BORGARTING COURT OF APPEAL

JUDGMENT

Delivered: 14 April 2016 in Borgarting Court of Appeal

Case no.: 14-117680ASD-BORG/02

Judges:

Court of appeal judge	Halvard Leirvik
Acting court of appeal judge	Thomas Christian Poulsen
Extraordinary court of appeal judge	Rakel Surlien

Lay judges:

Professor	Tomas Bergström
Professor	Jan-Erling Bäckvall

Appellant	Idenix Pharmaceuticals LLC	Advocate Camilla Sophie Vislie Advocate Harald Ludvig Joachim Irgens-Jensen
A ppellant	Centre National de la Recherche Scientifique	Advocate Camilla Sophie Vislie Advocate Harald Ludvig Joachim Irgens-Jensen
Appellant	Universita Degli Studi Di Cagliari	Advocate Camilla Sophie Vislie Advocate Harald Ludvig Joachim Irgens-Jensen
Appellant	Université Montpellier II	Advocate Camilla Sophie Vislie Advocate Harald Ludvig Joachim Irgens-Jensen
v.		
Respondent	Gilead Sciences Europe Ltd.	Advocate Are Stenvik
II Appellant	Idenix Pharmaceuticals LLC	Advocate Camilla Sophie Vislie Advocate Harald Ludvig Joachim Irgens-Jensen
v.		
Respondent	Gilead Pharmasset LLC	Advocate Are Stenvik

Disclosure to the general public is not subject to any restrictions

This present case concerns the validity of two pharmaceutical patents, *cf.* section 52 of the Patents Act.

The parties to this case each hold their own Norwegian patent. Both patents in suit concern chemical compounds suitable for use in pharmaceutical products, in the treatment of *Flaviviridae* infections (flavivirus), in particular hepatitis C virus (HCV) infections. The present case has its origin in a dispute over which party is the rightful inventor of the chemical substance in question, a nucleoside analogue of the pattern 2'-methyl-up, 2'-fluoro-down, and which of them first disclosed the invention in a patent application with a valid chain of priority. During its review of the technical background, the Court of Appeal will discuss nucleoside analogues, the significance of these in the treatment of viruses and the specific significance of the chemical substance in question.

Idenix Pharmaceuticals LLC, Centre National de la Recherche Scientifique, Università degli Studi di Cagliari and Université Montpellier II are joint holders of Norwegian patent NO 330 755 (hereinafter referred to as NO '755). Idenix Pharmaceuticals LLC is a pharmaceutical company registered in Delaware, USA, headquartered in Cambridge, Massachusetts, USA. It was founded in 1998 and is involved in research and development of antiviral pharmaceutical products (antiviral drugs), including drugs for the treatment of, among other things, HIV, HBV (the hepatitis B virus) and HCV. The company has cooperated with the three other holders of NO '755, all of which are universities or research institutions, on the research and development of antiviral drugs. These parties will jointly be referred to as Idenix.

Gilead Pharmasset LLC is the holder of Norwegian patent NO 333 700 (hereinafter referred to as NO '700). Gilead Pharmasset LLC is a pharmaceutical company registered in Delaware, USA, and is headquartered in New Jersey, USA. It was founded when the company Gilead Sciences Inc. acquired the company Pharmasset Inc. (Delaware) in 2012 for approximately USD 11 billion. As the Court of Appeal will discuss later, the patent applications leading to NO 700 were filed by the company Pharmasset Inc. (Delaware), its associated companies or employees of these.

A sister company of Gilead Pharmasset LLC, Gilead Sciences Europe Ltd., registered in the UK, is Idenix's respondent in the case concerning the validity of NO '755. The two sister companies will be referred to as Gilead, both jointly and individually. If on occasion it is important to distinguish between these companies, the full names of the companies will be used. The parent company, Gilead Sciences Inc., is also registered in Delaware, and its headquarters are located in California, USA. It was founded in 1987, and is a pharmaceutical company with a product portfolio comprising several disease categories, including HIV, hepatitis, serious respiratory diseases, cardiovascular diseases and cancer.

The patent history

The cut-off point for assessing whether conditions regarding patentability have been fulfilled is the date on which an application has been filed. Assuming that the two patents in suit are otherwise valid, the filing date will therefore be of crucial importance with regard to which of the two patents will be granted

priority, *cf.* section 2, second sub-section, second sentence of the Patents Act. If the patent that was first in time is declared invalid, this patent may also be of significance in assessing the validity of the patent that was last in time. The Court of Appeal therefore finds it expedient to begin by providing a patent history, indicating which dates – priority dates – the parties claim for their respective patents.

Idenix filed Norwegian patent application NO 20050465 (NO '465) on 27 January 2005. Gilead filed Norwegian patent application NO 20056221 (NO '221) on 28 December 2005.

A Norwegian patent application may, under certain circumstances, be deemed to have been filed at an earlier point in time, and may thus be given priority from this earlier date. First, it follows from the rules concerning so-called convention priority, *cf.* section 6 of the Patents Act, which implements article 4A(1) of the Paris Convention for the Protection of Industrial Property (Paris Convention), that a Norwegian patent application concerning the same invention as that in an application filed during the last 12 months in a foreign state party to the Convention shall be deemed to have been filed at the earlier date.

Further, it follows from the rules concerning international patent applications, *cf.* Chapter 3 of the Patents Act, which implements the Patent Cooperation Treaty (PCT), that an international application can be continued in member states designated by the applicant. It follows from section 31 of the Patents Act that an international application – a PCT application – can be continued in Norway no later than 31 months after filing of the PCT application. Such a continuation means, among other things, that the Norwegian application is given priority based on the date on which the international application was filed.

Idenix first applied for a patent in the United States. Several applications were filed, but only one application – US '350 – is relevant to this case. This application was filed on 28 June 2002. On 27 June 2003, Idenix filed an international application (PCT '246), and the Norwegian application (NO '465) is a continuation of PCT '246. Based on the rules mentioned above, before the District Court Idenix claimed priority from the US '350 applications (convention priority), which was filed during the last 12 months before the PCT application, which has been continued to apply in Norway. Before the Court of Appeal, however, Idenix has waived its claim for priority from US '350, so that priority only is claimed from the filing date for the PCT application, that is 27 June 2003. It is not contested that Idenix can claim priority with effect from the PCT application, provided that the Court of Appeal finds that the other patent conditions have been met.

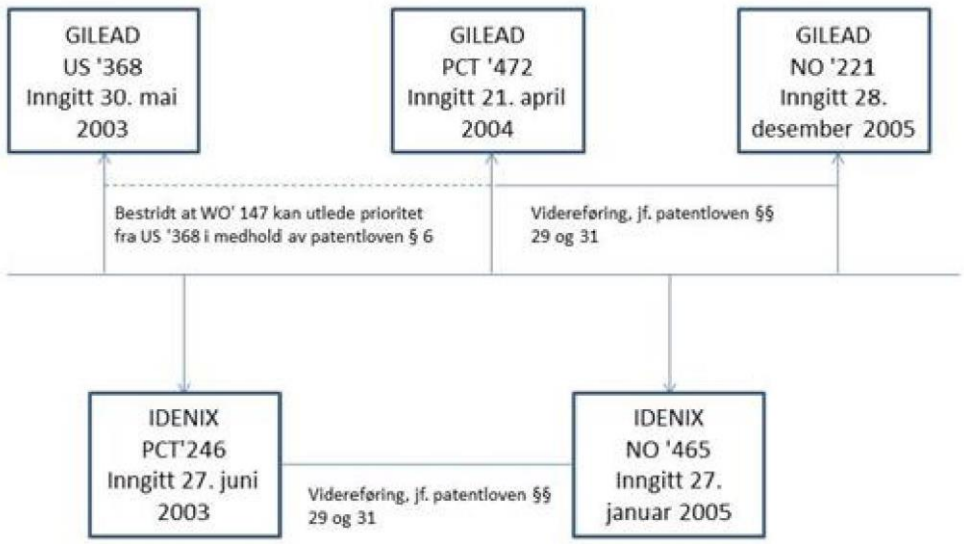
Idenix's international patent application PCT '246 became publicly available on 8 January 2004 through the publication of document WO '999.

Gilead, too, first applied for a patent in the United States. The application, filed by the inventor Jeremy Clark on 30 May 2003, is designated as US '368. Mr Clark was at the time an employee of the company Pharmasset Inc. (Georgia), and had in advance assigned his rights to the invention to his employer. The rights to

US 368 thus belonged to Pharmasset Inc. (Georgia). Gilead's PCT application was filed on 21 April 2004 (PCT '472) by the company Pharmasset Ltd. (Barbados). The Norwegian application (NO '221) is an extension of PCT '472, and was filed by Pharmasset Inc. (Delaware), which was successor in title of Pharmasset Ltd. (Barbados). Gilead claims priority with a basis in US '368 (convention priority), which was filed during the last 12 months before the PCT application and has been continued to include Norway. If Gilead can claim priority from US '368, it is uncontested that Gilead has best priority. As the Court of Appeal will discuss later, however, Idenix claims that Gilead cannot claim priority from US '368. It is submitted that legal title to the invention in US 368 had not been assigned to Pharmasset Ltd. (Barbados), which filed the PCT application, from Pharmasset Inc. (Georgia) before the PCT application was filed. If Gilead cannot claim priority from US '368, it is not contested that Idenix is first in time.

Idenix was granted Norwegian patent NO 755 on 4 July 2011, while Gilead was granted Norwegian patent NO 700 on 26 August 2013.

Schematically, the timeline for the patent application history may be presented as follows:



Procedural history

Gilead Sciences Europe Ltd. filed suit against Idenix Pharmaceuticals LLC, Centre National de la Recherche Scientifique, Università degli Studi di Cagliari and Université Montpellier II by way of a statement of claim to Oslo District Court dated 28 September 2012 (case no. 12-155575TVI-OTIR/01). Gilead presented a prayer for relief stating that Idenix's Norwegian patent NO '755 should be declared invalid. The defendant entered a prayer for relief that the court should find in their favour.

Idenix Pharmaceuticals LLC filed suit against Gilead Pharmasset LLC on 6 September 2013, demanding that Gilead's Norwegian patent NO '700 be declared invalid (case no. 13-170456TVIOTIR/01). The defendant entered a prayer for relief that the court should find in its favour. Both parties requested that the cases be consolidated for joint hearing in spite of the fact that there was limited time before the scheduled main hearing. Oslo District Court decided to consolidate the cases for a joint hearing.

On 21 March 2014, Oslo District Court, convened with two expert lay judges, delivered its judgment with the following conclusion of judgment:

In case no. 12-155575TVI-OTIR/01:

1. Norwegian patent NO 330 755 is declared invalid.
2. Idenix Pharmaceuticals Inc., Centre National de la Recherche Scientifique, Universita Degli Studi Di Cagliari and Université Montpellier II are ordered to pay, jointly and severally, the legal costs of Gilead Sciences Europe Ltd. in the amount of NOK 13,999,554 – thirteen million nine hundred and ninety-nine thousand five hundred and fifty-four Norwegian kroner – within two – 2 – weeks of service of the present judgment.
3. Idenix Pharmaceuticals Inc., Centre National de la Recherche Scientifique, Universita Degli Studi Di Cagliari and Université Montpellier II shall in addition pay, jointly and severally, the costs apportioned to Gilead Sciences Europe Ltd. in relation to the Court and the expert lay judges. The amount of these costs is to be specified in a separate ruling.

In case no. 13-170456TVI-OTIR/01:

1. The Court finds in favour of Gilead Pharmasset LLC.
2. Idenix Pharmaceuticals Inc. is ordered to pay the legal costs of Gilead Pharmasset LLC in the amount of NOK 736,819 – seven hundred and thirty-six thousand eight hundred and nineteen Norwegian kroner – within two – 2 – weeks of service of the present judgment.
3. Idenix Pharmaceuticals Inc. shall in addition pay the costs apportioned to Gilead Pharmasset LLC in relation to the Court and the expert lay judges. The amount of these costs is to be specified in a separate ruling.

The reason why the District Court concluded that Idenix's Norwegian patent NO '755 had to be declared invalid was that the invention was not so clearly disclosed that it could be carried out by a person skilled in the art, *cf.* section 8, second sub-section, third sentence of the Patents Act, *cf.* section 52, first sub-section, no. 2. As regards Gilead's Norwegian patent NO '700, which the District Court ruled was valid, the District Court concluded that this patent – in comparison with Idenix's patent applications – fulfilled the requirement of novelty and inventive step laid down in section 2, first sub-section of the Patents Act.

For further details concerning the facts of the case, reference is made to the District Court's judgment and the Court of Appeal's remarks below.

Idenix Pharmaceuticals LLC, Centre National de la Recherche Scientifique, Università degli Studi di Cagliari and Université Montpellier II have appealed the District Court's judgment in case no. 12-155575TVI-OTIR/01 (regarding the validity of Idenix's patent NO 755) to Borgarting Court of Appeal. In addition, Idenix Pharmaceuticals LLC has appealed the District Court's judgment in case no. 13-170456TVI-OTIR/01 (regarding the validity of Gilead's patent NO 700). The appeal cases have been consolidated for joint hearing by the Court of Appeal.

Both parties requested that court be convened with expert lay judges. The appointed lay judges were Jan-Erling Bäckvall, professor of organic chemistry at the University of Stockholm, and Tomas Bergström, professor of clinical microbiology at the University of Gothenburg.

A number of pleadings have been issued in connection with this case. Pursuant to section 9-9, third sub-section of the Civil Procedure Act, both parties have also provided written submissions concerning the issues of priority in this case. A planning meeting has been held as well as several case preparation meetings.

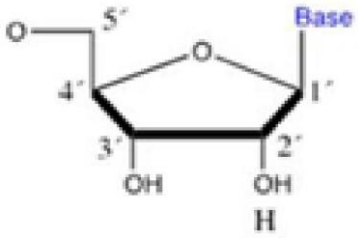
In its pleadings dated 23 January 2016, Idenix presented a petition to disallow the submission of a number of documents as evidence in both cases (approximately 2500 pages). As a basis for this, reference was made to section 21-7, second sub-section, litra b and section 21-8 of the Civil Procedure Act. Gilead opposed this claim. In Borgarting Court of Appeal's ruling dated 27 January 2016, this petition was not allowed.

The appeal hearing was held from 2 to 19 February 2016 in Oslo Courthouse. The parties were represented by legal counsel and by of counsel. On the second day of proceedings, Senior Director Cyril Dousson gave testimony as a representative for the litigant party Idenix. On day three of proceedings, Executive Vice President John McHutchison gave testimony as a representative for the litigant party Gilead. Testimony was heard from 14 witnesses, 11 of whom were expert witnesses engaged by the parties. A number of witnesses were present during all or part of the appeal hearing, *cf.* section 24-6 of the Civil Procedure Act. As regards the presentation of evidence, reference is made to the court records.

Technical background

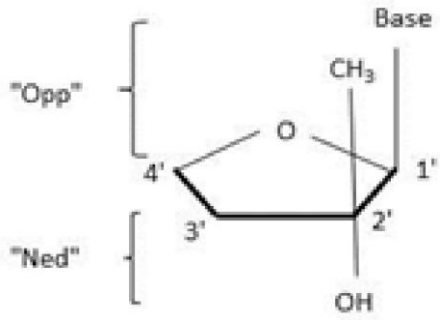
The Court of Appeal finds it expedient to describe the technical background before the parties' submissions are presented. This description is largely based on the account given in the District Court's judgment, to which the parties have no objections.

In the field of chemistry, a molecule that is bonded by two or more elements is called a compound. Organic chemistry deals with compounds containing carbon. One type of organic compound is the nucleoside. Nucleosides consist of a sugar ring that is bonded with a base. The sugar ring, called ribose or deoxyribose, is a carbohydrate with a ring structure, consisting of one oxygen atom and four carbon atoms. A fifth carbon atom is bonded to the ring. Ordinarily, the carbon atoms in the ring are numbered in a fixed pattern:



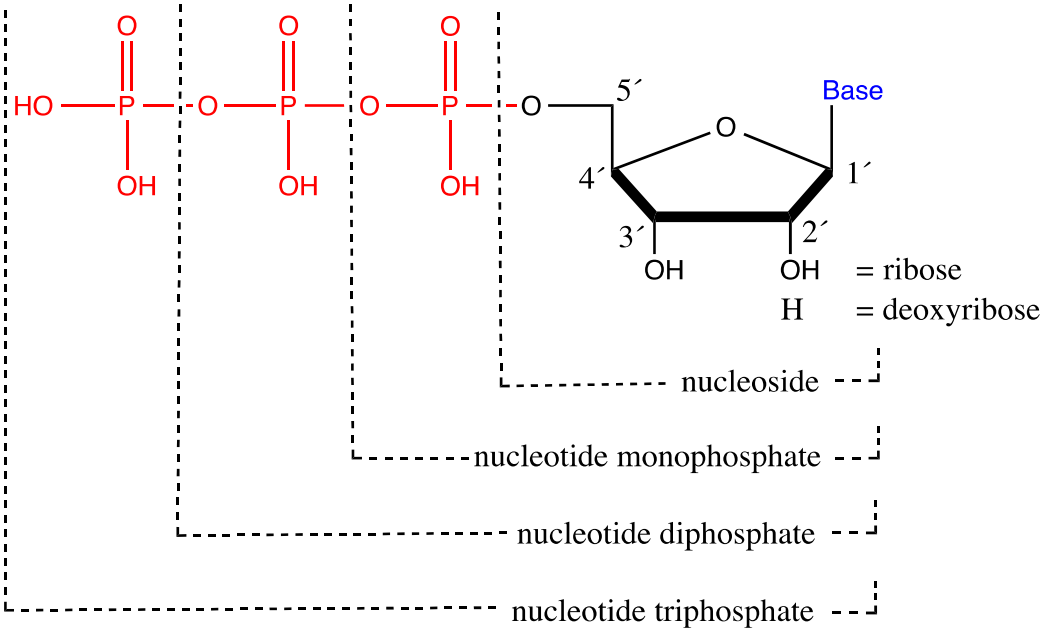
The structure above also shows the molecule's three-dimensional shape, since it indicates that the bonds between the atoms are pointing in the direction of the viewer. For this reason, some atoms and atom groups are designated as being "up" while some are "down". In the structure above, it is either hydroxyl (OH) or hydrogen (H) that is bonded with the carbon atom in the 2'-down position.

In the structure below, hydroxyl is bonded with the carbon atom in the 2'-down position, while methyl (CH_3) is in the 2'-up position:



The character ' is termed "prime". The designation 2'-down is thus called "2 prime down".

Nucleosides form starting materials for the biological formation of nucleotides. In addition to sugar ring and base, nucleotides contain one or more phosphate groups in the 5' position:



Nucleotides are molecules that constitute "building blocks" of nucleic acids (DNA and RNA), which are essential for the genetic material of living organisms. While DNA normally consists of two intertwined strands, RNA normally consists of a single strand. In addition, the nucleotides participate in biological processes in the cells. There are several differences between the two: Among other things, RNA has hydroxyl in the 2'-down position (the sugar ring is then called ribose), while DNA has hydrogen in the same position (the sugar ring is then called deoxyribose).

Nucleoside analogues are synthetically produced nucleosides, virtually identical to naturally occurring nucleosides but which are modified in certain positions on the sugar ring (substances are replaced with others) and/or in the form of a modified base. Since the 1960s, nucleoside analogues have been developed and used as pharmaceuticals, partly in chemotherapy in the treatment of cancer, partly in the treatment of viral infections. The Court of Appeal will later discuss the biological effect of nucleoside analogues.

A virus is a microorganism that causes disease. A virus replicates by infecting cells in other organisms, and this is what can result in disease. Each virus has a genome containing genetic information (genes). The virus' genome can either be DNA or RNA, and consists, as mentioned above, of nucleotides.

Hepatitis is a disease caused by certain hepatitis viruses, including the hepatitis C virus (HCV), which primarily affects the liver. HCV was first described in 1989. HCV is a single-stranded RNA virus, belonging to the Hepacivirus group, which again belongs to the *Flaviviridae* family. The *Flaviviridae* family also includes, *inter alia*, yellow fever virus, West Nile virus, dengue fever virus and the virus causing tick-borne encephalitis (acute inflammation of the brain). HCV is transmitted via blood or other bodily fluids.

Most patients (around 85%) infected by the hepatitis C virus do not show any symptoms, or only non-specific symptoms, during the acute phase. The virus will in many cases not display any symptoms for the first few years, not even for those who develop chronic infection after the acute phase. Chronic infection may lead to cirrhosis of the liver, and evolve into liver failure, liver cancer or other fatal diseases. It is assumed that at least 130–180 million people are suffering from hepatitis C virus infection worldwide, that 3–4 million people are infected each year and that around 350,000 people die each year as a result of hepatitis C virus infection.

At present, there exists no vaccine against hepatitis C virus infection. The standard treatment of hepatitis C virus infection involves administration of the active ingredients alpha interferon or pegylated alpha interferon and ribavirin. This treatment typically lasts for 48 weeks. Use of interferon involves frequent side effects, however, including bone marrow suppression, fatigue, flu-like symptoms, as well as neurological diseases and mental disorders. In general, only between 40 and 50% of patients with (genotype 1) hepatitis C virus infection achieve a sustained virological response indicating that the treatment is effective. Those who are not cured, and who develop liver failure or liver cancer, will often need a liver transplant. The large number of patients afflicted with the disease has resulted in the hepatitis C virus infection being one of the most widespread causes of liver transplants.

In the development of new treatment methods, extensive research has related to the hepatitis C virus replication process, which briefly summarised involves the following stages:

a) The hepatitis C virus enters a host cell;
b) the shell of the virus disintegrates and the RNA strand (the genetic material) of the virus is exposed;
c) by using the information from the RNA strand, the host cell produces polymerase (a protein called NS5B), which is used for making new copies of the genetic material of the virus, and other proteins included in, *inter alia*, the virus particle;
d) the polymerase recognises and binds to so-called nucleotides in the host cell, and incorporates the nucleotides into new RNA strands; and
e) the virus builds a shell around the new RNA strand, and thereby makes a new virus particle that can leave the host cell and infect other cells.

Several strategies have been pursued with a view to preventing replication of the hepatitis C virus. The inventions with which the present proceedings are concerned are nucleosides and nucleotides intended to influence what is referred to as stage (d) of the replication process above, and which thereby inhibit replication of the virus.

For a nucleoside/nucleotide compound to prevent replication of the hepatitis C virus, the following conditions must be met:

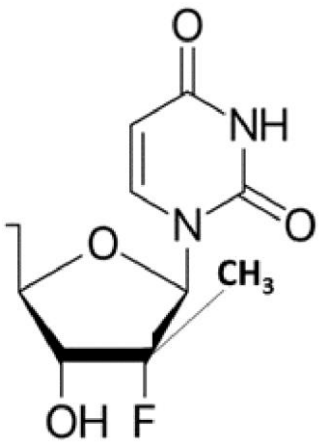
a) The compound must be recognised by the HCV polymerase;
b) it must be incorporated into new RNA strands instead of the naturally occurring nucleotides in the cells; and

c) the compound must have properties that enable it, after being incorporated into new RNA strands, to prevent replication from occurring.

Ribavirin, which until recently formed part of the standard treatment of hepatitis C virus infection, was synthesised – i.e. produced in a laboratory – in 1970. It was first marketed in 1980, and has been used in the treatment of hepatitis C virus infection since 1998. Ribavirin is a nucleoside analogue that influences the replication process as described above. Ribavirin does not work specifically on hepatitis C virus, but is active against a number of DNA and RNA viruses.

Sofosbuvir is an active substance representing a significant development in the treatment of the hepatitis C virus. This active substance is marketed by Gilead under the brand name Sovaldi. Sovaldi was granted a marketing authorisation in the United States in 2013, and in Europe and Norway in 2014. Treatment with Sofosbuvir takes approximately 12 weeks, has few side effects and leaves most patients virus free.

Sofosbuvir is a triphosphate nucleotide analogue. If one only looks at the sugar ring and the base, i.e. the nucleoside, this may be illustrated as follows:



The sugar ring's 2' position has methyl (CH_3)-up and fluorine (F)-down. The base is uracil, which is a pyrimidine base, and one of the natural bases.

Of central importance in this case is the sugar ring's 2' position. As evident below, both Idenix's patent NO 755 and Gilead's patent NO 700 consist of nucleoside analogues with methyl-up og fluoro-down in the 2' position, and with a natural base.

The two patents in suit

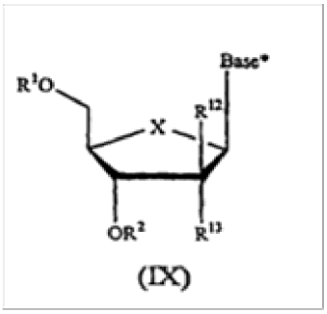
- Idenix's patent NO '755

The patent concerns chemical compounds that have shown to be suitable as pharmaceutical products, especially in the treatment of *Flaviviridae* infections, such as hepatitis C virus infection. In connection with this case, Idenix has limited the patent claims compared with the granted claims. Following this limitation, *cf.* Exhibit 1 a attached to Idenix's closing statement for the District Court, two sets of claims exist, one principal and one alternative set of claims.

The new claims are worded as follows:

1.

Compound, c h a r a c t e r i s e d in having Formula (IX)



(IX)

Or a pharmaceutically acceptable salt thereof, where:

R1 and R2, independently, are H; phosphate; straight-chain, branched, or cyclical $_{C1-10}$ alkyl; CO-aryl; CO-$_{C1-10}$ alkoxy (C_{1-10}) alkyl; CO-aryloxy $_{(C1-10}$alkyl); CO-substituted aryl; sulfonate ester; benzyl, wherein the phenyl group is optionally substituted with one or more substituents chosen from fluorine, chlorine, bromine, iodine, hydroxyl, amino, $_{C1-10}$ alkylamino, arylamino, $_{C1-10}$ alkoxy, aryloxy, nitro, syano, sulfonic acid, sulfate, phosphonic acid, phosphate, or phosphonate; $_{C1-10}$ alkylsulfonyl; arylsulfonyl; $_{(C1-10}$ alkyl) sulfonyl; or an amino acid chosen from α, β, γ or δ glycine, alanine, valine, leucine, isoleucine, methionine, phenylalanine, tryptophan, proline, serine, threonine, cysteine, tyrosine, asparagine, glutamine, aspartate, glutamate, lysine, arginine and histidine in D or L configurations;

X is O;

Base* is a purine or pyrimidine base;

R_{12} is $C(Y^3)_3$:

Y_3 is H; and

R_{13} is fluorine;

wherein aryl in each case means phenyl, biphenyl or naphthyl.

2.

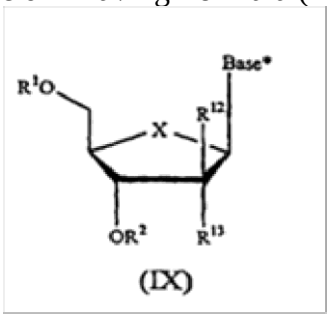
Compound according to claim 1, c h a r a c t e r i s e d in that R^1 and R^2 are H.

…

Alternative patent claims:

1.

Compound, c h a r a c t e r i s e d in having Formula (IX)



(IX)

or a pharmaceutically acceptable salt thereof, where:

R1 and R2, independently, are H; phosphate; straight-chain; branched or cyclical $_{C1-10}$ alkyl; CO-aryl; $_{CO-C1-10}$ alkoxy (C_{1-10})alkyl; CO-aryloxy $_{(C1-10}$ alkyl)$_{;}$ CO-substituted aryl; sulfonate ester; benzyl, wherein the phenyl group is optionally substituted with one or more substituents chosen from fluorine, chlorine, bromine, iodine, hydroxyl, amino, C_{1-10}alkylamino, arylamino, $_{C1-10}$ alkoxy, aryloxy, nitro, syano, sulfonic acid, sulphate, phosphonic acid, phosphate, or phosphonate; $_{C\ 1-10}$ alkylsulfonyl; arylsulfonyl; $_{(C1-10alkyl)}$ sulfonyl; or an amino acid chosen from α, β, γ or δ glycine, alanine, valine, leucine, isoleucine, methionine, phenylalanine, tryptophan, proline, serine, threonine, cysteine, tyrosine, asparagine, glutamine, aspartate, glutamate, lysine, arginine and histidine in D or L configurations;

X is O;

Base* is cytosine, uracil, guanine, adenine or thymine:

R_{12} is $C(Y^3)_3$:

Y_3 is H; and

R_{13} is fluorine;

Wherein aryl in each case means phenyl, biphenyl or naphthyl.

2.

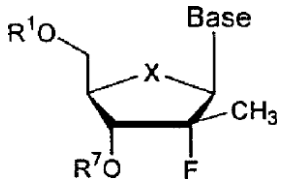
Compound, according to claim 1, characterised in that R^1 and R^2 are H.

Claims 1 and 2 in the principal set of claims correspond to claims 2 and 3 in the granted claims. Claims 1 and 2 in the alternative set of claims contain one additional limitation, in that the bases are limited to natural bases.

- *Gilead's patent NO '700*

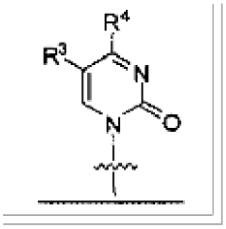
Gilead's patent also concerns certain nucleoside and nucleotide compounds that can be used in the treatment of *Flaviviridae* infections, especially hepatitis C virus infection. According to patent claim 1, the patent pertains to:

1. (2'R)—2'deoxy-2'-fluoro-2'C-methyl nucleoside or its pharmaceutical acceptable salt with the formula.



in which Base is a pyrimidine base represented by the formula:

X is O;
R1 og R7 is independent H, a monophosphate, a diphosphate, or a triphosphate; and



R3 is H; and
R4 is NH2 or OH.

Both Idenix's and Gilead's patents contain a number of dependent claims, i.e. claims relating to embodiments of the invention, *cf.* section 7, third sub-section, second sentence of the Patent Regulations. There is no reason to refer to the dependent claims here.

The parties' submissions

In their appeal regarding Oslo District Court's case no. 12-155575TVI-OTIR/01 (the validity of Idenix's Norwegian patent NO '755), the appellant parties, **Idenix Pharmaceuticals LLC, Centre National de la Recherche Scientifique, Università degli Studi di Cagliari and Université Montpellier II**, have mainly submitted:

The District Court's assessment is incorrect. NO '755 is not invalid.

It is the validity of the patent claims – not the application – that is to be decided. The patent claims are - compared to the application - limited to one principal set of claims and one set of claims in the alternative. The amendments are not unlawful, as nothing has been added that was not disclosed in the application; see section 13 of the Patents Act. The only changes made are that some things have been removed. Through the limited sets of claims, the skilled person is not presented with anything that could not be deduced unambiguously and directly from the application. Claims that following the limitation no longer form part of the patent are not relevant for the assessment of validity.

The invention in NO '755 is sufficiently described; see the Patents Act, section 8. It is not an independent requirement that the invention is identifiable. The patent claims in NO '755 are in any case not uncommonly broad. Special concerns apply with regard to pharmaceutical patents. Within this

segment it is common to have "lead compounds" and "backup compounds", because it is necessary to patent early and broadly. At the patent application filing date it is not possible to know which compounds will make it through to clinical trials.

Furthermore, the description is sufficient for the invention to be carried out by a person skilled in the art without undue burden; see the Patents Act, section 8 second subsection third sentence. The Norwegian Industrial Property Office has accepted the claims and Gilead has the burden of evidence to prove that the skilled person would have been subjected to undue burden. The only step in the process to make the compound that is not described in the patent is the fluorination. There is no requirement that all steps of the process must be described. Steps that in light of the skilled person's common general knowledge are obvious, may be omitted. The fact that the step requires a certain amount of experimentation does not mean that the skilled person is subjected to undue burden.

The skilled person would on 27 June 2003 (the filing date of Idenix's international application PCT ’246) have been able to make - synthesise - the compounds for which protection is claimed. The fact that the synthesis is not fully described in the patent is without significance, as the last step - the fluorination - follows from common general knowledge. The skilled person would be acquainted with appropriate methods for getting fluorine in the 2’ down position. When the description shows a compound with methyl and hydroxyl in the 2' position, this leads the skilled person to fluorination by nucleophilic substitution and the use of DAST/Deoxo-fluor. In chemistry handbooks, DAST was described as the most common fluorination reagent and it was stated to work also on tertiary alcohols, like here. It was further evident from scientific articles that DAST had been tried on similar compounds. The skilled person would quickly find the scientific articles by looking up the compound concerned in Chemical Abstracts.

The skilled person would at the same time be aware of the risk that DAST might lead to an inversion of the stereochemistry - that is, that the fluorine atom might enter the 2' up position instead of the 2' down position - and elimination reactions - that is, that a small molecule is cleaved off. The skilled person would however be aware that the conditions for the reagent would have to be adapted correspondingly, and that the reaction products would have to be analysed and separated. The skilled person would know that one should probably start with methyl-down-hydroxy-up to obtain the right stereochemistry if the reaction takes place with inversion. The skilled person would also be acquainted with the choice of reaction conditions like solvent, temperature etc. The conditions were simple and would require only routine experimentation. Despite the conditions, the handbooks thus showed that DAST was preferable compared to alternative reagents.

As secondary evidence, reference is made to the fact that all those who actually tried to make the compound, tried DAST/Deoxo-fluor. The assertion that Dr. Griffon, who was an employee of Idenix, did not manage to make the compound is of no significance. In any case, subsequent experiments show that Dr. Griffon probably managed to obtain the desired product, but that lacking analysis caused him not to discover it.

By way of summary, the skilled person would have chosen nucleophilic substitution with DAST as one of his first choices as a fluorinating reagent. The skilled person would also have been able to produce the desired compound without anything more than routine experimentation. The legal requirements for the description are thus satisfied.

Furthermore, at the time of filing it was plausible that the invention had a technical effect; see the Patents Act, section 1 first subsection. There is no reason to review the Norwegian Industrial Property Office's assessment on that point. The question of whether the invention is plausible rests on the patent application and the skilled person's common general knowledge. The requirement for plausibility is modest. It is sufficient that the technical effect is "reasonably credible" or is based on "an educated guess". The question of plausibility arises in particular where there is substantial doubt whether the invention has the claimed effect. That is not an issue in the present case.

It is true that the patent does not contain biological test data. That is of no significance, since the skilled person nonetheless - on the basis of common general knowledge - would find it plausible that the compounds concerned would have an effect against HCV. Firstly, Idenix's PCT application substantiates that the claimed 2'-methyl-up-2'-fluoro-down nucleoside analogues are useful as pharmaceuticals against flaviviruses. The mechanism that causes the effect is stated. Additionally, reference is made to the structurally similar compounds in Idenix's earlier patent applications published as WO ‘121 and ‘281. WO ‘121 and ‘281 contain data that show antiviral effect against the flaviviruses BVDV and yellow fever. Reference is also made to conference data and an earlier patent (the Emory patent) with nucleoside analogues with fluorine in the 2’ down position that had an antiviral effect.

In any case, it was part of common general knowledge that structurally similar compounds with 2'-methyl-up-2'-hydroxyl-down displayed antiviral effect against flaviviruses. In 2002-2003, a number of scientific articles were published that announced this. At the same time, it was part of common general knowledge that fluorine would be a good replacement for hydroxyl and that such a compound potentially would display an antiviral effect against flaviviruses. The skilled person would presume that fluorine could replace hydroxyl because of the similarities between them. Such a replacement would in 2003 be considered "conservative". It therefore seemed plausible to the skilled person that the claimed compounds would have an antiviral effect.

The fact that at the filing date it was not possible to foresee an antiviral effect, as submitted by Gilead, cannot carry any weight. It is not possible to have an overview of the compounds' effect and poisonousness (toxicity) before one has been through clinical trials. As a consequence, very little is known about effect/toxicity when the application is filed. What is decisive is whether it is reasonably credible that the compound will have a technical effect. In other words, it is sufficient that "the educated guess" is that the compound may display an effect, not that it will have an effect.

The invention in NO ‘755 fulfils the requirement of inventive step; see the Patents Act, section 2. Effect against flaviviruses was claimed in the application. The compound with 2'-methyl-up-2'-fluoro-down turned

out to have improved activity against HCV compared to the previously known compounds with 2'-methyl-up-2'-hydroxy-down.

Gilead has not invoked any new citations and the Court of Appeal shall thus be cautious as to reviewing the Norwegian Industrial Property Office's assessment of inventive step.

Idenix has best priority, which is derived from the international application PCT '246 filed on 27 June 2003. Gilead cannot claim priority from the US application US '368, which was filed on 30 May 2003. Priority on the basis of US '368 presupposes that the subsequent international application PCT '472 was filed by the same legal entity as the US '368 or its successor in title; see section 6 of the Patents Act, see Article 4 A (1) of the Paris Convention. That requirement is not fulfilled here. The right to the US '368 belonged to Pharmasset Inc. (Georgia) and was not validly transferred to Pharmasset Ltd. (Barbados) prior to the latter filing the PCT application PCT '472 on 21 April 2004.

An assignment of patent rights under federal US law (35 US Code Sec. 261) requires a written agreement that is signed by the assignee. The signature requirement also applies to voluntary transfers by "designation". A draft agreement exists for the assignment of patent rights from Pharmasset Inc. (Georgia) to Pharmasset Ltd. (Barbados), but that agreement - the Research and Development Agreement - was not signed prior to the filing of the PCT '472 application. Even if the agreement was to be signed, the wording of the agreement is in any case not sufficient under US law for it to be considered an immediate assignment of patent rights. Pharmasset Ltd. (Barbados) has therefore at most had "equitable title" to the US '368 application transferred to it. As opposed to "legal title", which is the actual right of ownership, "equitable title" is only a right to have the right of ownership transferred, either by a written statement or by judgment. Pursuant to the Paris Convention's Article 4 A (1), on which section 6 of the Patents Act is based, "equitable title" is not sufficient to be considered a "successor in title", which is a condition for Gilead being able to claim convention priority from US '368.

In their appeal regarding Oslo District Court's case no. 13-170456TVI-OTIR/01 (the validity of Gilead's Norwegian patent NO '700), **Idenix Pharmaceuticals LLC** has mainly submitted:

Since Idenix's patent NO '755 has better priority than Gilead's patent NO '700, Idenix's international application PCT '246, published as WO '999, is prior art for the assessment of whether NO '700 fulfils the requirement of novelty and inventive step.

Gilead's patent lacks novelty. The compound with 2'-methyl-up-fluoro-down in Gilead's patent is directly and unambiguously derivable from Idenix's PCT application. The limitations in Gilead's patent to mono-, di- or triphosphate are also described in Idenix's PCT application and are in any case a natural part of nucleotides. The limitation in Gilead's patent to one or two of the natural

bases are natural first choices to the skilled person and thus also something that can be deduced directly and unambiguously from Idenix's PCT application.

In any case, Gilead's patent lacks inventive step. The compounds in Gilead's patent are evidently obvious to the skilled person. The modifications in Gilead's patent do not differ substantially from prior art; that is, Idenix's PCT application; see the Patents Act, section 2 first subsection.

The claims in Gilead's patent will lack inventive step even if the Court were to conclude that Idenix's patent must be declared invalid due to insufficient disclosure. The District Court was evidently mistaken on this point. Fluorinating hydroxyl at the 2' position with DAST was obvious and evidently lacks inventive step. An unexpected effect cannot justify inventive step when prior art pointed out the technique to the skilled person.

The following prayer for relief has been submitted:

1. Norwegian patent NO 330 755 to be upheld with the claims set out in BF 32 pp. 15074-15077.
2. In the alternative: Norwegian patent NO 330 755 to be upheld with the claims set out in BF 32 pp. 15078-15081.
3. Gilead Sciences Europe, Ltd. and Gilead Pharmasset LLC to be ordered to pay the legal costs of Idenix Pharmaceuticals LLC, Centre National de la Recherce Scientifique, Università Degli Studi Di Cagliari and Université Montpellier II before the District Court and Court of Appeal.

The references to BF in items 1 and 2 of the prayer for relief refer to the Bundle of Facts before the Court of Appeal.

In their appeal regarding Oslo District Court's case no. 12-155575TVI-OTIR/01 (the validity of Idenix's Norwegian patent NO '755), the respondent, **Gilead Sciences Europe Ltd.**, has mainly submitted:

The District Court's judgment is correct. Idenix's patent NO '755 must be declared invalid.

Firstly, the description is not in agreement with the requirements of section 8 of the Patents Act. The description is not sufficiently clear to enable a person skilled in the art to carry out - that is, produce, apply and reproduce - the invention.

In part, the skilled person would on the basis of the basic documents (NO '465, see also PCT '246) not at all be capable of identifying the claimed compounds (2'-methyl-up-fluoro-down) as the solution to the problem (treatment of HCV infections). The description directs the reader's attention towards groups of compounds, especially with 2'-methyl-up-2'-hydroxy-down, that fall outside of the patent claims in NO '755. The "field of invention", as defined in the PCT application, also lies outside the patent claims. The same is true of the production processes that are described. Similarly, the biological data stated concern a compound outside of

the patent claims. Formula IX and the patent claims 9-11, invoked by Idenix, are listed among a large number of seemingly equal-ranking groups of compounds. The reader must without any guidance choose a compound from the list and then choose from one or several lists of substituents. Common general knowledge would not have helped the skilled person to find the solution. The problem is not the number of possible compounds, but the large number combined with the lack of a description of a concrete core that corresponds with the claimed invention in the patent claims.

In any case, the basic documents did not enable the skilled person to make the claimed compounds without undue burden or experimentation. The documents contain no information on the making of fluoro-substituted nucleoside analogues. The applicant may only refrain from describing explicitly circumstances that are so well known that a description is superfluous. That is not the case here. The fluorination step is essential and then a description is required. It was part of common general knowledge at the filing date that the introduction of tertiary fluoro substituents is difficult. Despite this, there is no information on starting materials, fluorination reagents or conditions. Specialist articles do not form part of common general knowledge. In any case, the specialist articles did not provide sufficient information to make the compounds. None of them concerned the 2' position in a sugar ring or nucleoside. Expert advice obtained by Idenix confirmed that the fluorination step is difficult and unpredictable. Idenix's own experiences also confirm that fluorination is difficult.

Idenix submits that DAST/Deoxo-fluor was a natural first choice to the skilled person. The legally relevant question is however whether the fluorination reaction was so inessential that a description was superfluous. In any case, DAST was not a natural first choice. It is also incompatible with Idenix's own experiments. Dr. Griffon had experience with DAST, but chose other fluorination reagents. Nor was DAST/Deoxo-fluor recommended in the expert advice received by Idenix. The argument that DAST was often mentioned and used is of little relevance because this primarily concerns primary/secondary substituents. It has not been proven on a balance of probabilities that Dr. Griffon managed to make the compound. Nor has it been proven on a balance of probabilities that his analysis of the reaction products following the synthesis with Deoxo-fluor as a reagent was lacking. Dr. Griffon was an experienced and well-qualified nucleoside chemist and there is no reason to doubt his competence.

Even if the description were to be sufficient, Idenix's Norwegian patent application was in any case not credible with a view to the claimed solution being susceptible of industrial application. The requirement of technical effect, see section 1 of the Patents Act, is therefore not fulfilled. There must be a rational, scientific basis that substantiates the claimed effect. "An educated guess" is sufficient, but not if the emphasis is placed on guessing. In the absence of indications to the contrary, it is contrary to expectation that a nucleoside would have an effect as a pharmaceutical against viruses. Idenix's application contains no data for antiviral effect, phosphorylation, bioavailability or toxicity for the claimed compounds. None of the compounds within the scope of the patent claims have been produced and tested. One cannot draw a conclusion from a molecule to antiviral effect without

testing. The description's breath and character also contribute to undermining credibility. The limitation of the claims does not increase the credibility of the remaining compounds.

Nor did common general knowledge encompass anything that could justify credibility. Structure-activity relationships (SAR) for nucleosides in 2003 were - and still are - fraught with great uncertainty. In 2003, there was nothing in common general knowledge to suggest that hydroxyl in the 2' down position could be replaced by fluorine. It is correct that hydroxyl and fluorine have certain qualities in common, but that does not mean that biological effects may be predicted with any noteworthy degree of credibility. Especially not with regard to the antiviral effect of nucleosides. An "educated guess" would rather have been that the claimed compounds were not effective, but potentially toxic. Therefore, the skilled person would both intuitively and upon further inquiry have had objections to replacing hydroxyl with fluorine in the 2' down position. It was commonly known that fluorine was often toxic. A reasonable supposition would have been that fluorine in the 2' down position would not have been recognized by the RNA polymerase, but rather by the DNA polymerase, thus being potentially toxic. In any case, it is not credible that a substantial part of the compounds in the limited sets of claims would have an effect - in total, these compounds number several thousand.

The limitation of the patent claims is unlawful. Both the principal and alternative set of claims result from arbitrary selections. Additionally, in the alternative claims set the choice of the natural bases is arbitrary. In the basic documents it is rather modified bases that are emphasized.

Idenix's patent also lacks inventive step; see section 2 of the Patents Act. If the solution only can be based on common general knowledge, there is no technical contribution. Thus, the invention does not differ substantially from what was already known.

Finally, the claimed solution was not novel; see the Patents Act, section 2 first subsection, see also the second subsection second sentence. Gilead's patent has better priority than Idenix's patent. Gilead's patent NO '700 has priority from 30 May 2003, when the US '368 was filed. The rights to US '368 belonged to Pharmasset Inc. (Georgia). The international application PCT '274 - of which the Norwegian application is an extension - was filed by Pharmasset Ltd. (Barbados). The Barbados company had however had the rights to US '368 transferred to it before the PCT '274 was filed. The Barbados company was thus the Georgia company's "successor in title"; see the Patents Act section 6, see also the Paris Convention's Article 4 A (1).

An agreement exists between the Barbados company and the Georgia company that the former was to own all patents (the Research and Development Agreement). The wording of the agreement is under US law sufficiently clear to be considered an immediate transfer of the right of ownership. Under US law, there is no requirement that such an agreement must be signed for it to be valid. In any case, it is to be presumed that the agreement was signed. In any case, the rights to the Georgia company's patents were transferred to

the Barbados company by "designation". Such a transfer is not subject to any requirements of form. Even if the Court where to conclude that the agreement suffers from defects as to form, so that the actual right of ownership - "legal title" - was not transferred prior to the filing of the PCT application, the Barbados company obtained at least "equitable title" to the Georgia company's patents prior to such date. Pursuant to the Paris Convention's Article 4 A (1), and thus also the Patents Act's section 6, "equitable title" is sufficient for being considered a successor in title.

In their appeal regarding Oslo District Court's case no. 13-170456TVI-OTIR/01 (the validity of Gilead's Norwegian patent NO '700), **Gilead Pharmasset LLC** has mainly submitted:

The District Court's judgment is correct. Gilead's patent cannot be declared invalid. Idenix's submissions that Gilead's patent lacks novelty and inventive step presupposes that Gilead cannot invoke priority on the basis of US '368. Even if the Court were to conclude that Idenix's patent has best priority, the requirements of novelty and inventive step are in any case fulfilled.

Firstly, Idenix's international application, published as WO '999, does not anticipate the invention in Gilead's patent NO '700. For an earlier patent application to be anticipatory (novelty-barring), it must describe the invention sufficiently clearly and describe a credible problem. As mentioned earlier, the description in PCT '246/WO '999 does not fulfil the requirements of the Patents Act. There is no highlighting of the structure with fluorine in the 2' down position, nor use of the bases cytosine and uracil, and there is no description of the method of production. Nor is there any information that made it credible to a person skilled in the art that the claimed effect is obtained. Therefore, Gilead's patent NO '700 fulfils the novelty requirement in the Patents Act, section 2 first subsection.

Furthermore, the requirement of inventive step is fulfilled. The invention in NO '700 differs substantially from what could be deduced from WO '999 and other prior art; see the Patents Act section 2 and the European Patent Convention (EPC) Article 56. To a person skilled in the art with knowledge of WO '999, it was not obvious to identify the invention (the solution to the problem), nor was it obvious to produce the invention.

The following prayer for relief has been submitted:

Regarding the claim that patent NO 330 755 must be declared invalid:

1. The appeal to be rejected; however such that the amount mentioned in item 2 of the District Court's conclusion of judgment is to be NOK 11,549,232.30.
2. Idenix Pharmaceuticals LLC, Centre National de la Recherche Scientifique, Università Degli Studi Di Cagliari and L'Université Montpellier II to be ordered to compensate the legal costs of Gilead Sciences Europe Ltd before the Court of Appeal.

Regarding the claim that patent NO 333 700 must be declared invalid:

1. The appeal to be rejected; however such that the amount mentioned in item 2 of the District Court's conclusion of judgment is to be NOK 607,854.70.
2. Idenix Pharmaceuticals LLC to be ordered to compensate Gilead Pharmasset LLC's legal costs before the Court of Appeal.

The Court of Appeal views the case as follows:

Summary of the Court of Appeal's conclusions

The Court of Appeal has arrived at the conclusion that the appeals must be dismissed. The basis is that Idenix's patent NO 755 must be declared invalid because it concerns an invention that is not sufficiently clearly disclosed to enable a person skilled in the art to carry out the invention. Furthermore, Gilead's patent NO '700 is valid, as it - in addition to the other requirements for patentability - fulfils the requirements of novelty and inventive step. Under the assessment of Idenix's patent, the Court of Appeal will in addition also describe some of the other submissions Gilead has presented as grounds for declaring the patent invalid; partly because they are linked to the basis on which the Court of Appeal decides the case, and partly because in any case there are reasons for attaching some remarks to central circumstances even if they have not been decisive for the outcome.

Introductory remarks

Section 52 first subsection of the Patents Act provides that a patent may be declared invalid by judgment if, *inter alia*, it has been granted despite the conditions in sections 1 to 2 are not fulfilled (paragraph no. 1); if it concerns an invention that is not sufficiently clearly disclosed to enable a person skilled in the art to carry out the invention (paragraph no. 2); or if the patent has been amended following a petition for a patent limitation in such a way that the patent's scope of protection has been extended (paragraph no. 5).

Pursuant to the Act, the inventor is entitled to be granted a patent by the Norwegian Industrial Property Office when the requirements for patentability are fulfilled. It is thus an assessment determined by statute, where the courts have full right of review. The decision on the patent application depends, however, on a professional assessment on the part of the Norwegian Industrial Property Office, a fact that suggests that courts should be cautious when performing their judicial review; see [*the Supreme Court judgment reported in*] Rt. 1975 page 603 (Swingball), lastly repeated in Rt. 2008 page 1555 (Biomar) paras 38-40. The Court of Appeal believes that the threshold for setting aside the assessments of the Norwegian Industrial Property Office will be lowered if it subsequently turns out that the Industrial Property Office did not take into consideration all relevant information at the time of the application.

The Court of Appeal also mentions that a case concerning the validity of a patent is not subject to the principle of party disposition in the direction of declaring the patent invalid, but it is subject to the principle of party disposition in the direction of acknowledging the patent as valid; see Skoghøy, *Tvisteløsning* [*Dispute Resolution*], 2nd edition (2014), page 574. Thus, courts will not be bound by the parties' submissions and claims in the direction of declaring a patent invalid, and they will have an independent responsibility for clarifying the facts. These principles do, however, not come into play in the present case.

The provisions of the Patents Act are presumed to be fully in line with the provisions of the European Patent Convention (EPC). Pursuant to Article 3 paragraph 4 of Protocol 28 to the EEA Agreement, Norway has a duty to comply with the substantive provisions of the EPC. In addition, Norway ratified the EPC in 2007. Consequently, the provisions of the Patents Act must be interpreted in the light of the corresponding provisions in the EPC; see [*the Supreme Court judgment reported in*] Rt. 2009 page 1055 (Donepezil) para 26. EPC's provisions are interpreted and applied by the bodies of the European Patent Office (EPO). As a result, decisions by the EPO should be taken into consideration for the purpose of interpreting the EPC, and thus also when interpreting corresponding provisions of the Patents Act. Still, the importance to be attributed to a decision by the EPO must depend on an independent assessment and not least on which body of the EPO it was that issued the decision; see Rt. 2008 (Biomar) para 51. There will be particular reason to attach weight to decisions by the Enlarged Board of Appeal, but also decisions by the ordinary Boards of Appeal will be of significance. Administrative practice by the Examination and Opposition Divisions should be taken into consideration only to a limited extent. Reference is made to Stenvik, *Patenters beskyttelsesbehov* [*The Scope of Patent Protection*] (2001), page 213. The aim of a uniform interpretation within the entire Convention area suggests that one should also consider relevant decisions by national courts of law in other Convention States. Reference is made to Rt. 2007 paras 45-50, which concerns the significance of case law from national courts of law in other jurisdictions concerning the interpretation of the Brussels Convention / Lugano Convention.

Which patent is first in time (priority)?

The way the case is presented, the question of what priority date Gilead may claim is the most natural starting point for the assessment of the validity of both patents. If Gilead's patent NO '700 is first in time, there is agreement that Gilead's patent is valid and that at the same time Idenix's patent NO '755 must be declared invalid for lack of novelty; see section 2 of the Patents Act.

As mentioned by way of introduction, it is the date of application that is decisive for which of the two patents in dispute that is given priority; see by way of inference the Patents Act section 2 second subsection second sentence. At the same time, a Norwegian patent application may on certain conditions be considered to have been filed at an earlier date and thus be granted priority from such earlier date. In our case it is clear that Idenix's priority date is 27 June 2003, which was the date of filing of the international application PCT '246, which was continued in the Norwegian application NO '465. Gilead's PCT application '472 was filed on 21 April 2004, and the international application was continued in the Norwegian application NO '221.

However, Gilead claims that priority may be deduced from the American application US '368, filed on 30 May 2003, pursuant to the provisions on convention priority; see the Patents Act section 6. The said provision, which implements the Paris Convention Article 4 A (1), provides that a Norwegian patent application that concerns the same invention as in an application filed in another Convention State in the course of the last 12 months prior to the filing of the Norwegian application, or - by inference - an international application that has been continued in Norway, shall be considered to have been filed at such earlier date. This presupposes however that the subsequent application is filed by the same legal entity as the one that filed the first application, or its successor in

title; see the Paris Convention Article 4 A (1). Section 6 of the Patents Act must be presumed to express the same, although it is not stated expressly in its wording.

The issue in the case at hand is whether the right to the American application US '368 was transferred from Pharmasset Inc. (Georgia) to Pharmasset Ltd. (Barbados) in such a way that the Barbados company must be considered to be the successor in title to the Georgia company in the sense of the Paris Convention, and whether this happened before the Barbados company filed the international application. It is clear that an agreement was entered into between the two companies to the effect that the Barbados company was to have the right of ownership to the patents of the Georgia company. Idenix has however submitted that the right of ownership to the patents has not been transferred. Several grounds for this have been invoked. Firstly, that the wording of the agreement is not sufficient for an immediate transfer of the right of ownership. Secondly, that it is a requirement that such agreements must be signed by both parties, and that the agreement concerned was never signed. It is common ground that the two issues regarding the significance of the wording of the agreement and regarding whether a requirement of a signature exists, are regulated by US federal law. If the actual right of ownership ("legal title") was not transferred through the agreement, the parties agree that the Barbados company at least had "equitable title" to the patents transferred to it. However, the parties disagree as to whether "equitable title" is sufficient to be considered a successor in title pursuant to the Patents Act section 6, see also the Paris Convention Article 4 A (1). All of these questions regarding Gilead's formal priority have been thoroughly argued and several of them come across as complicated. Since the Court of Appeal in any case has concluded that Idenix's patent is not valid even if having the best priority, the Court has not found reason to decide on the question of whether Gilead may claim priority from US '368.

The validity of Idenix's patent NO '755

The Court of Appeal then goes on to the assessment of the validity of Idenix's patent. As already mentioned, this is presupposing that Idenix's patent has the best priority. Gilead has invoked several grounds why patent NO '755 must be declared invalid: (1) that the patent concerns an invention that is not sufficiently clearly described to enable a person skilled in the art to carry out the invention on the basis of the description, see the Patents Act section 8, see section 52 first subsection (2); (2) that the patent was not plausible with a view to the claimed solution, especially as regards the requirement of a technical effect, see the Patents Act section 1, see section 52 first subsection (1); (3) that the requirements of novelty and inventive step are not fulfilled, see the Patents Act section 2, see section 52 first subsection (1); and (4) that the patent has been amended following a petition for a patent limitation in such a way that the patent's scope of protection has been extended, see the Patents Act section 52 first subsection (5).

The Court of Appeal shall first examine the description. The Patents Act section 8, second subsection, first to third sentences, provides that:

> The application shall contain a description of the invention, including drawings where necessary, and a precise statement of the subject matter for which protection by the patent is sought (patent claims). The fact that the invention relates to a chemical

> compound shall not imply that a specific use must be disclosed in the claim. The description shall be sufficiently clear to enable a person skilled in the art to carry out the invention on the basis thereof.

The provision is an implementation of EPC Article 83, which is of the following tenor:

> The European patent application shall disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

There is a marginal difference between the wordings of the two provisions, as section 8 of the Patents Act does not expressly state that the description must be "complete". However, the requirement of completeness is presumed to follow implicitly from the fact that the description must be sufficiently clear to enable a person skilled in the art to carry out invention - as defined in the patent claims - on the basis of the description; see NU 1963: 6 page 185 first column.

Neither the preparatory works of the Patents Act nor case law provide any further guidance as to the contents of the requirement for the description. It does however follow from EPO case law concerning EPC Article 83 that the fact that it must be possible to carry out the invention, means that it must be possible to produce and use it. The condition for it to be possible to make a product is that the description also contains information that makes it possible to identify the product; see for instance the decision of the EPO Technical Board of Appeal in case T 0412/93:

> Whether this product claim can stand for the purposes of Article 83 depends on whether what is claimed can be identified, and whether a reliable method existed for making it using the teaching of the patent and common general knowledge available at the priority.

It is a person skilled in the art - not the general public - that is to be enabled to carry out invention. In the preparatory works of the Patents Act, the person skilled in the art is defined as follows, see NU 1963: 6 page 127 first column.

> [A]n average skilled man in the sense of a skilled man who is not in possession of particularly inventive skills, but who on the other hand is fully acquainted with the state of the art at the time in question - the application filing date - and has the capacity to exploit all the known material in a good professional way, including also making obvious new constructions.

In our case, which concerns nucleoside analogues for use in pharmaceuticals against HCV, the parties agree that the person skilled in the art may be defined as follows:

> In the case at hand, the "person skilled in the art" will be a team possessing the knowledge and experience of, for instance, a synthetic organic chemist who is acquainted with the synthesis of nucleosides and nucleoside analogues, a medicinal chemist who is acquainted with structure-activity relationships for nucleosides and nucleoside analogues, as well as a virologist who is acquainted with assays for determining antiviral activity, especially with regard to Flaviviridae viruses, in addition to structure-activity relationships. Each member of the team may have

> experience, knowledge and skills that overlap with the knowledge of other members. Each of the members of team will have adequate education and experience, like a PhD degree within a relevant field, as well as at least two years' experience.

Information that belongs to common general knowledge in the field, and which as a consequence is considered to be superfluous or unnecessary, because it appears obvious to the person skilled in the art, may be omitted; see EPO Technical Board of Appeal's decision in case T 721/89:

> Furthermore, there is in the Board's opinion, no requirement in the European patent Convention that where it is not explicitly described how a claimed invention is to be carried out this must be practicable with the aid of only a few additional nondisclosed steps. The only essential requirement that must be fulfilled is rather that everyone of these additional steps must be so apparent to the skilled person that, in the light of his common general knowledge, a detailed description thereof is superfluous.

In other words, insufficiencies in the description of the patent may be bridged if the required information follows from common general knowledge.

It must however be possible to carry out invention - on the basis of the description in the patent and common general knowledge - without undue burden or experimentation, and without inventive effort; see EPO Technical Board of Appeal's decision in case T 629/05. A certain amount of experimentation may be accepted. It will however be unduly burdensome to the person skilled in the art if he or she only through trial and error may clarify whether the choice of parameters leads to a satisfactory result; see the Technical Board of Appeal's decision in case T 32/85.

Information found in handbooks and textbooks forms part of common general knowledge. Information that requires an extensive literature search is not encompassed, as it would entail an undue burden. Exceptionally, also more specialised knowledge taken from scientific articles and patents may be included - especially if the field of research is so new that technical knowledge is not yet available in textbooks. Reference is made to the summary of EPO's case law in the Technical Board of Appeal's decision in case T 890/02. There it is also stated that it is a requirement, whether the information is from textbooks/handbooks or more exceptionally from more specialized sources, that:

> [t]he information found must be unambiguous and usable in a direct and straightforward manner without doubts or further research work.

It is the Court of Appeal's understanding that if the information that is required in order to carry out - including manufacture - the invention, and which is claimed to form part of common general knowledge, cannot be used without uncertainty or without further work that may be described as independent research, it will not be possible to carry out the invention without undue burden.

For the assessment of what information a person skilled in the art would have been able to gather from his or her general common knowledge, the filing date will be decisive. In the present case, it is the filing date for Idenix's international application PCT '246; that is, 27 June 2003.

According to EPO case law, the party claiming that the description is insufficient has the burden of proving this to be the case. However, if it is not possible to deduce directly from the description how the invention is to be carried out - in other words, if carrying out the invention presupposes information from common general knowledge - there is only a weak presumption that the description is sufficient; see the Technical Board of Appeal's decision in case T 63/06.

The Court of Appeal now goes on to the concrete assessment of Idenix's patent NO '755. By way of introduction, the Court of Appeal mentions that it has not been documented that the Norwegian Industrial Property Office expressly has assessed whether the description was so clear that the invention could be carried out within the entire scope of the claims. In any case, the evidentiary situation before the Court of Appeal is completely different from what it was before the Norwegian Industrial Property Office. As a consequence, the opinion in the Swingball judgment of cautiousness when reviewing the professional judgment of the Norwegian Industrial Property Office will thus not be very significant due to the Court of Appeal's assessment of the situation.

The Court of Appeal shall first consider whether the description was so clear that it identifies the invention sufficiently.

As regards the description in Idenix's patent application, the District Court stated the following:

> The description includes numerous detailed embodiments. A number of these include formulas with high chemical variability. Application NO 465 uses the term "Principal Embodiments" to designate the first six groups specified. Sub-embodiments are specified under each of these groups. Some of these are termed "preferred" and some are termed "even more preferred" or "especially preferred". The Court finds the use of these designations to be purely incidental and void of guidance. After the six principal embodiments, [the description] specifies four forms designated as "particular aspects" of the invention. Some additional embodiments are also specified, one of which is termed "another preferred embodiment", cf. application NO 465, page 42.

Next, the District Court presents the formulas I-VII in the patent description. As noted by the District Court, none of these formulas are directly relevant to the amended patent claims, since they either do not contain fluorine in the 2' down position, or if they do have fluorine in the 2'-down position - do not contain natural bases. The District Court then goes on to state:

> **Formulas (VIII), (IX) and (X)** are discussed from page 32 and from page 111 of the patent description. In application NO 465, these formulas were designated as the "fifth principal embodiment".
>
> These formulas include three classes of nucleosides in which the base is designated as Base*. Base* is defined in the patent as "a purine or pyrimidine base as defined herein". It follows from the definition of purine or pyrimidine base on page 128 that the natural

pyrimidine (cytosine, thymine and uracil) and purine (adenine and guanine) bases fall within the scope of the term Base*. However, Base* is not limited to the natural bases. According to the definition, a large number of non-natural bases are also included, thus implying that the total number of available base choices is very large here as well.

The first discussion of Formulas (IX) and (X), cf. page 32 and page 111, mentions fluorine as one out of a very large number of alternatives for the R^{13} substituent (2'-down position). The number of available choices for R^{13} must be characterised as infinite. Fluorine is listed as the last alternative, and the Court is of the view that the skilled person would not perceive fluorine as being highlighted here in any way as a preferred choice. The description also offers up a very large number of available choices with regard to X, R^1, R^2, R^{12}. CH_3 (methyl up) is one of these alternatives, but it is not highlighted.

Following discussion of these three formulas, a "first aspect of the present invention" is mentioned, characterised by Formula (IX). R^{13} is therein limited to fluorine, whilst R^{12} is limited to $C(Y^3)_3$, cf. page 113. Thereafter, "a preferred embodiment" is disclosed, in which X=O and Y^3=H. Furthermore, "a second preferred embodiment" is disclosed, in accordance with the first aspect, in which R^1 and R^2=H. As mentioned, the base is specified as Base*, which also includes natural bases. Consequently, this embodiment encompasses the invention as currently accentuated by the limited patent claims. Reference is made to page 114 of the patent. It is noted that the said presentation of a limited version of Formula (IX) was not included in this part of the Norwegian application as originally worded in NO 465.

Thereafter follows a description of a number of nucleosides with **formulas from (XI) to (XXII).** These formulas are not assumed to be of any relevance to the invention, as now sought protected with the pattern 2'-fluorine-down, 2'-methyl-up and a natural base. The Court therefore does not examine this part of the patent in further detail. However, it is noted that these formulas also allow for a very large number of available choices for the various substituents. An infinite number of chemical compounds fall within the scope of this part of the patent description as well.

After discussion of Formulas (XI) to (XXII), the patent reverts to Formula (IX) on its page 123. In the corresponding part of application NO 465, page 118, the designation "a preferred embodiment" is used. The patent description of NO 755 does not use the said designation. The substituents are described in the same manner as in the preceding discussion of Formula (IX) on pages 111 and 112. In addition, there is a sub-embodiment in which R^1, R^2 and R^3 are specified as H when X is O and Y^3 is H. According to the said description of the formula, the chemical compound will be limited to 2'-fluorine-down, 2'-methyl-up, with only the base being variable. The base shall be a purine or pyrimidine base, but it could be either natural or non-natural.

…

The patent is very broad in scope. The description encompasses billions, or even an infinite number, of chemical compounds. Moreover, the structure of the description is not particularly good or clarifying. A number of the diagrams are featured several times. An example is Formula IX, which the Court considers to be the only formula of direct relevance to the invention. A variant of this formula is repeated after the other formulas have been discussed, without any explanation being provided in relation thereto. Application NO 465

> includes principal embodiments and sub-embodiments, preferred and especially preferred embodiments, etc. However, this terminology does not appear to have been consistently applied, and in many cases it would seem that the terms have been used almost randomly. Indeed, this [terminology] is abandoned in NO 755.
>
> The compounds in respect of which protection is now claimed, and which constitute the "invention" under the limited patent claims, is a compound featuring methyl up and fluorine down, as well as a natural N-bonded base. This invention is disclosed in a variant of Formula (IX). However, the said compound is not specifically highlighted, as it is one of an infinite number of compounds described at the same level of detail.

The Court of Appeal largely agrees with the District Court's presentation. The Court of Appeal considers it uncertain whether the number of possible compounds is as high as presumed by the District Court. In any case, the Court of Appeal shares the view of the District Court that what in the limited claim sets appears as the invention - compounds with methyl up and fluoro down at the 2' position with a natural base - is not highlighted in the application, but is a group of very many possible compounds that are described.

As argued by Idenix, special concerns apply with regard to pharmaceutical patents. The process of developing new pharmaceuticals takes a long time and is particularly resource demanding. Consequently, there is a particular need to patent early. At the same time there is need to patent broadly, because at an early phase not much will be known about which compounds will have a clinical effect. The evidence has shown that a completely normal way of doing this is to take as a starting point a core of one or several compounds that is expanded through a number of substituents and variations. One must therefore probably accept that pharmaceutical patents in total may encompass a high number of different chemical compounds. Nonetheless, the Court of Appeal presumes that it must be possible to point out a core of compounds for it to be possible to identify the invention. If there were to be a core in Idenix's patent, it does not appear to be fluorine at the 2' down position; it seems rather to be compounds with hydroxyl at that position. By comparison, Gilead's patent NO '700 presents a clear core, namely nucleosides with 2'-methyl-up-2'-fluoro-down. As the case stands, the Court of Appeal nonetheless does not find it necessary to reach a conclusion as to whether the description makes it possible to identify the invention. The reason for this is that the Court of Appeal finds it clear that the description in Idenix's patent in any case was not sufficient to enable the person skilled in the art to carry out the invention at the filing date.

Idenix's patent NO '755 gives a general description of the synthesis of 2'-branched nucleosides. There seems to be agreement between the parties that all necessary steps of the synthesis of compounds with methyl up and fluorine down at the 2' position, with the exception of fluorination, are expressly described in the patent. Fluorination is to introduce fluorine in a molecule, and in the case at hand it is a matter of replacing hydroxyl with fluorine. By comparison, the entire synthesis - including the fluorination - is explicitly stated in the description in Gilead's patent NO '700. There it is stated that the fluorination reagent DAST is used, and specific conditions for the reaction are given.

Since the fluorination is not described in Idenix's patent, the question is whether this step followed from common general knowledge and that the production as a consequence did not entail an undue burden to the person skilled in the art. As mentioned, for the omission of a necessary step in the production process to be allowable, it is a condition that it is perceived to be superfluous to the person skilled in the art because it followed from common general knowledge at the filing date.

Idenix submits that the person skilled in the art, based on common general knowledge, would have fluorinated by nucleophilic substitution with DAST or the corresponding reagent Deoxo-Fluor, and that he or she would have managed to make the desired compound without undue burden. Idenix has presented several expert witnesses in support of its view. Leiv Sydnes, a professor of chemistry at the University of Bergen, has, among other things, stated the following in his report dated 30 August 2013:

> The reaction [the fluorination] can be carried out in several ways and using several reagents, one being by direct conversion of alcohols, even tertiary alcohols, by means of ... DAST ... or ... [Deoxo-Fluor].
>
> …
>
> The use of fluorination would be apparent and the choice of reagents after careful consultation of the literature would provide several routes that would be routine to a person skilled in the art.

Chris Meier, a professor of chemistry at the University of Hamburg, amongst other things states the following in his second report, dated 30 October 2015:

> Furthermore, the DAST reaction proceeds as a one-pot reaction; thus the alcohol is activated and substituted by the DAST reagent without the need of an intermediate purification/isolation step. The simplicity of DAST and Deoxo-Fluor® fluorination reactions also serves to make them an immediate first choice for the skilled person.
>
> Having selected DAST or Deoxo-Fluor® as the fluorinating reagent, the skilled team would then select the conditions and solvents for the fluorination reaction. The condition for these reactions are contained in the literature above, and the starting points would be readily apparent to members of the skilled team.
>
> The literature suggests very similar solvents and reaction conditions for fluorinating with DAST. ... Accordingly in my opinion, the experimentation needed is quite simple for the skilled team, and certainly not undue experimentation.

On its part, Gilead submits that common general knowledge would not have enabled the person skilled in the art to carry out the fluorination without undue burden. Also Gilead has relied on several expert witnesses. Dr. Victor E. Marquez, who is attached to the National Cancer Institute, Maryland, USA, among other things stated the following in his first report dated 19 June 2013:

> An artisan as of June 27, 2003 would have understood, based on the art, that various fluorinating agents could be difficult to work with and might give products other than those intended. For example, attempted fluorination reaction could result in products with the wrong stereochemistry, products resulting from undesired rearrangements or products on which no fluorination occurred. ... Thus, considering the '999 publication in light of the art, an artisan as of June 27, 2003 could not have expected that any particular fluorination reaction would work to make a compound of the Idenix Claims. Rather, an artisan would have had to engage in a trial-and-error process of experimentation to try to determine appropriate starting materials, reagents and chemical transformations to use to make a 2'-fluor-2'C(Y^3)$_3$ nucleoside.

From the evidence submitted, it must be assumed that it was part of common general knowledge in the field at the relevant point in time that DAST and Deoxo-Fluor were two well-known reagents that could be used to replace hydroxyl with fluorine. These reagents have been described in several handbooks on organic chemistry: *Methods of Organic Chemistry* (Houben-Weyl), 4th ed., Stuttgart (2000), Larock, *Comprehensive Organic Transformations*, 2nd ed., New York (1999), and Smith/March (eds.), *March's Advanced Organic Chemistry*, 5th ed. (New York, 2001) (hereinafter referred to as March). From these handbooks, it appears that DAST could be used with primary, secondary and tertiary alcohols. Among other things, it is stated on page 519 of March that:

> Hydrogen fluoride does not generally convert alcohols to alkyl fluorides.[1156] The most important reagent for this purpose is the commercially available diethylaminosulfur trifluoride (Et2NSF3) (DAST),[1157] which converts primary, secondary, tertiary, allylic, and benzylic alcohols to fluorides in high yields under mild conditions.[1158]

March (p. 433) states, however, that nucleophile substitution in general – that is also, but not only, fluorination with DAST – on tertiary alcohols was difficult:

> To sum up, primary and secondary substrates generally react by the S_N2 mechanism and tertiary by the S_N1 mechanism. However, tertiary substrates seldom undergo nucleophilic substitution at all. Elimination is always a possible side reaction of nucleophilic substitutions (wherever a R hydrogen is present), and with tertiary substrates it usually predominates. With a few exceptions, nucleophilic substitutions at a tertiary carbon have little or no preparative value.

In the opinion of the Court of Appeal, the statement that DAST works on tertiary alcohols must be read in light of this general statement.

Inverted stereochemistry (inversion) means that the fluorine atom would appear in the 2'-up position instead of the 2'-down position. As mentioned above, Gilead's expert witness Dr Marquez also pointed to the possibility of such inverted stereochemistry in his testimony. During his witness testimony, Dr Marquez emphasised in particular elimination reactions, as is also mentioned in March in the aforementioned quote on page 433, that a small molecule is detached. All of these reactions would thus lead to a situation where the desired compound with 2'-methyl-up-2'-fluor-down would not be produced.

Idenix has – with the support of its expert witnesses – submitted, however, that a person skilled in the art would be aware of the risk that DAST may produce these undesirable results, and would at the same time be aware that the conditions for the reagent would have to be adapted, and that the reaction products would therefore have to be analysed and separated. In order to avoid inverted stereochemistry, the person skilled in the art would understand that one should probably start fluorination with methyl-down and hydroxyl-up.

In the opinion of the Court of Appeal, Idenix has not substantiated, however, that the specific conditions for using DAST in fluorination of a tertiary alcohol in the 2'-down position would be evident from handbooks or textbooks. As mentioned earlier, it follows from EPO practice as summarised in the Technical Board of Appeal's decision in case T 890/02 that information must be able to be used in a "direct and straightforward manner without doubts or further research work". Since it is stated in the handbooks that there is a great risk that use of DAST as a fluorination reagent with a tertiary alcohol will lead to undesirable results, and at the same time no information is provided about which conditions are required in order to avoid this, we cannot speak of information that can be used by a skilled person without doubts and additional work of the nature of independent research, and without a considerable degree of trial and error.

Idenix has referred, however, to several scientific articles regarding use of DAST in similar compounds, where the necessary conditions have been mentioned. Wachtmeister et al, "Synthesis of 4-substituted carbocyclic 2,3-dideoxy-3-C-hydroxymethyl nucleoside analogues as potential anti-viral agents", *Tetrahedron*, 55, 10761-10770 (1999) has been highlighted in particular. This article, which deals, among other things, with use of DAST and Deoxo-Fluor as reagents in the fluorination of tertiary alcohols in nucleoside analogues, is probably the publication best suited to assist the person skilled in the art. Gilead for its part has submitted that specialised articles – including the Wachtmeister article – cannot be considered to form part of the common general knowledge in the art. The Court of Appeal finds no reason to take a final stand on this point. Even though the articles may be considered to form part of the common general knowledge in the art, it is the Court of Appeal's opinion that this still does not constitute information that the person skilled in the art would use without having doubts and requiring further examination, and without a considerable degree of trial and error. Among other things, the Court of Appeal refers to the fact that the Wachtmeister article relates to the 4' position, and general conclusions cannot be drawn as regards the 2' position. Reference is made to the quote from March (p. 433) which states that nucleophile substitution on tertiary alcohols was difficult

In the opinion of the Court of Appeal, the person skilled in the art would therefore – based on the description and the common general knowledge in the art – not be able to produce the invention without undue burden.

In the view of the Court of Appeal, this conclusion is supported by evidence concerning Idenix's own efforts to produce the compound with 2'-methyl-up-2'-fluoro-down. A considerable amount of evidence has been presented by both sides concerning Idenix's work. On this basis, it is

clear that Idenix during the period 2002–2005 attempted to produce the relevant compound. This work was led by Dr Jean-François Griffon, a nucleoside chemist at Idenix's laboratory in Montpellier. Among other things, the parties disagree as to whether Dr Griffon managed to produce the compound – without being aware of this himself – during an experiment with Deoxo-Fluor in February 2003. Regardless of whether Dr Griffon's attempt was successful or not, it is clear that Dr Griffon had been working to produce the compound since the summer of 2002, and that he had tried five other methods before using Deoxo-Fluor as a reagent.

Further, it is evident that Idenix sought advice from external expertise in order to achieve fluorination. In December 2002, Griffon and several others met with professor George Fleet from the University of Oxford. During this meeting, the 2'-methyl-up-2'-fluoro-down compound was discussed. It also appears from the meeting report that professor Fleet proposed electrophile substitution rather than nucleophile substitution. Professor Fleet, a leading expert in carbohydrate chemistry, did not propose using DAST with tertiary alcohol.

In a letter dated 6 February 2003 from Dr Richard Storer, then Senior Vice President of Chemistry at Idenix, to Dr Paul Coe, a leading expert on fluorination, the following is stated:

> We are OK with the nucleoside chemistry, it's the fluorine chemistry we are struggling with and where your help will be valuable.

In his letter, Dr Storer mentions several nucleosides that he would like assistance with from Dr Coe, including 2'-methyl-up-2'-fluoro-down. Dr Storer received a reply from Dr Coe on 9 April 2003. In his reply, Dr Coe proposed four methods in order to achieve synthesis. None of them included DAST/Deoxo-Fluor. On the contrary, Dr Coe warned against the use of DAST to achieve fluorination:

> [I]n our experience and indeed in that of manner other particularly the de Clerc group the most viable routes to fluoro nucleosides are by sugar/base condensation methods the anomer problem notwithstanding, for the very reasons you have discovered, in that the leaving groups generated in situ e.g. in DAST reactions are readily attacked by the pyrimidine ring nucleophiles or elimination and/or participation of blocking groups. Further migrations of groups can readily occur ...

In the opinion of the Court of Appeal, Idenix's own problems in producing the compound, and the advice given by external expertise, lends support to the conclusion that fluorination was not something that could be carried out without unreasonable burden for the person skilled in the art.

Against this background, the Court of Appeal concludes – like the District Court – that the description in the patent is not sufficiently clear to enable a person skilled in the art to carry out the invention on the basis thereof at the time the patent application was filed, *cf.* section 8, second subsection, third sentence of the Patents Act. Idenix's patent NO '755 must therefore be rendered invalid, *cf.* section 52, first subsection no. 2.

Since invalidity also affects the limited sets of claims, it is not necessary for the Court of Appeal to take a stand on the validity of the limitation.

Even though it is not necessary for the final outcome, the Court of Appeal finds reason to make a few remarks about the issue of credibility or plausibility as regards technical effect.

The requirement of technical effect – in other words, that the invention must work – may be derived from the requirement that it must be able to be "exploited commercially", *cf.* section 1 first sub-section of the Patents Act, see Stenvik, *Patentrett*, (Patent Law), 2nd edition, Oslo (2013) p. 123. The requirement of technical effect entails that a patent application must describe a relevant application, and support the fact that the effect can actually be achieved. In NU 1963: 6 p. 110 second column states as regards section 1 and particularly in relation to chemical compounds for use in, *inter alia*, drugs:

> A new substance can...not in itself be considered to be a patentable invention, since, as stated earlier, it is a requirement that the substance must be able to be used for material production. For this reason, an invention first exists when the substance's application within a technical area has been demonstrated or even substantiated.

From EPO's practice, one could mention the Technical Board of Appeal's decision in case T 1329/04 paragraph 12:

> The definition of an invention as being a contribution to the art, i.e. as solving a technical problem and not merely putting forward one, requires that it is at least made plausible by the disclosure in the application that its teaching solves indeed the problem it purports to solve.

The invention's technical effect must be plausible already at the date of filing. As regards the opportunity to provide supplementary documentation after the application date, NU 1963: 6 p. 199 second column states:

> Further information may be required to strengthen the invention's technical effect. The technical effect must, however, already at the time the application was filed have been sufficiently strong that it must from the basic actions appear that the invention was carried out at the date the application was filed.

In other words, subsequent documentation may not in itself form the basis for plausibility. A corresponding requirement follows from EPO practice, see again the Technical Board of Appeal's decision in case T 1329/04 paragraph 12.

The question then is which documentation of technical effect is required. In the preparatory works to the Patents Act, it is stated that "[i]t is hardly possible, as also pointed out by the committees, to provide a general rule. In the case of pharmaceuticals, the applicant's own information about the therapeutic effect should thus often be accepted as sufficient", see Ot.prp.nr. [Proposition to the "Odelstinget"] 36 (1965–66) pp. 19–20.

That the threshold for meeting this requirement is relatively low also follows from EPO practice. It is sufficient if an "educated guess" indicates that the effect can be achieved, or that the effect is "reasonably credible", see the Technical Board of Appeal's decision in case T 0898/05. It is therefore not necessary that the application contains experimental data, unless doubts may be raised about the invention's technical effect (see T 578/06). In pharmaceutical cases, experimental data will typically be biological effect and toxicity. In the same way as with the requirement of disclosure, however, the application may be supplemented by common general knowledge in the art at the time the application was filed (see, e.g., aforementioned T 0898/05).

There is agreement between the parties that Idenix's patent application does not include experimental data that may support the claim that the compound with 2'-methyl-up-2'-fluoro-down would have a biological effect in relation to the hepatitis C virus. Idenix have submitted that the antiviral effect was nevertheless plausible, partly based on the fact that reference is made in the application to earlier patent applications containing data showing antiviral effect in relation to the flaviviruses BVDV and yellow fever, and partly due to the fact that it followed from common general knowledge in the art that structurally similar compounds with 2'-methyl-up-2'-hydroxyl-down exhibited an antiviral effect against flavivirus, and that fluorine would be a good replacement for hydroxyl.

In the opinion of the Court of Appeal, Idenix cannot succeed with this argument. Admittedly, it must probably be assumed that at the time the application was filed it was part of common general knowledge in the art that nucleoside analogues could demonstrate an antiviral effect, and that compounds with 2'-methyl-up-2' hydroxyl-down could show an effect against flavivirus. Reference here can be made to the other expert statement dated 30 October 2015 from Idenix's expert witness Dr Raffaele di Francesco, Instituto di Genetica Molecolare, Milan. However, the fact that one compound has an effect against one flavivirus does not mean that the same compound will have an effect against other flavivirus. Reference is made to the written statement, dated 1 July 2013, produced by two of Gilead's expert witnesses, Jo Klaveness, professor of pharmaceutical chemistry, and Kjetil Taskén, professor of medicine, both at the University of Oslo.

Even though it was credible that compounds with 2'-methyl-up-2'-hydroxyl-down could demonstrate an effect in relation to the hepatitis C virus, it was – in the opinion of the Court of Appeal – in the absence of test data nevertheless not credible at the time of filing the application that compounds with 2'-methyl-up-2'-fluoro-down would demonstrate antiviral effect in respect of the hepatitis C virus. Firstly, small modifications in a nucleoside can generally lead to a considerable change in biological effect and toxicity. Once again, reference is made to the expert statement made by Klaveness and Taskén, and to the witness testimony given by Dr Marquez. Secondly – and more importantly – by replacing hydroxyl with fluorine in the 2' position one could risk that the compound would be toxic. Admittedly, hydroxyl and fluorine are isosters; that means that the substances have many similar properties. Fluorine is also an isoster with hydrogen, however. Use of fluorine in the 2'-down position can therefore lead the cell's DNA polymerase to believe that it is hydrogen that is in this position. In that case, the nucleoside analogue would not make changes to the RNA thread in the cell; rather it would do so in the DNA thread, and thereby be

toxic to humans. Occasionally, such a modification may be desirable, as is the case with nucleoside analogues with fluorine used as chemotherapy in the treatment of cancer, but there are also examples where the use of fluorine in drugs has had fatal consequences. Reference is made in particular to the testimony given by Dr Marquez.

In the opinion of the Court of Appeal, "the educated guess" at the time of the filing of the application was therefore that there were considerable doubts concerning the biological effect and toxicity of compounds with 2'-methyl-up-2'-fluoro-down. In the absence of experimental data showing the opposite, the technical effect of the invention was thus not credible.

The validity of Gilead's patent NO '700
The Court of Appeal will now consider the validity of Gilead's patent NO '700.

Idenix has submitted that Gilead's patent lacks novelty and inventive step over Idenix's patent application, and must therefore be declared invalid, *cf.* section 52 first sub-section no. 1 of the Patents Act. This submission presupposes, however, that Idenix's patent NO '755 has better priority. In assessing the validity of Idenix's patent, the Court of Appeal has omitted to take a stand on whether Gilead has best priority; in other words, whether Gilead can claim priority from the US application US '368, filed on 30 May 2003, or whether priority may only be claimed from the international application PCT '472, filed in 21 April 2004. Since the Court of Appeal has concluded that the requirement of novelty and inventive step for Gilead's patent has been satisfied even though Idenix has best priority, there is no reason either to take a stand on the issue of priority.

The requirement of novelty and inventive step follow from section 2 first and second sub-section, which stipulates:

> Patents shall be granted only for inventions which are new in relation to what was known before the filing date of the patent application, and which also differ essentially therefrom.
>
> Everything made available to the public, either in writing, in lectures, by exploitation or otherwise, shall be considered as known. The contents of a patent application filed in this country before the said date shall also be considered as known if the application is made available to the public in accordance with the provisions of section 22. The requirement in the first paragraph that the invention shall differ essentially from what was known shall not apply in relation to the contents of such an application.

With the exception of situations mentioned in section 2 second sub-section third sentence, which are not relevant in our case, the novelty requirement does not have any independent significance. Anything that differs considerably from prior art must necessarily be novel. Nevertheless, it is common practice to discuss the requirement of novelty even in cases where it has no independent significance (see Stenvik, *op. cit.*, p. 172).

As evident from the wording, both novelty and inventive step shall be assessed on the basis of what was known at the time the application was filed. This is called prior art. As stated above, the Court of Appeal presupposes that the filing date of Gilead's patent was the time the PCT application was filed, that is 21 April 2004. Prior knowledge, against which the invention in the patent is considered, is called citations Reference is made to [*the Supreme Court judgment reported in*] Rt. 2008 p. 1555 (Biomar) paragraph 30–31.

If a technical solution is to be considered to be part of prior art, and thus be used as a novelty-destroying citation, it is a requirement that the solution has been disclosed in such a way that the skilled person would be able to carry it out. Unlike the earlier Patents Act of 1885 and 1910, this requirement no longer follows directly from the Act. It is clear, however, that the requirement – which in English is called "enabling disclosure" – is still applicable (see NOU 1963: 6 p. 120 second column and p. 123 second column). Pursuant to EPO practice, the requirement of enabling disclosure means that the invention may be clearly and unequivocally derivable from the citation (see, e.g., Technical Board of Appeal's decision in case T 0870/06:

> According to EPO practice, the claimed subject-matter would lack novelty only if it were derivable as a whole directly and unambiguously from a prior art disclosure and if a "clear and unmistakable teaching" of the combination of all claimed features could be found in said disclosure.

For an earlier patent application to constitute a novelty-destroying citation, it would be necessary, in other words, that a person skilled in the art on the date on which a patent application was filed could directly and unambiguously derive the invention from the earlier application.

Idenix's international patent application PCT '246 was published on 8 January 2004 as WO '999, and was therefore in the public domain when Gilead's PCT application was filed. However, since the Court of Appeal has found that the invention in Idenix patent NO '755 has not been sufficiently disclosed, it is still clear that the alleged invention cannot be derived directly and unambiguously from Idenix's patent application. Idenix's international patent application, published as WO '999, cannot therefore represent a novelty-destroying citation in respect of Gilead's patent. Since it has been stated there are no other citations, the requirement of novelty has consequently been satisfied.

Finally, the Court of Appeal will look at the requirement of inventive step, in other words whether the invention in Gilead's patent differs significantly from prior art. This requirement entails that the invention must represent such a technological development that it cannot be considered obvious in relation to prior art (see NOU 1976: 49 p. 102). In EPC, the requirement of inventive step follows from article 56 first sentence, which states:

> An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art.

[Norwegian translation of EPC Article 56 first sentence included.]

The Court of Appeal finds it evident that the invention in Gilead's patent was not obvious seen in the light of Idenix's international patent application, published as WO '999 on 8 January 2004. As the Court of Appeal has discussed above, the description given in Idenix's patent – and its patent applications – is insufficient, since it would not enable the person skilled in the art to carry out the invention. The process of manufacturing the compounds with 2'-methyl-up-2'-fluoro-down is not sufficiently disclosed, and it was not evident either from common general knowledge in the art at the time at which Idenix's PCT application was filed. The invention would not therefore be able to be manufactured without unreasonable burden for the person skilled in the art. In Gilead's patent application, however, the entire synthesis – including fluorination – is explicitly disclosed in the description. It is evident that DAST is used, and specific conditions for the reaction are given. Gilead's patent application also includes test data showing biological effect and toxicity, in support of the claim of antiviral effect.

In the opinion of the Court of Appeal, it cannot be such that a step in the manufacturing process that must be included in the description in order to satisfy the requirement set forth in section 8 of the Patents Act must at the same time be considered to be too obvious for the person skilled in the art pursuant to section 2. This is because the reason why that step must be included in the description is that it would not otherwise occur without unreasonable burden or experimentation and without inventive action on the part of the person skilled in the art. In such a situation, the same step cannot – neither linguistically nor logically – be considered to be obvious to that same skilled person.

From what has been presented, there are no other citations, and Gilead's patent NO '700 therefore meets the requirements set forth in section 2 of the Patents Act.

The appeal in both appellate cases is therefore rejected.

Legal costs

Gilead has won outright in both appeals cases. Pursuant to the main rule in section 20-2 first and second sub-section of the Civil Procedure Act, Gilead is then entitled to be award legal costs for the Court of Appeal. In the opinion of the Court of Appeal, there is no reason to make any exception to the main rule laid down in section 20-2, third sub-section of the Civil Procedure Act.

Advocate Stenvik has presented a statement of costs in which his party has claimed NOK 15,889,094.48 in total costs for both cases. These costs consist of NOK 10,530,012 in legal fees, NOK 4,491,985.16 in expenses and payments to expert witnesses, and NOK 867,097.32 in other expenses. Advocate Stenvik has attributed 95% of the total costs in the appeals case to the validity of Idenix's patent, while the remaining 5% is attributed to the validity of Gilead's patent.

No value added tax has been claimed on the legal costs, since it has been stated that these do not represent a *de facto* cost for the Gilead companies, who are entitled to reimbursement of value added tax payments.

In isolation, the claim is very high. However, this case is an extraordinarily wide-ranging and complex case involving extremely large financial values, and has necessitated particularly extensive preparation. The case has also been presented and elucidated exceptionally well and thoroughly by legal counsel from both sides. It should also be mentioned that the other party's claim amounted to just over NOK 23 million, and that there were no objections to Gilead's claim. The Court of Appeal therefore finds that the costs are reasonable and necessary, and it therefore accepts the claim for legal costs, *cf.* section 20-5 of the Civil Procedure Act.

As regards legal costs relating to the District Court case, the Court of Appeal will use as its basis the result from this body, *cf.* section 20-9 second sub-section of the Civil Procedure Act. In the District Court, however, the award of legal costs was made with the addition of value added tax. Since the Gilead companies are entitled to reimbursement of value added tax, the amount awarded must be adjusted, as stated in the prayer of relief.

The judgment is unanimous.

Owing to the scope and complexity of this case, judgment has not been delivered within the statutory time limit.

C O N C L U S I O N O F J U D G M E N T:

In the appeal of Oslo District Court case no. 12-155575TVI-OTIR/01:

1. The appeal is rejected, but the amount mentioned in the item 2 of the District Court's conclusion of judgment shall be NOK 11,549,232.30 – eleven million five hundred and forty-nine thousand two hundred and thirty-two Norwegian kroner and thirty øre.
2. In legal costs relating to the Court of Appeal case, Idenix Pharmaceuticals LLC, Centre National de la Recherche Scientifique, Università degli Studi di Cagliari and Université Montpellier II are ordered to pay – jointly and severally – to Gilead Sciences Europe Ltd. in the amount of NOK 15,094,639.76 – fifteen million ninety-four thousand six hundred and thirty-nine Norwegian kroner and seventy-six øre – within two – 2 – weeks of service of the present judgment.
3. Idenix Pharmaceuticals LLC, Centre National de la Recherche Scientifique, Università degli Studi di Cagliari og Université Montpellier II shall in addition pay – jointly and severally – the costs apportioned to Gilead Sciences Europe Ltd to the Court and the expert lay judges. The amount of these costs is to be specified in a separate ruling.

In the appeal concerning Oslo District Court case no. 13-170456TVI-OTIR/01:

1. The appeal is rejected, but the amount mentioned in the item 2 of the District Court's conclusion of judgment shall be NOK 607,854.70 – six hundred and seven thousand eight hundred and fifty-four Norwegian kroner and seventy øre.
2. In legal costs relating to the Court of Appeal case, Idenix Pharmaceuticals LLC is ordered to pay to Gilead Pharmasset LLC in the amount of NOK 794,454.72 – seven hundred and ninety-four thousand four hundred and fifty-four Norwegian kroner and seventy-two øre – within two – 2 – weeks from service of the present judgment.
3. Idenix Pharmaceuticals LLC shall in addition pay the costs apportioned to Gilead Pharmasset LLC in relation to the Court and the expert lay judges. The amount of these costs is to be specified in a separate ruling.

Halvard Leirvik Thomas Christian Poulsen Rakel Surlien

Tomas Bergström Jan-Erling Bäckvall

This document is identical to the signed original.
Anne Harriet Seim Andreassen (electronically signed).