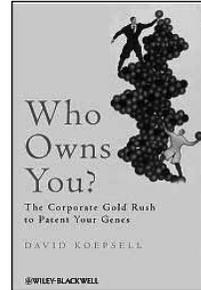


Book Review

'Who Owns You? The Corporate Gold-Rush to Patent Your Genes

Author : David Koepsell
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Genes can be, but ought not to be patented – this is the book's central argument. The patent act, as it has been interpreted in the US gives exclusive rights to the first inventor for selling his/her new, useful, and non obvious invention or improvement upon an existing invention. Patents do not protect ideas but exclude others from the use of those ideas. They do protect processes, methods, manufactures, and composition of matter. Genes, under certain conditions, can be patented in the US. Because of several international trade agreements patents on genes filed in the US, have consequences also in other world regions (e.g. the European Union, India). However, the author argues, genes just happen in nature; therefore, the act of locating and isolating genes does not give the discoverer (who cannot be seen as an inventor) any moral right which could lead to ownership claims.

The introductory chapter brings the reader into the realm of gene patents by briefly explaining the basic foundations of molecular biology.¹ There, the provocative tone already evocated by the book's title is set by sketching an imaginary scenario in which we (that is, human beings) are robots, whose (which?) composing parts are patented and who, therefore, cannot reproduce themselves without risking a patent suit. This imaginary and dystopic scenario is followed by a less hypothetical scenario, this one of the so-called Elephant Man whose physical deformity was exploited by others for (what could have been primarily defined as) economical enrichment purposes. This last scenario is metaphorically used to introduce the reader into the book's (interesting) central dilemma: is it right to exploit natural phenomena – that is, genes?

This same reader is sluggishly introduced into the subject matter – this, however, in some way, might facilitate the lecture by a public unfamiliar

with the research topic. The introductory chapter plus chapters one, two and (part of) three could have been shortened and integrated within an introductory chapter, as, independently, they do not go in depth into the tackled topics. A case in point is the first paragraph of chapter three (page 50 of a book of 170 pages) in which the very basics of DNA are provided. Notwithstanding this, in these introductory chapters, the author lays on the legal, biological and ethical foundations of the research topic, and, therefore, of the book. Explaining, for instance, how on the one hand, intellectual property law is an expedient designed to improve economic efficiency, because it rewards innovators who make 'public' their findings (by patenting them) by giving them the monopoly over their findings within an established period of time after which the invention falls into the public domain. But how, on the other hand, gene patents have implications on ethics and public policy when, for instance, more than 20 per cent of 'the human genome has already been patented and genes throughout the natural world are being mined for potential wealth right now' (page 19).

Moreover, in these same introductory chapters, the author claims that the novelty of his work on genes and patents is because he analyzes the ontology of genes through the exploration of the underlying relations among genomes, genes, individuals, persons, and species. This is alleged as innovative because, from the author's point of view, within the field of ethics a relevant question is: 'how do we reach a consensus about ethical dilemmas posed by radical new technologies when philosophers have never succeeded in reaching consensus about ethical theories in general?' (page 40). For instance, the consequentialist, kantianist, and emotivist schools approach the topic by informing their core values, which are, respectively, utility, universalizability and duty, and aesthetic feelings. That is why, Koepsell argues, these schools will never reach a consensus to distinguish between 'good' and 'not good' unless they can shift opponents over to their choice values. Accordingly, within this field, the book is aimed at building a methodological bridge among ethical investigators grounding, therefore, ethical studies on something objective, that is, studying the nature of the objects at stake, doing ontology – in this case, of genes, persons, and property rights. My knowledge as regards the foundational schools of ethics is too limited to warrant a judgement as to whether this objective is relevant or achieved.² But, to those in a similar situation, I can say that, this ethical background does not distort nor obstruct the lecture of the book with its relevant implications also for policy making, economics, innovation studies, politics, or sociology.

The book provides a historical overview of the most important findings which has defined DNA as the information storage and processor of heredity. Starting with Mendel's empirical means to determine the statistical truth of inheritance for certain traits (e.g. colour) before the underlying genetics were found; that is, DNA as the medium for genes and, therefore, for genetic inheritance. However, how do genes direct this complex process, the author extends the analysis, is an intricate dance, involving not only DNA, but also, other helpful molecules as well as the environment. In this way the author reaches the epigenetical formula: genes + environment = person. Meaning that genes can't be thought without the environment (natural and social, one could argue) and our environment does not exist without genes; as the environment is (partially) shaped by individuals (e.g. human beings) who in turn are partially shaped by genes.

After this extensive introduction addressing questions of the sort: what share of 'me' are my genes?, the book then formulates the type of interesting questions that determine the fascinating and puzzling character of the topic put on the table; such as, how much of my genome is 'mine'? Or, since much of the genome is shared by individuals within a particular species and even within other species, with only a relatively small fraction unique to the individual, then, to what extent do the elements of the genome belong to us as individuals? If you own a patent on a gene, the author argues (on page 67), then no one may reproduce it without paying you royalties. Unmodified (or wild-type) genes propagate throughout the natural world without anyone having any intent to infringe on anyone's patent. Curiously, the argument goes on, while you might own a particular sheep, you cannot own every sheep in the world by virtue of a claim over the type³ sheep. If you have successfully filed a patent over a non-engineered sheep gene, however, you suddenly do become the owner of at least a part of every new and existing sheep in the world. In this way, the author brings the reader into the 'molecular' discourses of the patentable. He distinguishes between *fungible* and *nonfungible* goods. The former meaning that any quantity of each is treated as equally interchangeable with the same quantity of the same type of thing (one litre of water = one litre of water). Among these goods are food, water and air. Nonfungible goods include real property (which usually refers to land and improvements upon land) and moveables which include any nonfungible property that is not land. One of the features of moveables is (human) intentionality, which is a characteristic difficult to apply to the genome, which is generated by nature – thus, non-fungible? Moreover, from the perspective of the relationship

between genes and person the author claims that patenting genes is also an aberration as persons and genes are very tightly linked as genes are shared among human beings and help to build up persons. I found fascinating the abstraction move to place genes in between the two levels of individuals and species. However, by doing so, interestingly, the author here opens the doorway for the ownership of genes. One might argue that since genes are so widely spread through human beings (and beyond), then, they cannot be considered anymore the property of the individual (e.g. persons who donor a cell for research purposes, from which a gene is isolated and patented) but as a natural resource which could be extracted/mined/harvested/isolated, and claimed as one's property...which once again, interestingly, brings us back to the example of the (type) sheep.

By briefly introducing the slippery slope process of patenting microorganisms, plants, and then humans, meaning, of course, their (-our) genes we arrive to the book's core business. This is done by providing the well elaborated examples that form the legal cornerstones of the patentability of living organism and, of genes (e.g. *Diamond vs. Chakrabarty*, *Moore vs. the Regents of the University of California*) that leads to the current situation in which there are no explicit administrative or legislative prohibition against patenting human tissues or products, and, therefore, of genes; although, argues the author, for instance, 'image' is strictly and precisely regulated. In this way, the reader is provided with (a good amount of) all the information that she/he always wanted to know about patenting genes. For example, that patents usually do not cover genes themselves (as they occur in nature) but their isolated and purified form which is considered a new composition of matter. Thereby, human patents issue for structures, functions and processes of genes and all are considered compositions of matter. But, Koepsell argues, in nature, genes direct cell development and metabolism. However, typical human gene patents specify the use as screening for that particular gene. In this context, with an underlying ironic tone, he remarks that the so-called *inventors* what really do is to isolate *their* gene (and apply for their patent) employing well-established techniques of human genome "map-reading" and using off-the-shelf technologies for isolating segments of that map and reproducing them (page 92). He compares this with the use of Global Positioning Systems (GPS) for claiming intellectual property protection on some previously unexplored landmark. In this context, and in my opinion, it is difficult to understand (and it should be clarified) the grey areas between the patentable and non-patentable. It seems contradictory to, on the one hand, prohibit the patentability of the discovery of human genes, including

their sequences, and, on the other hand, to protect through patents these same sequences if they are isolated from the human genome, even when it is recognized (Illescas 2010) that these isolated sequences could be 100 per cent similar to the 'natural' sequences.

No matter how dramatic the consequences of this unclear or broad-understanding of 'the' patentable can be, one can't avoid feeling amused with some odd situations and the peculiar related language. A case in point is the *Washington University vs. Catalona*, in which the physician Catalona collected prostate cell samples while affiliated with the plaintiff Washington University. The legal claim was started when Catalona found a new position somewhere else and sought to take (what he thought were) his samples. Even when Catalona got the consent of nearly 6,000 donors (who he personally contacted and asked for permission), the court held that the samples (and the contented information) were the property of the University on the basis of considering the samples *inter vivos* gift by which neither the donors nor the collector-researcher retain any property rights on the(ir) tissues or on the information encoded in them...This reflects and extends the argument we elaborated earlier, in this journal, on the schizophrenic position of public financed universities and their property policies (Puente-Rodríguez 2010).

Koepsell elaborates a convincing argument as regards the actual odd and complex situation concerning gene patents and its possible constricting consequences for innovation within health and life sciences by comparing genes with the chemical elements of the periodic table (on pages 115-116). These naturally occurring elements cannot be patented. Patents are granted (issued) both for newly created chemical compounds (which do not appear in nature) and for the processes by which they are extracted or synthesized, always that they are non-obvious, novel, and useful. In the same way, the writer says, genes ought to be free of patents to enable researchers to explore the natural functioning of genes and, therefore, developing new therapies, drugs, or expanding our knowledge on gene functioning. Moreover, the author distils the idea of gene patentability through the different legal and philosophical frameworks and understandings of 'owning things,' and concludes that, DNA is one of those types of things that cannot be owned; notwithstanding that its use may be regulated – that is, DNA is defined as commons. In this context, and not surprisingly, the book ends by reclaiming an open source approach within biology – an approach that has meanwhile already become mainstream, even classical. Mentioning, for so doing, some

successful examples, such as the SNP Consortium, the HapMap Project, or the BiOS initiative; and a type of *third way*, meaning a state regulation of gene markets – an example of which could be the agreement made between the Iceland government and the company deCODE which has been enabled for bio-prospecting the Icelandic population under certain conditions. Innovative here is, nevertheless, his elaboration of the conceptualization of DNA as ‘commons by necessity’. In the last chapter, the author sharply tackles the underlying philosophical tensions of the book’s central question – Does somebody else ought to own me or a constituent part of me? Ditto, can we patent life?

To conclude, this is an excellent introductory book to the main topics and concepts related to gene patents. Moreover, not only it is a (well written and) comprehensive piece of writing, but also, it has already had an impact within the academia (see, for instance, the many times that it has been reviewed) probably, because of the relevance of, and the accuracy by which the research topic is addressed, and, also probably, because of its strong (provocative and) normative tone and content. However, no matter how interesting and necessary normative arguments are, all the way through, one wonders what the arguments at the other side of the barricade are (hopefully there is something beyond profit making...) – that is, to what extent is the role played by patents of importance for the skyrocketing development of the gene-tech field at large? All in all, Koepsell’s book is *worth reading*.

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Endnotes

- 1 Making, as the author does, the mistake of confusing amino acids (the building blocks of proteins) and nucleotides (the building blocks of DNA) (Holman 2009). This might be seen as an irrelevant issue, however, as it is an intrinsic problem faced by researchers who pace the ‘inter-trans-’ disciplinary field addressed in this book; which forces us to elaborate arguments and link up information from different and highly complex disciplines; that is biology, genetics, sociology, ethics, law, etc. however the issues at stake are so relevant that it is worth trying, and, moreover, this type of mistakes are acceptable, especially as the author claims elsewhere the *mea culpa* (see, Koepsell 2009).
- 2 Some reviews from within the field of Ethics are, for instance, Hens, 2010, and (parts of) Portnow 2010.
- 3 The argument regularly comes back to the dichotomy *type-token*, meaning that, for instance, the blueprint of a machine is the type, while the individual machine is the token.

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