

# Industrial applicability, patents and the Supreme Court: HGS v Eli Lilly

In *Human Genome Sciences Inc v Eli Lilly and Company* [2011] UKSC 51, The UK Supreme Court overturned the High Court and Court of Appeal rulings and found that a patent met the requirement of industrial applicability. In doing so they set a standard for industrial applicability seemingly based on policy grounds as much as jurisprudence.

## **The Science**

A cell comprises a number of genes which contain the code for manufacturing the cell's proteins. A gene consists of a series of nucleotides, whilst a protein is made up of a chain of amino acids. The nucleotide sequence of a gene corresponds to the amino acid sequence of the protein which the gene encodes, such that the gene provides a template for the protein.

The traditional approach to biotechnology, referred to as a "wet-lab" approach, was to select a protein of interest (for example, insulin), and isolate that protein. The amino acid sequence of the protein could then be determined. This enabled a nucleotide sequence to be constructed which would encode for the protein; the nucleotide sequence would be introduced into a host cell, which would then manufacture the desired protein. The biological function of the protein would generally be known, as this would be the reason for which the protein was selected in the first place.

By the mid-90s, a new approach, the "bioinformatics" approach became available. Endeavours such as the Human Genome Project were producing large amounts of nucleotide sequence data, which could be used to deduce the existence of previously unknown proteins. It would not necessarily follow that simply by uncovering the existence of a protein, the protein's function would also become readily known, although in some

cases it would be possible to make an educated guess. It could be presumed that the protein would have some function, and so an abnormal excess or decrease in the amount of the protein in the body would be likely to contribute to some form of disease. In addition, the amino acid sequence of a protein might make it possible to assign the protein to a particular protein family. Often, protein family members have similar functions, and so this could provide an indication as to the function of the protein in question. In some cases though, proteins have a wide range of different functions, even when part of the same family, and so ascribing a protein to a particular family would not necessarily be determinative of its function.

HGS, using a bioinformatics approach, elucidated a nucleotide sequence which encoded for a protein, "neutrokin- $\alpha$ ". This protein seemed to be part of the TNF family of proteins, a group of proteins known to have effects on the immune system. HGS obtained a patent for neutrokin- $\alpha$ , which was subsequently attacked by Eli Lilly on a number of grounds, including that the patent lacked an industrial applicability.

### **The requirement for industrial applicability**

Whether under UK national law or before the EPO, in order to be patentable an invention must be capable of industrial applicability (as set out in the UK under s 1(1) of the Patents Act 1977 ("the '77 Act)", and for the EPO by Art. 52(1) of the EPC). An invention shall be considered as susceptible of industrial application "if it can be made or used in any kind of industry, including agriculture" (s.4 '77 Act; Art. 57 EPC), and so the requirement for industrial applicability is assessed broadly.

The EPC makes clear that "the description shall indicate explicitly, when it is not obvious from the description or nature of the invention, the way in which the invention is capable of exploitation in industry" (R.42(1)(f) EPC). In most cases, no explicit indication is necessary as the industrial applicability will be immediately obvious from the nature of the invention. However, where proteins have been elucidated using a bioinformatics approach, this will not necessarily be the case. It was because of this that the Biotech Directive (Directive 98/44/EC on the legal protection of biotechnological inventions) included a specific provision, later incorporated into the EPC, requiring that "The industrial application of a sequence or a partial sequence of a gene must be disclosed in the patent application." (R.29(3) EPC; Art. 5(3) Biotech Directive).

### **The Patent**

The HGS patent disclosed that neutrokin- $\alpha$  was a TNF family member. The TNF family is a large group of proteins with a range of different effects; all members however are expressed by T-cells and play some role in T-cell proliferation and T-cell mediated

responses. T-cells are cells involved in a number of ways in the immune system. Based on this, the patent disclosed that neutrokin- $\alpha$  could be used to treat a large number of specific diseases; in some cases these treatments were contradictory in nature. The patent's description covered most diseases a person might suffer from (an irony of the case is that HGS have gone on to develop a product based on neutrokin- $\alpha$  for the treatment of lupus, one of the few diseases not mentioned in the patent).

The question that then fell to be determined was whether these disclosures were enough for the HGS patent to meet the requirements of disclosing an industrial applicability.

### **Prior Decisions**

This was first assessed by Kitchin J. at the High Court. As there was no UK jurisprudence on this point, the judge turned to the case law of the Boards of Appeal of the EPO. Based on his analysis of these cases, Kitchin J. held the patent invalid for lack of industrial applicability.

The EPO Board of Appeal then considered the issue (the question not arising in the first instance EPO Proceedings) and reached a different conclusion, finding the patent valid.

Finally, the UK Court of Appeal heard the case. Jacob LJ, giving the leading judgment, pointed out the desirability of the UK courts following the EPO for the sake of harmony throughout Europe, unless it was clear that "the commodore is steering the fleet on to the rocks". However, the judge also made clear that two tribunals could reach different conclusions based on different evidence being presented, and on that basis the Court of Appeal agreed with Kitchin J. and found the patent invalid. Nevertheless, Jacob LJ. did comment in obiter that he was surprised that the EPO Board had found in favour of the patent even based on the evidence as before the Board. The Court of Appeal's decision was then appealed to the Supreme Court.

### **The Latest Decision**

In assessing the appeal, the Supreme Court, led by Lords Neuberger and Hope, determined that the EPO has set down a consistent approach to the issue of industrial applicability, and that if the earlier Courts had followed these principles, then it would be inappropriate to interfere with their conclusions. However, in conducting their own analysis of the EPO jurisprudence, the Supreme Court reached the view that this wasn't the case.

Lord Neuberger set out fifteen general principles derived from the EPO jurisprudence, including that, where an identified protein is shown to be a member of a known family, and all members of that family have a role in the proliferation, differentiation and/or

activation of immune cells then assigning a similar role to a protein may suffice. The problem to be solved in such a case can be the isolation of a further member of the protein family, and if the disclosure is important to the pharmaceutical industry then the disclosure of the sequence of the protein and its gene may suffice, even though its role has not been clearly defined.

In assessing whether the industrial applicability of the patent was plausible, the law lords also felt that Courts below utilised a different test to that of the EPO, with Lord Neuberger commenting that "If the statement "is indeed plausible" then, in the absence of any reason to the contrary, it at least prima facie satisfies the requirements of Article 57 according to the Board".

Based on this, the Supreme Court allowed the appeal and held that the patent met the requirements of industrial applicability. In doing so, a lower threshold for industrial applicability was applied than by Courts below. The Supreme Court felt this was desirable as a matter of policy, agreeing with an intervention by the BioIndustry Association ("BIA") which commented that the Court of Appeal's ruling could make it more difficult for applicants to obtain patent protection, requiring more tests to be done in order to make a valid patent application. The BIA felt that such applicants would then be forced to run the risk of a third party filing their own application whilst such tests are conducted, and that in any case it may be difficult to obtain funding to conduct such tests in the absence of a pre-existing patent application to protect the investment required.

## **Analysis**

The Supreme Court has therefore reached a conclusion at least partly out of policy considerations; their legal reasoning for reaching this conclusion is open to question.

The Supreme Court began their reasoning on the basis that there was a consistent position in the EPO jurisprudence. However, this is not obviously the case, for whilst the earlier EPO cases have referred to the need for an "immediate, concrete benefit" to be present in order to satisfy the requirement for industrial applicability, the term "immediate" is ignored by the EPO Board in their ruling in this case, who instead concluded that a "concrete benefit" was sufficient, with no immediacy seemingly being required. Likewise, the Supreme Court refer only to a "concrete benefit", and although the Supreme Court notes that the Court of Appeal placed great weight on the requirement of an "immediate, concrete benefit", Lord Neuberger addresses this only perfunctorily. Given the findings that what the patent provided was the first step of research work which would be necessary to gradually disclose the functions of the protein, and that it was sufficient that the protein was a research tool which could be used to develop appropriate means and methods for the diagnosis and treatment of B-

cell and T-cell lymphomas, this removal of the requirement of immediacy was seemingly material.

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Further, the weight of EPO jurisprudence has required that the disclosed industrial applicability is not vague and is more than speculative, characterised by Jacob LJ as the need for an industrial application to be specific and plausible. The Supreme Court instead seem to regard plausibility as enough, and do not directly address the question of specificity.

In the words of Lord Walker, “there are two strong policy arguments for allowing the appeal. The first is to reduce the risk of a chilling effect on investment in bioscience (though here the arguments are certainly not all one way). The other is to align this country’s interpretation of the European Patent Convention more closely with that of other contracting states. To my mind these considerations justify this court in taking what would otherwise be a questionable course.”

In allowing this appeal, the Supreme Court has set the threshold for industrial applicability at a level which should please those seeking patents for proteins. Absent a contrary ruling from the Enlarged Board of Appeal of the EPO, or the CJEU, neither of which has any relevant proceedings pending, this will remain the case.