IN THE HEARINGS AND MEDIATION GROUP OF
THE INTELLECTUAL PROPERTY OFFICE OF SINGAPORE
REPUBLIC OF SINGAPORE

Patent No. 51905
28 May 2014

APPLICATION FOR CORRECTION OF A PATENT
BY GENPHARM INTERNATIONAL INC

AND

OBJECTION THERETO
BY LONZA BIOLOGICS TUAS PTE LTD

Assistant Registrar Leslie Francis McCaffery
31 July 2014

Interlocutory hearing *– application for a correction of a patent specification under Section 107 of the Patents Act – objection by Opponents – 2 step test applied: is it clear that there is an error, and if so, is it clear what is now offered is what was originally intended? – the first consideration is on balance of probabilities – the second consideration is a strict one in that nothing would have been intended other than what is offered as the correction – consideration is through the eyes of the skilled person and what they would understand – if the correction relates to a technical matter then evidence may be required from a skilled person – if extraneous evidence of the applicant's intention is necessary to show that there has been an error, then that error cannot be an obvious error – corrections to the title of Table 17 are considered allowable based on the evidence – other corrections not allowed as either the evidence did not establish that the skilled person would consider it clear that there was an error, or the evidence showed that the skilled person would consider two corrections were feasible.*

Background

Singapore application 199802337-7 was filed by the proprietor, Genpharm International Inc (otherwise referred herein as the Applicant, or as Genpharm) on 10 October 1996 as PCT application PCT/US1996/016433, and entered the national phase on 26 March 1998. The specification describes methods of generating antibodies using transgenic animals. Antibodies, or immunoglobulins, are proteins that the immune system uses to bind and neutralize foreign material. The application states that one of the major impediments facing the development of monoclonal antibody therapies and diagnostics in humans is the intrinsic immunogenicity of non-human immunoglobulins. However a number of disadvantages existed in the methods by which suitable monoclonal antibodies could be generated. The invention sought to overcome these disadvantages by providing methods

for efficiently producing heterologous antibodies – antibodies encoded by a first species that are produced in a second species.

The specific details of the invention do not play a major role in the present consideration. Of greater relevance is the manner in which the binding properties of an antibody are expressed. Briefly, an antibody will bind to a particular antigen. The strength of the interactions between a single antigen-binding site on the antibody and a single epitope (or binding site) on the antigen is expressed as affinity. A low affinity means that the antibody binds only weakly and dissociates readily from the antigen. A strong affinity means that the antigen and the antibody bind tightly. An affinity constant (K_a) may be used to express this relationship and is calculated from the concentrations of bound and unbound antigen at equilibrium.

There may be multiple interactions between an antigen and an antibody. Avidity is a measure of the accumulated strength of these interactions and is sometimes referred to as functional affinity. Thus a single interaction between an antibody and an antigen may have a relatively low affinity, but if there are multiple interactions the antibody may have a strong avidity. However avidity is not merely a sum of the individual affinities as it is unlikely that all binding sites will dissociate at the same time. Thus one site may dissociate while another remains associated so the antigen remains bound to the antibody, and there is also an increased likelihood of re-association of the dissociated binding site because it remains in close proximity. Avidity constants are therefore often as much as two orders of magnitude greater than an affinity constant.

A request for the grant of a patent based on the PCT application was made on 23 June 1999, and the Singapore Patent SG51905 was subsequently granted on 16 November 1999. Lonza Biologics Tuas Pte Ltd (otherwise referred to herein as the Opponent, or as Lonza) filed a statement of grounds for revocation on 19 February 2010, thereby commencing revocation proceedings. An amended statement was filed by Lonza on 23 August 2010 but leave to amend was refused in the Registrar's decision of 12 November 2010. Genpharm filed a counter-statement, together with proposed amendments to the original claims on 21 May 2010. Some errors introduced as a result of these amendments were corrected on 26 August 2011. Specific details of the proceedings up to this stage have little bearing on the present issue and will not be further discussed here.

At this point in time both parties had submitted evidence from expert witnesses (details are provided below). Following a direction from the Registrar, Lonza requested re-examination of the Patent on 28th September 2011. On 29 September 2011 Genpharm filed a request for a further correction of an error in the specification. The basis for the corrections was stated to be that:

> … at various places in the specification the terms "affinity" or affinity constant" are incorrectly used, when in fact what is intended, and what should appear, are the terms "avidity" or "avidity constant".

The corrections are set out in Annex A (the claims) and Annex B (the description). There are essentially two related considerations in this regard:

(i) Amendment of the reference in the title of Table 17 of affinity to avidity. This table sets out specific experimental results.
(ii) Amendment of a number of references to "affinity" and "affinity constant" throughout the description and claims to read "avidity" and "avidity constant". Some specific references to affinity have been retained (for example in Table 18).

The Applicant argued that the evidence they provided in support of the correction established each mistake was obvious and that it was clear that nothing other than what was requested as the correction could have been intended by the proprietor. The evidence and submissions are discussed in greater detail below.

The Opponent objected to this request in a letter dated 5 October 2011. They submitted that the corrections did not deal with simple clerical and obvious errors, but rather with a fundamental and technical problem that was first raised in the evidence of one of the expert witnesses. They considered that the proposed corrections were in the nature of an amendment which would not be allowable since they would introduce new subject matter, and would in any case be contrary to the provisions of section 80(1) which allowed only one opportunity for amendment during revocation proceedings.

On 7 October 2011 the Registrar wrote to the parties informing them that re-examination would be deferred until after the matter relating to the proposed correction was resolved. The Applicant was also asked whether a corresponding request to correct the US priority patent application in the same manner had been made. The proprietor responded on 21 October 2011 that the corresponding US cases (granted patents US 7084260 and 5770429 and pending application 12/770402) did not use the terms "affinity constant" and/or "avidity constant" and therefore no correction was required. They noted however, that similar corrections were made for the corresponding granted EP patent EP0854917. In response, Lonza argued in their letter of 2 November 2011 that the use of different terms in the US cases (specifically the use of the term "binding constant") made it even clearer that the corrections were not obvious.

On 21 November 2011 the Registrar directed Genpharm to provide a copy of the European patent as corrected, as well as any relevant correspondence relating to the corrections. In a letter of 2 December 2011, Lonza pointed out that there were important differences between the corrections sought in the present case and those sought for the corresponding European case. In particular, they argued that the corrections were made in the pre-grant European application rather than post-grant, and that the claims of the European patent are not identical to those of the Singapore patent. In their response of 12 December 2011 Genpharm submitted that since UK legal principles are persuasive in Singapore and UK jurisprudence is harmonized with the EPC, in principle EP jurisprudence should also be persuasive. Furthermore, whether or not the correction was

pre- or post-grant in Europe should not affect the allowance of the correction in Singapore provided the conditions of Section 107 and Rule 91 are met.

On 5 March 2012, the Registrar directed that the parties make submissions on the obviousness of the corrections and the extent to which those issues were relevant in determining the revocation. The parties both filed their submissions on 5 April 2012, largely reiterating their respective positions on the allowability of the corrections. The Registrar directed on 27 April 2012 that the re-examination should proceed and that the issue of the corrections be considered after the re-examination was completed. The re-examination report was issued on 19 November 2012.

Case management conferences were held on 29 April 2013 and 10 June 2013. The opponent agreed at the second of these that they would not contest the correction issue. However, following a detailed consideration of the correction, the Registrar advised the parties by letter dated 25 October 2013 that the correction had been refused with the exception of the correction to the title of Table 17. In particular the Registrar's letter stated that:

> [I]n summary, the following determinations were made in considering the admissibility of the corrections:
>
> (i) The skilled person would, on balance of probability, understand that the document is in error. This threshold requirement of subsection 91(2) has therefore been met.
> (ii) The correction to the heading of Table 17 to change "affinity" to "avidity" is justified as the experimental methods used are consistent with a measurement of avidity.
> (iii) The correction of general references to "affinity constant" throughout the specification and claims to read "avidity constant" is not justified by the material provided in support of the request. Neither the specification on its face, nor the submissions and supporting material provided by the parties establish that only one rectification would be considered by the skilled person.
>
> The correction of an error cannot be considered immediately evident if more than one possibility can be envisaged. As a consequence the proposed corrections other than the heading of Table 17 do not meet the requirements of Patents Rule 91(2) and are refused.

The Applicant requested a hearing on 25 November 2013 and the Registrar issued a Notice for Hearing on 5 March 2014. This decision relates to that request.

No expert evidence specific to the corrections was adduced, and instead evidence filed in relation to the revocation proceedings was relied upon by both parties. The evidence filed to date includes:

(i) A first declaration by Dr Mahendra Deonarain, Senior Lecturer at Imperial College London, dated 23 August 2010.

(ii) A declaration by Dr Cheng-I Wang, Principal Investigator at A*Star, dated 29 November 2010 and comprising Exhibits A and B.

(iii) A second declaration by Dr Deonarain dated 25 February 2011 and comprising exhibits MD-1 to MD-6.

The parties also filed a number of documents with their submissions during the prosecution of the matter, as well as in support of their written submissions at hearing. Where relevant I will refer to these in the discussions below.

Held, allowing the correction of the title of Table 17 and the correction to page 24, line 25, but refusing all other corrections:

Burden of proof

1. It is a general principle in matters of this kind that the burden of proof lies with the party seeking the exercise of the Registrar's powers. As noted in Evidence and the Litigation Process (LexisNexis, 4th Ed, 2013) by Jeffrey Pinsler at 12.007:

> The legal burden (the burden of proving a fact to the requisite standard of proof) always remains on the party who seeks to prove the fact. The evidential burden (the burden of adducing evidence to meet the standard of proof or to prevent the opposite party from meeting the standard of proof) may be on either party depending on the circumstances of the case.

2. Here the Applicant is seeking the exercise of the Registrar's discretion. The onus therefore lies with them to prove that the correction is justified.

Reasons for Decision

3. Correction is the alteration of a document so that it may better express the intention the drafter had at the time of drafting. The statutory provisions dealing with corrections are set out in Section 107 and Rule 91. Section 107 provides for corrections as follows:

> (1) The Registrar may, subject to any provision of the rules, correct any error of translation or transcription, clerical error or mistake in any specification of a patent or application for a patent or any other document filed in connection with a patent or such application.

4. Rule 91 provides for further considerations to be made when considering corrections, including:

(2) Where such a request relates to a specification, no correction shall be made therein unless the correction is obvious in the sense that it is immediately evident that nothing else would have been intended than what is offered as the correction.

5. Correction is different to amendment. In particular, Section 84 states that an amendment cannot add subject matter or in the case of a patent, extend the protection conferred. The limitations of Section 84 apply only to amendments under sections 31, 38(1), 81 and 83. In contrast Section 107 has no such restriction, and as a consequence a correction can potentially result in the specification disclosing new matter or extending the scope of protection of a patent (*Rock Shing Industrial Ltd v Braun AG* BL O/138/94). Furthermore, once the correction is made the document is considered to have always been in the state in which it is after correction. In theory this can change the scope of the granted patent and make something an infringement that was not an infringement prior to the correction, but this is tempered by the requirement that it must be *immediately evident that nothing else* would have been intended than what is offered as the correction. Thus a skilled person reading the document would immediately ascertain that there was an error and understand what was intended. In effect there would be no new disclosure provided the error is truly obvious. Nevertheless, the implications of such corrections necessitate a stringent consideration of whether they are obvious.

6. There has been no previous consideration by the Singapore Courts or the Registrar of these provisions. However the corresponding provisions in the UK Patents Act 1977 and Patents Rules (Section 117 and Rule 105(3) respectively) are essentially the same and it is in the light of such similarity that the "Examination Guidelines for Patent Applications at IPOS" state that guidance may be taken from UK practice. The parties did not dispute adopting such an approach in the present case.

7. UK practice involves a two-step test for determining corrections (*Dukhovskoi's Application,* [1985] RPC 8):

    (a) is it clear that there is an error, and

    (b) if so, is it clear what is now offered is what was originally intended?

8. Notably a similar two-step test is applied under Rule 91.1(c) of the PCT, which states:

    91.1(c) The competent authority shall authorize the rectification under this Rule of a mistake if, and only if, it is obvious to the competent authority that, as at the applicable date under paragraph (f), something else was intended than what appears in the document concerned and that nothing else could have been intended than the proposed rectification.

9. This Rule has been considered by the UK courts in *R. v the Comptroller-General of Patents ex parte Celltech Ltd* [1991] RPC 475 and in *Drazil's Application* [1992] RPC 479, and has provided guidance in the determination of corrections made under

the UK national law. However the UK Manual of Patent Practice at Section 117.07 cautions that these judgments may not be fully applicable as the wording of PCT Rule 91.1(c) differs from the wording of the UK provisions, and section 117 of the UK is not one of the sections listed in section 130(7) as having the same effect as the corresponding provisions in the EPC, CPC and PCT.

10. In order to meet the requirements of the first step, it must be apparent on the face of the document that there is an error. The standard of proof in this regard is the balance of probabilities; i.e., whether on the balance of probabilities the reader would conclude that there was an error (*ex parte Celltech*). This consideration is made through the eyes of the skilled addressee, the common general knowledge in the art and the skilled person's understanding of the document.

11. Once it has been determined that there is an error, the rectification must be "immediately evident" (*Dukhovskoi's Application*). This is a strict requirement – the skilled person must understand that nothing other than the proposed correction was intended. The standard in this respect is not "on balance of probabilities" or whether the proposed correction is the "most likely" solution to the skilled reader – there must be only one feasible correction. To that end, if several alternative corrections may be envisaged then the rectification cannot be considered immediately evident. If the document makes technical and linguistic sense, it cannot be concluded that only one other meaning was intended (*ex parte Celltech*).

12. These are the principles that I will apply in the present case.

Is it clear there is an error?

13. The Applicant provided the following arguments in support of the proposed corrections:

    (i) As discussed above, the proposed corrections were allowed for the corresponding European Patent EP0854917, as well as in a divisional of that patent.

    (ii) Table 17 summarises experimental details associated with the procedures described at page 246-7 ("Rate and equilibrium constant determination"). The method involves immobilization of human CD4 (the antigen) on a sensor chip followed by flow of an antibody over the antigen. This method measures avidity rather than affinity.

    (iii)The journal article corresponding to the present work used the term avidity rather than affinity. In particular, the journal article corresponding to the present invention ("High-avidity human IgG k monoclonal antibodies from a novel strain of minilocus transgenic mice", Fishwild *et al*., Nature Biotechnology, Vol. 14, pp. 845-851, July 1996, hereinafter *"Fishwild"*), contains data which corresponds to that given in Table 17. The table is

labelled as measuring avidity, and reference is made throughout the article to avidity constants rather than affinity constants.

(iv) The skilled person would recognize that the orders of magnitude of the K_a values recited in the claims are consistent with the avidity values of Table 19, but inconsistent with the affinity values of Table 18. In particular the affinity constants in Table 18 are in the range of 4.3×10^7 to 6.6×10^8 M^{-1}, while the avidity constants of Table 19 are in the range of from 1.7×10^9 to 3.7×10^{10} M^{-1}. In general avidity constants are approximately 2 orders of magnitude greater than the affinity constants.

(v) Affinity and avidity constants are both represented by the same symbol K_a, and an error could arise as a result of this use of a common symbol. The Applicant submitted that it was a common error in the art that avidity was mistakenly referred to as affinity (referring to P. Tijssen, "Practice and Theory of Enzyme Immunoassays" in Laboratory Techniques in Biochemistry and Molecular Biology, Ed. R. H. Burdon and P. H. van Knippenberg, Vol. 15, Elsevier, 1985). They noted that Dr Deonarain made similar statements in his second declaration of 25 February 2011.

14. The gist of the Opponent's submissions at hearing was that the consideration is made through the eyes of a skilled person but the Applicant had adduced no evidence from a skilled person to establish that there is an error and whether the correction is immediately evident. They argued that the Applicant's submissions therefore were not from the point of view of the skilled person or based on evidence from a skilled person, but rather from what the Applicant *believed* the skilled person would do under the circumstances. The Opponent also noted that the evidence of the Applicant's expert, Dr Cheng, was silent as to there being an error. To the contrary they noted he referred to the high K_a values as affinity constants. It followed that the error was not obvious to Dr Cheng at the material time.

15. Before addressing the issues directly relating to the corrections, I will deal with the submissions concerning the corresponding EP patent and in particular the weight that should be given to the allowance of the corrections before the EPO. Admittedly, overseas prosecutions may be useful references in hearing matters, particularly in relation to the application of corresponding law where no local precedent is available. However, there may be differences in law or differences in the evidence before the offices that can result in a different determination. Indeed a different determination may be arrived at with even the same evidence. This is particularly relevant in the case of corrections, since a correction under the UK national law may lead to the inclusion of additional subject matter while such corrections are not allowable in the EPO (Decision G11/91 OJEPO 3/93), and as noted above the corresponding provisions in the UK are not listed in section 130(7) of the UK Patents Act as having the same effect as the corresponding provisions in the EPC. I therefore consider the submissions on the EP patent to be useful reference material, but in no way determinative of the matter before me.

16. The parties did not dispute that there was an error in the heading of Table 17. Notably, Dr Deonarain provided evidence addressing this issue. In short, avidity is measured by immobilisation of an antigen on a chip and flow over of an antibody. In contrast affinity is measured by immobilisation of an antibody and flow over of an antigen. Consistent with these techniques, the method represented by the results shown in Table 18 is a measurement of affinity, and the method associated with the results shown in Table 19 is a measurement of avidity. These Tables are correctly labelled as such. However the method associated with the results shown in Table 17 is consistent with a measurement of avidity constants (and the table uses the term K_a rather than "affinity" or "avidity"), even though the title refers to "affinity constants". An amendment is also made to page 24 to correct a reference to Table 17 from affinity to avidity. Given the evidence provided I am satisfied that it would be clear to the skilled person that there is an error in the title of Table 17.

17. Turning to the other corrections, while the submissions from the Applicant suggest that it is *likely* that avidity is mistakenly referred to as affinity throughout the specification, I agree with the principles underpinning the Opponent's submissions that evidence from a skilled person is necessary in the present case. Rule 91 requires that the correction is obvious in the sense that nothing else would have been intended than what is offered. Certain corrections may require no technical expertise in order to ascertain that there is indeed an error – for example a simple typographical error or the like. However if, as is the case here, the correction relates to a technical matter disclosed in a specification then evidence from a skilled person may be required to determine what they would have understood the patentee to mean from the language they used (*Kirin-Amgen v Hoechst Marion Roussel* [2005] RPC 9), and subsequently whether an error and its correction is self-evident.

18. Furthermore, the skilled person may also have regard to textbooks and other references in order to correct an error (*Dukhovskoi's Application*). Consistent with the general principles of construction a skilled person is not expected to recall everything in the art – they may refer to standard texts and the like to give specific meaning to known parameters. However this does not extend to using extrinsic material in order to establish that there is an error. As stated by Aldous J in relation to "obvious errors", albeit in the context of PCT Rule 91(b) (*ex parte Celltech Ltd*):

> The purpose of the rule is to enable errors to be corrected which are obvious and therefore cannot mislead. Thus the rule uses the words 'obvious errors' in a context of enabling them to be rectified. What must be obvious is not simply that there has been some mistake, but also what the error is so that it can be rectified. If extraneous evidence of the applicant's intention is necessary to show that there has been an error, then that error cannot be an obvious error.

19. In the present case, the Applicant submitted a number of documents which they considered made it clear that the skilled person would be well aware of the potential

for confusion of these terms, and would therefore read documents in this field with a view to spotting when the terms had indeed been confused. I agree that these documents indicate that it is a common error in the art to refer to avidity as affinity, but the documents do not establish what the skilled person would have considered taking into account all of the circumstances and the disclosure *in the present document.* Furthermore, while the Fishwild document may describe the same experimental work, if it were necessary to rely upon this extraneous material in order to establish an error, then such an error could not be considered clear. I therefore consider that little weight can be given to these particular submissions.

20. Furthermore, as noted by the Opponent, Dr Cheng did not specifically address this point. However, I do not consider that it can be concluded that the error was not obvious to him. While I can make no conclusion in this regard, I do observe that his statement does not appear to specifically refer to the constants given in Claim 1 as "affinity constants". For example, in part (i) of his statement he states "Claims 1-13 of SG51905 claim high affinity (association constant K_a of at least $2x10^9$ M^{-1} or at least $1x10^{10}$ M^{-1}) human immunoglobulins" – that is, he has referred to antibodies as being high affinity and having an association constant. His statement otherwise appears to refer to "higher affinity" and to "K_a" values in relation to the invention rather than specifically using the term "affinity constant". As no clarifying evidence was available I consider that the evidence of Dr Cheng is of little use one way or the other in determining whether an error was clearly evident.

21. The only evidence specifically addressing this point was provided by Dr Deonarain, who stated that the K_a values given in Claims 1 and 10 would only be "valid" if they are were avidity constants. I therefore consider it would be clear to the skilled person that Claims 1 and 10 contain an error.

22. However, Dr Deonarain referred only to Claims 1 and 10. Corrections were also sought to Claims 16, 17, 20, 39 and 48. There appears to be differences in the nature of the corrections, as illustrated by the following:

    (i) In the case of Claims 20 and 48, correction is sought to change the reference to an affinity constant to read an avidity constant. The numerical values are similar to those identified in Claims 1 and 10 by Dr Deonarain as indicating there was an error in the claim, and I am satisfied that a similar conclusion can be made.

    (ii) In the case of Claim 39, correction is sought to define "avidity constant" rather than "affinity constant". However, in contrast to the values defined in Claims 1 and 10 the numerical value defined in Claim 39 (10^8 M^{-1}) is consistent with both the affinity constants given in Table 18 as well as being lower than the avidity constants provided in Tables 17 and 19.

    (iii) Claims 16 and 17 do not define *affinity constants* but instead defines that the antibodies bind to "human CD4 with *an affinity* of at least 1.1×10^{10} M^{-1}."

The reference to "an affinity" rather than "affinity constant" raises the issue of whether the term "affinity" takes on a different meaning in this context. Notably some of the submissions from the parties indicated that avidity is sometimes referred to as "functional affinity".

23. Similar concerns apply to the corresponding corrections sought throughout the description. No evidence was adduced in relation to the latter two issues identified above in Claims 16, 17 and 39 (and the corresponding references in the description), and on a *prima facie* consideration I consider that there is a question as to whether the skilled person would consider there to be an error at all. In this regard, the Applicant argued that the skilled person would recognise an error in the heading of Table 17, and having recognised this error would therefore consider all references to affinity to similarly be in error. I do not agree. The application describes the calculation of both affinity constants and avidity constants on the same antibodies, and I can see no clear reason why it would follow that the error in the title of Table 17 would lead the skilled person to conclude that *all* references in the specification of affinity should read avidity, regardless of its context. In the absence of evidence addressing these specific issues I am unable to conclude that the skilled person would take these particular claims as clearly containing an error.

24. In short I consider that the skilled person would consider that Claims 1, 10, 20 and 48 are clearly in error. However I do not consider that the evidence before me establishes that Claims 16, 17 and 39 are in error. A similar conclusion is reached in relation to the corresponding changes in the description.

Is it clear what is now offered is what was originally intended?

25. The second part of the consideration is whether it is immediately evident that nothing else would have been intended than what is offered.

26. The correction of the title of Table 17 (and the related correction of page 24 line 25) was not in dispute. Both parties made submissions supported by the statement by Dr Deonarain, that the method described would immediately be understood as being a measurement of avidity. I am therefore satisfied that the correction is one which would be immediately evident based on the evidence before me.

27. As noted above, the bulk of the Applicant's submissions were not specific to the present case and therefore little weight could be afforded this material. Both parties otherwise referred to the evidence on file from Dr Deonarain, but drew different conclusions. The relevant statements were provided in Dr Deonarain's declaration of 25 February 2011, and particularly in a response to a question referring to the affinity constants defined in Claims 1 and 10 ("the human immunoglobulin of Claim 1 of SG51905 has an affinity constant (K_a) of at least $2x10^9$ M^{-1}. The human immunoglobulin of Claim 10 has an affinity constant (K_a) of at least $1x10^{10}$ M^{-1}…"), he responded that these values would only be "valid" if they are avidity constants.

This statement, if taken in isolation, would suggest a single possible correction, but Dr Deonarain went on to state that:

(i) Nowhere in the specification of SG 51905 are Igs [immunoglobulins] with affinity constants of 2 x 10^9 M^{-1} and/or 1 x 10^{10} M^{-1} actually experimentally proven to have been created using the technology in SG 51905. These claims are very misleading.

(ii) They should be claiming "avidity constants" of those values OR affinity constants of lower values e.g. up to 1.4 x 10^8, which is the maximum affinity constant measured in Table 18 of SG 51905.

28. The Applicant considered that his statement suggested it was most likely that the Claims should have referred to avidity rather than affinity. They argued that the skilled person would be aware that avidity is often incorrectly referred to as affinity, and having determined that there was an error in the title of Table 17, they would conclude there was an error in the reference to "affinity" throughout the specification rather than being an error in the numerical value given to the affinity constant.

29. This does seem a likely scenario. However, the relevant consideration is not made on *balance of probabilities* nor indeed on whether the correction is *likely* to be what the drafter intended. The requirement under Rule 91(2) is a strict one – "no correction shall be made therein unless the correction is obvious in the sense that it is ***immediately evident that nothing else would have been intended*** than what is offered as the correction". The decision of Aldous J in *ex parte Celltech* is particularly pertinent to the present case. In *ex parte Celltech* the applicants had erred in using an old form for a PCT application, resulting in several significant designations being omitted. Aldous J agreed with the following comments by the Superintending Examiner in that case:

> The argument based on the choice of designations used is more convincing and the choice might indeed have made a reader, once alerted to the situation, wonder whether an error had been made. However the possibility that an error might have been made is not sufficient, in my view to meet the criterion of an error being obvious, ie 'something other than what was obviously intended was written'. **A possibility, or even a probability, that an error might have been made does not prove an obvious intention** [emphasis added].

30. Dr Deonarain suggests there are two feasible conclusions: either the term "affinity constant" is incorrect, or the number is incorrect. No other expert evidence was adduced that contradicts this statement. Therefore I can only conclude that as Dr Deonarain identified two possible corrections it is not immediately evident that *nothing* else would have been intended than what is offered as the correction. Dr Deonarain did not specifically address the other corrections, but I consider that his comments in relation to Claims 1 and 10 are equally applicable to these.

31. In short I consider that the correction proposed to the title of Table 17 is allowable, as is the correction at page 24, line 25 which refers to Table 17. However the other proposed corrections are not allowable as they do not meet the requirements of Section 107 and Rule 91.

Other Submissions

32. The Opponent also made written submissions in relation to undue delay. They did not specifically address these at hearing, but stated that they depended on all of their written submissions, including these ones. In short the Opponent argued that the Applicant had knowingly and intentionally chosen to delay the corrections in order to exploit the time delay that the proceedings would cause and the corrections should therefore not be allowed.

33. *Prima facie* the Applicant has been aware of the present issue since at least the time when corrections were made to the corresponding European and US patents, but did not seek correction until late in the revocation proceedings and not until after the error had been raised by Dr Deonarain in his second declaration. However, given the determination in regard to the corrections to the claims, this is probably a moot point. In any case there is no apparent discretion for the Registrar to take such matters into account when determining whether the corrections are allowable under Section 107 and Rule 91. I therefore consider that this argument fails.

Conclusion

34. The correction of the title of Table 17 is allowable, as is the correction to page 24, line 25. I allow these corrections.

35. The other proposed corrections are not allowable and therefore I refuse these corrections.

36. The parties considered it appropriate that costs should follow the event. The Opponent has been successful in their case that the disputed corrections are not allowable. I therefore award costs of $475 against the Applicant, being $300 for preparation for the interlocutory proceeding and $175 for attendance at the proceedings.

Legislation discussed:

Patents Act Section 107
Patents Rules Rule 91(2)

Cases referred to:

Rock Shing Industrial Ltd v Braun AG BL O/138/94

Dukhovskoi's Application, [1985] RPC 8
R. v the Comptroller-General of Patents ex parte Celltech Ltd [1991] RPC 475
Drazil's Application [1992] RPC 479
Decision G11/91 OJEPO 3/93
Kirin-Amgen v Hoechst Marion Roussel [2005] RPC 9

Representation:

Mr James Kinnaird, Paul Ong and Bruce Dowsing (Marks & Clerk Singapore LLP) for the Applicants
Mr Prithipal Singh, Lim Hong Guan and Joshua Looi (Patrick Mirandah Co. (S) Pte Ltd) for the Opponents

Annex A

Corrections to the Claims

1. A composition comprising an immunoglobulin having an ~~affinity~~ **avidity** constant (Ka) of at least 2 x 10^9 M^{-1} for binding to a predetermined human antigen, wherein said immunoglobulin consists of:
a human sequence light chain composed of (1) a light chain variable region having a polypeptide sequene (sic) which is substantially identical to a polypeptide sequence encoded by a human V_L gene segment and a human J_L segment, and (2) a light chain constant region having a polypeptide sequence which is substantially identical to a polypeptide sequence encoded by a C_L gene segment; and
a human sequence heavy chain composed of a (1) a heavy chain variable region having a polypeptide sequene which is substantially identical to a polypeptide sequence encoded by a human V_H gene segment, optionally a D region, and a human J_H segment, and (2) a constant region having a polypeptide sequence which is substantially identical to a polypeptide sequence encoded by a human C_H gene segment.

10. An immunoglobulin having an ~~affinity~~ **avidity** constant of at least 1 x 10^{10} M^{-1} for binding to a predetermined human antigen, wherein said immunoglobulin consists of:
a human sequence light chain composed of (1) a light chain variable region having a polypeptide sequene (sic) which is substantially identical to a polypeptide sequence encoded by a human V_L gene segment and a human J_L segment, and (2) a light chain constant region having a polypeptide sequence which is substantially identical to a polypeptide sequence encoded by a C_L gene segment; and
a human sequence heavy chain composed of a (1) a heavy chain variable region having a polypeptide sequene which is substantially identical to a polypeptide sequence encoded by a human V_H gene segment, optionally a D region, and a human J_H segment, and (2) a constant region having a polypeptide sequence which is substantially identical to a polypeptide sequence encoded by a human C_H gene segment.

16. A hybridoma of Claim 14, wherein the immunoglobulin binds to human CD4 with an ~~affinity~~ **avidity** of at least 1.1 x 10^{10} M^{-1}.

17. A hybridoma of Claim 15, wherein the immunoglobulin binds to human CD4 with an ~~affinity~~ **avidity** of at least 1.1 x 10^{10} M^{-1}.

20. A transgenic mouse of Claim 18, wherein said immunoglobulin binds to a human surface or transmembrane protein present on at least one somatic cell type of a human, wherein the immunoglobulin binds said human surface or transmembrane

protein with an ~~affinity~~ **avidity** constant (K_a) of between 1.5 x 10^9 M^{-1} and 1.8 x 10^{10} M^{-1}.

39. The method of Claim 37 wherein the cell produces an immunoglobulin that that binds the predetermined antigen with an ~~affinity~~ **avidity** constant of at least about 10^8 M^{-1}.

48. The method of Claim 46 wherein the human sequence immunoglobulin of step (e) binds the predetermined antigen with an ~~affinity~~ **avidity** constant (K_a) of at least 10^9 M^{-1}.

Annex B

Corrections to the description

"Table 17. Rate and ~~affinity~~ **avidity** constants for monoclonal antibodies that bind to human CD4" (page 24, line 25).

"Such chimeric trans-switched antibodies generally bind to a predetermined antigen (e.g., the immunogen) with an ~~affinity~~ **avidity** of about at least 1 x 10^7 M^{-1}, preferably with an ~~affinity~~ **avidity** of about at least 5 x 10^7 M^{-1}, more preferably with an ~~affinity~~ **avidity** of at least 1 x 10^8 M^{-1} to 1 x 10^9 M^{-1} or more" (page 73, lines 16 to 18).

"Such transgenic mice may further comprise a serum comprising chimeric antibodies which bind a predetermined human antigen (e. g. CD4, CD8, CEA) with an ~~affinity~~ **avidity** of about at least 1 x 10^4 M^{-1}, more preferably with an ~~affinity~~ **avidity** of about at least 5 x 10^4 M^{-1}, more preferably with an ~~affinity~~ **avidity** of at least 1 x 10^7 M^{-1} to 1 x 10^9 M^{-1} or more. Frequently hybridomas can be made wherein the monoclonal antibodies produced thereby can have an ~~affinity~~ **avidity** of at least 8 x 10^7 M^{-1}" (page 74, lines 9 to 16).

"In a variation, hybridoma clones producing antibodies having a high binding ~~affinity~~ **avidity** (eg. at least 1 x 107 M-1, preferably at least 1 x 108 M-1, more preferably at least 1 x 109 M-1)…" (page 78, lines 20 to 21).

"… and a pool of said hybridomas will generally have a broader range of antigen binding ~~affinities~~ **avidities** from which hybridoma clones secreting high ~~affinity~~ a**vidity** antibodies can be selected. Typically, hybridomas secreting a human sequence antibody having substantial binding ~~affinity~~ **avidity** …" (page 78, line 37 to page 79, line 3).

"The other step is to identify hybridoma cells which bind to the predetermined antigen with substantial binding ~~affinity~~ **avidity** … Hybridoma cells which express switched antibodies that have substantial binding ~~affinity~~ **avidity** for the predetermined antigen are isolated…" (page 79, lines 14 to 20).

"Some of the immunoglobulins will exhibit an ~~affinity~~ **avidity** for preselected antigens of at least about 107 M-1…" (page 82, lines 17 to 18)

"These high ~~affinity~~ **avidity** human sequence antibodies may have binding ~~affinities~~ **avidities** of at least 1 x 10^9 M^{-1}, typically at least 5 x 10^9 M^{-1}, frequently more than 1 x 10^{10} M^{-1}, and sometimes 5 x 10^{10} M^{-1} to 1 x 10^{-11} or greater. Such high ~~affinity~~ **avidity** human sequence antibodies can be made with high binding ~~affinities~~ **avidities…** The B cells from such mice can be used to generate hybridomas expressing monoclonal high ~~affinity~~ **avidity…** These hybridomas can be used to generate a composition comprising an immunoglobulin having an ~~affinity~~ **avidity** constant (K_a)…" (page 84 lines 4 to 17)

"The mice (and hybridomas derived therefrom) are a source for an immunoglobulin having an ~~affinity~~ **avidity** constant (Ka)" (page 85, lines 10 to 12).

"… wherein the antibody response comprises an immunoglobulin having an ~~affinity~~ **avidity** constant (Ka) of at least 2 x 109 M-1…" (page 85, lines 34 to 35).

"… wherein the immunoglobulin binds said human surface or transmembrane protein with an ~~affinity~~ **avidity** constant (K_a) of between 1.5 x 10^9 M^{-1} and 1.8 x 10^{10} M^{-1} … The development of high ~~affinity~~ **avidity** human sequence antibodies… " (page 86, lines 17 to 25).

"The invention also produces a high ~~affinity~~ **avidity** human sequence immunoglobulin" (page 88, lines 4 to 5).

"Table 17. Rate and ~~affinity~~ **avidity** constants for monoclonal antibodies that bind to human CD4" (page 247, title of Table 17).