technological development often meets one of the most challenging of IP rights: trade secrets (Dreyfuss and Pila 2017).

The law of trade secrets and confidential information will differ depending on the applicable legal framework, as it emerged from early efforts to provide equitable relief for breach of confidence (Turner 1962). Unlike patents, it is easier and quicker to obtain protection of trade secrets, as no governmental intervention is required (Lemley 2008). In fact, trade secrets only require reasonable efforts to conceal the discovery from others, relying heavily on confidentiality agreements, and in turn offering protection in perpetuity. The threshold for protection is, thus, considerably lower than the disclosure of discovery or invention as required in patent applications: no novelty or inventiveness required. Trade secrets are mostly used for recipes -famously like Coca-Cola- and demand strict confidentiality through a series of

confidentiality agreements. Trade secrets are best suited to products that do not lend themselves well for reverse-engineering, the most notable vulnerability in these type of IP rights.

While trade secrecy may provide selected benefits to innovators, overly relying on them as technological maturity advances is to be discouraged. Various jurisdictions have refrained from delineating the scope of application for trade secret law, a field of law that has traditionally fed from a number of other legal disciplines, like privacy and information law. Crucially for cellular agriculture products, using trade secrets as an IP portfolio strategy could be the least desirable pathway to protect future IP assets and gain market access. This is primarily so due to the paramount role of safety in the production of novel foods for human consumption, where lack of transparency runs contrary to heightened levels of consumer information. In the same vein, trade secrets are at a higher risk of exposure to discovery in jurisdictions with a legal obligation to disclose a list of ingredients used. As such, trade secrets are often used in cases where patentability requirements are not met -a thorny issue during the initial phases where capital investment is sought. Ultimately, it is a strategic decision, rather than a legal one.

While regulatory transparency requirements can be transformative, it is not the only factor with the potential to play a beneficial role in the shift from intensive agricultural practices to more efficient, sustainable biotechnologies. The benefits associated with the disclosure of new discoveries are numerous, and as such, are rewarded with exclusive rights. The time, then, seems right to examine other IP rights that consider transparency a *condition sine qua non*: patents.

Patents are designed to promote invention and innovation by granting patent holders a comprehensive competitive advantage against third party imitation in return for public disclosure of information about the invention (Granstrand 2019).

There are critical public transparency implications associated with patents. Misconceptions about IP rights, and patents in particular, have led the general public to believe that patents hide information from third parties. Quite to the contrary, a patent cannot be successfully filed without an accurate disclosure of its inventiveness. Public disclosure of information is the price to pay in return for a time-limited monopoly, essentially to recover research and development investment. As such, the protection afforded by patents is not confidentiality – as it is the case with trade secrets- but an exclusive right to use the invention and license the technology if so desired. Through this lens, market action relying on trade secrets as the main IP strategy would indeed run contrary to increasingly robust calls for ‘open science’ in cellular agriculture, for it is precisely the confidentiality demanded by trade secrets that considerably hinders technological development behind closed (and locked) doors.

For novel foods, patenting processes -as opposed to products- tend to be less stringent, as the patentability requirements of novelty and inventiveness are easier to meet. Patents also afford the benefits of awarding credibility, as well as the basis for licensing of technologies. In fast-paced technological fields, as it is the case with cellular agriculture, the term of protection conferred by patents is an attractive alternative that warrants the (at times onerous) filing procedures. It is telling that the last years saw a significant increase in the number of patent applications in the cellular agriculture sector (Ng et al. 2021). Arguably, this development may

be explained via a number of reasons, which are potentially two sides of the same coin. First, companies had no incentive to date to file for patent applications earlier to conserve their technological advantage over competitors through trade secrets law via enforceable confidentiality agreements, as we have seen previously. Secondly, companies could have been incentivised by venture capitalists to file for patents in order to successfully secure capital for expansion. Being mindful of the divergent promissory narratives in cellular agriculture discourse (de Amstalden 2022, Stephens et al. 2019), it is also conceivable that reluctance to publicise the obtention of patents in the cellular agriculture sector is connected to the potential for consumer confusion and the reinforcement of perceptions about the ‘unnaturalness’ of the novel foods.

Once patents have been granted and capital investments secured, the upscaling and commercialisation of cellular agriculture products will demand yet another adaptation to IP portfolio strategies to obtain market access and consolidate market share: trademark registration.

3. Trademarks: Obtaining Market Access and Consolidating Market Share

The predominately economic nature and essentiality of trademarks to branding provide an essential tool to differentiate a particular product from other similar products in the same market. As a result, the level of uniqueness and distinctiveness of a chosen brand, as well as its potential for securing a satisfactory trademark that allows for a successful market positioning, appear key. However, in cases where a trademark incorporates terms that have a defined meaning under national legislation, legal risks may increase. More specifically for trademark holders of cultured meat products, the current ongoing adoption of food recipe measures that (re)define the meaning of what constitutes “meat” has the potential to display long-standing and unintended effects in their conferred IP rights. Depending on the applicable domestic legal framework, some marks could be considered false, misleading or deceptive, if they do not comply with the corresponding definition of “meat”. Under this scenario, legal challenges from livestock-based meat producers on the basis of IP rights are likely, as food labelling measures could be construed as providing for a means to deter market access and consolidate competitive advantage.

3.1. What are Trademarks? On Conceptualisation

In essence, marks are defined as signs used to distinguish goods and services during the course of trade. Marks offer businesses the opportunity to establish an exclusive link between a product and the consumer through a distinctive sign. Trademarks serve many functions, among which the guarantee of origin, quality, communication and advertising are of a protected nature. As such, in cases where a recognised mark is used, consumers will assume that a given product is safer or of higher quality. Hence, public perception is paramount in establishing that a mark represents a connection between the trademark owner on the one hand and the goods for which that trademark is used on the other (Schechter 1927), as it indicates that certain goods have already given the consumer a satisfactory experience, and that bore the same mark.

3.2. *What are the Types of Trademarks? On Taxonomy*

Not all marks are subject to the same set of rules. Different trademark categories warrant the application of different legal provisions. In general, there are two main categories of trademarks: individual and collective marks. The latter can be divided into three subcategories: conventional collective marks, geographical indication marks and guarantee or certification marks.

Individual marks are those used by an individual manufacturer to distinguish his products from those of a competitor. In order to enable consumers to individualise products, the mark must also indicate its source. Thus, individual marks always originate from the same existing business.

Collective marks are used collectively by several manufacturers in a group to indicate either common origin or common qualities of their goods (Peukert 2012). They are used by the trademark owner, his licensees, as well as companies marketing a given good. They may even facilitate the diffusion of relevant market information about specific characteristics of a given product using that trademark. This, in turn, benefits consumers and ultimately has a positive impact on competition.

3.3. *Why do we need Trademarks? On Functionality*

As discussed earlier, the primary function of a trademark is to identify a product as satisfactory and stimulate further purchases by consumers. A trademark is not merely a sign of goodwill, but it embeds "agency for the actual creation and perpetuation of goodwill, imprinting upon the public mind an anonymous and impersonal guarantee of satisfaction" (Schechter 1927). While this traditional trademark theory about origin and quality has been recognised as the two main trademark functions, it is nowadays possible to discern new ones, such as advertising and investing (Wilkof and Wilson 2018).

The most important function of a trademark continues to be the ability to enable consumers to distinguish one good from another. Thus, a trademark aims at increasing purchases from consumers by identifying a good as satisfactory. It creates goodwill by imprinting in the public perception a guarantee of constant and unique satisfaction that will eventually (re)sell the good. Hence, the effectiveness of a trademark's selling power is directly proportional to its degree of distinctiveness. The more distinctive a mark, the deeper its impress upon the public consciousness, and the greater its need for protection against vitiation.

Conversely, the guarantee of quality function refers to trademarks as identified satisfactory sources that increase the selling power of the goods bearing them. The creation and retention of custom act as the primary purpose of trademarks, for which preservation of uniqueness is paramount to the trademark owner. Trademark owners are not legally bound to offer a constant level of quality in the goods bearing the mark. As a result, the risk of conveying misleading information has the potential to increase, because consumers will tend to purchase a good bearing a mark that they can associate with previous satisfactory experiences without effectively knowing whether that product complies with the high standards it used to. Arguably,

the quality function of a trademark imposes a *de facto* higher standard of compliance on its owner. Any failure to reach this threshold would lead to a loss of distinction and, conversely, of consumer trust and product sales.

More fundamentally, trademark protection finds its justification in preventing consumer confusion (Calboli and Haught Farley 2016). Its ultimate aim is to promote the ability of consumers to make purchasing decisions based on accurate information in the market. Trademarks constitute a scarce resource as signs are limited and may ultimately be constitutive of a market access barrier for competitors. As such, trademarks are key in securing and consolidating market share. Of relevance for cellular agriculture products, however, is that trademarks that include terms with a defined meaning under compositional food legislation will be more vulnerable to be construed as misleading or deceptive, opening pathways to legal challenges. This is at present the case with cultured meat products.

3.4. How do we Enforce Trademark Rights at the International Level? On Strategy

Responses to increasing legal challenges posed by tensions arising out of the interface of IP rights and market access have been the object of lively academic interest (Drexler 2008). As cultured meat producers accelerate efforts to commercialize their products, the importance of legal certainty surrounding trademark rights as enhancers of food labelling is predicted to increase. For example, ongoing regulatory battles for cellular agriculture products are fought at the front of domestic labelling requirements -as it is the case in the United States. The multitrillion global meat market is preparing for a disruption unlike any other in times past and how the word “meat” is ultimately defined will have a significant on global food supply, public health and the environment (Sexton, Garnett and Lorimer 2019). As a result, the uncertainty surrounding how cultured meat will be regulated in different jurisdictions can be potentially mitigated with the knowledge that legal disputes regarding IP rights are likely to be settled pursuant to the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). As it has been previously the case with the tobacco industry, it is plausible to entertain the scenario under which relevant stakeholders in the livestock-based meat industry might engage in aggressive litigation tactics to ultimately cause regulatory limitations (Puig 2018).

4. Trademarks for Cellular Agriculture Products under the TRIPS Agreement

The TRIPS Agreement is the only international agreement addressing substantive trademark law (de Amstalden 2023). For example, Art. 16.1 provides trademark owners are granted a guaranteed minimum protection (*US-Section 211*, para 186). It further establishes protection beyond the prior existent system of international trademark law conventions by guaranteeing trade mark owners “exclusive rights” that were previously limited to protection against unfair competition under Art. 10bis.3 of the Paris Convention. Crucially, and reflecting the general character of TRIPS, Art. 16 is drafted as a negative right of exclusion, as opposed to granting positive rights to exploit or use the trade mark (*EC-Geographical Indications*, para 7.210 and *Australia-Plain Packaging*, paras 7.1974 and 7.1978). Accordingly, Members remain free “to pursue legitimate public policy objectives” as they may determine when the conditions listed under Art. 16 can validly be alleged (*EC-Geographical Indications*, para 7.210). Moreover, in

accordance with Art. 16.1, sentence 1, the owner of a registered trade mark has the exclusive right to prevent all third parties not having the owner's consent from using, in the course of trade, identical or similar signs for goods or services which are identical or similar to those in respect of which the trade mark is registered -where such use would result in a likelihood of confusion. The protection afforded to trade mark owners in Art. 16.1, sentence 1, is two-folded in that it grants them protection of the trade mark's identity and protection against confusion – exclusively, however, against unauthorised use by third parties.

4.1. Trademarks are Only Protected in the Course of Trade

Notably, however, protection under TRIPS applies only where the trade mark is used *in the course of trade*. It is arguably the case that any use in a commercial or economic context could be construed as constituting use of a trade mark in the course of trade. However, a narrow interpretation of these terms may regard *use* for economic purposes alone, as in *use in the course of trade*. Art. 16.1 does not elaborate on the term “course of trade”, and it is thus for national legislators to define the concept in context. However, there is guidance to be found in the Panel's analysis in *Australia—Tobacco Plain Packaging*. Here, the Panel engaged in an interpretation of the terms “in the course of trade” within the context of Art. 20 (*Australia-Plain Packaging*, paras 7.2261-64). Considering once again the ordinary meaning of the term, the Panel concluded that the term covers broadly the process relating to commercial activities, and goes beyond the understanding of “trade” as only “buying and selling”. This interpretation, provided under Art. 20, could be used *mutatis mutandis* in Art. 16. Relatedly, Art. 16 fails in identifying the necessary legal steps which should be taken against the registration of a sign that is identical or similar to a trade mark. In this respect, Art. 15.3, sentence 1, becomes relevant by providing that Members “shall afford a reasonable opportunity for petitions to cancel the registration”.

4.2. Trademarks Protect Against Likelihood of Confusion

One of the key features of Art. 16.1, sentence 1, is the protection it affords registered trademarks against the likelihood of confusion. In essence, the object of this provision is to allow for contingencies in the event that trade mark owners are in need of protection “against certain actions by third parties in the course of trade, *if* a likelihood of confusion would arise from such actions” (*Australia-Plain Packaging*, para 7.1999). Most significantly in light of recent interpretation, there is no obligation on Members to maintain market conditions that would enable circumstances such as a likelihood of confusion “to actually occur in any particular situation” (*Australia-Plain Packaging*, para 7.2000). Rather, Members have the right to prevent unauthorised use, should the circumstances arise. In *Australia—Tobacco Plain Packaging*, the Panel asserted that Article 16.1 does not make Members responsible for the conditions in which those infringement criteria, such as a “likelihood of confusion”, can be fulfilled, let alone obligated to refrain from regulatory conduct that might impair a trademark owner's ability to maintain the distinctiveness of a sign in order to satisfy the “likelihood of confusion” criteria (*Australia-Plain Packaging*, para 7.2010).

The exclusive and negative nature of trademark rights under Art. 16 is evidenced in the latest Panel's reasoning of TRIPS. More precisely, the exclusive rights conferred by Art. 16.1 are

intended to protect the source-identifying function of a trademark against actual infringements by third parties. As such, the negative nature of the right in Art. 16.1 to prevent illegitimate third party uses “does not extend to an entitlement to maintain or extend the distinctiveness of an individual trademark” (Australia-Plain Packaging, para 7.2015). As elaborated earlier, the rights conferred are thus not intended to protect this source-identifying “function against waning distinctiveness due to other reasons, such as changing market conditions” or changing consumer preferences. The Appellate Body concurred with the Panel, stating that nothing in the TRIPS Agreement or the Paris Convention suggests that there is “a positive right to use its trademark or a right to protect the distinctiveness of that trademark through use” (Australia-Plain Packaging AB, paras 6.586, 7.7-10). Moreover, the Appellate Body stated in the same report that Art. 16.1 does not provide criteria for examining whether unauthorised third party “use of similar signs ‘would result in a likelihood of confusion’”.

In addition, Members are not responsible for safeguarding the distinctiveness of a sign, either before or after such signs have been registered as trademarks. The Panel in *Australia—Tobacco Plain Packaging* (para 7.2028) further elaborated that:

[t]he importance of use of a trademark is recognized in the TRIPS Agreement by conditioning measures that encumber such use in the context of Article 20, and by recognizing the right owner’s interest in using the trademark to maintain distinctiveness as a factor in determining permissible exceptions in the context of Article 17. At the same time, it is clear that obstacles to trademark use can and do legitimately exist, and that Members retain the authority to encumber the use of trademarks under certain conditions. The Panel further elaborated that the text of Art. 16 does not require Members to guarantee a minimum opportunity to use a trademark. It ultimately concluded that a reading of Art. 16 that entails an imposition upon Members on their level of discretion on the regulation of trademark use “could potentially render Art. 20 itself, which addresses this point directly”, void of meaning.

4.3. Limited Exceptions to Trademark Rights

Rights conferred to trade mark owners under Art. 16 TRIPS are limited by the exception clause set out in Art. 17. Members may adopt, at their own discretion, an exception to those rights conferred in their own domestic laws, provided that these measures take into account the legitimate interests of trade mark owners and third parties. The limited exceptions provided under Art. 17 arguably constitute a non-exhaustive list. As an example, Art. 17 mentions the “fair use of descriptive terms”. Guidance about this concept can be found in case law. Art. 17 was first interpreted in *EC—Geographical Indications and Trademarks*. In this case, the Panel considered whether the European Union’s scheme of coexistence between geographical indications and prior trademarks was justified under Art. 17. It ultimately concluded that the scheme, which allowed certain unauthorised uses of words registered as trademarks, would constitute a limited exception under Art. 17 in cases where the trade-marked phrase consisted of a protected geographical indication (EC-Geographical Indications, paras. 7.655-7.661).

4.4. *The Notion of “Limited Exceptions”*

Crucially, in *EC—Geographical Indications and Trademarks*, the Panel held that exceptions under Art. 17 must be narrow, because a literal interpretation of the language in this provision suggests that only a small reduction of the rights conferred on trademark owners can be accommodated therein (para. 7.650). As a result, a measure that qualifies as a limited exception will be consistent with Art. 17 so long as it does not render devoid of meaning the minimum standard of protection afforded to trade mark owners under other TRIPS provisions (de Amstalden 2013).

Hence, the term “limited exceptions” indicates that Members’ authority to provide for exceptions must be restrictively interpreted and must “not undercut the body of rules from which it is made” (EC-Geographical Indications, para. 7.650). An obligation to interpret the provision restrictively also follows from the inclusion of the word “limited” in Art. 17, suggesting that “[an] exception must be narrow and permit only a small diminution of rights”: it is an *exception* to the general rule provided for in Art. 16. Moreover, in light of the standard that is arguably set by the example of an unfair use of descriptive terms, the term “limited exceptions” is open to interpretation so as to cover those cases which pertain to the law of unfair competition. Consequently, the limited exception under Art. 17 manifests a binding purpose that demands consideration of other rights conferred under TRIPS, limiting it to the extent that is necessary to achieve competition law purpose(s).

4.5. *Rights Conferred by a Trademark and Balance of Interests*

Generally, Art. 17 does not define precisely which rights conferred by a trademark may be limited, although it can be inferred that it allows exceptions to the whole list of protections in Art. 16.1. The rights conferred on trademark owners under Art. 16.1 contain a number of elements, whose rights could potentially all be curtailed by an exception. More specifically, the Panel in *EC—Trademarks and Geographical Indications* noted that “[t]he overriding requirement is that the exception must be ‘limited’” and must take into account the legitimate interests of trademark owners and third parties (para. 7.653). In *Australia—Tobacco Plain Packaging*, the Appellate Body held that a Member would need to rely on Art. 17 to defend an adopted measure only in cases where the obligation to give effect to Art. 16.1 was not met (para. 6.612). Conversely, a violation of the rights under Art. 16.1 must be established before an examination of a possible infringement of Art. 17 can take place.

4.5.1. Legitimate Interests of the Trademark Owner

Exceptions under Art. 17 are subject to the balancing of the interests of trademark owners and those of third parties. Arguably, an exception under Art. 17 will inherently harm the interests of the trademark owner. The limits on Art. 17, however, reveal that the permissibility and relevance of an exception, once acknowledged, will not fully curb the rights of the trademark owner - a fact further emphasised by the use of the words “limited exceptions”. The balance of interests should then be examined as regards its reasonableness and/or appropriateness. While it is unlikely that fair use of a trademark could completely or largely reduce the dominant position of the trademark owner, it is conceivable that impairment of the rights conferred to the

owner would fail to pass the balancing test.

Specifically, the Panel concluded that the concept of “legitimate interests” is to be understood as a normative claim that calls for the protection of justifiable interests backed by relevant public policies and other relevant social norms. This was also suggested by the Panel in *Australia—Tobacco Plain Packaging* in the context of Art 20 (paras. 7.2426-7). This suggestion was not disputed by the Appellate Body in its report (paras. 6.652-3). In conducting its analysis, the Panel in *EC—Trademarks and Geographical Indications* emphasised the distinction between the legitimate interests of trademark owners, on the one hand, and the rights conferred by a trademark on the other, stating that the former should not be confused with, and equated to, the enjoyment of full legal rights under Art. 16 (para. 7.662). The Panel subsequently considered that the economic value of a mark, its reputation and its indication of quality constitute “legitimate interests” within the meaning of Art. 17 (para. 7.664). Arguably, the non-exhaustive nature of rights conferred on trademark owners under Art. 16.1 indicates that their legitimate interests exceed those rights arising out of the use of a mark in the course of trade, and also encompass those rights stemming from, for example, the unauthorised use of a mark outside the course of trade and resulting collateral infringements (de Amstalden 2012). As a result, the establishment of a legitimate interest by trademark owners will give rise to a right to defend that interest.

4.5.2. Third-Party Interests

According to Art. 17, limited exceptions to the rights conferred are necessary to balance the legitimate interests of trade mark owners with those of third parties. As with the legitimate interests of trade mark owners, the establishment of a legitimate interest by a third party gives rise to a greater likelihood of creating legally enforceable rights (Calboli and Haight Farley 2017). For example, the Panel in *EC—Geographical Indications and Trademarks* considered that the interest of consumers in being able to distinguish between the goods of different undertakings in order to avoid confusion amounted to a legitimate interest of third parties for the purposes of Art. 17 (para. 7.676). This reading could suggest that Art. 17 has the potential to impose a lesser standard of regard for third party interests (de Amstalden 2013). To date, however, Art. 17 has been interpreted as equally treating the legitimate interests of third parties with those of the right holder. Legitimate third-party interests will include both those of parties aligned with the interests of trade mark owners, such as licensees, and those of parties whose interests are opposed to those of trade mark owners, like competitors or consumers.

In particular, and since compulsory licences cannot be regarded as third-party interests pursuant to Art. 21, consumer interests, like the interest in being protected from deception when the trade mark is used by another competitor, should be considered a legitimate third-party interest under Art. 17. This is even more so because misleading uses of a trademark are already contrary to the concept of fairness, to which use of the exceptions in accordance with Art. 17 is generally subject.

5. Forward-Looking: IP in Cellular Agriculture as Vector for Social Progress

A sustainable IP strategy for cellular agriculture products will take into account that different IP rights will be of relevance at different stages in technological maturity. Trade secret law,

while not a pure IP right, has the potential to accommodate the flourishing of ideas at early stages of development, as any information with potential commercial value will be protected - primarily through a series of contracts or contract-like circumstances that ensure strict confidentiality. Successful patent applications will become relevant once the innovative step could be identified and replicated, as most likely allowed for by the protection previously conferred via trade secrets. They will also become relevant in cases where the innovation protected by trade secrets can be easily reverse engineered. In turn, patents will aid the flow of capital to pilot and scale up the technology. Once investment and upscaling equip IP right holders with the necessary tools to begin commercialisation, trademarks become key in obtaining market access and ensuring market share.

While inherited, performative IP law may be fit for purpose at present, adjustments might be necessary to appropriately manage the benefits and risks posed by emerging fields like cellular agriculture. It remains to be seen whether these IP legal structures provide the optimal framework for cellular agriculture to display its potential societal benefits, while promoting innovation. The importance of scientific replicability to ensure human progress cannot be understated and lends itself well to reconciliation with the main rationale for IP protection, that is, to reward intellectual creation. What we understand as IP, and how we engage with it, will shape the contours of academic discourse, public policy debates and entrepreneurial success. Trademarks, in particular, are critical in addressing information asymmetries and mitigating uncertainties in free markets, even in post-scarcity economies.

This chapter explored IP rights in cellular agriculture to better understand the extent to which they are deployed to generate optimal public welfare. More generally, it also elucidated how is open access, and not open science, the critical element in a flourishing innovation ecosystem. These nuances are important, because they reflect on the significance of calibrating IP rights as a vector for social progress. Engaging with legal interpretations of ‘rights conferred to IP rights’ holders’ through a public interest lens, this chapter demystified the long-held presumption of exhaustion as equivalent to ‘exclusive’ or ‘negative’ rights to enable innovation. Just as cell-cultivation technology has the potential to be considered a ‘technology of abundance’, IP rights can, and indeed, should be construed as an abundant resource. In doing so, it demonstrated, with trademarks as an example, that IP rights have the ability to invigorate multiple tonalities in new global economic governance mechanisms, while being mindful of, and in fact amplify, a variety of seemingly unrelated elements uniting to address complex social challenges. Whether IP rights as public interest mechanisms succeed in advancing policy considerations to reimagine food systems through cellular agriculture merits further empirical research.

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