SUPREME COURT OF SOUTH AUSTRALIA

(Criminal: Permission to Appeal)

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R v PARENZEE

[2007] SASC 143

Reasons for Decision of The Honourable Justice Sulan

27 April 2007

CRIMINAL LAW - APPEAL AND NEW TRIAL AND INQUIRY AFTER CONVICTION - APPEAL AND NEW TRIAL

APPEAL AND NEW TRIAL - NEW TRIAL - IN GENERAL AND PARTICULAR GROUNDS - PARTICULAR GROUNDS - FRESH EVIDENCE - GENERAL PRINCIPLES AS TO GRANT OR REFUSAL OF NEW TRIAL

EVIDENCE - ADMISSIBILITY AND RELEVANCY - OPINION EVIDENCE - EXPERT OPINION - QUALIFICATIONS OF WITNESS

APPLICATION FOR PERMISSION TO APPEAL - ENDANGERING LIFE

Applicant had been convicted of three counts of endangering life - basis of convictions was that applicant had unprotected sexual intercourse with three women at a time when he knew he was infected with the virus HIV and had been advised not to have unprotected sexual intercourse with his sexual partners - applicant sought permission to appeal on the ground that there should be a retrial to enable fresh expert evidence to be led - evidence sought to be led was heard during application for permission - whether evidence sought to be led was expert evidence - whether witnesses sought to be called were experts - whether fresh evidence could be led - held, witnesses were not experts - held, evidence was not such that it might have led a jury to acquit - held, there was therefore no basis for a retrial - application for permission to appeal refused.

R v Bonython (1984) 38 SASR 45; *R v Reci* (1997) 70 SASR 78; *Winslett v The Queen* (1992) 60 SASR 1, applied.
Commissioner for Government Transport v Adamcik (1961) CLR 292; *Frye v United States* (1923) 293 F 1013; *Gallagher v The Queen* (1986) 160 CLR 392; *J* (1994) 75 A Crim R 522; *Mickleberg v The Queen* (1989) 167 CLR 259; *R v Barker* (1988) 34 A Crim R 141; *R v McIntee* (1985) 38

On Appeal from SUPREME COURT OF SOUTH AUSTRALIA (THE HONOURABLE JUSTICE SULAN) SCCRM-06-16

Respondent: R Counsel: MS S MCDONALD WITH MS L BOORD AND MS R RICHARDSON - Solicitor: DIRECTOR OF PUBLIC PROSECUTIONS (SA)
Applicant: ANDRE CHAD PARENZEE Counsel: MR K BORICK QC - Solicitor: MICHAEL HEGARTY & ASSOCIATES

Hearing Date/s: 24/10/2006 to 14/03/2007

File No/s: SCCRM-06-65

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SASR 432; *R v Runjanjic and Kontinnen* (1991) 56 SASR 114; *Weal v Bottom* (1966) 40 ALJR 436, discussed.
Re Petition by Van Beelen (1974) 9 SASR 163, considered.

R v PARENZEE
[2007] SASC 143

Court of Criminal Appeal

1 **SULAN J:** On 31 January 2006**,** Andre Chad Parenzee was convicted of three counts of endangering life. The basis of the convictions was that he had unprotected vaginal sexual intercourse with three women. The prosecution case was that he engaged in unprotected sexual intercourse during a time when he knew that he had the Human Immunodeficiency Virus ("HIV"), the virus that causes AIDS, and had been advised of the risk that the virus could be transmitted if he were to engage in unprotected sexual intercourse. It was the prosecution case that Mr Parenzee knew that the act or acts were likely to endanger the life of each of the women and that he was recklessly indifferent as to whether their lives were endangered.

2 On 17 February 2006, Mr Parenzee applied for permission to appeal. The Notice of Appeal did not disclose any grounds of appeal and was rejected. A further Notice of Appeal, dated 9 March 2006, was filed; it discloses one ground of appeal, which is that there has been a miscarriage of justice. The Notice of Appeal states:

> **Grounds of Appeal**
>
> There has been a miscarriage of justice.
>
> **Particulars**
>
> 1. Prior to the trial the defence were not informed of the existence of reputable scientific opinion demonstrating the following facts:
>
> (1) At present there are cogent scientific arguments that the set of laboratory procedures known as HIV isolation are non specific and thus the existence of HIV has not been proven.
>
> (2) There is no scientific evidence that AIDS is caused by a unique infectious agent.
>
> (3) Cross-reactions between HIV-I antigens and antibodies formed against other antigens, may lead to false positive reactions.
>
> (4) Testing procedures used to diagnose HIV (ELISA and WB) are manifestly unreliable.
>
> (5) Viral load tests do not measure the number of viral particles and no HIV researcher has been able to correlate the "viral load" with the number of viral particles in plasma.
>
> (6) There is no proof that CD4 cells are killed by HIV.
>
> (7) There is no proof that HIV, if it exists, is sexually transmitted.

(8) If HIV does exist, the risk of it being sexually transmitted is extremely low.

2. The fact that this information was not before the jury (irrespective of any contrary opinions) means that the accused unfairly lost the opportunity for an acquittal.

3. If the new information is cogent, the jury would have had to acquit.

4. The defence was not advised of the existence of the material by the prosecuting authority, if it was aware of it or by any of the prosecution experts, if they were aware of it, or by any of the experts consulted by the defence, if they were aware of it.

In relation to particular 8 above the defence specifically requested any information relevant to this issue but were not informed of the PADIAN research results (see outline of argument Para 28).

3 I will deal with the question whether to grant an extension of time in due course.

4 At a directions hearing on 10 March 2006, counsel for the applicant submitted that I should not proceed to sentence the applicant because the material the applicant intended to put before the Court relating to the risks of transmission in heterosexual contact would be relevant to sentencing.

5 At a further directions hearing on 12 April 2006, the report of Dr Valendar Francis Turner had been received and the prosecution informed that there may be another report upon which the applicant would seek to rely. At that stage, counsel for the Director of Public Prosecutions ("the DPP") submitted that if the material was to be treated as fresh evidence, the DPP would request that fresh evidence be called. Counsel for the DPP submitted that the statistical material upon which the applicant sought to rely regarding the issue of the risk of contracting HIV from sexual contact was meaningless. However, given that evidence was to be called on the topic counsel agreed that sentencing be held over until evidence had been heard and the application determined. I agreed sentencing should await the outcome of the application, after the evidence had been considered.

6 By the next directions hearing on 18 May 2006, the prosecution had been provided with the affidavit of Dr Turner, to which I referred earlier, a half-page affidavit of Ms Eleni Papadopulos-Eleopulos and an affidavit of Mr Helman Sabdi Alfonso Parada. The prosecution submitted that this material was wholly inadequate and challenged the expertise of the witnesses proposed to be relied upon by the applicant.

7 On 9 June 2006, I was advised that further particulars had been sought from the applicant's legal advisers and that the DPP was in the process of obtaining statements from a number of expert witnesses. At a directions hearing on 19 July 2006, counsel for the DPP advised that various experts' reports were being obtained.

8 At a directions hearing on 5 September 2006, I was advised that reports of Professors French, Kaldor, McDonald and Gordon had been provided to the applicant. The DPP indicated that a report of Professor Cooper would also be provided. I was informed that the witnesses for the applicant would be Dr Turner and Ms Papadopulos-Eleopulos. The hearing was listed to commence on 23 October 2006. As the hearing progressed, I was advised by counsel for the DPP that additional evidence would be led from Associate Professor Dax, Dr Dwyer and Professor Gallo.

Fresh evidence generally

9 The case for the applicant is that, at the time of the trial, there existed a genuine scientific controversy regarding the existence of a virus HIV, the reliability of the tests that purport to diagnose HIV, whether HIV causes AIDS and whether HIV was sexually transmissible, and that the applicant and his advisers were not aware of these areas of controversy.

10 I will address the nature of the fresh evidence sought to be admitted later in these reasons.

11 The ultimate purpose of the rules relating to the admission of fresh evidence by appellate courts is the prevention of miscarriages of justice. In *R v McIntee*,[1] King CJ made the following observations:

> The rules relating to fresh evidence, like all rules of law, should be applied so as to serve and not to frustrate the interests of justice. I have no doubt that appellate courts will always receive fresh evidence if it can be clearly shown that failure to receive such evidence might have the result that an unjust conviction or an unjust sentence is permitted to stand.[2]

12 Similarly, Gibbs CJ in *Gallagher v The Queen*,[3] stated:

> No test can detract from the force of the fundamental principle that the appeal must be allowed if a miscarriage of justice is shown to have occurred. It is only a practical guide to the application of that principle to say that the court will grant a new trial if, having approached the matter with the caution that is always demanded when fresh evidence is produced in a criminal case, and having weighed the credibility of the fresh evidence and considered its cogency in the light of the evidence given at the trial, it considers that a jury might reasonably have reached a different verdict if the evidence had been available at the trial.[4]

13 These passages were cited with approval by Duggan J (with whom Legoe and Mohr JJ agreed) in *Winslett v The Queen.*[5] Similarly, in *R v Reci*,[6] Doyle CJ cited with approval a passage of the judgment of Gibbs CJ in *Gallagher* to the

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[1] (1985) 38 SASR 432.
[2] *R v McIntee* (1985) 38 SASR 432, 435.
[3] (1986) 160 CLR 392.
[4] *Gallagher v The Queen* (1986) 160 CLR 392, 399.
[5] (1992) 60 SASR 1.
[6] (1997) 70 SASR 78.

same effect, and referred also to the view of the Court in *Re Petition by Van Beelen*,[7] stating: 'the decided cases provide "working rules developed for use in the ordinary and general run of cases", but the ultimate question is whether there has been a miscarriage of justice.'[8]

14 Nevertheless, there are principles by which an appellate court is guided in determining whether fresh evidence should be admitted in a particular case. In *Winslett*,[9] Duggan J set out the principles applicable to the receipt of fresh evidence by an appellate court. These principles have been expressed in different terms in other cases.[10] Duggan J summarised the principles as follows:

> 1. The appellate court has a responsibility to examine the probative value of the fresh evidence.
>
> 2. The principal function of the appellate court is to decide whether a miscarriage of justice has taken place because evidence now available was not led at the trial.
>
> 3. The conviction will not usually be set aside if the evidence relied upon could, with reasonable diligence, have been produced by the appellant at the trial. However, this is not a universal and inflexible requirement: the evidence may be so significant in some cases that interference with the verdict will be appropriate in any event.
>
> 4. The evidence must have cogency and plausibility as well as relevancy. [Citations omitted].[11]

15 Duggan J also observed that differing approaches had been taken by members of the High Court in *Mickelberg v The Queen*[12] and *Gallagher* as to the test to be applied in deciding whether to set aside a conviction, which Duggan J characterised as the fifth principle. In *Mickelberg*, Mason CJ stated that the proper question for the appellate court (and the view of four of the five Justices in *Gallagher*) is:

> … whether the court considers that there is a significant possibility that the jury, acting reasonably, would have acquitted the appellant had the fresh evidence been before it at the trial[13]

16 Deane J also preferred this test. Conversely, Brennan J stated in *Mickelberg* that:

> The formulation which, in my respectful opinion, was settled by this Court in *Ratten v The Queen* and in *Lawless v The Queen*, is whether the jury, if the fresh evidence had been laid before it together with the evidence given at the trial, would have been likely to have entertained a reasonable doubt about the guilt of the accused. That was the formulation to which I adhered in *Gallagher*. The test has sometimes been expressed not

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[7] (1974) 9 SASR 163, 183.
[8] *R v Reci* (1997) 70 SASR 78, 92.
[9] (1992) 60 SASR 1.
[10] See, eg, *Gallagher v The Queen* (1986) 160 CLR 392, 395-6 (Gibbs CJ).
[11] *Winslett v The Queen* (1992) 60 SASR 1, 4.
[12] (1989) 167 CLR 259.
[13] (1989) 167 CLR 259, 274.

> in terms of 'likely' but in terms of 'might' or in terms of 'significant possibility'. Although I agree with Toohey and Gaudron JJ that it is not necessary to elaborate in this case upon the differing nuances of these formulae or to decide between them, my preference for the 'likely' formula remains.[14]

17 In *Winslett*, Duggan J did not expressly prefer one formulation to another, instead emphasising the fundamental principles expressed by King CJ in *McIntee* and Gibbs CJ in *Gallagher*. In analysing the facts of that case, however, Duggan J referred to the *likely* effects of the evidence in question and considered that it would have been *likely* to have given rise to a reasonable doubt.

18 In *Reci*, Doyle CJ considered the test for the introduction of fresh evidence.[15] Doyle CJ preferred the approach of Mason and Deane JJ in *Gallagher* – the significant possibility test – without deciding whether there was a real difference in that case between the views of Brennan J and Gibbs CJ, Mason and Deane JJ. Doyle CJ also considered that:

> … the court is required to consider the impact of the evidence upon the jury at the trial, had it been given, although to do so the court must make a limited assessment of the credibility of the evidence, in the sense explained by Toohey J and Gaudron J.[16]

19 In other words, the approach of Doyle CJ was that the appellate court, in determining whether there has been a miscarriage of justice, must consider the effect of the evidence upon the trial jury. In that assessment, it is relevant to consider the credibility of the evidence. The "sense explained by Toohey J and Gaudron J" is:

> … that it is necessary that the fresh evidence be credible in the sense that a reasonable jury could accept it as true, but not necessary that the court should think it likely that a reasonable jury would believe it [citations omitted].[17]

20 In accordance with the formulation of Doyle CJ, the five principles expressed by Duggan J in *Winslett* are not to be regarded as separate considerations; rather, they are interrelated. I consider that the approach of Doyle CJ in *Reci* is the correct approach to adopt: namely, that the ultimate question is whether there has been a miscarriage of justice and that in determining this question it is necessary to have regard to its effect on the trial jury. In my following reasons, I have applied the test of whether, if the fresh evidence had been given at trial, the jury might have entertained a reasonable doubt about the guilt of the applicant. For the reasons which follow, if the test I have applied is incorrect and the correct test is the 'likelihood' or 'significant possibility' that the jury would have arrived at a different verdict, that would not lead to a different result. In assessing the effect on the trial jury, it will be necessary in turn to determine whether the evidence is credible, in the sense that

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[14] (1989) 167 CLR 259, 275.
[15] *R v Reci* (1997) 70 SASR 78, 93-5.
[16] *R v Reci* (1997) 70 SASR 78, 94.
[17] *Mickelberg v The Queen* (1989) 167 CLR 259, 301-2.

a reasonable jury could accept it. This will depend on factors including its relevance, plausibility, cogency and probative value, as set out by Duggan J in *Winslett*. The availability of the evidence at the original trial is also a matter for consideration in determining whether there has been a miscarriage of justice.

Submissions on fresh evidence

21 At the commencement of the hearings in the application for permission to appeal, Mr Borick QC, counsel for the applicant, set out the scope of the three propositions he sought to make during the course of the application:

1. "firstly, that viruses are proven to exhibit by a procedure virologists refer to as virus isolation. The presently available evidence does not prove a virus known as HIV has been isolated."[18]
2. "that the tests used to in effect diagnose HIV do not do that. What they do is that they measure not the virus itself but antibodies."[19]
3. "no evidence for sexual transmission of HIV can be found even in the best conducted studies published from the United Kingdom, Europe, United States of America and Africa."[20]

22 He went on to say:

> The defence has not introduced and nor are we concerned with the issue of whether or not HIV causes AIDS. HIV and AIDS, although generally linked in the public mind, are two separate and distinct issues. In this case, what is important is whether there is any scientific evidence whether Mr Parenzee is infected with the unique virus HIV.[21]

23 In closing, Mr Borick QC made the following submissions on the admissibility of fresh evidence:

> MR BORICK: I hope I've correctly identified the issue where the jury, in the light of the new material, might have a reasonable doubt about proof of the element of the crime charged.
>
> I think basically when I read my friend's outline overnight and this morning that's the issue for your Honour.
>
> HIS HONOUR: I'm sorry, the issue for me?
>
> MR BORICK: Is whether a jury, in the light of the new material, may have a reasonable doubt about the proof of the elements of the crime charged.
>
> And the second major proposition we have advanced is that the issue of expertise is to be decided according to the relevant legal principles which are well-known to all of us, and that that does not depend on the resolution of the scientific controversy. In other words, I'm submitting to your Honour that you can't go through a process of resolving the

[18] T 2.
[19] T 3.
[20] T 3.
[21] T 4.

> scientific controversy and then go to the legal principles. You go to whether they have achieved that by their training study and experience.
>
> That's all I really want to say about that because the principles are clear, and your Honour knows what the issues are. My friend is arguing that they are not experts and we say they are.[22]

24 He went on to say:

> Going back to the first point, it would then be a matter that could be put to a jury.
>
> I think, your Honour, probably we are just looking from a practical point of view as lawyers. If there were to be a retrial then the prosecution would be put on notice that they have to prove that HIV exists and it causes AIDS. Professor McDonald would be called to give his evidence and Professor Gordon would have to be called. Professor McDonald would be cross-examined in much the way he was this morning and that would be before the jury. And if defence counsel were addressing the jury they would say 'Ladies and gentlemen, on the question of HIV causing AIDS that's our case and it's for you, not for his Honour or anybody else, you the jury will decide this'.
>
> Obviously it would have to be put to Professor McDonald in cross-examination what the views of the Perth group were. Depending upon his answers, but I would envisage then that the defence would call the Perth group, they may call others like Duesberg or Mullis, it's hard to look ahead, but at the end of the day in the jury trial the jury would have been made very well aware that there is a controversy, they would be made very well aware of other experts, the prosecution witnesses would say they shouldn't take any notice of the Perth group. Fundamentally that's an issue for the jury not for your Honour. That's why my starting point is whether it could make a difference, the jury deliberating is an important one.[23]

25 Mr Borick QC identified some of the points which he would wish to make to the jury in a retrial.[24] In his written outline of argument, he stated: "The issue is whether a jury, in light of the new material may have had a reasonable doubt about proof of the elements of the crime charged." I have noted above the authorities on the necessary effect of fresh evidence before it can be received by an appellate court.

26 Two issues arise from the submissions of Mr Borick QC. The first of these is the appropriate test to be applied by the appellate court. For the purpose of clarity, I note that, insofar as counsel's oral submissions could be taken to imply that the appellate court is to consider how the case might have been presented differently, or how the jury's deliberations may have differed, in the light of the fresh evidence, I reject that implication. I consider it is not to the point to consider how the trial might have been differently conducted, except insofar as is relevant to the principal issues of the effect on the verdict of the jury and whether there has been a miscarriage of justice.

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[22] T 1422.
[23] T 1423 – 4.
[24] T 1430.

27 The second issue is the scope of the applicant's propositions. Counsel for the DPP, Ms McDonald, submitted that the scope of the evidence proposed to be called at a retrial by counsel for the applicant had changed during the course of the permission to appeal hearings:

> My learned friend, at the beginning of this whole hearing, expressly disavowed any reliance upon the proposition that HIV does not cause AIDS. Your Honour might recall that occurred at the time that the respondent's expert reports had started to come in and they spent some time on the issue between the relationship of HIV and AIDS. My learned friend indicated to the court that wasn't a plank of their argument. It surfaced its head during the hearing. It is just not a useful exercise to speculate about what other evidence there might be out there that might be called - witnesses who might be prepared to say that they don't accept that HIV has been proved to cause AIDS.
>
> The evidence before your Honour is, of course, that there are two experts who hold the view that HIV has not been proved to exist and they stand, if you like, on an island of their own, in amongst the other dissidents. I raise that in response to my learned friend's submission this morning, that there might be other evidence presented at another trial. In terms of this hearing, your Honour has heard what the fresh evidence is and it is limited to those two witnesses.
>
> HIS HONOUR: Do they go on to say that if they're wrong about that, then it has not been proved that it causes AIDS?
>
> MS MCDONALD: Yes.
>
> HIS HONOUR: They do?
>
> MS MCDONALD: Eventually they do. There was confusion when Mrs Papadopulos-Eleopulos wouldn't accept as an assumption -
>
> HIS HONOUR: She had some difficulty working from an assumption where she didn't accept the basis.
>
> MS MCDONALD: I took the end product of her evidence to be that that is another prong of their argument and that is one of the points that is raised on the home page of the website.[25]

28 I accept the submission of counsel for the DPP that the scope of the applicant's propositions altered between the opening and closing submissions. In particular, the issue of whether HIV causes AIDS emerged during the hearing, despite having been initially disavowed as an issue by counsel for the applicant.

29 Ms Papadopulos-Eleopulos's position was that she would not enter into the debate as to whether HIV caused AIDS because she could not accept the assumption that HIV existed, which was necessary to respond to the question.[26] Although her evidence was confused on this topic, her position appeared to be that the first step to proving that HIV caused AIDS was to prove that HIV exists, and, given she was of the view that HIV had not been proven to exist, it could not

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[25] T 1440 – 1.
[26] T 280.

be proven to cause AIDS, nor to be sexually transmitted.[27] She did, however, go on to say that even if HIV did exist, there was no evidence that it causes AIDS.[28] Dr Turner did not address the question directly, however, the issue of whether he accepted the "HIV theory of AIDS" did arise indirectly during the course of his evidence.[29]

30 Several of the witnesses for the prosecution – in particular, Professor Gallo and Professor McDonald – gave evidence that HIV causes AIDS. Professor McDonald stated that there was, however, some controversy as to the mechanism by which HIV leads to AIDS.[30] Much of Professor McDonald's evidence in this regard arose when he was recalled to be cross-examined on correspondence between him and Dr Mullis, who was later cited by counsel for the applicant as a potential witness in the event of a retrial. I will deal with the evidence in more detail later in these reasons.

31 In determining whether the question whether fresh evidence is to be admissible, it is necessary for the appellate court to apprehend the scope and nature of the evidence sought to be admitted. The change in position of the applicant had the potential to confuse this issue.

32 The evidence heard during the course of the application was highly technical. In determining the credibility of the evidence and its potential effect on a trial jury, it has been necessary for me to hear the evidence sought to be led at a retrial. These reasons will therefore be limited to an analysis of the evidence which was led during the course of the application and will not extend to speculation about unspecified further evidence which could be led from additional witnesses.

33 In his closing submissions, counsel for the applicant addressed the question of whether the applicant should have led the evidence in question at trial. He submitted:

> On the question of diligence, whether we should have found out about this, I submit it is impossible for anyone to have known that this scientific debate, which has been tucked away in the journals - it is never published anywhere, so far as I'm aware, where the general public could know about it. Everybody knew that HIV existed, that HIV caused AIDS and that was it. There is no way that any lawyer could have known about this, unless they were told by the experts that were giving assistance to the court or giving assistance to the defence. Those that I spoke to didn't tell me anything about the controversy and, certainly none of the witnesses - Professor Gordon or Professor McDonald - didn't mention it to the court. They didn't mention it to the court because they, presumably, took the view that it was so way out, they didn't believe it. There is perhaps an argument that they should have. There is no way that any lawyer, in these

[27] T 280 – 1.
[28] T 282.
[29] T 731 – 2.
[30] T 1412 – 16.

> circumstances, could have found out about the argument that is now raised. In my submission, your Honour should grant leave.[31]

34 The question of whether the fresh evidence sought to be led could have been obtained, with reasonable diligence, at trial, is but one consideration that is relevant. I accept that, given the fact that the views expressed by Dr Turner and Ms Papadopulos-Eleopulos are outside the scientific mainstream and given that their views have not been widely expressed in either mainstream or scientific publications, it would have been extremely difficult for counsel to be aware of the existence of the opinions of Dr Turner and Ms Papadopulos-Eleopulos at the time of trial. Of far greater significance in the present case is the question of the effect of the admission of the fresh evidence on the verdict of the jury and the associated consideration of its credibility. I will address these questions as I consider the evidence led.

What is HIV/AIDS - terminology

35 HIV is an acronym for human immunodeficiency virus (HTLV-III).

36 According to mainstream scientific opinion, HIV is a retrovirus. In the most general terms, a virus is a particle (minute infectious agent) characterised by the ability to replicate only within living host cells. The general principle of viral replication is that the virus binds to its target cell, either killing the cell, causing disease inside the cell or taking over the cell machinery to produce the virus that leaves that cell to infect other cells. Dr Dwyer, the Senior Medical Virologist at Westmead Hospital in Sydney, explained:

> … With a virus such as HIV there are unique features and HIV has got some very elegant virologic features.
>
> …
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> All viruses use receptors to hit the target. The genetic material of the virus goes into the host cell. In the case of HIV it's an RNA virus. It undergoes an interesting mechanism where it is reverse transcribed to DNA which is the opposite of what we are all taught in sort of high school biology where you go from DNA to RNA to protein so here you have this reverse step. That DNA is then transported into the nucleus of the cell and that DNA then integrates into the host cell genetic material or the genome of the host cell where it then sits. There's some little bits and pieces that might hang outside the genome but, for all intents and purposes, that's what happens. So that virus is an integrated part of the cellular genetic material Then when that cell is sort of stimulated, for whatever reason – it is exposed to another infection or something like that – it can turn on virus production from the genetic material. You then get the process of transcription to RNA, which then goes out into the cytoplasm of the cell. The RNA produces proteins and those proteins are gathered together underneath the cell membrane and eventually bud out to go off as a free virus to go and infect other cells. All of this is typical of viral infections. It is just that retroviruses and HIV have few very interesting unique features and because they are reasonably unique they become drug targets. If you have targets that target the reverse transcriptase, that is very good because that then works on the HIV, not other viruses that

[31] T 1439 – 40.

> might be present or ordinary cells that might be okay. Similarly, the integration, where the virus inserts itself into the host genetic material, is also a target. There are numerous targets in the life cycle for anti-viral drugs, or even vaccines for that matter, that's why you need to understand the sort of picture. This is not unique to HIV. The other retroviruses, which HIV is one, and there are plenty of others – animal and human – have similar but slightly different replicative cycles.[32]

37 Viruses are able to reproduce with genetic continuity and the possibility of mutation. The particle, or virion, consists of nucleic acid (the nucleoid), DNA or RNA (but not both) and a protein shell containing the nucleic acid, which may be multi-layered.

38 For many years scientific researchers held the view that human cells contain DNA (deoxyribonucleic acid) which can form RNA (ribonucleic acid). That is, genetic information flowed from DNA to RNA.

39 In 1970, two scientists, Howard Tenin and David Baltimore, discovered an enzyme (catalyst), referred to as reverse transcriptase, by which genetic information could flow in the reverse direction from RNA to DNA. This occurs in viruses referred to as retroviruses.[33]

40 The genome is the full set of genes contained in a nucleic acid molecule (DNA or RNA). The gene is a segment of the nucleic acid that contains all the information required for synthesis of a protein product. It includes both coding and non-coding sequences.

41 In 1980, Professor Robert Gallo, a researcher in the United States of America, and his colleagues described the first human retrovirus, the cause of a form of adult T-cell leukaemia. I will return to the work of Professor Gallo later in these reasons.

42 According to mainstream scientific opinion, acquired immuno deficiency syndrome (AIDS) is a condition which is caused by HIV. Those persons who have been diagnosed as being infected with HIV, if untreated, will eventually develop certain conditions which are considered as AIDS-defining diseases from which they will eventually, if untreated, die. The effect of HIV, according to mainstream medical scientists throughout the world, including those who were called by the respondent, is that a person who is infected with the virus HIV will eventually contract one or other of these AIDS-defining diseases as a consequence of their immune system becoming depleted to the point that they have inadequate resistance to fight the disease.

43 HIV is said to attack the body's immune system, with the result that the patient contracts diseases which, in non-HIV patients, would not normally occur. If such diseases do occur in non-HIV patients, the immune system in most

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[32] T 950 – 1.

[33] Exhibit P90, David O White and Frank J Fenner, *Medical Virology* (4th ed, 1994); *Dorland's Illustrated Medical Dictionary* (30th ed, 2003).

instances is able to resist the development of the condition, such that it would not usually be fatal.

The Witnesses

44 During the application, the witnesses called on behalf of the applicant were Eleni Papadopulos-Eleopulos and Valendar Francis Turner. The witnesses called on behalf of the respondent were David Albert Cooper, Martyn Andrew Haydon French, Elizabeth Mara Dax, Dominic Edmund Dwyer, David Llewellyn Gordon, John Martin Kaldor, Robert Charles Gallo, and Peter James McDonald.

Witnesses called as experts by the applicant

45 In his opening submissions, counsel for the applicant explained Dr Turner's and Ms Papadopulos-Eleopulos' qualifications and proposed subject areas of evidence as follows:

> The two witnesses to be called by the defence are Eleni Papadopulos-Eleopulos - we will refer to her as Mrs Eleopulos - and Dr Valendar Turner.
>
> Mrs Eleopulos is a physicist. She is trained in the most basic of physical sciences. In round terms, that is physics, science, and the most important of all, mathematics. That science underpins biology. In turn, biology underpins virology. It follows that manner and way in which the prosecution witnesses claim expertise is the same manner and way in which the defence witnesses claim expertise - that is, an understanding of the basic science involved and an understanding of the basic principles, research and experience.
>
> Both the defence witnesses have been involved in the study of this issue since 1983, virtually 25 years. Your Honour has seen the fact that they have had a number of papers published but also the fact that a number of their papers were not published for reasons which will be explained to you.[34]

46 Counsel went on to say:

> Just briefly, Montagnier, in 1983, discovered HIV. Our witnesses will be viewing evidence, in this case through Mrs Eleopulos, explaining to you the experiments that he conducted and then to tell you what is wrong with it or the problems with it.
>
> Our case will be that Montagnier probably conducted the best experiments that have yet taken place and we will challenge the type of testing which now takes place, but in the end result, it is obviously necessary for the court to understand what Montagnier did before we can move forward to the issue of isolation. You will see from the 1997 interview that Montagnier himself said 'We did not purify', meaning 'We did not isolate the virus'.[35]

47 Each witness called by the DPP purported to have expertise only in a limited field – for example, epidemiology, or molecular virology – and gave evidence only in that area. Several of the respondent's witnesses gave answers during the course of their testimony in which they stated that a particular

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[34] T 4.
[35] T 7.

question was outside their area of expertise, and stated which of the respondent's other witnesses would be best qualified to answer. I will address the evidence of the respondent's witnesses in greater detail later in these reasons.

48 In contrast, counsel for the applicant identified no particular areas of knowledge on which Ms Papadopulos-Eleopulos and Dr Turner purported to be experts. Counsel for the applicant described the evidence to be given by the applicant's witnesses in his opening submissions:

> My first witness will be Mrs Eleopulos. Your Honour has read her qualifications and I won't go through them now. She will expand upon that a little in her evidence and in particular she will tell you of how her interest first started, which is when she was doing work in cancer research in about the time of Montagnier's discovery. She has done a huge amount of work, as your Honour has seen, since then on this issue. She will tell you of a meeting that she had with Luc Montagnier in Amsterdam in - I think it was the 1980s, late 1980s, and her description of that interview is a little important because it encapsulates what is the central issue in this case. I have explained to your Honour she will be dealing with the question of proof of existence of a retrovirus and isolation with the Montagnier test and some other technical matters which your Honour has seen referred to.
>
> Dr Valender Turner will then deal with the antibody test, and his evidence will conclude with the proposition that the tests have not been successfully proven to be capable of determining HIV infection or transmission, and it is impossible to say how many of any people who are said to be HIV-positive are infected with and HIV retrovirus.
>
> Mrs Eleopulos will then deal with the question of sexual transmission and she will review the various studies, the studies of a group of prostitutes in 1985, an Australian study known as Philpot over in Sydney, three European study groups, and from 1989 to 1994 one of which involved a large number of United States servicemen who had been serving in Germany and arrived back and then testing occurred with their partners in the United States, and that is a significant one in understanding the way in which these tests have been done.[36]

49 The evidence of the two witnesses for the applicant, as is apparent from the statements of counsel in his opening, covered only a limited number of "topics"; namely, the existence of the virus, the accuracy of antibody testing and the question of sexual transmission. However, within these "topics", the witnesses gave evidence pertaining to a wide range of scientific disciplines. One significant feature of the evidence of the applicant's witnesses was that neither Ms Papadopulos-Eleopulos nor Dr Turner claimed to have practical experience or qualifications in any of the particular scientific disciplines to which their evidence pertained. I will say more about this later in my reasons.

50 Another significant feature of the evidence led from the applicant's witnesses was their failure to provide an alternative theory to explain the observations that led to the discovery of HIV/AIDS. Rather, their evidence sought to demonstrate that the HIV had not been proven to exist by critiquing the work of others. As such, the applicant's witnesses did not criticise the conduct of

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[36] T 8 – 9.

HIV research on the basis that it conflicted with their own research, experiences or observations. Instead, their evidence was in the form of a critique, in which they identified perceived flaws in the scientific process and research findings that had led the mainstream scientific community to accept the existence of HIV.

51 These two features I have identified complicate the question of expertise. The evidence given by the two witnesses for the applicant was essentially a critique of the work of others, based upon what those witnesses considered to be general scientific principles and the necessary scientific approach to research. Before I address in greater detail the question of the expertise of each of the applicant's witnesses, I will consider the principles to be applied to expert evidence.

Expert evidence generally

52 The importance of determining whether a witness is an expert in a particular field of knowledge was explained by King CJ in *R v Bonython*:[37]

> The general rule is that a witness may give evidence only as to matters observed by him. His opinions are not admissible. One of the recognized exceptions to this rule is that which relates to the opinions of an expert. This exception is confined to subjects which are not, or are not wholly, within the knowledge and experience of ordinary persons. On such subjects a witness may be allowed to express opinions if the witness is shown to possess sufficient knowledge or experience in relation to the subject upon which the opinion is sought to render his opinion of assistance to the court. Before allowing a witness to express such opinions, the judge must be satisfied that the witness possesses the necessary qualifications, whether those qualifications be acquired by study or experience or both. But when it is established that the witness is an expert in the relevant field of knowledge, he will be permitted to express his opinion, however unconvincing it might appear to be, subject always, of course, in a criminal trial to the discretion to exclude evidence whose prejudicial effect is disproportionate to its probative value. The weight to be attached to his opinion is a question for the jury.[38] [Citations omitted]

53 King CJ therefore explained the process by which the opinion evidence of an expert may be admitted:

> Before admitting the opinion of a witness into evidence as expert testimony, the judge must consider and decide two questions. The first is whether the subject matter of the opinion falls within the class of subjects upon which expert testimony is permissible. This first question may be divided into two parts: (a) whether the subject matter of the opinion is such that a person without instruction or experience in the area of knowledge or human experience would be able to form a sound judgment on the matter without the assistance of witnesses possessing special knowledge or experience in the area, and (b) whether the subject matter of the opinion forms part of a body of knowledge or experience which is sufficiently organized or recognized to be accepted as a reliable body of knowledge or experience, a special acquaintance with which by the witness would render his opinion of assistance to the court. The second question is whether the witness

[37] (1984) 38 SASR 45.
[38] *R v Bonython* (1984) 38 SASR 45, 46.

has acquired by study or experience sufficient knowledge of the subject to render his opinion of value in resolving the issues before the court.[39]

54 The five principles governing the admission of expert evidence have been expressed slightly differently by Freckleton and Selby in the text *Expert Evidence: Law, Practice, Procedure and Advocacy*:[40]

1. The "expertise rule": does the witness have knowledge and experience sufficient to entitle him or her to be held out as an expert who can assist the court?
2. The "common knowledge rule": is the information sought to be elicited from the expert really something upon which the tribunal needs the help of any third party or can the tribunal rely upon its general knowledge and common sense?
3. The "area of expertise rule": is the claimed knowledge and expertise sufficiently recognised as credible by others capable of evaluating its theoretical and experiential foundations?
4. The "ultimate issue rule": is the expert's contribution going to have the effect of supplanting the function of the tribunal to decide the issue before the court? If so, it is likely to be rejected.
5. The "basis rule": to what extent can an expert's opinion be based upon matters not directly within the expert's own observations? Such reliance on material that cannot be directly evaluated by the court falls foul of a fundamental principle of evidence.[41]

55 Rule 1 corresponds to the second part of King CJ's test and rules 2 and 3 correspond to the first part of King CJ's test. The final two rules are, as Freckleton and Selby imply in rule 5, rules that in substance are applicable to all evidence, expressed in terms relevant to expert evidence.

Is the evidence of the applicant's witnesses opinion evidence?

56 The first step in assessing the admissibility of the evidence of the witnesses heard during the course of the application, therefore, is to consider whether the evidence is the opinion of the witness, or matters of observation to those witness. It is only if the evidence sought to be admitted is the witnesses' opinion that it is necessary to consider the test identified by King CJ in the second passage recounted above. I note that in this section, I will address only the evidence of the witnesses for the applicant. I will address the admissibility of the evidence of the respondent's witnesses later in these reasons.

57 Barwick CJ in *Weal v Bottom*[42] emphasised that evidence given by a witness as to their own experience and observations, perhaps acquired over a long period of time, "is not the expression of an opinion nor is he strictly within

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[39] *R v Bonython* (1984) 38 SASR 45, 46 – 7.
[40] 2nd ed, 2002.
[41] Freckleton and Selby, *Expert Evidence: Law, Practice, Procedure and Advocacy* (2nd ed, 2002) 2.
[42] (1966) 40 ALJR 436.

the category of an expert, though there is a tendency to refer to such evidence compendiously as expert evidence".[43] An example of the distinction that must be drawn may be seen in the case of *R v Barker*.[44] In that case, the question for determination was whether evidence given by a police officer as to the use of certain appliances in the consumption of Indian hemp should have been admitted. The evidence was treated by the trial Judge as opinion evidence given by an expert. However, King CJ, with whom the other members of the Court agreed, did not regard the evidence as opinion evidence, as it pertained to the officer's "actual observations and experiences". King CJ stated that this evidence was not opinion evidence, but factual evidence. He considered that the trial Judge's reference to the evidence as opinion evidence given by an expert was an example of the tendency described by Barwick CJ.[45]

58 I have noted above the features of the evidence of the applicant's witnesses which complicate the assessment of its admissibility. However, I consider that it is clear that the evidence led from the applicant's witnesses is opinion evidence. The witnesses were asked about their practical experiences and observations only briefly, and predominantly for the purpose of leading evidence relevant to the question whether they had the necessary credentials to qualify as experts. On the contrary, the evidence led from the applicant's witnesses was their views on the techniques used in research conducted by others and the validity of conclusions drawn by others. They explained the literature on HIV by reference to their own understanding of scientific principles and the scientific process.

59 I consider that this is clearly opinion evidence. Consequently, this evidence is inadmissible unless it is admissible as expert evidence. It is therefore necessary to consider the other aspects of the test expounded by King CJ in *Bonython* to determine whether the evidence can be admitted as an exception to the general rule.

Is the subject matter of the opinion within the class of subjects upon which expert testimony is permissible?

60 This part of the test has two aspects, described by Freckleton and Selby as the "common knowledge" and "area of expertise" aspects.

61 I turn first to the question of whether the subject matter is such that the court requires the assistance of an expert in order to form a sound judgment. The issues arising during this application were all of a scientific or technical nature. The issues gave rise to complex questions of immunology, micro virology and epidemiology, to name but three of the relevant disciplines. I consider that the subject matter is of a nature that expert testimony is of assistance to the Court and therefore permissible.

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[43] *Weal v Bottom* (1966) 40 ALJR 436, 438-9.
[44] (1988) 34 A Crim R 141.
[45] *R v Barker* (1988) 34 A Crim R 141, 142-3.

62 The second question that must be asked is whether the evidence sought to be led is credible, in the sense that it is accepted by those who are able to evaluate its basis, or that it is "sufficiently organized or recognized to be accepted as a reliable body of knowledge or experience".[46]

63 This second aspect has been the subject of differing judicial opinion. One often-cited explanation of the test is that contained in *Frye v United States*:[47]

> Just when a principle crosses the line between the experimental and the demonstrable stages is difficult to define. Somewhere in this twilight zone, the evidential force of the principle must be recognised, and while the courts will go a long way in admitting expert testimony deduced from a well-recognised scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

64 The test proposed in *Frye* therefore includes the concept that not only must there be an organised body of knowledge, but that it must be reliable. Further, it also necessitates the consideration of whether the particular opinion of the witness whose evidence is sought to be led is sufficiently related to the general body of knowledge in the field. This is in accordance with King CJ's posing of the question in *Bonython*: "whether the subject matter of the opinion *forms part of* a body of knowledge or experience which is sufficiently organized or recognized to be accepted as a reliable body of knowledge or experience"[48] (emphasis added).

65 King CJ further developed this notion in *R v Runjanjic and Kontinnen*,[49] a case dealing with the admissibility of psychological evidence relating to battered women's syndrome:

> An essential prerequisite to the admission of expert evidence as to the battered woman syndrome is that it be accepted by experts competent in the field of psychology or psychiatry as a scientifically established facet of psychology. This must be established by appropriate evidence.

66 King CJ cited in support of his approach several cases from the United States in which the general recognition and acceptance of battered women's syndrome had been a factor in admitting evidence of the syndrome.

67 Conversely, the Victorian Court of Criminal Appeal in *J*[50] took a different approach:

> Provided that the judge is satisfied that there is a field of expert knowledge to which recourse may be had, it is no objection to the reception of the evidence of an expert within that field that the views which he puts forward do not command general acceptance by other experts in the field [citations omitted].

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[46] *R v Bonython* (1984) 38 SASR 45, 47.
[47] (1923) 293 F 1013, 1014.
[48] *R v Bonython* (1984) 38 SASR 45, 47.
[49] (1991) 56 SASR 114.
[50] (1994) 75 A Crim R 522, 535.

68 It is common ground between the applicant and the respondent that the opinions proffered by the applicant's witnesses are well outside the scientific mainstream and are not accepted by the general scientific community. The test to be adopted is therefore critical: if acceptance of a point of view by the general community of experts competent in the field is necessary, as indicated by King CJ, then the evidence is inadmissible.

69 However, the divergent opinions developed in the context of battered women's syndrome are not completely analogous with the dispute between the witnesses in this application. In those cases, the subject of the evidence in question was an emerging field of knowledge, and so the question was not, as it is here, whether to accept a dissident opinion, but whether to accept an emerging theory. The dispute was whether the knowledge had passed the theoretical stage to be established in the field.

70 I note at this point the approach of the High Court in *Commissioner for Government Transport v Adamcik*.[51] In that case, a tram conductor suffered an injury as a result of an accident between a lorry and a tram. Soon after, he developed leukaemia and ultimately died. His widow brought an action for compensation, claiming that the accident had caused the leukaemia. During the course of the trial, a doctor was called to give evidence pertaining to his theory that leukaemia could be caused by emotional disturbance. The doctor conceded that at that time, he was the only proponent of that view.

71 Windeyer J (with whom Kitto J agreed) drew attention to the "improbable" nature of the witness' assertions (Menzies J drew attention in his judgment to the deficiencies in the theory exposed during cross-examination) before going on to say:

> But, however far-fetched some of his statements may seem, however much his theory may be criticized as unproved, however much it is out of line with orthodox opinion, it would be a bold court that could say that he was not qualified to express an opinion on medical matters and that the jury should have been told that, as a matter of law, they must disregard his opinion. The learned trial judge did in effect advise them to treat it with scepticism.
>
> …
>
> The case is not one in which a witness, posing as an expert, made assertions that are contrary to proved scientific facts or to the known phenomena of nature, thus exposing his ignorance of the learning he professed. To liken the doctor's statements, as counsel did, to the assertion of an eccentric person that the earth is flat is, even for argumentative purposes, mistaken. If there were any value at all in such a comparison – and there really is not – Doctor Haines would, no doubt, answer that he should be likened rather to those who first denied that the earth is flat.[52]

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[51] (1961) 106 CLR 292.
[52] *Commission for Government Transport v Adamcik* (1961) 106 CLR 292, 306.

72 Menzies J drew attention to the fact that the witness was a "practising specialist physician with high qualifications and a hospital appointment", and went on to say:

> Had this witness said that in his opinion there was no relation between the deceased's injuries and the leukaemia which brought about his death – as did other doctors who qualified as experts by giving evidence of the same kind of qualifications as those Dr Haines possessed – there could hardly have been a challenge to the admissibility of his evidence. It is only because his opinion was one that medical science seemingly does not accept as reliable that it is contended he lacked the qualifications necessary for expressing it; but the giving of correct expert evidence cannot be treated as a qualification necessary for giving expert evidence.[53]

73 I do not consider the case of *Adamcik* is perfectly analogous with the present case. It is clear from the reasons that understanding of leukaemia was at that time limited, and the witness was proposing a theory which was, whilst not accepted, not contrary to a well-developed body of knowledge. Conversely, there was evidence during the course of this application that HIV is an extremely well understood virus, and that the issues raised by the applicant's witnesses were not the subjects of legitimate scientific controversy. Further, whereas the witness in *Adamcik* was proposing a new theory, the applicant's witnesses in this case are seeking to discredit a well-established theory. The reasoning of Windeyer J in particular makes these distinctions and their effect clear. One might also argue that the extent and depth of knowledge of HIV is such that the applicant's witnesses are in the position of the person who claims the earth is flat in the analogy drawn by Windeyer J, and have exposed their ignorance of the subject on which they propose to be experts.

74 However, I find persuasive the line of reasoning adopted by the High Court in *Adamcik* that ultimately, the level of acceptance of a witness' evidence should not be determinative of the question whether that witness is qualified to give expert evidence. This is so even where, as in *Adamcik*, the evidence is far-fetched or implausible. However, those considerations are highly relevant to the weight to be given to the evidence.

75 I note that the level of acceptance of a witness' testimony, and its plausibility, do have further significance in the appellate context. If a witness' testimony is implausible, or if it is contrary to the accepted understanding of the community of experts in the relevant field, this will bear on the appellate court's assessment of the likely effect of that evidence on a jury. This is, therefore, of very great significance to considering whether that expert evidence can be admitted as fresh evidence.

76 In my view, the most significant aspect of the admissibility of the evidence of the applicant's witnesses is whether they are qualified to give expert evidence. I turn now to that question.

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[53] *Commission for Government Transport v Adamcik* (1961) 106 CLR 292, 302 – 3.

Purported field of expertise of Ms Papadopulos-Eleopulos

77 Counsel for the applicant sought to establish the expertise of Ms Papadopulos-Eleopulos by first leading evidence of her study and work experience:

> Q. You have a degree in nuclear physics from the University of Buchuresti in Romania.
>
> A. Yes.
>
> Q. Were you born in Romania.
>
> A. No, I was born in Greece.
>
> Q. And what took you to the Bucharest.
>
> A. I went to study there because in Greece there was no faculty of nuclear physics.
>
> Q. Could you outline what is involved in obtaining a degree in nuclear physics. What is nuclear physics.
>
> A. Nuclear physics is studying the most basic composition of matter and it involves the then explanation of how matter is not only the composition but what is the fraction of matter. And it is the most basic of sciences. It tries to explain physics and 'physician' originates from the same Greek word and they are really - they are the scientists who study nature. 'Physics' in Greek is 'nature'. So, that is what physics does, it studies nature.
>
> Q. I obtained the degree in 1960.
>
> Q. And following graduation, you migrated to Australia.
>
> A. Yes.
>
> Q. And in 1996 or thereabouts, you worked as a laboratory attendant in the Department of Public Health and during this time you studied English.
>
> A. Yes, I didn't know any English. I studied other languages in Romania but not English. So when I came to Australia I studied English.
>
> Q. So since the early 1970s you have engaged in early biological research.
>
> A. Yes.
>
> Q. Would you in your own words explain to his Honour what research projects you were involved in.
>
> A. Really when I start working, I initially as I said I was working as a laboratory attendant and then after a few years after I learn English I was in the position of as a physicist and initially it involved to do a lot of routine work in the Royal Perth Hospital, then, the department of medical physics where we were studying and treating patients with cancer and other diseases. So, I was coming in contact with patients and I was doing a number of routine works of routine tests with patients. In about mid 1970s, a Dr Holt in Perth with the then premier, they bought a machine

> which was made by a physicist in Germany to treat cancer and I was asked to evaluate the physics part of the machine. But since the machine involved treating cancer patients and I knew nothing about cancer at that stage or biology for that matter, I thought if I studied two system and I know nothing about one and no matter how much I know about the other I wouldn't be able to come to any conclusion. So then I taught myself biology and that's how my interest in biology started and by the end of 1970 I put forward a theory of cancer and which was published in a small journal, an abstract of it, and then in 1982 was published in one of the most prestigious journals in biological research called the Journal of Theoretical Biology with good reviews.[54]

78 She said:

> And then I come with a theory when doing this, I came with a theory of normal biological function. So, it was cell – a theory of cellar function but the course was – it was not cancer it involved the theory, make prediction about not only about cancer but other basic or other diseases, chronic diseases for example like cardio vascular diseases, diabetes and made prediction about it. The prediction about cardiovascular diseases was proven in other departments with the help with the professor of neurosurgery and these papers were published, again, in the journal but at that time AIDS appeared ...[55]

79 Ms Papadopulos-Eleopulos referred to a period in about 1983 when two scientists, Professor Luc Montagnier and Professor Robert Gallo, claimed to have discovered the virus HIV. She said the two were conducting cancer research. It became known that young men on the west coast of America and, in particular, in San Francisco, were becoming ill. She said that the two main diseases at that time with which these men were diagnosed were Pneumocystis carinii (a lung disease) and Kaposi's sarcoma (a malignancy of the skin). She said that she was involved at the same time with cancer research. It is not clear what research she was conducting at the time.

80 Montagnier and Gallo developed the theory that the illnesses observed in these men were common to those who were infected with the HIV virus. Ms Papadopulos-Eleopulos doubted that the diseases were caused by a virus.

81 Ms Papadopulos-Eleopulos gave evidence about a brief conversation she had with Montagnier in Amsterdam in 1992, and stated that prior to that conversation she had sent him some of her papers.[56] Counsel for the DPP objected to the evidence regarding the conversation on the basis that it was hearsay; however, counsel for the applicant stated that the evidence was led merely to establish that Ms Papadopulos-Eleopulos had a peer relationship with Montagnier.[57]

82 Ms Papadopulos-Eleopulos has promoted her view that it has not been proved that the HIV virus exists or that it is linked to Acquired

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[54] T 13 – 14.
[55] T 15.
[56] T 16 – 19.
[57] T 18.

Immunodeficiency Syndrome (AIDS). Nor does the research establish that the virus is sexually transmissible.

83 Ms Papadopulos-Eleopulos questions the "HIV theory of AIDS", which is the view that HIV causes AIDS. She questions whether it has been proved that HIV exists as a unique virus. She questions the view that the HIV genome originates in a unique exogenously acquired infectious retroviral particle. Her view is that it has not been proved that HIV is infectious, either in blood, blood products or by sexual intercourse. Her opinion is that mother to child transmission of the HIV virus has not been established. She questions whether antiretroviral drugs have any effect in controlling or suppressing the progression of AIDS.

84 Ms Papadopulos-Eleopulos has no formal qualifications in medicine, biology, virology, immunology, epidemiology or any other medical disciplines. She has never treated or been directly involved in clinical trials of any kind relating to any disease. Her duties at the Royal Perth Hospital are to test people for sensitivity to ultraviolet radiation.

85 Ms Papadopulos-Eleopulos professes to have expertise because she has studied HIV and AIDS for 25 years and she has published papers on the subject. Counsel for the applicant submits that her degree in nuclear physics enables her to give expert opinion on the subject of the discovery of a virus and on the various tests that have been developed to diagnose HIV. The submission is that she is trained in physics, science and mathematics. Counsel submits that her qualifications underpin biology which underpins virology.

86 There is no evidence that the propositions advanced are valid. I consider that her qualifications do not provide her with the academic study required to give opinions on medical and scientific matters unrelated to nuclear physics.

87 Ms Papadopulos-Eleopulos claims that she conducts research in the area of HIV/AIDS in her private time. It became clear that, when she spoke about research, she meant reading various medical papers about the research of others. Her experience with the HIV virus and with AIDS is limited to reading and critiquing the work of researchers involved in various studies. She purports to have expertise to speak on the subject of virology, epidemiology, electron microscopy, biology and immunology. She has no practical experience in any of these areas. She has no formal qualifications in these disciplines.

88 It became clear during her evidence that much of her criticisms related to research in the 1980s and to papers published up to about the mid-1990s. She has not read or she has chosen to ignore an enormous volume of recently published material on the diagnosis and treatment of HIV/AIDS. She has been selective in the material upon which she relies. I will deal with that in more detail and by example later in these reasons.

89 Ms Papadopulos-Eleopulos states that she has been the author or co-author of a number of papers which purport to support her theories. A significant number of publications to which Ms Papadopulos-Eleopulos has been a contributor have been rejected by reputable scientific journals. In response to the suggestion that her articles have not been accepted, she claims that the editors were required to reject her articles because those who peer review the articles are members of the mainstream scientific community who support the mainstream view that HIV is a virus which is the cause of AIDS. I reject that explanation. Reputable journals will only publish material which has been peer reviewed and from which it can be demonstrated that recognised scientific techniques have been followed. Opinions which question scientific conclusions, if adequately researched and peer reviewed, will be accepted for publication.

90 Ms Papadopulos-Eleopulos holds strong views about the phenomena of HIV which has been the subject of much research and writings. She believes that the HIV virus has never been isolated. She believes that those who are diagnosed with the HIV virus have not been proved to suffer from a virus. She also holds the view that the diseases from which HIV positive persons suffer are not due to the virus. She has expressed the opinion that the virus has not been proved to be sexually transmissible or transmissible through blood transfusions or from a mother to a child.

91 Ms Papadopulos-Eleopulos' evidence-in-chief was presented in an unusual way. She gave her evidence with the assistance of a slide presentation. The slide presentation consisted predominantly of quotations or her interpretation of research papers of others. The evidence was not presented as opinion evidence in the traditional manner. During her evidence-in-chief much of the evidence was disjointed and difficult to understand. The research papers upon which she relied were not tendered. Rather, she referred to parts of the papers. Many of the research papers were put to her in cross-examination.

92 In cross-examination, she was often non-responsive to questions. She gave lengthy answers which did not address the questions. On the occasions when she did answer the question, it was often difficult to understand her responses. On some occasions, she simply responded by refusing to accept the validity of work published by reputable scientists.

93 Examples of the way in which Ms Papadopulos-Eleopulos responded to the suggestion that she had misused research follows.

94 During her evidence dealing with sexual transmission of HIV, Ms Papadopulos-Eleopulos relied upon the studies of Professor Nancy Padian.[58] In her evidence-in-chief, Ms Papadopulos-Eleopulos referred to a number of slides which were prepared from papers authored by Professor Padian and published in

[58] Exhibits P40, P41 and P42.

1987, 1988, 1991 and 1997.[59] Ms Papadopulos-Eleopulos also relied upon a Ugandan study of RH Gray et al from the Rakai district, published in the Lancet in 2001.[60] Ms Papadopulos-Eleopulos sought to demonstrate that the probability of transmission of HIV in the United States of America and Uganda, assuming sexual contact once every three days, was so low as to conclude that there was no proof from these studies that HIV was transmissible by heterosexual contact, that is, vaginal sexual intercourse. She concluded from the Ugandan study that there is no more heterosexual transmission of HIV in Africa than anywhere else, including Britain, the United States of America, Australia and Europe. She stated that there is no proof that HIV is sexually transmissible by vaginal sexual intercourse from male to female and vice versa.

95 In cross-examination, she was asked the following questions:

Q. In your PowerPoint presentation, in slides 37, 38, 40, 41, 42, 43 and 44, you rely on three Padian studies.

A. Three publications.

Q. One in 1987, one in 1991, and one in 1997; correct.

A. Yes

Q. And we have another slide in there relating to a slide in 1988. Is it the case, though, that is one you have withdrawn because you can't find what that is based on.

A. I could find out, but unfortunately I forgot. I have it, but I forgot.

Q. You didn't find it, because on the last occasion you were asked to produce it.

A. No, we were here. When you ask, we were here and I ask somebody from my office, a friend in fact, to look in my filing and finding that paper. She could not find it. But when I went back, I just omitted to look. That's all.

Q. Whatever the reason, slide No. 39 has been withdrawn, so we are left with the '87, '91 and '97 references.

A. But I think I delivered that paper.

Q. You're aware, aren't you, that 1997 study was published and commented upon, that Nancy Padian, the author of the studies, has attempted to clarify what the results of the studies mean.

A. Yes.

Q. You're aware of that, aren't you.

A. Where?

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[59] Exhibit A8, slides 37, 39, 40, 40, 42 and 49.
[60] Exhibit A8, slide 45.

Q. I'm asking you a question. Are you aware of the fact that since the time the 1997 study was completed, that Nancy Padian has written and clarified what those studies meant. Are you aware of that fact. That's a simple question.

A. Nancy Padian wrote a commentary on a website called 'AIDS Truth', the owner of which says that only they have the truth about HIV and AIDS and nobody else. Yes, I'm aware of that.

Q. And we will take it one step further: you were aware of that before you gave your evidence in this court, weren't you. You knew about that further clarification from Nancy Padian before you even stepped into this courtroom.

A. No, I did not know that. I did not know that. And if I knew, it wouldn't make any difference. Even if I knew, and I may have said it, I know, it does not make any difference. I cannot remember if then I have it or did not have it, but it wouldn't make any difference. These are the studies – and let's go to the commentary. I will be very happy to discuss her commentary, or her clarification.

Q. I'm a little confused. Did you or didn't you know before you gave evidence that subsequent to the 1997 study, Nancy Padian had written a clarification of her interpretation of these studies.

A. Let's assume that I had –

Q. Did you know. It is a direct question. Did you know.

A. Let's say that I had it, I not question, let's say that I had, I forgot, but let's say that I had it, I knew that, it wouldn't make any difference to the interpretation. No difference at all.

Q. Did you know before you gave your evidence about the further clarification by Nancy Padian. It is a simple question.

A. There is no clarification there. There is no clarification. I cannot say there is a clarification there. In fact, in that piece of writing, if anything, she complicates things.

HIS HONOUR

Q. Can I ask the question perhaps this way: did you know about the piece of writing.

A. Yes, I know that.

Q. Yes, but did you know about it at the time you gave your evidence, I think the question is.

A. When I gave the evidence?

Q. When you gave the evidence and presented these slides, did you know about the piece of writing by Nancy Padian.

A. I cannot recall. I just can't recall, because even if I knew and I did mention it here, I would not have done it because that would have to admit something, to admit interpretation. It would not have changed.

Q. I understand that you say now that you have read it and know about it, it wouldn't have changed your views, but is your answer that you can't now recall whether you knew about it or not.

A. I can't. And even if I knew, I read it and I know only things which are changing, which are important. That didn't change anything.

Q. Is it fair to say that if you had read it, you don't now recall having read it because it wouldn't change anything.

A. It wouldn't change anything. I may have read it, but it wouldn't have changed anything.

XXN

Q. We might go straight to what she had to say, because when we look at what she says in that article, I suggest to you there is no way you wouldn't have a memory one way or the other of having read this article. She is damning of your interpretation of her studies.

A. No, she had not. Please read me, please read me.[61]

96 In a document written by Professor Padian, who is the Professor of Obstetrics, Gynaecology and Reproductive Sciences at the University of Canada and a researcher who has worked on the heterosexual transmission of HIV since 1984, Professor Padian states:[62]

> HIV is unquestionably transmitted through heterosexual intercourse. Indeed, heterosexual intercourse is now responsible for 70-80% of all HIV transmissions worldwide. The current likelihood of male to female infection after a single exposure to HIV is 0.01-0.32%, and the current likelihood of female to male infection after a single exposure is 0.01-0.1%. These estimates are mostly derived from studies in the developed world. However, a man or a woman can become HIV-positive after just one sexual contact. (Endnotes omitted).

97 She then considers the issue in sub-Saharan Africa. As a result of a variety of factors, the risk of heterosexual transmission is increased to 20 per cent or even higher. In her paper, she refers to a number of studies. She states:

> In short, the evidence for the sexual transmission of HIV is well documented, conclusive and based on the standard, uncontroversial methods and practices of medical science. Individuals who cite the 1997 Padian et al. publication or data from other studies by our research group in an attempt to substantiate the myth that HIV is not transmitted sexually are ill informed, at best. Their misuse of these results is misleading, irresponsible, and potentially injurious to the public. (Endnotes omitted)

98 She then discusses some of the common practices in which her research is misquoted. She criticises the misuse of her 1997 paper and comments:

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[61] T 559 – 62.
[62] Exhibit P39.

> Anyone who takes the trouble to read and understand the paper should appreciate that it reports on a study of behavioural interventions such as those mentioned above: specifically discordant couples were strongly counseled to use condoms and practise safe sex.
>
> …
>
> Any attempt to refer to this or other of our publications and studies to bolster the fallacy that HIV is not transmitted heterosexually or homosexually is a gross misrepresentation of the facts and the travesty of the research that I have been in for more than a decade.
>
> …
>
> But many people misunderstand probability: they think that if the chance of misfortune is one in six that they can take five chances without the likelihood of injury. This "Russian Roulette" misapprehension is dangerous to themselves and to others. Furthermore, complicating factors are not evident or obvious in a relationship, so their perceived absence should not be counted on as an excuse not to practise safe sex. (Endnotes omitted)

99 In her paper, Professor Padian refers to a number of studies to support her conclusion. The very misuse of mathematical probabilities which she criticises is the methodology used by Ms Papadopulos-Eleopulos. In response to the document, Ms Papadopulos-Eleopulos makes it clear that she does not accept Professor Padian's criticism that the mathematical models that Ms Papadopulos-Eleopulos uses are invalid and she does not accept Professor Padian's models.

100 When it was put to Ms Papadopulos-Eleopulos that she had not informed the Court of Professor Padian's views about the misuse of the Padian papers, at first Ms Papadopulos-Eleopulos was evasive. When she acknowledged that she had read Professor Padian's document, she stated that she disagreed with it. She was asked:

> Q. Are you telling this court that you now have no memory when you came in to give your evidence about whether you read what Nancy Padian had to say about your sort of use of her studies.
>
> A. I'm not interested in what she says. I'm not interested her data. And her evidence does not prove heterosexual transmission, no matter how you take it. It is not what she says in AIDS Truth. It is not what she says in published scientific work, and for published scientific work let me tell you in her prospective studies she has over 170, or 173 I think, or five, individuals, men who are positive and their negative partners, and women who are positive and their negative partners. In the average, they live up to 60 years, and even at the end of the study, when the study started, the one I think, only 33% of people who are using condoms. And at the end of the study, 25% who were still not using consistently condoms, and no-one, no-one of these couples become positive. How can I say that the Padian paper proves heterosexual transmission? How she can say that her studies prove heterosexual transmission, more importantly?
>
> HIS HONOUR

Q. Can I ask you this: in your role as an expert witness, did you not think it might be important to inform the court that people upon whose studies you rely have a different view as to the interpretation of them than you.

A. I don't know. If it is important, yes, I will accept, but, your Honour, she has no evidence for transmission.

Q. I understand your criticism of her, I understand that. The question really wasn't related to that.

HIS HONOUR: You go on, Ms McDonald.

XXN

Q. Do you have a view that you have a greater level of expertise about what these studies meant than the doctor who actually conducted them.

A. I'm saying what they're publishing. They're not publishing – you cannot say they say one thing and they're publishing another thing. Unless they do that, then I cannot see how she can say, how she can say that her study proves heterosexual transmission. It's beyond me.

Q. Let's go to look at –

A. Unless they mean totally different things.

Q. Let's look at what Dr Padian says is the misuse of her studies and then we will look to see what you told the court to see if it is similar. She goes on after that passage I have just read to you to say 'A common practice is to quote out of context a sentence from the Abstract of the 1997 paper: "Infectivity for HIV through heterosexual transmission is low". Anyone who takes the trouble to read and understand the paper should appreciate that it reports on a study of behavioural interventions such as those mentioned above. Specifically, discordant couples were strongly counselled to use condoms and practise safe sex That we witnessed no HIV transmission after the intervention documents the success of the interventions in preventing the sexual transmission of HIV. The sentence in the Abstract reflects this success – nothing more, nothing less. Any attempt to refer to this or other of our publications and studies to bolster the fallacy that HIV is not transmitted heterosexually or homosexually is a gross misrepresentation of the facts and a travesty of the research that I have been involved in for more than a decade'. You don't remember whether you had read that before you gave evidence in court and relied on your PowerPoint.

A. I cannot agree with that, that is a commentary by her and her data shows a totally different thing. I repeat, her evidence does not prove heterosexual transmission. In fact, I remember now, last year we have wrote to Dr Padian –[63]

101 She then said that one of the Perth group had written to Professor Padian, who did not respond. Ms Papadopulos-Eleopulos inferred from that that Professor Padian had no answer to their criticism. That was a theme of Ms Papadopulos-Eleopulos' evidence.

[63] T 564 – 6.

102 The approach to the Professor Padian papers demonstrates that Ms Papadopulos-Eleopulos misunderstands her role as an expert. She used Professor Padian's papers to support her evidence that there was insufficient evidence to establish that HIV is sexually transmissible by heterosexual contact. Knowing that Professor Padian held diametrically opposite views, Ms Papadopulos-Eleopulos did not disclose that to the Court, nor was she frank with the Court when she was confronted with the document from Professor Padian. It was only after extensive cross-examination that she eventually conceded that she knew about the document. She admitted that she knew that there had been correspondence to Professor Padian by a member of her group as a consequence of that document. Her evidence on this topic demonstrated her inability to bring a balanced approach to the subject matter.

103 I will deal with sexual transmissibility of HIV later in these reasons.

104 Another example of the misuse of material is the evidence given by Ms Papadopulos-Eleopulos about a study known as the Rodriguez study. The background is that the evidence of a number of witnesses called by the DPP, together with the research studies upon which they rely, is that as HIV infection progresses, the CD4T cell count decreases and the viral load increases. The witnesses relate the CD4T depletion to infection with HIV.

105 Ms Papadopulos-Eleopulos presented a number of slides[64] upon which she relied to support her evidence that there is insufficient evidence to establish that HIV causes AIDS.

106 As a greater understanding of the HIV infection developed, treatment of those who were diagnosed as being HIV positive also developed. The use of antiretroviral drugs has revolutionised the treatment of HIV/AIDS. There have been a number of studies which demonstrate that treatment with retroviral drugs results in an increase of the CD4T cell count and a reduction of the viral load. Professors Gordon, Cooper and Gallo, and Dr Dwyer, all of whom have research and clinical experience, have observed that treatment with antiretroviral drugs is very effective in the management of HIV infected patients.

107 In a paper published by Rodriguez and others, including Michael H Lederman,[65] the authors conducted a study to estimate the proportion of variability in rate of CD4T cell loss predicted by presenting plasma HIV RNA levels in untreated HIV infected persons. Ms Papadopulos-Eleopulos referred to part of that study in which the authors state:

> We report that plasma HIV RNA level can account for only a small proportion of the variability in rate of CD4 cell loss in chronic, untreated HIV infection.[66]

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[64] Exhibit A5, slides 90 – 9.
[65] Exhibit P19.
[66] Exhibit P19, 1499.

108 They conclude:

> Presenting HIV RNA level predicts the rate of CD4 decline only minimally in untreated persons. Other factors, as yet undefined, likely drive CD4 cell losses in HIV infection. These findings have implications for treatment decisions in HIV infection and for understanding the pathogenesis of progressive immunity deficiency.[67]

109 Ms Papadopulos-Eleopulos concludes that the findings presented by Rodriguez and others supports the opinions of those who favour non-virological mechanisms as the predominant cause of CD4 cell loss.

110 Ms Papadopulos-Eleopulos referred to the paper by Rodriguez . She said:

> So they're two important things which one concludes, from these conclusions you draw. One, the HIV is responsible for only – what the words they use – for a minimal decline of the CD4 cells. That's for acquired immune deficiency. There are other factors which cause the decline. Secondly, the risk get very important implication regarding the HIV theory and regarding treatment of HIV infected patient.[68]

111 Ms Papadopulos-Eleopulos used the work of Rodriguez to support her view that it has not been proved that HIV infection causes the loss of CD4 cells and the break down of the immune system. She considers that AIDS is caused by factors other than HIV.[69]

112 In March 2006, Rodriguez and Lederman published a commentary entitled "What Our Works Means".[70] In that paper, they refer to their findings and their paper, which was tendered during the application as Exhibit P19. They state:

> Positive as we believe cross-examination of scientific findings to be, we have learned with growing concern about interpretations of the work that are not only inaccurate, but misleading and potentially dangerous to HIV-infected persons everywhere. Thus, we are writing here to clarify the significance of this work, its implications for the role of HIV viral load measurement in clinical practice, and its meaning to persons living with HIV/AIDS.

113 They then go on to discuss their findings:

> Most disturbing among all the interpretations of this finding, this has been taken by some to mean that our data raise doubts about HIV being the cause of AIDS; some have gone as far as to affirm that our results prove that it is not. As this is the most damaging of all the interpretations of our work, we will address it first.
>
> There is absolutely no doubt that HIV is the cause of AIDS; far from challenging the veracity of this statement, our work further confirms it. This is easily appreciated from our initial analysis of the data, which shows that on average, individuals with higher viral loads tend to lose CD4 cells more rapidly than those with lower viral loads. There is no contradiction between this finding and our main message, because the overall trend

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[67] Exhibit P19, 1498.
[68] T 76.
[69] T 76.
[70] Exhibit P20.

> among a group of subjects cannot be directly translated into a prediction of what will happen to a single individual within that group. Importantly, this finding replicates, rather than disputes, the substance of the seminal paper by Mellors et al, which demonstrated this almost ten years ago. Thus, using our work to claim that those previous conclusions are invalid reveals either a combination of sloppy thinking, sloppy reading or malicious intent. We choose to believe that it is the first two. (Emphasis omitted; references omitted)

114 They discuss the fact that 25 years after AIDS was first recognised, there has been enormous scientific and medical progress and learning about the disease. They make the point that there is still uncertainty about how HIV infection causes progressive immune deficiency which results in AIDS. They give the following analogy:

> An oft-cited analogy posits that the clinical course of HIV infection can be thought of as a train approaching a broken bridge: the CD4 cell count is the distance that separates the train from certain doom, whereas the viral load is the speed at which the train is traveling towards that point. Expanding on this image, we propose that the train's fuel, rather than a single material, can be thought of as a mixture of combustibles, of which the number of viral particles in the blood (i.e., the viral load) is but one of the components. As the relative contribution of each component to the mixture changes, so does the efficiency of combustion and hence the power of the engine and the speed of the train. From this follows that were the train to run out of fuel, it would cease to move. This sine qua non in the equation is the presence of HIV in the system: no HIV, no AIDS. Thus, in two persons with the same amount of HIV in the blood, the efficiency of combustion and hence the speed of the train (rate of CD4 decline) may vary; that is precisely what our work shows. For the HIV-infected patient, this means that it is very difficult to predict what the pace of his or her CD4 cell decline will be just based upon measurement of the amount of HIV in the blood. For this reason, more recent treatment guidelines have placed less emphasis on using HIV levels in blood to determine when to start treatment. Once antiviral treatment is started, however, it is critical to monitor the HIV levels in blood, because these levels remain the best indicator of the success of the treatment and the likelihood that its benefits will be sustained over time.

115 The paper discusses what other elements may affect the progression of the infection. The authors conclude:

> In summary:
>
> 1. HIV is the cause of AIDS.
>
> 2. In large groups of HIV infected persons who are not receiving antiretroviral therapy, those with higher levels of HIV in blood tend on average to lose CD4 cells from circulation faster than do those with lower levels of HIV in blood. But …
>
> 3. Levels of HIV in blood explain only a small proportion of the variability in the rate at which CD4 T cells are lost. Therefore:
>
> (a) For any HIV infected person not receiving antiretroviral therapies it is difficult to predict the rate at which CD4 T cells will be lost.
>
> (b) Expanded efforts to identify the other elements that drive CD4 cell losses in chronic HIV infection are needed.

116 When Ms Papadopulos-Eleopulos was cross-examined about the commentary she was evasive.[71] She attempted to rely on other commentators whose papers were not produced. She suggested it was not her view, but the view of others. She was asked:

> Q. Isn't it as simple as this: you have relied on this study as supporting your opinion that HIV doesn't cause AIDS, when in fact the very authors of that study have come out and said that is wrong, that is not what that study means at all.
>
> A. That is what they said in the paper and that is what the commentary says. If the commentary was not written by me, it was written by Layne and if you read the paper and if you read what is here, their analogy tells you that is exactly what the analogy tells you. I know they're saying it, they said it in the paper, they said it in their analogy and that is what Layne said in the commentary to this paper and this is what Furuchi said in the commentary to this paper in science.[72]

117 Later in her evidence, she again reiterated her views.[73] Professor French commented upon Ms Papadopulos-Eleopulos' evidence and made the following observation:

> The publication by Rodriguez et al demonstrated more comprehensively than any other previous publication what has been accepted for many years by immunologists studying HIV disease; that is that CD4 T cell depletion does not just result from replication of HIV in CD4 T cells. There is now a large amount of evidence (some are referred to in the paper by Rodriguez et al) supporting the view that CD4 T depletion results from immune activation triggered by HIV infection. The immune activation is affected by genetic factors in the host so varies from individual to individual. It would therefore be more correct to state that "AIDS is caused by factors in addition to HIV".[74]

118 Ms Papadopulos-Eleopulos simply disagreed with the views expressed by Rodriguez and by Professor French.

119 Ms Papadopulos-Eleopulos' treatment of the Rodriguez paper is an example of her misusing information in a manner in which the authors of that information considered was a misuse and misinterpretation of their conclusion. She did not bring to the Court's attention that the authors disagreed with her interpretation of their work.

120 The two instances to which I have referred demonstrate that Ms Papadopulos-Eleopulos is not objective in her evidence. She commences with a proposition which she then seeks to justify by reliance on material which, when properly understood, does not support the proposition.

121 Ms Papadopulos-Eleopulos propounds theories which are not supported by adequate scientific research or knowledge. She demonstrates an ability to read scientific literature but she has misused and misinterpreted much of the material

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[71] T 333 – 9.
[72] T 339.
[73] T 640 – 2.
[74] Exhibit P59.

upon which she seeks to rely. She takes statements out of context and then relies upon them to support conclusions which are not supported by the text.

122 Her evidence is littered with examples of misunderstandings, misinterpretation and denial of established scientific research. In many instances she relies upon material which is outdated. She either deliberately fails to acknowledge or is not aware of the most recent scientific research that establishes that HIV exists and that, if untreated, will lead to the breakdown of the immune system.

123 Ms Papadopulos-Eleopulos is a leading member of a group known as the Perth Group who for many years have been proponents of the view that it has not been proven that a unique HIV retrovirus exists. They are also proponents of the view that antibody tests are not proven to have been specific for HIV infection.

124 The Perth group has advanced the propositions that the mainstream scientific community has not proven:

(1) The existence of a unique exogenously acquired virus HIV.

(2) That HIV antibody tests are specific for HIV infection.

(3) That HIV causes AIDS (that is, destruction of T4 lymphocytes). The Perth Group describes this as "the HIV theory of AIDS".

(4) That the HIV genome (RNA or DNA) originates in a unique exogenously acquired infectious retroviral particle.

(5) HIV/AIDS is infectious either by blood, blood products or sexual intercourse.

(6) Mother to child transmission of a retrovirus HIV or its inhibition with antiretroviral medication AZT.[75]

125 One of the methods promoted by the Perth group to have their theories exposed to the public is to encourage individuals to have the evidence for their diagnosis of HIV infection examined in courts of law.[76]

126 An example of the lack of independence of Ms Papadopulos-Eleopulos and Dr Turner was demonstrated by the use they have of a website of "The Perth Group". The Perth Group has promoted their views through their website.[77] During the cross-examination of Ms Papadopulos-Eleopulos, she admitted that the affidavit of Dr Turner used in the proceedings had been published on the website. When she was first questioned about it, she said that she had little to do with material that was on the website. When she was further cross-examined,

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[75] Exhibit P3.
[76] Exhibit P3.
[77] Exhibit P3.

she finally agreed that she knew that Dr Turner's affidavit had been published on the website.[78]

127 It was suggested to Ms Papadopulos-Eleopulos that the reason for publishing the affidavit on the website was to get publicity for the Perth group and their theory about HIV. Ms Papadopulos-Eleopulos responded:

> A. We have many things on our web site which are publicity of our theory of HIV/AIDS. All our papers are there and that is what they are there for, for people to read them. That is what everybody else has on their web site. At least in our web site we welcome people to respond. In fact we ask people to respond. On the other hand on the AIDS truth web site, from which I have some of your items, people, scientists, are not allowed to respond. The HIV expert claims that they have the truth and the only truth and nobody else got any question or respond to their claims on that web site. On the other hand, we beg for people to tell us, anyone, to tell that we are wrong.
>
> Q. Isn't it the case that on the very front page of your web site you in fact indicate that a way to get your message across is to have this issue, that is in relation to HIV, agitated in the courts.
>
> A. Agitated in the courts, no, I am not aware. No, I am not aware.[79]

128 Ms Papadopulos-Eleopulos gave the impression that the Perth group was a substantial group of scientists. She was then referred to the part of the website dealing with contributors to the site. She and Dr Turner are referred to as the scientific contact and the facilitator respectively. The only other contributors listed are Joseph and Wallace Turner, who are the web designers.[80] She was asked why there were no other contributors listed. She said she did not know, but that was Dr Turner's responsibility.

Is Ms Papadopulos-Eleopulos qualified to give expert evidence?

129 Ms Papadopulos-Eleopulos sought to give evidence over a wide range of areas of knowledge. The starting point in considering whether a witness has acquired a sufficient knowledge of the subject matter for their opinion to be valued is to consider the academic study undertaken by the witness. In medicine there are many areas of specialisation. It is relevant in determining a person's state of knowledge to have regard to their further study in the areas of specialisation.

130 Ms Papadopulos-Eleopulos has not undertaken any formal study in any of the disciplines of specialised medicine of which she seeks to express an opinion. She is self-taught to the extent that she has read much on the various subjects. There may be circumstances in which a person can become expert in a particular area of expertise, simply by reading and self-teaching. However, I do not

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[78] T 200 – 1.
[79] T 201 – 2.
[80] Exhibit P15.

consider that the areas in which she sought to give evidence are such areas. In my view, it is virtually impossible to develop an expertise in medical science, sufficient upon which others can rely, simply by reading textbooks and research papers.

131 A person's practical experience must be relevant. If a person has work experience and has developed their knowledge from learning from others and being taught, that may be sufficient to qualify the person as an expert. In many disciplines, practical experience is essential. For example, an expert in winemaking may gain their expertise by working and being taught by an experienced winemaker. Simply reading about the subject may not be sufficient.

132 Ms Papadopulos-Eleopulos has no practical experience. She has never worked with patients who are said to be infected with HIV, or with any virus. She has never treated or diagnosed patients who have viruses. She has never worked in laboratories or conducted research. She has no practical experience.

133 She has given evidence on the topics of virology, immunology, epidemiology, microbiology and microscopy. She has no practical experience and she has never worked in any of the areas.

134 Although Ms Papadopulos-Eleopulos demonstrated a superficial understanding of a number of the areas, I consider that her knowledge is limited to her reading. She has what one might describe as a textbook understanding of the science of viruses, but she has no depth of knowledge or understanding and she simply relies upon written material. She did not demonstrate any understanding or knowledge similar to that demonstrated by the witnesses called by the DPP.

135 I conclude that she does not have expertise in the various disciplines in which expertise is required. In my opinion, she is not qualified to express opinions about the existence of HIV, or whether it has been established that it causes AIDS. Nor has she expertise to express opinions about whether the virus is transmissible. Nor is she qualified to express opinions about the tests that have been developed to diagnose the virus.

136 Even if I were to conclude that Ms Papadopulos-Eleopulos had some expertise to express opinions about the methodology for determining whether HIV exists, I consider her opinions to be so out of line with the prevailing opinions and the prevailing evidence which supports the existence of the virus, that no jury could rely upon her opinions. In my view, no weight could be given to her evidence. That is a relevant factor in considering whether permission to appeal should be granted.

137 Ms Papadopulos-Eleopulos lacks independence. She is an advocate for a cause. She chooses to rely upon opinions of others which she often takes out of context and misinterprets. She lacks objectivity. If faced with evidence which

does not support her views, she simply refuses to acknowledge it, or dismisses it without any basis for so doing. Examples of her refusal to acknowledge evidence which does not support her views include her response to the epidemiological evidence which she says is not proof and which she dismisses as unreliable.[81]

138 The evidence given by Ms Papadopulos-Eleopulos about the Perth group demonstrates that she is promoting a cause. She is not independent. She is motivated to create a debate about her theory. The Perth Group will use whatever means available to promote that debate, including encouragement of persons such as the applicant, to promote their theories in courts of law.

139 This is another example of the failure on the part of Ms Papadopulos-Eleopulos to bring a balanced and independent assessment of the scientific evidence.

140 I consider that her opinions lack any credibility. In my view, based upon her evidence, no miscarriage of justice has been demonstrated.

Purported field of expertise of Dr Turner

141 Counsel for the appellant asked Dr Turner to describe to the court his qualifications and the development of his interest in HIV:

> Q. Will you take his Honour through your qualifications.
>
> A. I have an MBBS in the University of Sydney 1969 FRACS, FRACM.
>
> HIS HONOUR:
>
> Q. FRACS is a Fellow of the Royal Australasian College of Surgery.
>
> A. Yes, and FRACM is a Fellow of the Royal Australasian College for Emergency Medicine.
>
> MR BORICK:
>
> Q. And your work history.
>
> A. I have been an emergency physician since 1977 and I have worked in several - in fact I have worked in all major emergency departments in Perth. I have spent over 20 years in the Royal Perth Hospital and I was at one stage in charge of the Royal Perth Hospital emergency department. I am currently employed on a part-time basis by the Department of Health in Western Australia, in a clinical advisory capacity and in the project development unit. I would like to stress that the views I am going to express in this court case are not the views of the Department of Health of Western Australia, if I may say that.
>
> Q. Now, you are experienced with what I generally call HIV.

[81] See, e.g., T 144 – 5; T 161 – 74; T 459 – 61; T 502 – 7; T 512 – 15; T 518; T 522 – 4; T 535 – 7; T 558 – 9.

> A. I became interested in HIV back in 1981 like a lot of doctors did because it was new, something interesting, terrifying at the time as I recall, and of necessity because just about everything that can happen in medicine happens in emergency departments and we had to learn about this disease. I possibly became more interested in it than a number of my colleagues and I knew a lot about - in the years before we had HIV there was a couple of years between 1981 and 1983 before HIV was accepted to be the cause of AIDS when people were wondering what it was caused by and I cooperated with her and I became interested in it and another reason I became interested in this topic, especially the antibody test, because we in medicine treat needle stick injuries which involves the antibody test and I was concerned to know that the tests we were ordering were rigorous and could be relied upon and I had lots of patients with needles stuck and I had colleagues needle stuck and I have been needle stuck myself and I developed an interest in this topic because of that, and I suppose I have spent 25 years reading about this, studying it, thinking about it. At one stage my children asked me how much time I had spent on this and I worked out I had spent the equivalent of two undergraduate medical degrees studying the literature. I have written several papers. I have co-authored several papers and I have spoken at the South African Presidential AIDS Council Meeting and I was invited to that and I have published some invited papers as well and I supplied those with my affidavit.[82]

142 Dr Turner's knowledge of the subject matter is limited to reading. He has no formal qualifications to give expert opinions about the virus. He has no practical experience in the treatment of viral diseases. He has no practical experience in the disciplines of virology, immunology or epidemiology.

143 His opinions are based on reading scientific literature, studying of scientific literature, and spending a considerable amount of time thinking.

144 I conclude that Dr Turner is not qualified to advance expert opinion about virus isolation, antibody tests, viral load tests, or sexual transmission of the virus. His knowledge of these subjects is limited to having read a number of publications. He relies entirely on his interpretation of various studies in the specialised disciplines of virology, epidemiology, microbiology, immunology, pathology or infectious diseases, in none of which he has qualifications beyond his medical degree. He has no practical experience, and has performed no research which has been published.

145 Ms Papadopulos-Eleopulos and Dr Turner have attempted to suggest that their views have legitimacy by aligning themselves with the hospital in which they work. A simple example of how they misrepresented that position was revealed in evidence that they gave about work that they conducted at the Royal Perth Hospital. One of the leading researchers and clinicians in HIV treatment is Professor Martyn French of Royal Perth Hospital.

146 Ms Papadopulos-Eleopulos was asked about Professor French. She said:

> A. Of course I know him. I know him. We have been in two different camps with regard to HIV. He has always been, like many HIV experts, he has always been

[82] T 79 – 80.

very polite. From 1984 we agreed to disagree that HIV exist and is the cause of AIDS but we have been always – like many HIV experts, he has been always very polite. As I said, we try to collaborate and do experimental work together.[83]

147 She was asked what she was talking about when she said that she tried to collaborate and do experimental work together with Professor French. She said:

A. We have designed some experiments to show, to prove that one of the prediction of our theory, that is that patients could develop AIDS, induce AIDS, they have – they are oxidised, relatively to – their tissue is oxidised relatively to normal individuals, to healthy individuals. We wanted to do that for long time but we never get any money. Then Dr Turner's father donated us $10,000 to try and do this experiment and we ask Professor French if he will collaborate with us and the documents are there, we have many letters, many exchange letters. He agreed to collaborate. In fact, he asked one of his registrars to help us in collecting the blood and we are trying to develop the test, and we did develop the test and this is just a preliminary study. Unfortunately the money, the $10,000, can't go too far these days and we have to stop the collaboration and the test, but, yes, we did agree – he agreed, in fact he agreed to be a co-author of any paper which result from this study, but he has to read the interpretation and agree with that which would be all right.

Q. So when you say 'we have designed some experiments to prove one of your predictions', who is the 'we' you are talking about.

A. It was me, that was my theory, my theory predicted that AIDS patients would be relatively oxidised, their tissues would be oxidised and this prediction, I must say it, has been proven by several people who do HIV research and the best prediction – the best proof came from researchers from Germany and from the University of Stamford. They had a couple of immunologists who worked at the University of Stamford and their evidence, they have been shown that oxidation is a much better prediction of AIDS development than actual decrease in CD4 cells.

Q. So I'll go back to the question I actually asked you, that is when you talked about 'we have designed some experiments' you weren't suggesting, were you, that Professor French was involved in designing those experiments.

A. No, I just said the group, and Professor French agreed to collaborate with us.

Q. I suggest that all Professor French did was let you have some blood samples, that was the extent of the collaboration and doing the experimental work together.

A. Not only that, he agreed to be a co-author of the paper. We have the letter where he responded.

Q. Any other, as you put it, collaboration.

A. He wouldn't collaborate in any other different way because we were doing the test. The test was developed in the Department of Medical Physics with money by Dr Turner's father.

Q. Any other collaboration and conducting experiments work with Professor French that you can tell us about.

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[83] T 253.

A. No.[84]

148 Dr Turner was asked:

Q. Have you conducted any studies or tests in relation to HIV yourself, and by that I mean primary studies, not just taking up the work of others.

A. I was involved in the collaboration that my colleague discussed briefly during her cross-examination, where we collaborated with Professor French. That is all.

Q. So you're talking about the occasion on which he gave yourself and others some samples to use for some tests.

A. Yes, and he also gave us access to his medical staffer and the records so that we could correlate the findings with clinical data.

Q. And that is the testing that never really got off the ground.

A. That's correct, unfortunately, yes. There were some findings, but they weren't much to speak of.

…

Q. I want to go back to a couple of discrete topics and the first relates to your evidence yesterday about collaborating with Professor French. When do you say that occurred.

A. Look I can't honestly remember the date. It was over a decade ago but I don't know the year. There is a letter somewhere in our files from the Royal Perth which would indicate the exact date but I'm sorry I can't tell you.

Q. But over a decade ago.

A. I think so.

Q. Is your rough memory.

A. I'd say at least a decade ago.

Q. What was the extent of the collaboration that you say occurred.

A. We approached Dr French for permission to test some of his patients for their redocs status and to compare that with clinical outcomes and we had a person who measured these in the medical physics laboratory and on at least a couple of occasions I remember meeting with one of his registrars whose name I think was Dominique Mellon, but I'm not sure of the surname, but his first name was Dominique, and we went through case notes. But I mean I emphasise it was very low key, very low level study and for $10,000 you can't do very much.

Q. Did you have any direct dealings with Professor French in relation to this so-called collaboration.

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[84] T 418 – 19.

> A. Not very much, I mean an initial approach and I can't actually recall discussing individual cases with him at all. I mean it was not unusual for him to send his registrar in.[85]

149 Dr Turner accepted that the work that was undertaken did not result in any published papers or in any concluded research. When Dr Turner was further pressed on the question of whether Professor French had agreed to co-author any reports, he said that he did not have a clear memory.

150 Professor French was asked whether he had collaborated with Ms Papadopulos-Eleopulos and Dr Turner in a study:

> Q. What do you say to a suggestion that, in the past, about a decade or so ago, you collaborated with these two people to work together in some sort of study.
>
> A. I have never collaborated with Dr Turner or Mrs Eleopulos. I cannot remember if I ever agreed to provide blood samples in the past, I just cannot remember that, but I've certainly never collaborated with them.
>
> HIS HONOUR
>
> Q. What do you understand by 'collaboration'.
>
> A. By 'collaboration' I mean having meetings to design studies and providing samples to undertake a study which I would help to supervise and then to write a publication.[86]

151 Professor French said that about a decade ago he wrote to the Chief Executive of the Royal Perth Hospital because he was concerned about the views being expressed by Ms Papadopulos-Eleopulos and that those views could be associated with the Royal Perth Hospital.[87]

152 Professor French at no time agreed to collaborate with Ms Papadopulos-Eleopulos or Dr Turner in any study. When the witnesses were asked to give details of the collaboration with Professor French, it finally became clear that, put at its highest, Professor French agreed to facilitate their work by providing blood samples. It later became clear that the experiments they proposed did not advance to a point where they could publish any findings.

153 Their evidence demonstrates how they misinterpret their position and promote their opinions by attempting to authenticate their views in a misleading way.

154 During cross-examination, the DPP tendered a letter from the Vice Chancellor of the University of Western Australia to Ms Papadopulos-Eleopulos, dated 20 July 2006. In this letter, the Vice Chancellor observed that on the Virus Myth website, Ms Papadopulos-Eleopulos was described as a

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[85] T 657 – 8; T 717 – 18.
[86] T 786.
[87] T 786 – 7.

"Professor of Medical Physics at Royal Perth Hospital, a teaching hospital of the University of Western Australia". The Vice Chancellor noted that although this might be technically correct, there was a possible interpretation that Ms Papadopulos-Eleopulos was a Professor of Medical Physics at the University of Western Australia, which was incorrect, and he consequently asked her to clarify the association to the website.[88]

Witnesses called by the DPP

155 The DPP called a number of witnesses, each of whom had qualifications in different areas of medicine and science. In each case, the witnesses had studied a field of knowledge which could not be understood by the Court without explanation and assistance. Each of the witnesses had extensive practical experience in the subject matter. Each taught their subject at a high level. I will refer to each witness and summarise their qualifications and experience.

David Albert Cooper

156 David Cooper is a Professor of Medicine at the University of New South Wales. He is a Director of the National Centre in HIV Epidemiology and Clinical Research. He is head of the HIV Infectious Diseases Immunology Clinical Services Unit at St Vincent's Hospital, which provides care for people with HIV.[89] Epidemiology is the science concerned with the study of the factors determining and influencing the frequency and distribution of disease and other health-related events. It studies the causes of disease in a defined human population for the purpose of establishing programs to prevent and control their development and spread.[90]

157 From 1981 to 1983, he was a Research Fellow in Pathology at the Harvard Medical School. He worked at the Dana Faber Cancer Center, which is the laboratory in which human CD4 was first recognised. Without the work of that laboratory, the pathogenesis of HIV would not be understood as well as it is today. The laboratory was referred samples from the first AIDS patients to study their CD4 cells. One of the symptoms of patients who are diagnosed with HIV infection and develop AIDS is that their CD4 cells decline in number. The effect of current antiretroviral treatment is that the CD4 cell count increases when AIDS sufferers receive that medication.

158 Professor Cooper has been involved in a number of world studies of HIV. He was involved in the Smart study, which demonstrated that disrupting antiretroviral treatment had a negative impact on someone who had been diagnosed as HIV positive. The study involved about thirty countries. He said that the study was quite extraordinary in that it established that if therapy with

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[88] Exhibit P1.
[89] Exhibit P53.
[90] *Dorland's Illustrated Medical Dictionary* (30th ed, 2003) 626.

antiretroviral drugs was intercepted, HIV sufferers became sick and died at a rate two and a half times greater than if they had maintained the treatment.

159 Professor Cooper has been a member of various government advisory bodies. He has a long list of publications in which he co-authored or collaborated with the authors on the subject of HIV/AIDS.[91]

160 Professor Cooper has extensive experience in research and in the clinical treatment of persons suffering from the HIV infection. He is a recognised leader worldwide in the study and treatment of HIV/AIDS.

161 His evidence demonstrated his extensive knowledge of the subject matter. He was able to explain highly complex medical and scientific concepts.

162 He is qualified to express expert opinion on the subject of HIV/AIDS and the treatment of it.

Martyn Andrew Haydon French

163 Professor French is the Clinical Director of the Department of Clinical Immunology and Biochemical Genetics at the Royal Perth Hospital. In that position, he supervises all clinical activities, including the services that the hospital provides for patients with HIV and AIDS. He is the Clinical Professor of the School of Surgery and Pathology at the University of Western Australia. He is a Member of the Royal College of Pathologists and the Royal College of Physicians. He is a Member of the Australasian Society for Clinical Immunology and Allergy, the Australasian Society for Immunology and the Australasian Society for HIV Medicine. He has served as a member of a number of committees and boards. He is the Deputy Chair of the Antiretroviral Working Group of the National Centre in HIV Epidemiology and Clinical Research, and has been a member of the *AIDS* Editorial Advisory Board.

164 Professor French trained at the University of Sheffield where he developed his expertise in clinical immunology. He has extensive experience in the area of immune function testing for diagnosis of immuno deficiency diseases. When he returned to Perth in 1986, he played a major role in developing the clinical management of and research into immuno deficiency diseases, particularly antibody deficiency diseases and AIDS. He has been the principal investigator in over thirty national and international clinical trials of therapies for HIV infection and HIV diseases. He has been heavily involved in the establishment of a national clinical trials program for Australian HIV infected patients. He has conducted research and published a number of studies relating to immuno deficiency diseases.

165 Professor French has supervised and collaborated in a number of studies, including a research study by Dr Paul Cameron and Dr Simon Mallal on immuno

[91] Exhibit P54.

genetic determinants of the development of immuno deficiency in HIV infected patients. He has conducted research into the complications that may arise as a result of antiretroviral therapy for HIV infection. He is currently involved in research into the clinical trials of antiretroviral therapy and interleukin-2 in patients with HIV infection, immune reconstitution in HIV infected patients treated with antiretroviral therapy and characterisation of the immuno genetic factors underlying the immuno regulatory abnormalities resulting in IgA deficiency and common variable immuno deficiency.

166 Professor French has extensive practical experience in the treatment of HIV/AIDS. He has given presentations at international conferences on the subject. He has visited countries overseas, including the United States of America and Africa, where he has conducted workshops on the subject matter.

167 He has made clinical observations of patients and he is able to speak directly of the use and effect of antiretroviral medication upon those suffering from HIV/AIDS.

168 Professor French is a leading medical scientist in Australia, dealing with the issue of HIV/AIDS. He expressed the opinion, as did others, that the debate about HIV and whether it causes AIDS is a debate that is no longer valid or current today.[92]

Elizabeth Mara Dax

169 Associate Professor Dax is the Director of the National Serology Reference Laboratory of Australia. She is a Principal Fellow of the University of Melbourne in the Department of Microbiology and Immunology. She is a Principal Fellow of the St Vincent's Institute of Medical Research. She is an Associate of the McFarlane Burnett Institute for Medical Research and Public Health. She is an Associate of the Royal College of Pathologists. She has a degree in medicine and a doctorate in medicine from the University of Melbourne. She has a PhD from the Monash University and a specialist qualification from the University of Maryland, USA, in endocrinology.

170 She has won a number of awards for her work. She is a member of a number of committees and working groups, some of which involve the standards for performing HIV testing. She has taught and trained members of laboratories, both in Australia and overseas, particularly in South-East Asia. She is the author or co-author of a number of papers relating to HIV testing. She has written a widely used teaching manual on quality assurance. She has published widely on the subject of laboratory testing.[93]

171 In 1985 it was decided to introduce HIV virus testing in Australia when no-one knew how the tests should be interpreted or which tests to use. It was

[92] Exhibit P57.
[93] Exhibit P61.

decided there should be a national reference laboratory. The National Serology Reference Laboratory ("NRL") was developed. The laboratory collects sample banks from people who display the signs and symptoms of having HIV. A sample bank was developed against which tests could be evaluated. This has changed and become refined over the years. In Melbourne there is a sample bank of thousands of samples against which can be evaluated any new test that comes into the country before it is approved for marketing.

172 Tests which may be used for blood sampling which are critical would be evaluated in up to 10,000 samples. If laboratories do HIV testing they are required to have liaison with the NRL, which ensures that laboratories are processing tests correctly. Samples are collected from people who arrive from overseas. If someone acquires HIV from outside Australia, the viral types are represented in the sample bank.

173 Associate Professor Dax's primary position is the Director of the NRL. That is an institution that is responsible for the quality of HIV, hepatitis and blood-borne viral testing in Australia.

174 Associate Professor Dax has both the qualifications and experience to discuss the different types of tests which are used in Australia to diagnose HIV infection. She has many years' experience in the use of the tests. Those responsible to her are charged with ensuring that laboratories throughout Australia which conduct blood tests to identify the HIV virus are up to standard.

175 Associate Professor Dax gave extensive evidence about the various tests and test kits which exist in Australia for the diagnosis of HIV infection. She exhibited a high degree of knowledge in the way in which tests are conducted in other parts of the world. She was cross-examined at length about a number of subject areas, some of which she deferred to other specialists, particularly in the areas of virology, immunology and epidemiology.

176 I am satisfied that she is qualified to give evidence and to give opinions about the various tests which exist for the diagnosis of HIV, their accuracy and their specificity.

Dominic Edmund Dwyer

177 Dr Dwyer is the Senior Medical Virologist in the Centre for Infectious Diseases and Microbiology Laboratory Services at the Institute of Clinical Pathology and Medical Research at Westmead Hospital, Sydney. The hospital provides public health microbiology and specialist HIV laboratory services for much of New South Wales. His position also involves clinical practice, predominantly in the field of HIV and other viral infections. It also includes a research component, which is related to HIV and its resistance to antiretroviral drugs. Approximately 25 per cent of Dr Dwyer's time is spent with patients, infected with HIV.

178 Dr Dwyer has a degree in science and medicine from the University of New South Wales, and a doctorate in medicine from that university. He is a Fellow of the Royal Australian College of Physicians and a Fellow of the Royal College of Pathologists of Australasia. He worked at the Pasteur Institute in France between 1988 and 1990 when much work was being conducted into the HIV virus. He has peer reviewed a number of publications, and is a co-author of a number of publications relating to the HIV virus.

179 Dr Dwyer has been a presenter about the HIV virus at a number of national and international conferences. He has received research grants and has been involved in a number of investigations relating to HIV and antiretroviral drugs. He has undertaken post-graduate research at the Pasteur Institute.[94]

180 Dr Dwyer has extensive experience in virology and, in particular, HIV. His experience is both in research and in treating HIV infected patients. He has worked at the Pasteur Institute with members of the team headed by Luc Montagnier, the discoverer of the HIV virus. Dr Dwyer is a leading medical expert in Australia in virology.

181 He gave clear and concise evidence upon a subject of extreme complexity. He also expressed the view that the debate about the existence of the HIV virus and it being a cause of AIDS is long over.

David Llewellyn Gordon

182 Professor Gordon is the Head of Microbiology and Infectious Diseases at the Flinders Medical Centre and the Professor and Head of the Department of Microbiology and Infectious Diseases at Flinders University. He is a Chief Examiner in Microbiology of the Royal College of Pathologists of Australasia.

183 He has a degree in medicine from the University of Adelaide and is a Doctor of Philosophy at Flinders University. He is a Fellow of the Royal Australian College of Physicians and a Fellow of the Royal College of Pathologists of Australia.

184 He has received numerous research grants and has won a number of awards for his work in the area of infectious diseases.[95] He has been involved in a number of clinical drug trials, and has had to consider the results of those drug trials in relation to HIV and antiretroviral medication.

185 The clinical drug trials in which he has been involved generally involve the comparison of a new HIV drug with existing therapy. He has extensive experience with HIV research and with the treatment of the HIV virus.

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[94] Exhibit P67.
[95] Exhibit P71.

186 He has extensive expertise in the clinical diagnosis of HIV and in the treatment of persons who are diagnosed as having contracted the virus.

187 He also was able to explain complex areas of science and medicine to the Court. He has extensive expertise in his field of knowledge and is well qualified to express opinions about the HIV virus and the cause of AIDS.

John Martin Kaldor

188 Professor Kaldor is an epidemiologist.[96] Epidemiology is the study of patterns and causes of disease and disease progression in the population. The practice of epidemiology is to consider groups of people, make comparisons amongst different groups and sub-groups, and to determine how they differ with regard to a variety of factors including their lifestyle, their age and their sex. An epidemiologist will then attempt to draw conclusions about the cause of disease from understanding the similarities and differences between the groups.

189 Professor Kaldor has a Bachelor of Arts Degree (Honours) from the University of Western Australia, a Master of Arts from the Australian National University, and a doctorate from the University of California in the United States of America. He is currently Professor of Epidemiology and the Deputy Director of the National Centre in HIV Epidemiology and Clinical Research in Australia. He is a member of a number of advisory committees concerned with the evaluation of HIV infection. He is the author of a number of articles and books on the subject matter in respect of the HIV/AIDS virus. He has extensive experience in the study of the causes of AIDS.

190 He is qualified to give opinion evidence about HIV and the epidemiological work that has been performed in respect of the virus.

Robert Charles Gallo

191 Professor Gallo is currently the Director of the Institute of Human Virology at the University of Maryland School of Medicine.[97] The Institute employs approximately 300 people, 100 of whom are physicians or PhDs, and almost all doing virological studies, clinical epidemiological public health and working in laboratories. The Institute focuses on chronic persistent viral infections, particularly retroviruses, such as HIV and the leukaemia viruses HVLD1 and HVLD2. The Institute also does work in respect of papilloma viruses that cause cervical cancers, herpes viruses, Kaposi's sarcoma (a cancer named after an Hungarian physician) and hepatitis.

192 The Institute is concerned with viruses that stay with a person. It is divided into six listed divisions: a division of basic science; a division of epidemiology; public health; clinical division; the animal model division; and a vaccine division. The Institute works in Southern Africa, South America, Haiti, as well

[96] Exhibit P76.
[97] Exhibit P80.

as in the USA. The Institute is currently caring for about 5000 people in Maryland. It is heavily involved in attempting to develop a vaccine for HIV.

193 Professor Gallo is a Professor of Medicine and Professor of Microbiology and Immunology. He is an adjunct professor at various universities throughout the USA, including the Department of Genetics, George Washington University; Department of Biology, John Hopkins University; and the Department of Microbiology and Immunology and Parasitology at York State College of Veterinary Medicine at Cornell University, New York.

194 He is a member of the editorial boards of various well-known medical and scientific publications. He is a past and present member of numerous scientific advisory boards, committees and panels. He has numerous honorary doctorates and numerous scientific awards. He has lectured nationally and internationally for many years. He is regarded as a world authority on the subject of viruses and retroviruses. He has performed detailed work in the area of HIV research. He was the most referenced scientist in the world between 1980 and 1995. He is regarded as one of the scientists who discovered HIV and the cause of AIDS.

195 He is one of the leading scientists in HIV/AIDS research in the world. He is regularly quoted in textbooks and papers dealing with the HIV/AIDS virus.

196 When he gave his evidence he was forthright. At times, he was impatient with propositions that were being put to him. Mr Borick QC is critical of the manner in which Professor Gallo gave his evidence. He submits that Professor Gallo was not entirely frank and that his aggressive attitude towards the questioner was due to the fact that his opinions lacked credibility.

197 I reject that submission. I consider that Professor Gallo was a frank, forthright witness. Professor Gallo has been recognised throughout the world for his work. He is a pre-eminent expert in the field of virus identification and treatment. I accept his evidence and his opinions. I accept his evidence that the debate about HIV, whether it causes AIDS and whether it is sexually transmissible by heterosexual vaginal sexual intercourse, is a debate that was completed by the mid-1980s. I accept his evidence that the witnesses called by the applicant have misused material in support of their argument that HIV has not been proved to exist.

Peter James McDonald

198 Professor McDonald is qualified with a Bachelor of Medicine and a Bachelor of Surgery at the University of Adelaide in 1967. He is a Fellow of the Royal College of Pathologists of Australasia, a Member of the Royal Australian College of Physicians, a Fellow of the Royal Australian College of Physicians, a Member of the Australian Society for Microbiology, and a Fellow of the Australian Society for Microbiology. He was the inaugural Head of Microbiology and Infectious Diseases at Flinders University. He took up that

post having completed a fellowship in Infectious Diseases at the University of Wisconsin Department of Medicine in the United States of America.[98]

199 Professor McDonald has been involved in a number of international clinical studies. He has published papers on the subject. He has been involved in numerous committees on the subject of HIV/AIDS. He has advised the Australian Government. He has been involved in the development of an HIV vaccine, and has been involved in HIV/AIDS treatment since the disease was first discovered.

200 Professor McDonald is a member of the Federal Ministerial Advisory Committee on AIDS, Hepatitis and Sexually Transmissible Diseases. Professor McDonald is the Chairperson of the Scientific Advisory Committee with the Special National Centre. He is also a member of the Scientific Advisory Committee of the Virology Initiative. He has worked and studied in the United States of America and has extensive experience and knowledge about HIV/AIDS.

201 I am satisfied that Professor McDonald has qualifications and experience in a field of knowledge which cannot be understood by a court without expert assistance. He is well qualified to give expert opinions on the subject of HIV/AIDS and, in particular, the initiatives that have been taken by governments to deal with AIDS.

202 He was present throughout the time during which Ms Papadopulos-Eleopulos and Dr Turner gave evidence. He has expressed the opinion that, in order to support their views, they have been selective in their interpretation of complex literature. He concluded that they have relied on literature of the 1980s and 1990s, without acknowledging subsequent scientific developments. Professor McDonald observed that various international authorities have adopted policies and procedures based on their acceptance of mainstream scientific opinion. These include the United Nations and health authorities in various countries throughout the world which have recognised that there is an epidemic (AIDS) resulting from a virus (HIV) which is transmissible sexually, transmissible by blood transfusion, transmissible by intravenous drug users sharing needles, and by other forms of contact such as non-sterilised medical or dental equipment.[99]

203 I agree that Ms Papadopulos-Eleopulos and Dr Turner have ignored or failed to give sufficient recognition to the considerable amount of work and research that has been conducted since the 1980s. Professor McDonald's view is that the debate as to whether HIV is a virus, whether it has been isolated and whether it is sexually transmissible and a cause of AIDS is long over.

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[98] Exhibit P87.
[99] T 1346 – 51; Exhibits P88 and P89.

204 I accept his expert views.

The case for the applicant

205 I have found that Ms Papadopulos-Eleopulos and Dr Turner are not experts in the subject matter upon which they have given evidence. I have concluded that the witnesses called by the DPP are experts.

206 Because the witnesses called by the applicant are not expert, the opinion evidence which they gave is not admissible. I have noted above that the evidence given on whether HIV has been proved to exist, whether HIV is sexually transmissible, and whether it causes AIDS is opinion evidence. The finding that the witnesses for the applicant are not experts, and thus are not qualified to give expert opinion evidence, is, in my view, a sufficient basis upon which to refuse the application for permission to appeal.

207 Nevertheless, I intend to consider the case for the applicant and to deal with a number of the propositions advanced by the applicant.

Background

208 In attempting to understand the case for the applicant, it is necessary to give an historical overview.

209 In the late 1970s a phenomenon occurred in the USA, where it was observed that young men were developing diseases which had not previously been observed in such large numbers in young adult males. Those who contracted the diseases were dying in significant numbers. Research was being carried out throughout the medical scientific community to discover the cause. This phenomenon came to be referred to as the Acquired Immunodeficiency Syndrome, or AIDS.

210 A French scientist, Luc Montagnier, was conducting research at the Pasteur Institute in Paris. At the same time, Robert C Gallo in the USA was conducting research at the National Cancer Institute of the National Institute of Health, of which he was Head of the Laboratory of Tumour Cell Biology.

211 Both scientists are eminent researchers in the area of virology. Both researchers have authored and co-authored numerous research papers on the subject. Professor Gallo and his researchers are credited with the discovery of the first human retrovirus, HTLV-1 in 1980. This virus was linked to the causes of adult T-cell leukaemia, a cancer epidemic in southern Japan, the West Indies and parts of Africa. In 1982, he and his researchers reported the second human retrovirus, HTLV-2.[100]

212 In the early part of 1982, Professor Gallo expressed the view that the cause of AIDS was a new T-cell retrovirus. In 1983, a French group of scientists, led

[100] Exhibits P81 and P90.

by Luc Montagnier, reported an isolate HIV from a patient with lymph gland enlargement. The patient's name was BRU. At that time, the virus could not be expanded into a cell line, nor was it linked to AIDS. In a series of papers later that year, Professor Gallo and others described isolates from 48 different patients. Scientists in his laboratory were able to produce the virus in cell lines. An HIV blood test was developed. The complete sequence of HIV genome was provided by the French group and Gallo's group in late 1983-1984.

213 Since that time, extensive research has continued and a great deal of knowledge has been acquired. In their publication, "Medical Virology, 4th Edition",[101] the authors, White and Fenner state:

> The threat posed by AIDS has triggered an unprecedented effort, by research scientists and Governments alike, to understand and conquer this disease. We already know more about the human immuno deficiency virus (HIV) than about any of the viruses of longer standing. Indeed, HIV now sets the pace in virus research. Many outstanding virologists have moved across to HIV, and new concepts and techniques pioneered by HIV virologists in every area of the discipline – from regulation of viral replication, through molecular pathogenesis, to laboratory diagnostic methods and novel approaches to antiviral therapy and vaccinology – now represent the gold standard to which others aspire.[102]

214 A similar opinion as to the extent of research has been given by the various expert witnesses called by the respondent. It is their general consensus that HIV is one of the most researched viruses in the world, and more is known about it than many other viruses in the world.

The evidence of Ms Papadopulos-Eleopulos and Dr Turner

215 The manner in which the evidence was led was not how a court would traditionally expect to receive expert evidence.

216 Ms Papadopulos-Eleopulos did not provide a report. Her evidence consisted of her stating that she was in general agreement with Dr Turner. Dr Turner provided an affidavit in which he set out his views on a number of the contentions made by the applicant. I will come to that affidavit in more detail later. Ms Papadopulos-Eleopulos generally agreed with the conclusions of Dr Turner and then gave her evidence in the form of a presentation with a number of slides to which she spoke.

217 The evidence was more in the form of a number of statements. However, I permitted the evidence to be given in that form because I considered it was the most likely way in which I would be able to understand the propositions that were being put on behalf of the applicant.

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[101] Exhibit P90.
[102] Exhibit P90, 31.

Virus isolation

218 A major plank in the case of the applicant is that the virus HIV has never been isolated. The argument is that, because there has been no evidence of the virus having been isolated or purified (these terms are used interchangeably by the witnesses for the applicant), the existence of a virus HIV has not been proved.

219 The immune system responds to the presence of foreign material, such as proteins, bacteria or viruses by producing proteins which are known as antibodies. The external proteins or viruses which cause the antibodies are called antigens.

220 Dr Turner describes the HIV theory of AIDS:

> There exists a unique virus, classified as a retrovirus and referred to as human immunodeficiency virus (HIV). This entity is transmitted from person to person principally by blood, sexual contact and from infected mothers to their unborn children. When HIV gains access to the body it (a) infects and causes the death of a subset of white blood cells of the immune system known as CD4 lymphocytes; (b) causes the immune system to produce antibodies that react with the biochemical constituents (proteins) of the virus particle. Detection of such antibodies is used to diagnose individuals infected with HIV. After infection and typically over many years, the number of CD4 cells gradually diminish leading to a state known as acquired immune deficiency ("AID"). In turn AID is followed by the development of a number of different ("AIDS indicator") diseases which constitute the clinical AID syndromes ("S"). Hence a person has AIDS when he or she has HIV and develops one or more of these diseases. HIV does not directly cause the approximately 30 different AIDS indicator diseases, but indirectly by its effect on the immune system.[103]

221 Dr Turner and Ms Papadopulos-Eleopulos consider that the theory is unproven. In his affidavit, Dr Turner makes the following observations: [104]

1. A virus is a microscopic particle made up of nucleic acid genetic blueprint ("RNA" or "DNA") and some protein. In order to replicate, viruses (unlike bacteria) are obligate parasites of living cells.

2. Particles with the appearances of a virus are not regarded as a virus, unless there is proof that they replicate in this manner.

3. Retroviruses belong to a family of virus particles which have in common RNA as their genetic blueprints, and a protein enzyme called reverse transcriptase. The function of reverse transcriptase is to copy the viral RNA into DNA.

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[103] Exhibit A2, 3.
[104] Exhibit A2.

4. Retrovirus particles can only be visualised and their morphology studied using the electron microscope (morphology is the branch of biology that is concerned with the form and structure of organisms).

5. Virologists claim to prove the existence of viruses by carrying out a number of laboratory procedures collectively referred to as virus isolation.

6. In regard to HIV, the interpretation of these data as proof of virus isolation is highly problematic because:

(i) each phenomenon has well-known and accepted causes other than a retrovirus.

(ii) the isolation experiments were not accompanied by correct or sometimes even by any controls. Controls are an essential component of retrovirus isolation experiments because retrovirological phenomenon may arise even spontaneously in material known not to be infected with the retrovirus.

7. The person credited with discovering the HIV virus, Professor Luc Montagnier, did not purify virus-like particles, and did not purify HIV. Subsequent researchers have not performed experiments substantially different from those reported by Montagnier and his colleagues.

222 According to Dr Turner, the morphology of a retrovirus can only be studied by using the electron microscope. It is the only method by which a scientist can elucidate the size, shape and general and distinguishing features of viral particles.

223 Ms Papadopulos-Eleopulos agreed with the conclusions of Dr Turner. She commenced her evidence by defining a virus as a microscopic particle which is too small to be seen with light microscope, and can only be visualised by use of an electron microscope. She said that the main components of viruses and cells are proteins, RNA and DNA. Some viruses contain only RNA. She defined enzymes as a catalyst which is a substance that accelerates the rate of chemical reaction.

224 Ms Papadopulos-Eleopulos discussed her definition of isolation as meaning to separate a substance from a mixture.[105]

225 Ms Papadopulos-Eleopulos gave evidence of the first published papers by Luc Montagnier and his team dealing with the isolation of the HIV virus. She referred to the three main experiments that were conducted by Montagnier. According to Ms Papadopulos-Eleopulos, Montagnier in his first experiment took T lymphocytes, that is, white blood cells, present in blood and in the lymph nodes from the man, BRU, and put them in a culture. After about fifteen days in the fluid, he observed reverse transcription (RT) activity and concluded that the culture was producing virus. He concluded that the detection of reverse

[105] T 25.

transcription activity proves detection of a retrovirus. Ms Papadopulos-Eleopulos' theory is that Montagnier's experiments and the conclusions therefrom, is only valid if reverse transcription cannot be found anywhere else. That is, that it is only specific to these viruses. According to Ms Papadopulos-Eleopulos, reverse transcription is not specific to viruses. She said that many molecular biologists consider that about 40 per cent of our DNA is obtained by reverse transcription of RNA. She referred to work done and reported by a biologist, Harold Varmus.

226 There are, she said, many viruses, apart from retroviruses, including hepatitis B, which contain reverse transcription activity. Ms Papadopulos-Eleopulos stated that because reverse transcriptase is not specific to retroviruses, one cannot conclude that the observation of reverse transcription activity is indicative of a retrovirus. She claims that there are no published pictures of the virus.

227 She referred to Montagnier's second experiment in which Montagnier took BRU infected cells and added lymphocytes from a healthy blood donor. He detected reverse transcriptase activity in the culture. He interpreted this as proving propagation of HIV from the BRU lymphocytes to the healthy blood donor. Ms Papadopulos-Eleopulos claims that no published pictures to demonstrate Montagnier's conclusions have ever been made available. She concludes that Montagnier's findings that reverse transcriptase activity in BRU's cell culture was equivalent to the detection of HIV was a flawed interpretation.

228 Ms Papadopulos-Eleopulos discussed Montagnier's third experiment in which he found particles which had characteristics of retrovirus in the culture in the cells. She criticised this experiment because he failed to have any controls. It is not necessary in these reasons to go into the detail of her evidence, other than to observe that she refers to various articles and papers which she claims establish that it has not been determined to which genus HIV belongs. She claims that there is no agreement as to what the particles look like.

229 Montagnier's work and experiments were the beginning of over twenty years of intensive research by scientists throughout the world. The witnesses called by the DPP recognise that Montagnier's work did not provide a complete account of the virus.

230 Dr Dwyer who worked at the Pasteur Institute and with Montagnier summarised the position:

> A. Yes. I mean I think, having been involved in sort of the description and discovery of emerging viruses in a number of areas over the last 20 odd years, there's always difficulties at the beginning in trying to ascribe a cause of what is a new disease. So you then call in all the ability of people, both the epidemiologists and the public health people, to work out what's going on in the community with this disease, how the disease is being transmitted, how people are faring with it, the mortality rates and so on. At the laboratory, at the basic science level, you are trying to

> identify what is this pathogen that is causing a disease. At the diagnostic level you are trying to work out what test can he do to get out there to at least start being able to diagnose what is going on. And the way we went through HIV is just the same way we've been through things like SARS and like avian influenza, the technology is so much significantly better and the knowledge of different pathogens is so much better than it used to be. So with technology and the speed that all this discovery and so on happens is much, much quicker than it used to be, but people still make mistakes, and even with something like SARS there was still great arguments in the early weeks of SARS on is it this virus or is it that virus. Careers rose and fell on this, but even then quickly that was sorted out. The same thing with HIV, again there were a lot of causes that people thought could be responsible, viruses, other things as well, and really as the bits of information came though, and they often are tidbits as they come through, improved by further experimentation, improved by newer technology, particularly the molecular technology you have been mentioning before, the case gets stronger and stronger so that, if you like, the discovery of AIDS is really like all of these other discoveries. The reason we keep referring back I suppose to the 1983 paper of Montagnier, or Barre-Sinoussi, she's a legal author on that paper, is that with all the work that's gone on since, it all shows that really what they were doing was going in the right direction, no doubt about it. There were lots of other papers published at the time saying it could be a herpes virus or it could be CMC, it could be drugs or it could be this, but none of the evidence at the diagnostic science level and the clinical epidemiology level ended up supporting that, so they fell away. You don't hear of those any more. That's why that paper takes on the importance it does, not because at the time it is definitive, but because it proved to be the first of what I regard as the ultimate sorting out of what was the cause of AIDS.[106]

231 Ms Papadopulos-Eleopulos observed that cells may reproduce retroviruses spontaneously. She referred to those retroviruses as endogenous retroviruses. These endogenous retroviruses can be reproduced from DNA in cells by a person who has never come into contact with anyone with a retrovirus. That is, our DNA can start synthesising retroviruses inherently without contact with outside retroviruses.

232 Ms Papadopulos-Eleopulos summarised her evidence at that point as follows:

> A. Now, let's summarise the evidence, continue evidence so far. We have a problem that the RT, which is detection of which is that proof of infection but RT – that is, RT means reverse transcriptors activity – is not specific. There is no agreement as to the toxonomy of the age of the particle. Particle even with RT activity are not proof that they are infectious, that is they are viruses and this is accepted, most accepted by Gallo as far back as 1976, particles may appear in culture even if the culture is not infected with HIV. Knobs are fundamental to the definition of retrovirus and so far nobody has proven they existed or not, the particles which are said to represent the HIV virus, and as I said, they are absolutely necessary for infectivity. If they have no knobs, there can't be infection and they cannot be transmitted.[107]

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[106] T 947 – 8.
[107] T 45.

233 Dr Dwyer said that the 1983 paper of Montagnier was the first identification of the virus. As time progressed, there has been more evidence to support the initial findings of Montagnier. In Dr Dwyer's opinion, the debate about the cause of HIV being the viral cause of AIDS was concluded before he went to France to study in the late 1980s. He conceded that there is still a lot that is not understood.

234 Dr Dwyer accepted that, at the time Montagnier first concluded that the cause of the illnesses observed in young men in the United States of America was HIV, there were valid criticisms that could be made of his work. However, the point he emphasised was that, twenty five years later, there is much more known and medical science has advanced significantly.

235 Ms Papadopulos-Eleopulos fails to refer to much of the research that has been built on the foundation of Professor Montagnier's research. She concentrated on the early research of Professor Montagnier and Professor Gallo. Her focus on the early research and her criticisms of that research ignores the immense amount of research and knowledge that has been developed since the first papers on the subject were published.

236 In 1983-1984, Robert Gallo and his team authored five papers. His team succeeded in growing HIV in large quantities by adapting it to permanently growing cell lines. He said that when Montagnier published his papers in 1983, they had not learned how to properly grow the virus but, by 1984, he and his team were able to grow the virus, as was Montagnier.

237 Professor Gallo had viruses from 48 different patients. Six of them were able to be grown permanently in continuous culture to mass produce. He said that when his team succeeded in mass producing the virus in a continuous culture, they had a great quantity of the virus with little cellular debris.

238 Professor Gallo said that the whole debate about isolation/purification is invalid. He said that, in these days, the genes of the virus are cloned. All the proteins are purified. The proteins are encoded by the genes of the virus. The genes are not in the DNA of uninfected people, but are in numerous cells in the DNA of infected people. He said that in 1985 the complete gene sequence of HIV was published and that, today, there are hundreds and hundreds of HIVs that have been fully sequenced and cloned. The genes do not exist in normal cells.

239 Professor French said that the early work of Montagnier and Gallo in 1983 and 1984 demonstrated evidence of HIV. They provided the first evidence. Over time it became very clear that HIV did exist and was the cause of AIDS. He said the evidence in 1983 was far less than it is now. When he was asked whether, assuming that the virus was not isolated in 1983 and 1984, would that be relevant to his consideration, he said:

A. Not really because it's very clear now that it has been isolated. Whether any doubts existed back in 1983 and 1984 are not relevant to what we know in 2007.

Q. When, in your opinion, were all the doubts and deficiencies finally removed; when was the HIV virus isolated without any question of doubt.

A. I'm not sure, I really don't know.

Q. Would we have to ask Dr Dwyer about that.

A. If he can remember. As I say we are dealing with HIV infected patients here and now, we are not dwelling on things that happened 25 years ago.[108]

240 The witnesses called by the DPP did not accept that the HIV virus has never been isolated. Dr Dwyer said:

A. The term 'virus isolation' and 'virus culture' are used interchangeably in this discussion by laboratory people and medicos and so on. Really, the term is virus culture, because viruses need living cells to grow, so a virus culture or virus isolation is putting a clinical sample through a particular cell line, or particular cells, that will then produce free virus at the end of the culture which you can then measure or assess.

XN

Q. Has HIV ever been isolated or cultured in the way you have described.

A. HIV was isolated in a 1983 paper by Montagnier's group. It is not the way we do it now but it was done then and we now isolate HIV by other somewhat quicker techniques and so on and we do it in our lab many times a year. It is a routine procedure. It is not done much for the diagnosis of HIV because it takes a few weeks and it is also expensive, so we tend to do it, I guess, for research purposes but we still occasionally do it clinically, where it is felt to be necessary or where the other tests are not working or what have you.[109]

241 In cross-examination, when it was suggested to him that there was no proof of isolation or purification of a new retrovirus, he said:

I completely disagree with the point that the virus is not isolated. To my satisfaction and as proved many, many times, as we now do routinely, the virus was isolated, it was collected from an infected person, it was put into other cells and then put into other cells yet again, and that's exactly what isolation is all about. When it comes to purifying virus, if you start undertaking the other analyses to determine the protein structure, the electron microscopy structure, they didn't do that in their paper. But they went on and did it. And of course where there is obvious disagreement is in this concept of purification. It think what Dr Turner wanted Montagnier to do was to do an electron microscope of the particular gradient there that shows the activity but the way we do – you know, in looking for new viruses that's not kind of the pathway we follow because it's actually not terribly

[108] T 823.
[109] T 953.

> important to be honest. The other things are far more important. And now of course it's the genetic analysis that's the most important. And he didn't have that then.[110]

242 Professor Gallo considered that that the suggestion that the virus had not been isolated is completely wrong. He made the point that he and his team had succeeded in mass producing the virus in a continuous culture. They had produced a great quantity of the virus with little amount of cellular material. He said that the genes of the virus have been cloned and all the proteins purified. The proteins are encoded by the genes of the virus.

243 Professor Cooper said that there were a number of ways to isolate the virus. The most usual way is to culture it from white blood cells that are infected with HIV, and that had been done on numerous occasions. Scientists had taken micrographs of that. He said that once the virus is purified it is then genetically sequenced, and those sequences are unique. He explained that the usual method of isolation is called viral co-culture where one takes the cells from the person who is HIV infected, stimulates them to divide and culture them with fresh, uninfected cells and those cells then start producing virus. The virus is then maintained, usually on replicating cell lines. He explained that with the development of new techniques the genetic blueprint of the virus is now known, so to show that someone is infected you identify the gene of the virus. That has revolutionised molecular biology over the past twenty years. The genetic sequence of the virus is unique to the virus. He explained that every organism is unique and has a unique genetic sequence. That unique genetic sequence identifies one micro organism from another. It also identifies one person from another. He said that there are many pictures of the virus.

244 Professor French said that the virus had been grown from the peripheral blood or the lymph nodes of patients with AIDS. In more modern times, scientists have been able to demonstrate the presence of the virus by showing DNA sequences or fragments of RNA from patients that are specific for the virus. They do not occur in any other virus, and it has been demonstrated that they have been present in the blood or tissues of those patients. He said that he has seen pictures of the virus. He explained virus isolation in the following terms:

> HIV in the past has been isolated by taking blood or lymph nodes from people with HIV infection and culturing the blood cells or lymph node cells with normal human T cells which are stimulated with a substance called PHA, or phytohaemagglutinin. What happens is that in the culture, the virus from the person, the infected T cells from the person, come out of those cells and infects the normal T cells, and then overall you have increasing amounts of viral replication which you can measure.[111]

245 It is the case for the applicant that, in order for the virus to be isolated, it needs to be separated from all other cellular debris.

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[110] T 1214 – 15.
[111] T 816.

246 That suggestion has been refuted by Professors Cooper, Gordon and Gallo, and Dr Dwyer.

247 The test for virus isolation propounded by Dr Turner has no scientific basis. Professor Gallo and Dr Dwyer both observed that if purification as defined by Dr Turner was necessary, it could never be said that any virus has ever been identified. That is unrealistic and unsound scientifically. Numerous viruses have been identified, yet not purified or isolated as would be required by Dr Turner.

248 The requirement that, in order to isolate a virus it must be separated from all other cellular debris prior to identification, does not accord with scientific practice. Professor Gallo was asked about purification. He said:

> … One of the other things I read by the witness was a misunderstanding, or if not a misunderstanding a misrepresentation – I hope it is the former – and that is this business of purification. You have to purify. The witness shows a complete lack of understanding because a sucrose gradient barely purifies. She is always talking about purifying it into a gradient and then you have to do that to co-purify. The court should know that a retrovirus comes out of chromosome membrane. In so doing, it incorporates some cellular proteins in the virus. You could do it until hell freezes over and you get viral proteins. What about proteins outside the virus? Montagnier's early paper had a lot of that too, too much, because by putting it through a sucrose gradient it would do hardly anything when you have very little virus. So the ratio of cellular material to virus, I don't want to say this is an accurate number but I will give an example. Let's say it would be a thousand to one but when we succeeded in mass producing the virus in a continuous culture, you have got an enormous purification far beyond the sucrose gradient alone because you are now producing loads of virus with little amounts of cell. I hope that is clear. And you know, I mean, all this purification, it is an extreme wild goose chase. The genes of the virus are cloned now. All the proteins are purified. We know these proteins are encoded by the genes of the virus, we know those genes are not in your DNA, nor mine, nor anybody's in this courtroom who is not infected by HIV. And even a person infected with HIV we know it's not in his heart cells or kidney cells but specifically only the cells that get infected. The DNA is not in the normal uninfected cell. So this hogwash that the genes have not been cloned or sequenced in 1985, we published the complete sequence of HIV, it's not done for many viruses to this day. Montagnier's group told us within a few weeks of our paper, it was then done by another group, by now there are hundreds and hundreds of HIVs that have been fully sequenced and cloned. Those genes do not exist in normal cells. I was going out of my mind reading that. The stupidity of it is to the extreme.[112]

249 He said in cross-examination in reference to a discussion of Montagnier's early work:

> … He satisfied me, but let me tell you where your people are confused about purification. The witness, not Dr Turner, but the witness that I read –
>
> Q. We know what you mean, the witness –

[112] T 1257 – 9.

> A. Yes – keeps coming to this point of purification. I'll make the statement that it is utterly absurd. Let me tell you why. I said it before; I'm going to say it in this context now. All retrovirus particles that form, form from lifting off the cell membrane, pulling out of the cell. We call it the phenomenon of budding. All enveloped viruses, they have a lipid fatty substance around them formed by budding off of cell membrane. All such viruses carry within them, right within the virus, if you purify you see it is all over, cellular proteins that are not virus encoded. In addition, around the virus you'll still have some cellular protein. You can't purify just by putting it through sucrose gradient. Montagnier's early problem was inadequate growth of the virus. I'm saying this repeatedly and I don't want to say it as a criticism of Montagnier's paper. He reported a new retrovirus particle. He could transmit it invitro. He didn't say it was the cause of virus in the baby. He couldn't characterise it well. We cannot fault him for that because he couldn't grow it properly. Once we could mass-produce this virus, that's purification. If you have a tonne of something and you contaminate it by a drop of water, didn't you purify it? It's the ratio of cell protein to viral protein.
>
> Sucrose gradient gives you a little bit of help but you could do that five times and it's not going to purify as much as we did by mass-producing it. To use the extreme hyperbole, if you have a tonne of some something and a drop of water, you've purified it. That what we did. Stop focussing on the Montagnier paper. The world doesn't end with the Montagnier paper …[113]

250 I reject the evidence of Ms Papadopulos-Eleopulos and Dr Turner that the HIV virus has not been isolated. The evidence establishing that the virus HIV exists and is identifiable is compelling. There is no longer any genuine scientific dispute about that proposition.

Electron micrographs

251 Ms Papadopulos-Eleopulos and Dr Turner made much of the fact that no electron micrographs have been taken of the virus. Their evidence was rejected by other witnesses. There were a number of photographs of the HIV virus tendered. Witnesses gave evidence that there had been many electron micrographs of the virus found in scientific literature and textbooks.[114]

252 Mr Borick QC submitted that the photographs that had been produced cannot be relied on because the source of those photographs has not been sufficiently identified.

253 I reject the submission. Dr Dwyer said photograph Exhibit P70 was sourced from a publication titled, "Current Opinion in Microbiology from 2006".[115] Dr Dwyer said that it was a series of electron micrographs, which is a new technology of electron microscopy. The photographs show the differences between herpes simplex virus, vaccinia virus, and HIV.

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[113] T 1277 – 8.

[114] See, e.g., T 838 – 41; T 951 – 2; T 790; Exhibits P62, P70 and P86.

[115] The article is titled, "Structure of Complex Viruses and Virus Infected Cells by Electron Cryotomography".

254 Associate Professor Dax said that there are many photographs of the virus. She produced four slides[116] which show different magnifications. Professor Cooper said that there are many pictures of the virus in the scientific literature.[117]

255 Professor French said that he had seen pictures of the virus in scientific papers and textbooks.[118] Professor Gallo gave evidence that there have been many photographs of the virus published in papers and textbooks. He referred to early photographs which were published in papers of which he was the co-author.[119]

256 It was put to Professor Gallo that this was a photograph of a contaminated sample. Professor Gallo accepted that a sample he received from Montagnier was contaminated. However, he pointed out that his laboratory had identified 48 isolates. He rejected the suggestion that the photographs were not photographs of the virus. Ms McDonald submitted that the photographs in the paper were photographs of the virus taken from one of those persons amongst the 48 isolates to which Professor Gallo had referred. The photographs refer to a patient RN from whom the virus was isolated. I reject the submission that the photographs are of contaminated virus.

257 I accept the evidence of Dr Dwyer, Associate Professor Dax, Professor Cooper, Professor French and Professor Gallo. I reject the submission that there have been no electron micrograph photographs of the virus proved.

258 I reject the evidence of Ms Papadopulos-Eleopulos and Dr Turner that no electron micrographs of the virus have been taken. I find that there is overwhelming evidence that such electron micrographs do exist.

Genetic sequencing nucleic acid testing

259 Dr Dwyer was asked what nucleic testing is. He said:

> A. Well the core part of a virus, or of any living material for that matter, is a genetic material contained within it; in the case of a virus that's either RNA or DNA. What nucleic acid testing means is using methods to identify what that genetic material is, and you can do that in a number of ways. You can sequence the virus, or the sequence material where we look for all the building blocks of DNA if you like in a regular fashion, and then we can take that sequence and compare it to all the known sequence material where we look for all the building blocks of DNA if you like in a regular fashion, and then we can take that sequence and compare it to all the known sequences in the world that are in various database and so on and say 'it's exactly like that one, that's what it is', or 'it's more completely new, this is interesting', or 'it's slightly different from what's in the data base'. Rather than detecting the whole part of the genetic material you can also look for particular parts of the genetic material, and that's what we do in the diagnostic lab. So we look for short segments of genetic material that's unique to that virus and use these

[116] Exhibits P62, P62A, P63, P63A and P64.
[117] T 690.
[118] T 790.
[119] Exhibit P86; T 1301 – 4.

> assays to say 'yes that material is there' or 'no, it isn't', that's what we call a 'yes' or 'no' PCR, or you can quantify the amount of that material in the sample and give some idea of how much is there.
>
> Q. Do we now have the full genome of the HIV.
>
> A. We have thousands if not tens of thousands of copies of the full length of the HIV genome.[120]

260 Professor Cooper was asked how he knew that a person might be infected with HIV. In response, he said that there were various techniques of identifying the virus, including molecular techniques. He said that what has now happened is that the genetic blueprint for the virus is known and, in order to show that someone is infected, the gene of the virus can be identified which is a much more rapid way of identifying the virus. He was asked:

> Q. What is the genetic blueprint of this HIV, of the virus.
>
> A. The genetic blueprint is a sequence.
>
> Q. You said it is unique, everybody knows what it is. You tell us what it is.
>
> A. It is a genetic sequence which makes you and me different from any other plant or animal or virus or bacteria. It is a genetic sequence.
>
> …
>
> It is a genetic sequence that is basically the principles of DNA and molecular biology that every organism is unique and has a unique genetic sequence, and that unique genetic sequence identifies one microorganism from another and it also identifies one person from another, which you probably know, in terms of DNA evidence in legal matters. It is a very unique tool to identify an organism.[121]

261 Professor French said that through reverse transcriptase there is a chain reaction and the RNA from the fragment, the viral RNA, in the plasma of patients is changed into DNA and the complementary DNA is then measured in an assay. He said that the complementary DNA can then be used to sequence parts of the viral genome. This technique is used to assist in determining the appropriate antiretroviral drugs to be prescribed.

262 Professor French was asked:

> Q. You talked about the genetic makeup of the virus, what information do we now have these days about the genetic makeup of the RNA virus.
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> A. The RNA is, the sequence of the viral RNA is known, we measure the amount of viral RNA in the plasma of patients every day as a test of how effective our treatments are.

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[120] T 959.
[121] T 689.

> Q. How do you do that, how do you measure it.
>
> A. We measure it by an assay called reverse transcriptase PCA polymelias chain reaction and what is done there is that RNA from the fragment of RNA which are circulating in the plasma are changed if you like into DNA and the complementary DNA is then measured in an assay. We can also use that complementary DNA to sequence parts of the viral genome, for example if we are looking for changes in the viral genome that might cause drug resistance, and that's done routinely everyday in practice.
>
> Q. So when you are looking to see how you should treat someone you look at their genetic make up to see if they are going to be resistant to certain sorts of medication.
>
> A. Yes, we look at the genetics medication of the virus so we take viral particles from the blood and we amplify them up and then we sequence the DNA inside a DNA sequencer of particular parts of the virus genome. So we are interested in the part of the genome encodes, the reverse transcriptase enzymer and the part of genome that encodes the protease of the virus and we can look for changes in the structure of the reverse transcriptase or protease genes, which would make the virus resistant to antiretroviral drugs. That is a routine test that we use every day in the clinics. [122]

263 Professor Gallo also referred to the HIV genome having been identified and stored in databases around the world.

264 Professor Gordon explained the methodology used in determining whether a sample contains the HIV virus by genetic sequencing. He produced the entire HIV sequence.[123] He demonstrated how a region of the sequence, which includes the P24 protein, along with some other proteins, is identified. By use of a computer program, it was compared, against a number of genomes and partial genomes.

265 Many thousands of copies of the full length of the HIV genome have been identified. They are stored in databases throughout the world. Different strains of the HIV virus have been identified. It is now possible to identify from where different strains emerge. Professor Gordon explained how the results are interpreted and explained that when the comparison is made it is extremely accurate. He said any similarities which might exist are very minor and that the genetic sequencing is very specific for the virus.

266 I am satisfied that the genetic testing which has been developed is specific and accurate for the identification of HIV. Professor Gordon gave clear, unequivocal evidence that the genome of the virus has been sequenced. He produced a sequence and explained the methodology. Professor Gordon's evidence was not challenged by any credible evidence. His evidence was confirmed by Professor Gallo, Dr Dwyer, Professor Cooper and Associate Professor Dax.

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[122] T 791.
[123] Exhibit P92.

267 I reject the proposition that the HIV virus has not been proved to have been identified.

Endogenous retroviruses

268 Ms Papadopulos-Eleopulos and Dr Turner both suggested that the retrovirus HIV could be mistaken for an endogenous retrovirus when undertaking current virus isolation techniques. They said that unless the retrovirus is purified, then it is possible that a test which appeared positive for HIV was false, because what was being identified was as a consequence of an endogenous retrovirus. An endogenous retrovirus is retrovirus-like sequences found in the human genome thought to constitute the remains of true retroviruses that have been absorbed through evolution.

269 Professor Gallo referred to the evidence of Ms Papadopulos-Eleopulos and Dr Turner on this topic. He said:

> The witness likes to say particles are found from endogenous retroviruses, genes exist from ancient infections of man in our DNA, of ancient retrovirus infections, part of us come out rarely. Yes they can come out occasionally in human placenta. Nobody has ever demonstrated, even one time, their production from a normal human lymphocyte, human blood lymphocyte, not even one. They make it that this is just there all the time. That is utter, frank nonsense and if it were true, molecularly it is simple to distinguish HIV from endogenous retroviral sequences, they are night and day. It is like a giraffe to a gorilla.[124]

270 Professor Cooper said:

> … - as we have evolved over generations and generations we may have been infected with different retroviruses over, you know, over the generations and these retroviruses have gone into our DNA and are in fact quite harmless and sometimes they will have, you know, they can activate the genome to produce this P24 in very low levels. The issue which I think you are missing is that, the fact that this P24 antigen is specific to HIV so – and just, I was saying before, every organism has a unique genetic footprint, blueprint. The P24 antigen of HIV is unique protein.[125]

271 Dr Dwyer was asked about reactions from an endogenous retrovirus. He said:

> A. You would want to be sure of that. There are very few endogenous retroviruses that are present in man, or animal, for that matter, that can actually be cultured, most of them are just small amounts of genetic material and incomplete viruses. There are very few endogenous retro-culture. One way around this of course, and in fact Montagnier's group did this in 1983, that they take the patient sample which they add to the donor cells to grow the virus but they also look at the donor cells by themselves and they go through exactly the same sort of process to make sure, to

[124] T 1260.
[125] T 703.

see, and nothing comes out of those cultures, it only comes out of the cultures where clinical material from a person with the disease occurs.[126]

272 Dr Dwyer also said:

… Some of those are – the concern is that in some of the cell lines that one might use for cultural, or indeed in human cells, you may sometimes see evidence of retroviral material there, either detected – well, really, in culture, I might say, it is not something we see in culture at all. The retroviral particles are usually part of the genome of that cell, so-called endogenous retroviruses which we talked about the other day. Most of those are not what we call replication competent. In other words, even if you have cell lines which have endogenous retroviruses in them, it is actually extremely rare to be able to culture them. If you sequence a human genome which, of course, has been done, there's a lot of retroviral elements in that genome but it is actually extremely difficult to culture them and even more difficult to then transmit them into another culture. That is something that is quite different from what you see with HIV where you can breed a culture virus and transmit it onto another culture.[127]

273 Professor Gallo was asked in cross-examination:

Q. He says 'Controls are an essential component of the retrovirus isolation experiments because 'retrovirological phenomena' may arise, even spontaneously, in material known not to be infected with a retrovirus'.

A. Yes; that's a classic example of a nanogram of knowledge is dangerous. So the answer is a yes, no. There are endogenous virus like particles encoded in our genome. What does that mean? Long ago we were infected by retroviruses from one species or another of animals. Those retroviral genes integrated in our DNA and we evolved with it and, eventually, they became infected genomes so you couldn't make fully infectious viral particles. A considerable amount of our genome contains such sequences that may encode nothing or they may give us a few kind of retroviral endogenous proteins, or they may actually give rise to a particle which so far is not infectious. However, your client or I should say your witnesses before, and this one, make it appear these things are jumping beans that come out all over the place. This is nonsense. In normal human lymphocytes they've never been seen, they've never been identified and, if they were, it's as easy as eating a piece of apple pie to distinguish one retrovirus from another. Morphologically it's not so good, but epidemiologically protein characteristics and especially by molecular biology, which is never in your witness's accounts, with electron microscopy since 1984 it's simple to distinguish. Retrovirus endogenous particles of man, which were seen for the first time probably in the 1980's, have never infected another cell. You can't transmit it. To this day no-one has taken such particles and put it in another cell, unlike HIV, which obviously, Mr Borick, no-one could have misappropriated any virus if it can't grow. If you can't put it in a culture and it can't grow, none of these endogenous particles can grow. The witnesses also fight with themselves throughout the witnesses' testimonials. They say one thing here which is incompatible with what they say later. This would be a beautiful example. We could transmit HIV into normal cells; you can't do that with endogenous retroviral particles. Where they've been seen occasionally is in normal human placenta. I've never seen a report to this day of any verified endogenous human retrovirus particle coming out of normal blood so it is

[126] T 998.
[127] T 1204 – 5.

> misleading, I assume not deliberately, I assume it's because of lack of knowledge, to say they're popping out of cells all the time. That is utter nonsense. One wishes so; there would have been a lot of publications early in one's career when we were looking for such things. It's like looking for needles in a hay stack. It took us 10 years to find the first human retrovirus HDL1. In that time we cultured thousands of tumorous tissues, thousands of normal human blood cells. We never cultured an endogenous human retrovirus particle. We also never could transmit today endogenous human retrovirus particles. No one has done that to this day in culture or in man.[128]

274 The evidence by Ms Papadopulos-Eleopulos and Dr Turner that, because the HIV virus has not been purified then the tests cannot be regarded to be accurate, is again an example of a misunderstanding of their reading of the scientific material. The evidence of Professor Gallo and Dr Dwyer, both experienced virologists with clinical experience and research experience, expels any doubt expressed by the witnesses. Their evidence, which I accept, is that endogenous retroviral sequences are distinguishable from HIV; that there are relatively few endogenous retroviruses which can be cultured; that most are incomplete and will not replicate. I reject the suggestion that confusion can arise and endogenous retroviruses might be confused with HIV.

The antibody tests

275 In opening the case for the applicant, Mr Borick QC said:

> The test routinely used to diagnose HIV is not virus isolation. Infection is diagnosed indirectly by using antibody tests. At present there are two major antibody tests used, the ELISA and Western Blot. The Western Blot test is used as a supplemental confirmatory test because the ELISA is not specific. However, neither of these tests have been scientifically proven capable of determining HIV infection or transmission.[129]

276 He went on to say:

> As explained earlier, there were the two test kits, ELISA and Western blot. The only way to have proof for the existence of such proteins is to isolate or purify HIV. The anti-bodies that are formed in our bodies that react with these proteins are assumed to be HIV antibodies. The problem, however, is that antibodies are well-known to react with many different proteins apart from those which led to their production in the first place. Immunologists have described the behaviour of antibodies as promiscuous, which means there can never be any guarantee that a reaction in an antibody test is specific. This fact means that non-HIV antibodies may also react in these tests.
>
> The tests that are carried out, you can get a reaction which you can see that does not prove that that reaction is specific to HIV. So unless the virus which is said to produce the test kit proteins is isolated and used as a gold standard for comparison with the tests, it is impossible to relate an antibody response specifically to HIV infection. Without the establishment of a gold standard, there is no proof that the antibody tests prove HIV infection of humans.[130]

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[128] T 1275 – 6.
[129] T 2.
[130] T 6.

277 Later in opening, Mr Borick QC said:

> Dr Valender Turner will then deal with the antibody test, and his evidence will conclude with the proposition that the tests have not been successfully proven to be capable of determining HIV infection or transmission, and it is impossible to say how many of any people who are said to be HIV-positive are infected with and HIV retrovirus.[131]

278 Dr Turner explained that antibodies develop as the immune system can detect the presence of foreign material, such as a virus, that has gained access to the body. He explained that any substance that induces the formation of antibodies is known by the generic term "antigen". Hence, when a person is infected with a foreign substance, such as a protein from a virus, one can predict that antibodies will develop. Antibodies are detectable in the bloodstream about ten days after an infection.

279 The presence of antibodies is demonstrated by the fact that they react with the inducing antigen. The laboratory scientists detect the occurrence or reaction because it results in a detectable physical alteration in the reaction mixture. Dr Turner stated that to perform a test to determine whether there are any antibodies that react with HIV, two things are required. Firstly, the HIV protein. Secondly, a serum specimen from the person being tested. His position is that because the virus has never been isolated or purified, it is not possible to characterise particular proteins as those of a retrovirus infecting individuals with AIDS. Dr Turner claims that research published since Montagnier's papers shows that the proteins considered unique to HIV may be found in non-HIV infected cells. Dr Turner also stated that antibodies induced by a particular antigen do not necessarily react only with that antigen, but may also react with other antigens. The fact that an antibody reacts with proteins said to come from the retrovirus HIV is not proof that the antibodies are caused by infection of HIV, in Dr Turner's view. Dr Turner concludes that it is not possible to claim that a reaction between an antibody and an antigen proves that the person has been exposed to or infected with that antigen.

280 Dr Turner is of the opinion that the only means by which antibody reactions can be proven specific for a putative agent is to compare the reactions with that agent. He gives the example of pregnancy tests. He explains his position in the following way:

> Pregnancy tests are antibody tests. To prove the veracity of a blood test to detect pregnancy one compares positive and negative test results against the presence of absence of babies being born. In the case of a 100% accurate test one would expect all women who had babies to have a positive test and all women who did not have babies to have a negative test. In other words, the test parameters, including specificity for detecting pregnancy, are proven by using the baby as the "gold standard". In the case of "HIV", the antibody tests are claimed to prove HIV infection. Hence the gold standard for such a test must be HIV itself, as proven by isolating the virus. In this case HIV is "the baby" that authenticates whether or not the reactions between the antibodies and the test kit

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[131] T 9.

> proteins are caused by infection with "HIV". This gold standard principle is used to verify tests throughout clinical medicine but has been ignored by the HIV/AIDS experts in regard to determining antibody test parameters for HIV infection. Nowhere in the scientific literature are there reports of antibody tests verified independently of an antibody/antigen reaction against a virus isolation gold standard.
>
> Since HIV isolation itself is problematic this gold standard verification cannot presently be done.
>
> Hence in my view there are no scientific reasons for asserting that a person who is "HIV antibody positive" is infected with a retrovirus HIV.
>
> This conclusion does not negate the facts that (a) the antibodies are present; (b) whatever their genesis, within the AIDS risk groups they predict the presence or development of illness.
>
> HIV/AIDS experts are aware that persons may have antibodies that react with one or several of the "HIV" proteins and yet not be infected with HIV. In fact they explain these as "biological false positives" caused by cross-reacting, "non-HIV" antibodies.
>
> HIV experts claim they can distinguish between "true" (caused by HIV) and "cross-reaction" (not caused by HIV) by using second, third and fourth generation antibody tests and arranging these into various test algorithms. By developing such methods they claim HIV infection can be diagnosed with the utmost accuracy. I reject such claims because no amount of "technological tinkering" can obviate the fundamental need to verify all antibody tests, no matter what methods are used and in what arrangement they are conducted, against the virus isolation gold standard.[132]

281 Dr Turner refers to the antibody test known as the Western Blot. He described that in the Western Blot procedure the ten or so HIV proteins are impregnated at separate sites along the length of a nitrocellulose strip. Proteins are identified by giving them a number. When serum is added the strips develop, the sites of antibodies/protein reactions show up as coloured bands. The laboratory technician determines which proteins have antibodies reacting with them. Dr Turner suggests that HIV proteins which are not caused by HIV are highly prevalent in healthy people with no risk of developing AIDS.

282 Dr Turner is also critical of the Western Blot test because he says it is not standardised throughout the world and, therefore, the criteria for defining a positive Western Blot are not the same in different parts of the world. He concludes, therefore, that there is no scientific proof that the applicant transmitted a retrovirus to his sexual partner.

283 Associate Professor Dax gave a lengthy explanation of the development of the ELISA test. She described the various generations through which the test had gone in its development. She concluded that the antibody tests have been through four generations, that they are highly specific, and that they are highly sensitive. She said:

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[132] Exhibit A2, [36]-[41].

> … Now I can read the transcript and say how do you know, I mean somebody is going to ask me how do I know they are highly sensitive and highly specific, that is because over the years we have collected serum or plasma from people who have been infected who have transmitted through blood transfusions, who have had infection and become ill and those people demonstrate the presence of antibodies, the presence of nucleic acid, RNA, within their cells, they demonstrate the HIV DNA and they also can be shown to have virus in their blood or in their tissues that can be purified, and sequenced. So we take those samples and we compare the performance of the tests in those samples that are negative and those samples that are positive and I have also alluded to when we evaluate the kit we look at other characteristics of the kit to make sure the integrity is there, it's robust. So a lot of work goes into evaluating a kit before it goes on the market. In Australia, only fourth generation tests are used, consistently, in the laboratories. There are some third generation tests that are on the market. Those tests that are used all recognise HIV 1, HIV 2 and the major outlier types which are a type of HIV that's seen in Western Africa that at first didn't react in the tests as they were being presented early on but appropriate antigens were added so now those tests all recognise this type of HIV called O-outlier. So you can see they are highly sophisticated in terms of what's on the plate and what can be identified.[133]

284 Professor Cooper was asked:

> Q. The next proposition that I want to put to you is that the tests used for diagnosing are not reliable, particularly ELISA in the Western blot.
>
> A. Right. Again that is absolutely wrong. Diagnostic tests in medicine are sometimes problematic and we say that diagnostic tests should be sensitive and specific and, you know, diagnostic medicine is sometimes not easy because we don't have the best tests for diagnosis to include a disease or to exclude a disease. In this case, we have one of the best tests ever. There is no diagnostic test in medicine that has the sensitivity and specificity of the HIV antibody test, whether it is done by ELISA or by Western blot. The best is 99. – very close to 99.9% sensitive and 99.9% specific. So there is no better diagnostic test in medicine that I know of.[134]

285 Professor Cooper confirmed that the ELISA test is 99.9 per cent sensitive and 99.9 per cent specific, which means that if it is positive it is almost certain that a person is infected, and if it is negative it is almost certain that they are not infected.

286 Associate Professor Dax agreed that different countries have different requirements: for example, in some countries one positive ELISA test is sufficient for a positive diagnosis. In Australia, it is common to perform a Western Blot test before diagnosing that a person has HIV.

287 The fact that different countries may have different requirements before a person is diagnosed as HIV positive does no more than evidence that different countries have different requirements before the diagnosis will be confirmed. It does not follow that people who are HIV positive in Africa are not also HIV positive when in Australia.

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[133] T 857 – 8.
[134] T 674 – 5.

288 As Professor Cooper pointed out, one ELISA test is sufficient because of its accuracy. He made the point that if there is a population in which many of the people being tested are HIV infected, then the chances of having a false positive ELISA test are very low. If one has a low risk population, such as blood donors, and it is very rare to find an HIV infected person, as is the position in Australia, it is more common to get a false positive ELISA. He said it depends upon the population that is being tested.

289 This explains why in Australia it is common to not only test with the ELISA test but also perform a Western blot test.

290 Professor French confirmed that the ELISA tests that are used these days are better than the ones that were used in the early days. He said that the criteria that are used to call an antibody positive are better today than the criteria that were used in the early 1980s. He stated that the normal procedure in Australia is to use two ELISA tests, confirmed by a Western Blot.

291 Professor Gallo said that the ELISA test followed by a Western Blot will score with enormous sensitivity and precision.

292 It was put to Professor Gallo that a positive antibody test may be indirect evidence of viral infection, but only if the antibodies are proven specific. Professor Gallo agreed that if the tests are performed improperly, one can get false interpretations; that is, positives when it is negative and vice versa. He said:

> - no test in medicine is perfect. To the best of my knowledge this is as close to being as good as it gets. I repeat again, in my hands or my group's hands we found the virus every time we found antibody positivity in that study designed to verify the foolproofness of the blood test done properly. Having said that, there are rare occasions where you can get fooled. That is true with any test and, frankly, as far as I know it's true in almost anything in science.[135]

293 Based on the compelling evidence given by the respondent's witnesses, I conclude that the method for testing for HIV is extremely rigorous and is highly specific and sensitive. I accept that, as Professor Gallo said, "no test in medicine is perfect"; however, I reject the proposition that the tests for HIV antibodies provide "no scientific basis" for establishing HIV infection.

The gold standard

294 A further contention of the applicant is that the various tests which have been relied upon by the scientific community do not support the conclusions that HIV exists, or that it is a cause of AIDS.

295 I have already dealt with the claims by Ms Papadopulos-Eleopulos and Dr Turner that the virus has not been isolated. Uniformly, the witnesses called

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[135] T 1280.

by the respondent disagree with the proposition that it is not possible to claim that a unique retrovirus has been isolated from the tissues of AIDS patients. Associate Professor Dax, Professor French, Dr Dwyer, Professor Gallo, Professor Cooper and Professor Gordon all reject that proposition.[136]

296 A further proposition advanced by Ms Papadopulos-Eleopulos and Dr Turner when speaking of the antibody tests is that, assuming that there was proof that there are proteins belonging to a retrovirus HIV, the fact that patients have antibodies that react with these proteins is not proof that the antibodies are caused by infection with HIV. Dr Turner contends that this is because antibodies induced by a particular antigen react not only with that antigen, but also react with other antigens. He regards that as a critical factor and concludes that the only means by which antibody reactions can be proved specific for a putative agent is to compare the reactions with that agent. He states that has not been done in the case of HIV. He concludes that since HIV isolation itself is problematic, the gold standard verification cannot presently be done. In response to that proposition, Associate Professor Dax said:

> A. I find that I think I understand what Dr Turner means by a gold standard, in that it's really a very physical concept that he has, that you want something that is there, that you can always punch at or – but I don't understand why he can't see that the virus is there if you look at electron micrographs, if you look at immunology, if you look at virus isolation, if you look at molecular methods, so we can actually take virus preparations and quantify them these days. That's not difficult, and we can quantify them by numbers of different methods and numbers of different molecular methods, but I think what it ignores too is the way we know that people have HIV antibody or they don't, goes back historically. So that people who got sick with HIV had that HIV syndrome – and not necessarily AIDS – but had that HIV syndrome, developed antibodies; those people that transmitted HIV through blood transfusion had those antibodies. There are cohorts where the transmission took place, for example, in Ireland, a group of women got Anti-D for RH babies, treating that, and got contaminated preparations and the virus was passed on. So there's a lot of ways you could say there's a gold standard. Now I'm not quite sure and I suspect that this gold standard again is looking at it in such a way that it shows no latitude to what that standard – what you're really looking at.
>
> Q. He tried to describe it, well, not tried, he did describe it to me in terms of a paternity suit. I don't know if you remember his evidence about that. Basically he was saying if you don't know who the father is or if you haven't got an identified father you've got nothing to compare your sample with so you never know who the father is.
>
> A. Yes, I find that an extraordinary sort of concept in this day and age because there's always sorts of paternity suits out there and we know even though you have a basic human DNA with lots and lots of sections of that DNA, that if two people are closely related they have some very similar sections of their DNA, which unrelated people don't. I mean paternity suits rest on this type of evidence. And, similarly, with viruses, we know about their composition, their molecular composition and we – I think that it was presented, the evidence was presented or it will be

[136] See, e.g., T 1157 - 9; T 1173, T 1206 – 7; T 1278 – 9; T 673; T 1013.

> presented about the different types of viruses and mapping them and showing that you can follow where viruses go by their molecular structure, and so I find that little – I find that rather a difficult explanation to accept.[137]

297 Associate Professor Dax said that the gold standard in respect of HIV could be described as the genome sequence. She expressed the view that the gold standard referred to by Dr Turner was, in her view, rather meaningless.

298 Dr Dwyer interpreted gold standard to relate to the idea that when a new test is introduced to diagnose an infection, the medical profession and the community want to know how good that test is. Ideally, he said, one would like to compare it to a test that is already known to be very good, but unfortunately when scientists are discovering something for the very first time, then they have got nothing to compare it with. He said that as time goes on and medical scientists start to develop all sorts of different tests, then clinicians try to measure the relative ability of the tests to best diagnose the infection.

299 He accepted neither Montagnier nor Gallo had a gold standard in the terms defined by Dr Turner. He was of the opinion that it makes no sense to speak of a gold standard in respect of their work. He said:

> Q. You said 'it makes no sense'. What do you mean by that.
>
> A. Well it makes no sense because what Montagnier's paper does is describe the new virus, he doesn't describe a diagnostic test, okay, so he has got nothing to sort of compare it with. If he then, as he did and others did, went on to make a diagnostic tests well that's when the argument and discussion about should we have a gold standard, how do we know whether your test is better than the American or Australian test, whatever. That's when you start to wish you had something to which you could compare the new testing. His paper is not a description of a diagnostic test for AIDS, it is a description of a possible new virus causing a clinical disease.[138]

300 Professor Gordon was asked:

> Q. What do you understand by 'gold standard' firstly.
>
> A. A gold standard is if you have an existing test for an existing disease, so, say you have an antibody test against chickenpox and then someone comes along with what they think is a better test, maybe they use a different antigen or something like that. What would usually be done to evaluate how good that test is is to compare it with what's the existing standard at the moment which is accepted as the routine way in which it is done, so you can call that the gold standard if you like. So test A is the existing test, the gold standard test, and test B is your new test. You test say 100 samples with method A and 100 samples with method B, compare the results and compare one with the other.

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[137] T 852 – 4.
[138] T 1033 – 4.

> Q. Let's go back a step. How do you get to test A. Let's take chickenpox, for example. I presume you find people who are suffering with symptoms of what we now know is chickenpox.
>
> A. Yes; so, when a disease is first apparent, there is obviously no test for it so there can't be a gold standard, so the stage then involves developing a diagnostic test, evaluating how accurate it is, so, for example, if you're developing a test for chickenpox you might take people who come in who you suspect have chickenpox, take blood from them and see and grow the virus from that perhaps, and work out how many of those people who have unequivocal chickenpox test positivity, and that becomes the standard, but that then may be replaced. The gold standard may shift, and the gold standard 20 years ago might be considered a relatively poor test now, so the gold standard for HIV antibody detection in 1984 or '84 is different to the gold standard that we have now because the test has improved. The antigens have been purified. There have been refinements in the testing so, naturally, what used to be the gold standard is no longer the gold standard.[139]

301 He rejected the suggestion that one cannot use antibody tests to define infection with a retrovirus, unless the virus has been purified. Professor French rejected Dr Turner's view of the gold standard. He said that if a person is shown to have HIV antibodies, they have HIV infection. Professor McDonald said that in 1983 a gold standard had not been established, but it was very quickly established because the gene was sequenced, and that is HIV.

302 Dr Dwyer agreed that the genetic test would be the gold standard. There now exists a test by which the antibody test can be compared. He agreed that HIV diagnostics development of antibody tests was done without a gold standard, because one could not compare it to anything other than people with the disease. He said that now molecular testing exists. It has been established that antibody testing is extremely reliable, specific and sensitive.

303 I reject the propositions of Ms Papadopulos-Eleopulos and Dr Turner that, because there has been a failure to verify HIV infection, the gold standard, as defined by Dr Turner, the question of HIV identification is problematic. The evidence clearly establishes that the HIV virus has been identified and the ELISA test is both specific and sensitive.

304 I reject the submission of the applicant that the antibody tests which are used throughout the world do not accurately test for the virus HIV.

Has it been proved that HIV is sexually transmissible?

305 The applicant contents that there is insufficient evidence to establish that the HIV virus (which the applicant contends has not been proved to exist) is sexually transmissible. A theory propounded by the witnesses for the applicant was that the act of anal intercourse produces antibodies in the person who is the passive or receptive partner in the act, which react positively to the tests which

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[139] T 1055 – 6.

purport to diagnose HIV. Both Ms Papadopulos-Eleopulos and Dr Turner rejected the evidence that the virus can be transmitted by heterosexual sexual intercourse. This theory was rejected by witnesses called by the DPP.

306 Professor Kaldor explained how epidemiological research and evidence has led to and assisted in the identification of causes of various medical conditions. He explained how research by epidemiologists was significant in making the connection between smoking and lung cancer. He explained that the best epidemiological evidence comes from randomised controlled trials There are many circumstances where it is not possible to perform that kind of trial. Epidemiological research into HIV is one of those areas. It is self-evident that for many reasons, including ethical reasons, it is not possible to take a randomised controlled trial and inject a group with HIV positive blood and another group with a placebo, and then study the results.

307 Professor Kaldor explained that the next level of evidence comes from prospective or longitudinal studies where groups are observed and conclusions drawn therefrom. For example, in Tasmania there was a study which observed that children who slept on their back had a lesser incidence of death from Sudden Infant Death Syndrome than those who slept on their front. The epidemiological research established that front sleepers had a higher risk of death than back sleepers.

308 Professor Kaldor explained that the third type of study is a cross-sectional study in which a target group of people are considered: one group which has a disease and the other group which has not, and then the risk factors in those two groups are compared. The final level of study is an ecological study, where populations as a whole are compared.

309 Professor Kaldor has worked in HIV epidemiology since the 1980s. He has been involved in a number of studies, and he is familiar with studies which have been conducted throughout the world.

310 He described an ecological study which determined that countries where circumcision was widely practised happened to be countries where there was less HIV. When that observation was made, there was a prospective study performed with a group of men who were regularly engaging in sex with sex workers in Nairobi. It was observed that men who were circumcised became infected with HIV at a much lower rate than those who were not circumcised. Further studies in Kenya and Uganda demonstrated that there was a 60 per cent reduction in transmission risk in the case of circumcised men.

311 Professor Kaldor expressed the opinion that it has been proved absolutely that HIV is sexually transmissible. He said there were a number of cross-sectional studies which started to create a picture of what looked like a sexually transmissible disease. He said that over time several key prospective studies were completed which confirmed the earlier findings and put beyond any

reasonable doubt that HIV was a sexually transmissible infection. He referred to a study published in the New England Journal of Medicine on 11 August 1994 titled "A Longitudinal Study of Human Immuno Deficiency Virus Transmission by Heterosexual Partners" authored by Isabelle De Vincenzi, which he interpreted as showing "pretty conclusively" that couples who used condoms all the time never transmitted; couples who used condoms more than half the time transmitted to some degree; and couples who used condoms less than half the time transmitted more of the virus.[140]

312 Ms Papadopulos-Eleopulos criticised that study on the grounds that it is not possible to verify the information that was provided by those who are the subject of the study. She expressed the view that it is impossible to verify whether people involved in the study were having anal sexual intercourse or homosexual contact; that people lie about their use of condoms, and that they misrepresent facts. She went on to quote from an exchange between Dr De Vincenzi and a Dr Brodie from which Ms Papadopulos-Eleopulos concluded that Dr De Vincenzi admitted that in Europe they did not have proof that a positive HIV antibody test, or what is known as HIV, is acquired through heterosexual contact.

313 Professor Kaldor strongly disagreed with the proposition that the De Vincenzi study does not provide evidence that HIV is heterosexually transmissible. Professor Kaldor accepted that prospective studies are difficult undertakings, and they are not watertight evidence. He said that any of these kinds of studies have their limitations. They rely upon what people tell the epidemiologists about their sexual behaviour. However, he said that the studies are performed by experienced professional people who work through different methods. They gain their subject's trust and the risk of misinformation is minimised. He considered that it was "remotely possible but highly unlikely that these distortions [meaning distortions caused by participants in the studies failing to describe their sexual behaviour accurately and honestly] would have had any serious effect on the conclusions".[141]

314 Professor Kaldor then referred to work being done in the Rakai region of Uganda which concluded that the risks of becoming infected if a person has an HIV positive partner increased dramatically if the partner was highly infected with the virus. He said the study showed a very strong relationship between the amount of virus in the HIV positive partner and the chance of transmission.

315 He observed that the Rakai study or project resulted in a comprehensive series of reports. He said that a paper by Quinn and others on viral load and heterosexual transmission of human immuno deficiency virus type 1,[142] showed effectively that the more virus, the more transmission. Ms Papadopulos-Eleopulos' evidence was to the effect that one could draw very little by way of

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[140] Exhibit P37.
[141] T 1116 – 17.
[142] Exhibit P78.

conclusion from these studies because of the nature of the studies and the reliance upon information provided to those conducting the study. She was asked:

> Q. Do you accept the epidemiology has an important and valid role to play in science.
>
> A. Epidemiology cannot prove or disprove anything. Epidemiology can only prove correlation but cannot give you scientific proof.
>
> Q. Isn't it the case that as a scientist, you look at all the available evidence, you look at scientific studies, you look at epidemiology, you look at biology, virology, immunology and then, from the combined effect of all the information, you draw your conclusions.
>
> A. You cannot have an epidemiological study of HIV if you have not got virological evidence for its existence. Professor Gallo would be the first one to tell you that you cannot prove the relationship between HIV and AIDS and claim scientific evidence or proof by epidemiological study. I think that is what it is in his statement.
>
> Q. It is your evidence that studies that show that HIV strains have been traced between sexual partners, or found clustered together in a group who live together or have sexual contact, isn't valid legitimate information relevant to this issue.
>
> A. No, no, that is not scientific proof. I am sorry, it is not. You can beg to differ. It is not proof. You can't have scientific proof for HIV unless you have virological evidence for its existence. You can't have proof of this transmission, unless you have it first. It is as plain as that. Epidemiology cannot prove it. It can change you once you have HIV, it can give you an association, yes, I totally agree with you. You can start from there but, first, before you have to have the virus and epidemiological studies can be so biased that evidence from epidemiological depends how you design them, what answers you are going to get. That is why – and again Professor Gallo will agree on this – unless you have prospective studies, you can forget all the cross-sectional studies. You can't have retrospective – you cannot have cross-section – you have to have prospective studies.[143]

316 Even though epidemiology is a recognised speciality and a recognised discipline from which conclusions can be drawn about disease and how diseases affect populations, Ms Papadopulos-Eleopulos appears to take the view that epidemiology cannot provide proof.

317 Professor Kaldor demonstrated that epidemiology has been at the forefront of the discovery of causes of death and disease. If there is sufficient epidemiological evidence it is possible to draw conclusions from those studies. He observed that epidemiologists do not make conclusions about the cause of disease simply from epidemiological studies alone. There needs to be other evidence of cause, in addition to the statistical evidence. For example, although there is epidemiological evidence that there is a strong correlation between smoking and lung cancer, causation is only established in the presence of other evidence such as the carcinogenic properties of tobacco.

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[143] T 512 – 13.

318 Professor Kaldor gave further examples. He referred to a study in Thailand amongst young military recruits which addressed sexual transmission. The army had a policy of 100 per cent condom use, and it was noted that the proportion of young men becoming infected with HIV dropped significantly by enforcing condom use.

319 Professor Kaldor expressed the opinion that epidemiological studies can prove causation beyond reasonable doubt. This evidence was in stark contrast to that of Ms Papadopulos-Eleopulos, who expressed a contrary view.

320 Professor Gordon gave evidence of an epidemiological study conducted in California amongst people who worked in the pornographic film industry. The study considered the extent of HIV infection amongst exposed workers to an adult film worker who had contracted the virus. Regular HIV tests were conducted which enabled those conducting the tests to trace the transmission after a male participant has tested positive. With one HIV positive participant who had thirteen sexual partners, three became HIV positive.[144]

321 I consider that there is clear evidence that epidemiological research in studies can establish causation. There have been numerous studies of HIV infection which establish that it is sexually transmissible via heterosexual sex.

322 Professor Gordon gave evidence about the presence of the virus in genital secretions. Dr Dwyer also gave evidence that HIV can be found in saliva, vaginal secretions, seminal fluid and semen.[145]

323 There is overwhelming evidence that HIV can be and is transmitted by sexual intercourse, including heterosexual contact.

324 There was a considerable body of evidence about the transmission of HIV through blood transfusions. The evidence of a number of the witnesses, including Professor Cooper, Professor Gallo, Professor Kaldor and Professor McDonald was that infection via blood transfusion has been eliminated in the western world. Evidence was also given about the Sydney surgeon case in which infection was transmitted as a consequence of a Sydney surgeon failing to sterilise instruments. The instruments were unknowingly used in respect of an HIV positive patient and the infection was transmitted to other patients through the use of those unsterilised instruments.[146]

325 Ms Papadopulos-Eleopulos was unable to afford a meaningful explanation as to the conclusions that can be drawn from those various studies and tests.

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[144] Exhibit P74.
[145] T 971 – 2.
[146] T 712; T 714 – 15.

Does HIV cause AIDS?

326 Professor Cooper explained that AIDS is a state of the immune system in which a person is susceptible to various opportunistic infections. The infections are a result of the parlous state of the immune system. He said that those opportunistic infections occur after people had been diagnosed with HIV. If untreated, those with the HIV infection will develop these opportunistic infections from which ultimately they will die.

327 One of the opportunistic diseases which was discussed in some detail by the witnesses is tuberculosis. Professor Cooper said that in the case of someone who is HIV positive, the opportunistic disease or infection is pulmonary tuberculosis. He accepted that there are individuals who can develop tuberculosis without being infected with HIV. In those cases they are not suffering from AIDS. In order to be diagnosed with AIDS it is necessary to have contracted HIV. He said that there are many people who contract infections that might be due to other causes of immune impairment but, in those cases, they would not be regarded as suffering from AIDS.

328 Ms Papadopulos-Eleopulos explained her understanding of the purpose of the HIV theory of AIDS. She said:

> According to the HIV theory of AIDS, HIV infection itself or CD4 cell leads to the decrease of CD4 cells. HIV infection kills CD4 cells. The decrease in CD4 cells leads to the clinical syndrome that is AIDS. Now, if this is the case then the more HIV you have the more killing of CD4 cells you will have and the higher the rate of death from AIDS and the higher the rate of AIDS. But this is not what all the evidence shows.[147]

329 She then referred to a study by M T May and others published in the Lancet in 2006 in which 22,217 patients who commenced highly active antiretroviral therapy (HAART) were reviewed. The review found that those who had commenced HAART had shown improvement in their virological response. The study also concluded that there was no corresponding decrease in the rate of AIDS or death in the following year. From that study, Ms Papadopulos-Eleopulos concluded that it has not been established that there is a connection between HIV and AIDS.

330 Professor Cooper rejected the conclusion and explained that the continued death rate was due to migrating populations into Europe from Africa.[148] He said that even with antiretroviral treatment people continue to die from HIV/AIDS.

331 Dr Turner, in discussing the studies relating to antiretroviral treatment, accepted that antiretroviral drugs seem to be beneficial. He observed, however, that he did not know how often they are beneficial and what other actions they may have. He did not concede that the studies that demonstrate that antiretroviral

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[147] T 72.
[148] T 682 – 3; T 694.

drugs do have an effect on people suffering from HIV/AIDS establishes that HIV causes AIDS.

332 The prosecution case that there is proof that HIV causes AIDS relied on the evidence of Professor Gallo, Professor Cooper, Professor French and Dr Dwyer. In support of the proposition that HIV is the cause of AIDS, the DPP relied upon the Durban Declaration, which was a document signed by 5000 scientists and research institutions acknowledging that HIV causes AIDS.[149] Additionally, the DPP relied upon a United Nations and World Health Organisation document referred to by Professor Cooper.

333 Further evidence relied upon by the respondent was the evidence of Dr Dwyer, Professor French and Professor Gallo that antiretroviral therapy has had a major effect in the treatment of AIDS.

334 Additionally, antiretroviral treatment has had a significant effect upon reducing and, in western countries, eliminating infection through blood transfusions. Professor Cooper was involved in a study in 2006 on the effect of antiretroviral treatment. He said that it was extraordinary and resounding in the fact that if a person who was on antiretroviral therapy had that therapy interrupted, they became sick and died at a rate two and a half times greater than if they stayed on the treatment. This study was conducted in about thirty countries.

335 Professor French confirmed that, in his experience, antiretroviral treatment was very specific and had the effect of interacting with the structure of HIV and not any other virus.

336 A number of the clinicians observed that since antiretroviral treatment had developed, there was a distinct reduction in the people who were admitted to hospital and who were dying from AIDS.

337 I consider that the evidence adduced both from studies which have been conducted and from the evidence of the witnesses overwhelmingly establishes that HIV causes AIDS. I do not regard Ms Papadopulos-Eleopulos' evidence and conclusions as credible. Her evidence on this subject demonstrated that when confronted with specific evidence of studies she simply responded by stating that she did not accept those opinions as evidence.

Professor McDonald

338 Professor McDonald confirmed in his evidence that the overwhelming view of governments throughout the world, the United Nations General Assembly, and of the medical scientific community is that there is both scientific and public health evidence that HIV is sexually transmissible and a threat to the welfare of populations. Further, it is preventable in the sense that if populations can be

[149] Exhibit P6.

educated to avoid taking risks in their sexual practices and to avoid taking risks in their drug use practices, that will reduce the spread of HIV.

339 On the question of whether HIV is sexually transmissible, he referred to the epidemiological evidence based on numerous studies that indicate that populations who embark on high-risk sexual behaviour have a high incidence of HIV. He also referred to the fact that specific strains of HIV have been tracked and been demonstrated by molecular techniques to be passed from one person to another by way of sexual intercourse.

340 As to the evidence that diagnostic tests are capable of providing false positive results, he accepted that all laboratory tests have a level of false positives. However, in the case of HIV he said that there are initiatives and systems in place to confirm the accuracy of test results. The National Laboratory in Australia headed by Associate Professor Dax ensured that HIV testing was done in appropriately certified laboratories. He was of the opinion that the chances of a false positive test arising in Australia was very low.

341 On the issue of whether HIV actually causes AIDS, he said:

> The condition of AIDS [Acquired Immune Deficiency Syndrome] was originally identified as a symptom complex of life threatening infections and cancers that were associated with reduced immune function resulting from loss of crucial defense white blood cells [CD4 lymphocytes].[150]

342 He observed that numerous and extensive studies have confirmed that HIV is capable of infecting and destroying the CD4 cells that are essential protection against infections and cancers in humans.

343 He referred to the evidence that blood donors infected with HIV do transmit infection resulting in AIDS. There is evidence that antiretroviral drug treatment of people with the infection has reduced the progression of their infection to AIDS and death.

344 He commented on Ms Papadopulos-Eleopulos' views and observed that, although she raises some valid questions about transmission, diagnosis and pathogenesis of HIV infection in the 1990s, those views have not been supported by international peer review. Her propositions have not been confirmed with epidemiological clinical or laboratory studies. He observed, as did other witnesses, that events and information have moved on since the 1980s and 1990s. In his view, her opinions are based on outdated scientific evidence. He said:

> In 2006, which is 25 years after the initial reports of AIDS there has been an enormous international initiative that has progressively explicated the epidemiology and approaches

[150] Exhibit P88.

> for control of an infection that is a threat to the welfare of whole countries especially in the developing world.[151]

345 He considered that Ms Papadopulos-Eleopulos' views and her writings are not credible views in terms of public health, epidemiology or virology.

346 Professor McDonald was present throughout the evidence of both Ms Papadopulos-Eleopulos and Dr Turner and provided expert assistance to counsel for the respondent. He explained in his report[152] that whenever a new infection becomes apparent through epidemiological observation, there is a period of technical development where methods of identification of pathogenesis, that is, the process of causing disease, are refined. It is not unusual that in the early days there is genuine scientific debate. This happened with HIV.

347 However, he observed that the evidence of Ms Papadopulos-Eleopulos and Dr Turner and their criticisms were based on early experiments and findings. They do not acknowledge the progress that has been made in the various techniques, including molecular methods, which are now predominant in the diagnosis of HIV.

348 As I have observed, the molecular detection systems have revolutionised the detection and treatment of HIV. Professor McDonald observed that the suggestion that HIV has not been isolated ignores the developments that have occurred in testing. He said that the whole genome of HIV has been identified and sequenced on many occasions. This was confirmed by Professor Gordon. The genes are unique to HIV and the antibody tests and viral load tests are highly specific for detection of HIV.

349 As to the claims that the diagnostic tests are erroneous and have a high rate of false positives, he observed that the HIV tests have been the subject of vigorous assessment and validation. He confirmed the evidence of Associate Professor Dax that the tests are highly specific and sensitive in diagnosing HIV and antibodies.

350 As to the claims by Ms Papadopulos-Eleopulos and Dr Turner that, firstly, antibodies are not entirely specific; secondly, that antigens (proteins) and the test kits designed to detect HIV antibodies in patients' serum are not unique to HIV; and, thirdly, that the testing methodology is intrinsically inaccurate and produces a high number of false results, it was Professor McDonald's opinion that the notion of non-specific antibodies and potential cross reactions has been well recognised in the design, regulatory approval, implementation and quality control of testing methodology. He is of the opinion that HIV antibody tests today and the diagnosis of HIV are probably the most accurate of all tests in medical diagnosis. As to the second proposition, he is of the opinion that test kits that have been developed are unique and specific for HIV antibodies. As to the third

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[151] Exhibit P88.
[152] Exhibit P89.

proposition, he is of the view that the quality and accuracy of HIV testing systems in Australia has been well established. He is of the opinion that there is no basis in fact to support the contentions of Ms Papadopulos-Eleopulos and Dr Turner.

351 As to the question of whether HIV is sexually transmitted by heterosexual sex, Professor McDonald observed that the epidemiological studies which have been conducted confirm that HIV is sexually transmissible through heterosexual sexual intercourse.

352 Professor McDonald had made contact with Professor Mullis. Professor Mullis is recognised as the person who invented the PCR (polymerase chain reaction) technique, which is used in the process of identifying the gene sequence of DNA. He explained that the ability to amplify small amounts of genetic material to manipulate them and sequence them was as a result of PCR technology.[153] He said that PCR was founded by a person whose name Professor Cooper could not recall but has now been identified as Professor Kary Mullis. Professor Cooper acknowledged that Professor Mullis is an AIDS denialist.

353 Dr Dwyer was cross-examined about nucleic acid testing. He was asked:

> Q. You have spoken about the nucleic acid test or the NAT, which is now being used, the genomic sequence. In effect we are talking about the viral load, aren't we.
>
> A. No, the viral load is a type of nucleic acid test but a nucleic acid test is not just the viral load. The first nucleic acid test – well, nucleic acid tests aren't designed to pick up either DNA or RNA. It so happens that you can quantify them to give a viral load.
>
> Q. What sort of testing is nucleic acid testing; is that known as PCR.
>
> A. PCR is one of the NAT technologies.
>
> Q. Can you isolate it for quantitative assessment.
>
> A. You can.
>
> Q. You realise that the man that discovered it, Malla, said you can't.
>
> A. I have never heard him say that you can't quantify material using PCR.
>
> Q. If you do quantify you would expect to be getting pretty good results which are mathematically sensible.
>
> A. Well, I'm not quite sure what you mean by that question.
>
> Q. I'll show you what I mean. Look at annexure 5 to Dr Turner's affidavit. Have you got that.
>
> A. Yes.

[153] T 689 – 90.

> Q. It will save time if you read it because I want you to comment on it.
>
> A. Yes.
>
> Q. Obviously you need to look at the figures.
>
> A. Yes, I know this paper.
>
> Q. Do you agree with Dr Turner's conclusion about it that it in effect demonstrates the concept of using HIV viral load is just, on those figures it's incomprehensible.
>
> A. I think he has completely misinterpreted the data in this. What this data is telling me is that there are three different laboratory types of quantitation that are being used, all of those assays need to detect the specific part of the HIV genome. Some of the original material that was produced by companies only actually picked up the North American strain of HIV and completely missed the African strains of HIV. So some, and in fact the company that produced the RTPCR assay, which is Roche, in fact had to re-alter their product to make sure that it picked up all genetic variations of HIV and they now do and those assays are now used. Our own lab has done exactly, and published, the same sorts of experiments and it's quite well recognised that unless your PCR primers, which are what start the reaction, are to highly conserve parts of the genome you will miss certain strains of HIV. That is quite well-known and understood.[154]

354 Ms Papadopulos-Eleopulos had said that the inventor of PCR was purported to have expressed a lack of confidence in PCR. Professor Mullis received a Nobel Prize in Chemistry for having invented the PCR technique. As a consequence of the reference to Professor Mullis, Professor McDonald made contact with him.

355 Professor McDonald said the effect of Professor Mullis' answer was to express confidence in the PCR system. Professor McDonald said that the controversy around HIV is not a controversy around whether PCR is a valid technology or technique. Professor Mullis had stated in a paper titled "A hypothetical disease of the immune system that may bear some relation to the Acquired Immunodeficiency Syndrome"[155] that there was a controversy as to whether and how HIV caused AIDS.

356 In his paper, Professor Mullis observed:

> The cells of an individual immune system could be so highly infected with latent viruses that were immunicologically distinct from one another as to result in an immune dysfunction resembling the acquired deficiency syndrome.

357 That was a theory propounded by Professor Mullis some ten years ago. Professor McDonald commented that the paper and the hypothesis postulated by Professor Mullis has not had any support from experts in the field of HIV/AIDS research.

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[154] T 1004 – 5.
[155] Exhibit A19.

358 Mr Borick QC contended that there is a continuing controversy in respect of whether HIV causes AIDS. He sought to support that contention by reference to the paper of Professor Mullis.

359 I consider that Professor Mullis' views, as expressed in the paper ten years ago, are not supported by research. Over the past ten years since the paper was written, there is no evidence in any of the research that has been conducted in respect of the HIV/AIDS virus that the hypothesis of Professor Mullis has any scientific basis. The fact that a scientist who does not work or research specifically in the area of HIV/AIDS publishes an hypothesis does not establish that there is a genuine scientific debate about whether HIV causes AIDS.

360 Another basis upon which Mr Borick QC contends that there is a genuine debate that HIV causes AIDS resulted from the views expressed by Professor French, Professor Cooper, Professor McDonald and Dr Dwyer, that there is still a great deal of knowledge to be gained in respect of the mechanism by which a person infected with the virus then develops a disease and the progress of that disease.

361 Professor McDonald was cross-examined about what he meant by the distinction between cause and mechanism. He was asked:

> Q. When you use the word 'mechanism' do you mean the process as to why or how HIV manages to caused AIDS as distinct from the fact that, in your opinion, it does not cause AIDS.
>
> A. Sorry, I didn't fully understand that.
>
> Q. When you used the word 'mechanism' did you mean the process as to why or how HIV manages to cause AIDS as distinct from the fact that in your opinion it does cause AIDS.
>
> A. My reason for believing that HIV causes AIDS is all to do with my clinical observations, my association with research. I suppose because, I've been closely associated with vaccine development, I recognise that there are some remaining factors about the interaction between HIV and the host immune system that we need to understand more fully so that we can make a vaccine properly.
>
> Q. As you sit here in the courtroom today do you accept that there are a lot of unknowns that you have described as 'tiny but important details' as to why or how HIV manages to cause AIDS, meaning, in your terms, mechanism.
>
> A. Yes.
>
> Q. Would you accept that it is critical to acknowledge the unknown areas of the science. Critical to acknowledge that fact.
>
> A. It's important to know what is not known but the factors that are not known reside in detailed host response immunology and possibly some of the mechanisms whereby the virus provokes a dominant antibiotic response as distinct from a T cell response.

Q. In the passage that I read out to you from your earlier evidence at p.1356 lines 17-19, and I'll just read it again 'There is still a lot of unknowns into the tiny but important detail as to why or how HIV manages to cause AIDS or reduction in CD4 or other cells'. Do you accept that it is, in your view, unknown as to how HIV kills CD4 cells.

A. There are a lot of factors known about how HIV infects CD4 cells. It's known that they reduce in numbers with time. There are however factors other than the infection in the CD4 cell with the virus that modulate the extent to which CD4 cells die off.

Q. Do you yourself have doubts about the mechanism by which HIV could result in the death of CD4 cells faster than the body could replace them.

A. I can only reply that in a sense there are details to do with the immune handling of the virus that remain uncertain. There is no uncertainty about the fact that there is a progressive loss of CD4 cells.

Q. Just to return to the question. Do you yourself have some doubts about the mechanism by which HIV could result in the death of CD4 cells faster than the body could replace them.

A. I don't – do I have doubts? I'm a true believer in the fact that CD4 cells deteriorate and reduce in number with time. And –

HIS HONOUR

Q. As a result of HIV infection.

A. As a result of HIV infection.

XXN

Q. Do scientific experts agree that it is an open question as to how HIV kills CD4 cells.

A. As to the exact mechanisms. I don't think there is any doubt about the fact that all experts would accept that with HIV infection there is a progressive loss of CD4 cells.[156]

362 Mr Borick QC seeks to draw from that evidence and evidence of Professor French and Professor Gallo the conclusion that there is a genuine debate about whether it has been established that HIV causes AIDS. In my view, that is a misinterpretation of the evidence of the witnesses. What the witnesses conceded was that there are still a great deal of unknowns as to the mechanisms by which the CD4T cells are diminished.

363 The witnesses for the respondent, however, are uniformly in agreement that HIV causes the depletion of CD4 cells and causes the break down of the immune system, resulting in the various diseases which are defined as AIDS-related diseases.

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[156] T 1395 – 7.

A paper titled "The Use of Phylogenetic Analysis as Evidence in Criminal Investigation of HIV Transmission"

364 After submissions had been concluded, I was requested by counsel for the applicant to consider a further argument which Mr Borick QC submitted had recently come to light. He produced a document titled "The Use of Phylogenetic Analysis as Evidence in Criminal Investigation of HIV Transmission". It was a document prepared as a briefing paper aimed at professionals working in the criminal justice system, and HIV professionals who may be called as expert witnesses in criminal HIV transmission cases. The document purports to explain how phylogenetic analysis should and should not be used in criminal trials for the reckless transmission of HIV. It is a document dated February 2007. I admitted the document for the purpose of hearing the argument.[157]

365 At the trial, Professor Higgins, who is the Deputy Head of Infectious Diseases at the Institute of Medical and Veterinary Science in Adelaide explained that the profile of a virus in two people with whom it is common would be very similar. He said that in South Australia there is a database of 550 patients and approximately 850 sequences of persons infected with HIV. In the case of the applicant, the virus had been sequenced. He concluded that there was a 1 per cent variance between the virus contracted by one of the complainants with whom the applicant had had sexual intercourse and that contracted by the applicant.

366 Mr Borick QC submitted that the document[158] throws doubt upon the methodology that might have been used by Professor Higgins. He submits that if the defence had been aware of the commentary contained in the document he may well have cross-examined Professor Higgins differently. The methodology adopted by Professor Higgins may well have been the subject of some conjecture. Thus, the document did not directly relate to any of the propositions the applicant had sought to make during the application.

367 I indicated to Mr Borick QC that he would have to make an application to amend the grounds of appeal. No such application was made.

368 Ms McDonald opposed the receipt of the document. She submitted that very little was known about its provenance or about the qualifications of those who had prepared it. She submitted that the document was no more than a document designed to assist counsel about matters to which counsel should have regard when this kind of evidence is led. She submitted that Professor Higgins' evidence was led in a particular way because there had been an agreement between counsel as to the manner in which it would be led and, therefore, she led next to no evidence about methodology controls processes that were followed by Professor Higgins in his analysis. She submitted that if this material were to justify an application to lead fresh evidence or to conduct the defence in a

[157] Exhibit A20.
[158] Exhibit A20.

different way, then these kinds of applications would be never-ending. Developments in every area of science will necessarily result in greater knowledge and more sophisticated methodologies in undertaking scientific testing. She submitted that in relation to HIV there is constant further work being done. The fact that there have been further scientific developments is not a basis to permit the case to be re-opened.

369 In any event, Ms McDonald submits that the evidence of Ms C, one of the complainants, that she became infected after her sexual relationship with the applicant must have been accepted by the jury. The material does not amount to fresh evidence nor should it lead to a further investigation into the evidence at trial.

370 As the matter presently stands, there has been no application to amend the notice of appeal. If such application were to be made, based upon the material contained in the document, I would refuse leave to amend. My reasons for so doing are that the document is simply a short briefing paper. There is nothing in the document which would suggest that the evidence of Professor Higgins is unreliable. No evidence has been sought to be tendered which might throw doubt upon Professor Higgins' evidence. This is simply a document which counsel submits it might wish to use if Professor Higgins was further cross-examined. In effect, Mr Borick QC submits that he should be entitled to re-open the case to embark on a form of fishing expedition to investigate the methodology used by Professor Higgins in arriving at his conclusions. That is not a basis to justify re-opening the case. The document can only lead to speculation. It has no evidential weight. No evidence has been provided to support the application. There is no evidence to doubt the accuracy of Professor Higgins' conclusions.

Conclusion – summary

371 I reject the evidence of Ms Papadopulos-Eleopulos and Dr Turner. I conclude, for the reasons expressed, that they are not qualified to give expert opinions about whether it has been proved that a virus HIV exists. They are not qualified to express opinions on the tests that have been developed to diagnose the virus in humans. They are not qualified to express opinions about whether the virus is sexually transmitted. The opinion evidence of these two witnesses is therefore inadmissible.

372 I find that the respondent's witnesses are all qualified to give expert opinion evidence in their respective fields. I find that the evidence that HIV exists is compelling. Even assuming that Ms Papadopulos-Eleopulos' and Dr Turner's evidence was admissible in a trial, I am satisfied that no jury would conclude that there is any doubt that the virus HIV exists. I consider no jury would be left in any doubt that HIV is the cause of AIDS or that it is sexually transmissible.

373 In my view, the probative value of the evidence proposed to be called by the applicant is minimal. The proposed evidence lacks cogency.

374 I am satisfied that no miscarriage of justice has taken place because the evidence now proposed to be adduced was not so adduced at trial.

375 For the reasons I have given, I reject the submission of Mr Borick QC that I should apply the test according to how the case might have been different at trial. The question to be answered is whether the failure of the jury to have heard the evidence might have led to an unjust conviction.

376 For the reasons I have given, I do not consider that the evidence proposed to be called is plausible or cogent. There has been no miscarriage of justice.

377 At the trial, the three complainants gave detailed evidence of their sexual contact with the applicant. Ms C, who has been diagnosed with the virus, gave evidence that her only sexual contact during the relevant time before she was diagnosed as HIV positive, was with the applicant.

378 When the strain of HIV, for which she had tested positive, was compared with the tests from the applicant, the genetic sequence of her HIV positive test had a variance of about 1% from the sequence of the applicant. There was evidence at trial that of all the virus profiles on the database of the SA Institute of Medical and Veterinary Science, the closest profile to that of the applicant was that of Ms C. The closest unrelated sequence to either the applicant or Ms C had a variance of about 4%.

379 The applicant presented with AIDS symptoms. His CD4 count was extremely low and his viral load count was very high. After he was prescribed antiviral medication, his CD4 count increased and his viral load decreased. He exhibited the symptoms that might be seen in a person who has contracted HIV/AIDS. He responded to antiretroviral medication in a manner that is expected and is predictable, according to mainstream experts.

380 For these reasons, I refuse an extension of time in which to grant permission to appeal. If an extension of time for permission to appeal were to be granted, I would refuse permission to appeal.