

Lilly v. HGS Supreme Court decision

Good for biotech and the wider picture

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William James, Partner
Marks & Clerk Solicitors

Legal background

Patentable inventions (Patents Act 1977)

1.(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say -

- (a) the invention is new;
- (b) it involves an inventive step;
- (c) **it is capable of industrial application;**
- (d) the grant of a patent for it is not excluded by subsections (2) and (3) or section 4A below;

and references in this Act to a patentable invention shall be construed accordingly.

ART 52 & 57 EPC**ART 52**

European patents shall be granted for any inventions, in all fields of technology, provided that they are

- new,
 - involve an inventive step and
 - **are susceptible of industrial application**
- [list of exclusions]

ART 57

[...means] **it can be made or used in any kind of industry, including agriculture**

Guidance on what this means?**CIPA GUIDE:**

“in s.1(1)(c) Patents Act 1977 the expression ‘capable of industrial application’ is used, whereas Art 52(1) EPC requires an invention to be ‘susceptible of industrial application’.

‘The EPO Guideline...indicates that the expressions are synonymous’

Art 57 EPC then states that the expressions are satisfied if the invention is one which **‘can be made or used in any kind of industry including agriculture’**”.

In practice?

Industrial applicability:

- Considered a low hurdle to clear

(at least as a revocation attack it rarely works, hence lack of UK case law)

- There to keep speculative/prophetic patents off the register?

***Thompson's Application* [2005] EWHC 3065**

“A means for purveying energy for the future comprising an engine in the form of a contra-rotational drive plate and fan that serves to create a pressure differential above and below drive plate without consuming fuel in the process”.

The applicant described it as a “flying saucer”.

According to Patten J, the Examiner had rejected it as being “incapable of industrial application because, to put it bluntly, it did not work”

(the contravention of Newton's third law of motion and the first law of thermodynamics being a clue...)

BUT

...does Art 57 have any wider use than as a coarse filter for crackpot 'inventions'?

HGS's Patent EP 0 939 804

Applied for in 1996

Based on work sequencing the human genome (using bioinformatics rather than wet lab techniques)

It identified a novel gene sequence – which coded for (because of homology with known gene sequences) a previously unknown member of the TNF ligand “superfamily” of proteins

It was designated **neurokine-α**

The Patent contd...

HGS also identified the tissue distribution and expression in T-cell and B-cell lymphomas

This suggested a wide range of potential physiological effects for neutrokine- α – the modulation of which offered a wide range of therapeutic applications

For example....

Potential uses of neutrokine- α (set out in the Patent)

- i) to modulate angiogenesis;
- ii) to **inhibit immune cell functions** and hence have a wide range of anti-inflammatory activities;
- iii) to act as an anti-neovascularizing agent to treat solid tumours and other non-cancer indications where blood vessel proliferation is not wanted;
- iv) to enhance host defences against resistant chronic and acute infections, for example, myobacterial infections via the attraction and activation of microbiocidal leukocytes;
- v) to inhibit T-cell proliferation by the inhibition of IL-2 biosynthesis for the treatment of T-cell mediated auto-immune diseases and lymphocytic leukaemias;
- vi) to stimulate wound healing, both via the recruitment of debris clearing and connective tissue promoting inflammatory cells;
- vii) to treat other fibrotic disorders, including liver cirrhosis, osteoarthritis and pulmonary fibrosis.
- viii) to increase the presence of eosinophils which have the distinctive function of killing the larvae of parasites that invade tissues, as in schistosomiasis, trichinosis and ascariasis;
- ix) to regulate hematopoiesis, by regulating the activation and differentiation of various hematopoietic progenitor cells, for example, to release mature leukocytes from the bone marrow following chemotherapy, i.e., in stem cell mobilization; and
- x) to treat sepsis.

Uses of neutrokin- α antagonists (as set out in the Patent)

- i) the inhibition of Neutrokin- α ;
- ii) **to inhibit the chemotaxis and activation of macrophages and their precursors**, neutrophils, basophils, B lymphocytes and some T-cell subsets, eg activated and CD8 cytotoxic T cells and natural killer cells;
- iii) in certain auto-immune and chronic inflammatory and infective diseases: examples of auto-immune diseases including multiple sclerosis and insulin-dependent diabetes; infectious diseases including silicosis, sarcoidosis, idiopathic pulmonary fibrosis;
- iv) to treat idiopathic hyper-eosinophilic syndrome by preventing oesinophil production and migration;
- v) to treat endotoxic shock by preventing the migration of macrophages;
- vi) to treat atherosclerosis by preventing monocyte infiltration in the artery wall;
- vii) to treat histamine-mediated allergic reactions and immunological disorders including late phase allergic reactions, chronic urticaria, and atopic dermatitis;
- viii) to treat IgE-mediated allergic reactions such as allergic asthma, rhinitis, and eczema;
- ix) to treat chronic and acute inflammation chronic and acute inflammatory pulmonary diseases;
- x) to treat rheumatoid arthritis by preventing the attraction of monocytes into synovial fluid;
- xi) to treat degenerative and inflammatory arthropathies;
- xii) to prevent inflammation;
- xiii) to inhibit prostaglandin-independent fever induced by chemokines;
- xiv) to treat cases of bone marrow failure;
- xv) to treat asthma and allergy by preventing oesinophil accumulation in the lung.

Patent contd...

The Patent was granted by the EPO

Including claims to:

- the gene sequence of neutrokin- α
- neutrokin- α itself

Eli Lilly's challenge

Had HGS disclosed enough to justify their claim to therapeutic applications flowing from disclosure neutrokine- α and its sequence?

Was the invention mere speculation?

Or was the invention a concrete disclosure of possible applications which merited a patent?

Timeline

July 2008	UK Patents Court – held patent invalid (on Art 57)
October 2009	EPO Technical Board of Appeal – held valid
February 2010	UK Court of Appeal – held patent invalid
November 2011	Supreme Court – held patent valid

Kitchin J – 1st Instance UK Patents Court

"230. I accept that the contribution made by HGS was to find Neutrokin- α and to identify it as a member of the TNF ligand superfamily. However it is clear from the cases to which I have referred that **simply identifying a protein is not necessarily sufficient to confer industrial utility upon it.**

... **It may be sufficient if the identification of the protein will immediately suggest a practical application,** such as was the case with insulin, human growth hormone and erythropoietin.

But if the function of the protein is not known or is incompletely understood and if no disease has been attributed to a deficiency or excess of it, then the position may well be different. **In these cases the industrial utility must be identified in some other way.** ...

Kitchin J – 1st Instance UK Patents Court

234. **Does [the] common general knowledge,** taken as a whole, **disclose a practical way of exploiting Neutrokin- α ?** Or does it provide a sound and concrete basis for recognising that Neutrokin- α could lead to practical application in industry?

In my judgment it does not. The fact that Neutrokin- α might be expected to play a role in regulating the activities of B-cells and T-cells and play an unspecified role in regulating the immune and inflammatory response did not reveal how it could be used to solve any particular problem. Neither the Patent nor the common general knowledge identified any disease or condition which Neutrokin- α could be used to diagnose or treat. Its functions were, at best, a matter of expectation and then at far too high a level of generality to constitute a sound or concrete basis for anything except a research project.

Kitchin J – 1st Instance UK Patents Court

235. I believe this conclusion is confirmed by the activities of those in the pharmaceutical industry in the years following the filing of the application. HGS, Lilly and Biogen (and possibly others too) carried out research programmes to try and find out where Neutrokine- α was expressed, where its receptors were expressed and what its activities appeared to be.

They carried out *in vitro* assays and animal studies and determined that it appeared to have an activity in relation to B lymphocytes with a particular biological profile. On the basis of this work they recognised that it was an important therapeutic target – some two to three years after the application for the Patent had been filed. It is significant that in so doing they considered that its utility might lie in the treatment of B-cell disorders of particular kinds."

EPO Technical Board of Appeal

(22) As pointed out in T 870/04 of 11 May 2005 (cf. in particular points 5 and 6 of the Reasons), in many cases the allocation of a newly found protein to a known protein family with known activities suffices to assign a specific function to the protein because normally the members of the family share a specific function. This may be a well-characterized and perfectly understood function which provides in a straightforward manner enough support for industrial applicability. In such cases, the "immediate concrete benefit" is manifest.

In other cases, where the members of a protein family have different, pleiotropic effects which may even be opposite and neither completely characterized nor understood, no effect can be assigned to a new member without relying on some experimental data.

EPO TBA

(26) When reading the patent specification, a skilled person would distinguish the positive technical information such as that mentioned above from other allegedly contradictory and broad statements found in the patent-in-suit, such as - in the respondent's view - the wide range of activities and conditions for which Neutrokine- α could be useful.

This is because the skilled person realises that the description of the structure of Neutrokine- α , its structural assignment to the family of TNF ligands, and the reports about its tissue distribution and activity on leukocytes, are the first essential steps at the onset of research work on the newly found TNF ligand superfamily member. In view of the known broad range of possible activities of such a molecule, the skilled person is aware of the fact that the full elucidation of all properties requires further investigations which will gradually reveal them....

EPO TBA

...In this context, the skilled person regards the long listing of possible actions of Neutrokine- α and of medical conditions in which it might take part as the enumeration or generalisation of the properties of the members of the TNF ligand superfamily.

This is seen as the frame in which the newly found molecule has to be placed as one could *prima facie* have a reasonable expectation that most of them could in fact be present.

At any rate, none of these specific conditions and/or activities is actually claimed and the language used in the specification is in many instances quite prudent (cf. for example in paragraph [0123] "Since Neutrokine- α belongs to the TNF superfamily, it also **should** also [sic] modulate angiogenesis" (emphasis added)).

Court of Appeal – Jacob LJ

Only considered the Art 57 question

Considered the reasoning of the EPO TBA

Considered the EPO case law (of which there was much more authority)

Court of Appeal

Jacob LJ upheld the Patents Court decision:

“It is clear from these authorities that discovering a nucleotide sequence encoding for a human protein and being able to show that the protein concerned has some common homology with known proteins (i.e. is a member of a family) may satisfy Art.57.

But whether it does or not is case dependent and in particular depends upon how well established the functions of the other members of the family are.

To say "my new protein is similar to a known family of proteins" is not all that helpful in indicating a possible use if the function of that family is itself poorly understood at best”.

Court of Appeal

I just pick out a key sentence:

"How physiologically relevant this activity is in vivo needs to be further investigated."

That seems to me to be a clear statement, nearly 9 years after the date of the patent, that it was not known what significance the T-cell activity had – that seems rather a long way from "an immediate and concrete benefit."

Court of Appeal

[157] There are other differences between the findings of the Judge and the TBA, but what I have said is enough to demonstrate why their results were different.

The upshot of all this is that Board, working on different evidence and using a different procedure came to a different conclusion on the facts.

We are not bound to follow, or even give deference to, the Board's findings of fact.

APPEAL TO SUPREME COURT

Lord Neuberger

Lord Hope

Lord Walker

Lord Clarke

Lord Collins

Lord Clarke's conclusion

Like Lord Neuberger, I was initially attracted by the submission that, as the Court of Appeal held, *Kitchin J* was entitled to reach the conclusion he did. Moreover, Lord Walker has expressed with clarity the correct approach of an appellate court in a case such as this. In short, where the judge, especially a judge of great experience in his field has carried out what Lord Walker calls a multi-factorial evaluation of the evidence and the Court of Appeal has refused to interfere with that evaluation, it will be the rare case indeed in which this Court will be entitled to interfere.

However, like Lord Walker, I have been persuaded by the detailed analysis by Lord Neuberger of the decisions in this and other cases of the Technical Board of Appeal of the European Patent Office that the appeal should be allowed. In all the circumstances I would allow the appeal for the reasons given by Lord Neuberger and Lord Hope.

Supreme Court – Lords Neuberger and Hope

This is a difficult and troublesome case. It is well known that modern techniques in the field of biomedical science offer immense benefits in the promotion of human health, particularly in the combating of a wide range of degenerative diseases previously thought to be incurable and in the provision of techniques for the effective treatment of cancers.

As the BioIndustry Association has pointed out in its written intervention, patent portfolios are often the most valuable asset of companies in the bioscience industry...

Lord Hope contd...

...So assessments of the value of a bioscience company's patent portfolio are likely to be a key consideration in deciding whether to acquire or invest in such a company.

This in turn affects the funding that is made available for research and development, without which effective progress in putting a patented invention to practical use is likely to be very limited.

The evaluation of a patent specification for this purpose will depend on whether it discloses an invention that is reasonably capable of industrial application.

Lord Hope

ON JACOB LJ's Decision

In para 112, having said that to be "plausible" a statement must be sufficiently precise, he added:

"It is not good enough to say this protein or any antibody to it probably has a pharmaceutical use. Such a statement is indeed plausible, but is of no real practical use. You are left to find out that that use is."

I think that there are indications in these passages that the standard which Jacob LJ was setting for susceptibility to industrial application was a more exacting one than that used by the TBA. He appears to have been looking for a description that showed that a particular **use for the product had actually been demonstrated** rather than that **the product had plausibly been shown to be "usable"**.

CONCLUSION

- 1st Patent Decision of the Supreme Court
- No new principles of law – but useful 15 point summary of ART 57 issues
- Confirms the EPO standard of Art 57 should be followed in UK
- Policy considerations were extremely important to reversing the lower courts
- Amicus brief of BIA appeared to be critical

OUTSTANDING ISSUES?

Low bar to industrial applicability?

- If you put a sequence in the specification you can claim it

These sequence/protein claims now prior art?

- May have effect on later generation patents

Effect of stifling research?

- Greater cross licensing necessary

FURTHER ISSUES

Industrial applicability

...but what about inventive step?

Neuberger's 15 point summary

Does it define the height of the bar – or just summarise what was allowed at the EPO?

Marks&Clerk



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