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Datasheet for the decision of 2 July 2024

Case Number: T 0903/22 - 3.3.04

Application Number: 15195398.1

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Language of the proceedings: EN

Title of invention:
Pneumococcal polysaccharide conjugate vaccine

Patent Proprietor:
GlaxoSmithKline Biologicals s.a.

Opponents:
Sanofi Pasteur Inc./Sanofi-Aventis Deutschland GmbH/Sanofi Winthrop Industries S.A.
SK Bioscience Co., Ltd.
Pfizer Inc.

Headword:
Conjugate vaccine/GLAXO

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no)

Decisions cited:
G 0001/03, G 0002/10, G 0001/16, T 0197/86, T 0939/92

Catchword:

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Case Number: T 0903/22 - 3.3.04

D E C I S I O N
of Technical Board of Appeal 3.3.04
of 2 July 2024

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 7 February 2022 revoking European patent No. 3017827 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairwoman M. Pregetter
Members: D. Luis Alves
L. Bühler

Summary of Facts and Submissions

I. The appeal by the patent proprietor (appellant) concerns the decision of the opposition division to revoke European patent No. 3 017 827, entitled "*Pneumococcal polysaccharide conjugate vaccine*". The patent in suit was granted on European patent application No. 15 195 398.1, a divisional application of European patent application No. 06 830 744.6. The latter had been filed as an international application published as WO 2007/071710.

II. Three oppositions had been filed. The patent had been opposed as a whole invoking the grounds of lack of novelty (Article 54 EPC) and lack of inventive step (Article 56 EPC), under Article 100(a) EPC, as well as the grounds under Article 100(b) and (c) EPC.

III. The decision under appeal dealt with a main claim request (patent as granted) and 12 auxiliary claim requests. The opposition division held, *inter alia*, that the main request and auxiliary requests 1 to 3, 5 and 10 did not comply with the requirements of Article 54 EPC and that all other claim requests did not comply with the requirements of Article 56 EPC.

IV. Joint-opponents 1 (respondent I), opponent 2 (respondent II), and opponent 3 (respondent III) filed replies to the statement of grounds of appeal. Respondents I and II filed document D34.

V. By letter dated 9 March 2023, the appellant made further submissions.

VI. With the letter dated 17 May 2024, the appellant submitted auxiliary request 3a and further arguments.

VII. The board sent a summons to oral proceedings and a communication pursuant to Article 15(1) RPBA in which the board set out its preliminary view on the appeal.

VIII. Oral proceedings were held as scheduled. Respondents I and II did not attend, as announced by letters dated 6 June 2024.

At the oral proceedings, the appellant withdrew all auxiliary requests on file and maintained its main request only. The appellant also withdrew its request for remittal of the case to the opposition division.

At the end of the oral proceedings, the chair announced the board's decision.

IX. Claim 1 of the main request (patent as granted) reads:

"1. An immunogenic composition comprising *S. pneumoniae* capsular saccharide conjugates from serotypes 19A and 19F wherein 19A is conjugated to a first bacterial toxoid which is pneumolysin, diphtheria toxoid or CRM197 and 19F is conjugated to a second bacterial toxoid which is diphtheria toxoid or CRM197 and further comprising conjugates of *S. pneumoniae* capsular saccharides 4, 6B, 9V, 14, 18C, 23F, 1, 5 and 7F, wherein the average size of the 19A saccharide is between 110 and 700 kDa."

X. The following documents are referred to in this decision:

D1: WO 03/051392

D3: Obaro, S.K. *et al.*, Pediatr Infect Dis J 19(5), 2000, pages 463-9.

XI. The appellant's arguments relevant to this decision may be summarised as follows.

Main request
Novelty (Articles 100(a) and 54 EPC) - Claim 1

Compositions where the saccharides of serotypes 19A and 19F were both conjugated to CRM197 or diphtheria toxoid (DT) were not directly and unambiguously derivable from document D1. It was necessary to combine several selections from the disclosure in this document to arrive at such a composition. The first was selecting the 13-valent paediatric vaccine from the vaccine compositions disclosed on page 5. The second was selecting which of the three alternatives on page 4, fifth paragraph, applied to the 13-valent paediatric vaccine. The third selection was to provide the serotype 19A saccharide in conjugate form. Indeed the passage disclosing the 13-valent paediatric vaccine did not mention whether all saccharides were conjugated. Nor could this information be taken from page 1 of the document, which concerned background information only. Finally, it was necessary to select the carrier for each of saccharides 19A and 19F. The preferred second carrier was protein D, which was not one of the carriers listed in claim 1 under consideration.

Inventive step (Articles 100(a) and 56 EPC) - Claim 1

The closest embodiment in document D1 to the claimed composition was the 13-valent paediatric vaccine (see page 5). There was, however, no example or indication on how to achieve this paediatric vaccine as the

carrier proteins and the size of the serotype 19A saccharide were not disclosed. Moreover, it was not disclosed whether for the 13-valent vaccine the serotype 19A saccharide was in conjugate form. There was also no link between serotype 19A and any saccharide size. The sizes were, however, specific for each saccharide (see document D3, page 465).

The state of the art included a 23-valent unconjugated vaccine, thus for which the issue of immune interference due to the carrier did not arise, and a 7-valent conjugated vaccine "Prevnar". It was, however, unprecedented to provide a vaccine with so many conjugated saccharides as claimed. The patent showed a significant immune response to the vaccine. The examples showed vaccines with a serotype 19A saccharide size 151 kDa and with different carriers. The provision of an effective vaccine was an improvement over the prior art. In fact, document D1 merely provided the skilled person with a puzzle. It presented three alternatives for the serotypes to be conjugated to the first and second carriers without disclosing whether 19F was a difficult serotype. Page 2, example 7 and claims 1 to 3 left undecided whether serotype 19F saccharide should be conjugated to the first or the second carrier. This question was only solved in example 4 of the patent, which showed carriers suitable for this saccharide.

The patent contained three sets of experimental results with a 13-valent vaccine, showing immunogenicity of the compositions even for serotype 6B (see tables 15 to 17). It showed different conjugates of serotype 19A which were effective in a mouse model (see example 9 and table 16). Even for the most unfavourable group, that of senescent mice, three of the tested

compositions achieved good immune responses, both with serotype 19A conjugated to pneumolysin as well as to DT (see table 15, groups 3, 5 and 6).

Conjugates of saccharides 19A and 22F were not well known, even if some prior-art vaccines showed good immunogenicity, such as an 11-valent PD-saccharide conjugate vaccine (see document D19), a DT- and TT-conjugate vaccine (see document D17), and a 9-valent CRM197-saccharide conjugate vaccine (see document D3).

It was not possible to provide a comparison with the 13-valent vaccine disclosed in document D1 since this document did not disclose the carriers for each saccharide. Further, in view of regulatory requirements for paediatric studies, there were limits to the experimental results that could be produced.

Moreover, the patent showed increased immunogenicity for serotype 19F saccharide conjugated to DT when compared to protein D (see example 4). The most relevant results were the OPA titres, which provided a measure of functional activity (see tables 9 and 11). The difference in the amount of adjuvant in the DT compositions compared to the protein D compositions did not preclude a comparison of the respective immune responses because that amount was higher for the composition with protein D.

The results obtained with DT as the carrier could be extrapolated to CRM197. Indeed, these two proteins differed merely in one amino acid and represented different forms of detoxified diphtheria toxin.

The objective technical problem was the provision of an effective multivalent immunogenic composition

comprising *S. pneumoniae* capsular saccharides. Document D1 already provided several solutions to this problem, including increasing the saccharide amounts and conjugating 6B and 23F, optionally also 19F, to DT, and all other saccharides to protein D (see also example 7). The skilled person would follow the teaching in document D1 to use protein D as the carrier for serotype 19A (the preferred second carrier in document D1) and DT for the first carrier, i.e. the preferred carrier for serotype 19F. There was no evidence on file on what response could be expected for serotype 19A when conjugated to DT, CRM197 or pneumolysin.

XII. The respondents' arguments relevant to this decision may be summarised as follows.

Main request
Novelty (Articles 100(a) and 54 EPC) - Claim 1

Document D1 disclosed compositions as defined in claim 1. It disclosed a 13-valent vaccine comprising all the saccharides listed in claim 1 (see page 5). These saccharides were provided in conjugate form, as could be understood from a reading of the document with a mind willing to understand and also in view of the disclosure that a paediatric use required a conjugated form of the saccharides (see page 1, lines 7 to 9). Three alternatives were disclosed for conjugating some of the saccharides to a first carrier and others to a second carrier. This resulted in embodiments where serotype 19A and 19F saccharides were both conjugated to a second carrier as well as embodiments where serotype 19A saccharide was conjugated to a second carrier and 19F to a first carrier (see page 4, line 17 to 24). However, there was a clear pointer to the

alternative where only saccharide serotype 6B was conjugated to the first carrier, and thus 19A and 19F were both conjugated to a second carrier. It required at most one selection from the list of possible carriers on page 5, lines 16 to 19, to arrive at an embodiment where the saccharide serotype 19A and 19F were both conjugated to CRM197. Even if there was a preferred first carrier, namely DT, the second carrier was to be selected from the list (see page 4, line 31). Thus, the second carrier could be CRM197.

Inventive step (Articles 100(a) and 56 EPC) - Claim 1

Document D1 was taken as the starting point for the assessment of inventive step.

Claim 1 did not limit the number of conjugates and defined the carriers for serotype 19A and 19F only. However, there was no technical effect associated with the carriers in claim 1, which constituted an arbitrary choice from the carriers listed in document D1, pages 4 to 5.

The experimental results in the patent did not compare the carriers in claim 1 with other carriers likewise disclosed in document D1 since all compositions tested included serotype 19F conjugated to DT and 19A conjugated to either pneumolysin or DT, both listed in claim 1. Example 4 did not allow concluding on carrier DT versus protein D for serotype 19F because several parameters differed between the experiments, such as the amount of 19F saccharide and the amount of adjuvant. Therefore, no improvement could be attributed to choosing DT or any of the carriers in claim 1.

It was contested that the patent showed that the DT and pneumolysin conjugates combined well with the other saccharide conjugates. For many serotypes, the presence of the conjugate 19A-DT resulted in interference (see table 16, group 1 versus group 6 and table 17, groups 2 to 5 versus group 6). Moreover, any results obtained were restricted to the tested conjugates, which contained additional components that influenced immunogenicity but were not included in claim 1. Examples included the use of carrier protein D and the use of three or four carrier proteins in one composition. It was not credible that a good immune response could be reproduced with any carrier, whereas the claim did not limit the carriers other than for saccharides 19A and 19F.

The objective technical problem was to be formulated based on a technical effect made credible for essentially all the claimed embodiments. In view of the lack of a technical effect, the objective technical problem was formulated as the provision of an alternative composition.

The skilled person addressing this problem would have taken any of the carriers proposed in document D1 (see page 4, last paragraph to page 5, first paragraph). There was no prejudice preventing the skilled person from taking one of those carriers. Any of the possible solutions was obvious when the problem to be solved was the provision of an alternative.

XIII. The appellant requested that the decision under appeal be set aside and the patent be maintained as granted (main request). The appellant further requested that document D34 not be admitted into the appeal proceedings.

Respondents I and II requested in writing that the appeal be dismissed and the patent be revoked in its entirety. Respondents I and II further requested that the case not be remitted to the opposition division and the board decide on inventive step should the board find that the subject-matter of claim 1 of the main request was novel over the disclosure in document D1. Respondents I and II also requested that document D34 be admitted into the appeal proceedings.

Respondent III requested that the appeal be dismissed and the patent be revoked in its entirety.

Reasons for the Decision

Parties not represented at the oral proceedings

1. Respondents I and II were not represented at the oral proceedings before the board, as announced beforehand. The proceedings were continued in their absence in accordance with Rule 115(2) EPC, and they were treated as relying on their written case in accordance with Article 15(3) RPBA.

Admittance of document D34 into the appeal proceedings

2. This document was filed by respondents I and II with their replies to the statement of grounds of appeal. The appellant requested that the document not be admitted into the appeal proceedings.

3. The document was filed in support of arguments against inventive step of compositions including saccharides of serotype 22F, such as defined in claim 1 of auxiliary request 4 filed with the statement of grounds of appeal. Auxiliary request 4 and all other auxiliary requests were withdrawn at the oral proceedings before the board. Document D34 was not relevant for the board to reach a decision on the main request, and thus there was no need to decide on its admittance into the appeal proceedings.

Main request (patent as granted)
Novelty (Articles 100(a) and 54 EPC)

4. Claim 1 is directed to a composition comprising *S. pneumoniae* capsular saccharide conjugates. The claim lists eleven saccharides and defines the carrier for two of them only, namely for the saccharides of serotypes 19A and 19F. For the first, the carrier is one of pneumolysin, diphtheria toxoid (DT) and CRM197, whereas for the second, the carrier is one of DT and CRM197.

5. The opposition division held that this composition was not novel because document D1 disclosed: (i) a 13-valent infant vaccine where the saccharide of serotype 6B was conjugated to a first carrier, each other saccharide was also provided in the form of a conjugate, but to a second carrier, which was identical for all saccharides other than the saccharide of serotype 6B, and the second carrier was DT; (ii) a composition with all the features of composition (i) except for the second carrier, which was CRM197.

6. The respondents additionally submitted that document D1 disclosed compositions where the carrier was

pneumolysin for saccharide of serotype 19A and one of DT and CRM197 for the saccharide of serotype 19F.

7. It is established case law of the boards of appeal that the concept of disclosure is the same for the purposes of the right to priority under Article 87(1) EPC, the basis for amendments in an application under Article 123(2) EPC and novelty under Article 54 EPC (G 1/03, Reasons 2.2.2; G 2/10, Reasons 4.6 and G 1/16, Reasons 17). Therefore, when assessing the disclosure content of document D1, the relevant question is what a skilled person would derive directly and unambiguously, using common general knowledge, from the whole of document D1.

8. Document D1 concerns multivalent vaccines against infection by *S. pneumoniae*, comprising conjugated capsular saccharides. It was challenging to provide an effective multivalent vaccine due, on the one hand, to the need to provide the saccharides in the form of a conjugate with a carrier protein and, on the other hand, to the impact (interference) that the carrier protein in multiple conjugates had on the immune response to the saccharides (pages 1 to 2, line 2). The invention, according to document D1, entails carefully choosing the carrier proteins for each serotype such that saccharides of (i) serotype 6B, (ii) serotypes 6B and 23F, or (iii) serotypes 6B, 23F and 19F are conjugated to a (first) carrier which is different to the one or more carriers for the other saccharides (page 3, last line to page 4, line 5 and page 4, lines 17 to 24). The most preferred embodiment is option (i), i.e. that the carrier for 6B is different to all other carrier(s). A list of 23 serotype saccharides that may be included in the vaccine is exemplified with three embodiments, namely the 11-valent vaccine and the

paediatric and elderly 13-valent vaccines (see page 5, third paragraph).

9. It is not directly and unambiguously derivable from document D1 which of the concepts (i), (ii) or (iii) mentioned above is intended for each vaccine exemplified, i.e. whether only the saccharide of serotype 6B is conjugated to a different (first) carrier, which implies that 19A and 19F might have an identical (second) carrier, or to the contrary whether 19A and 19F have different carriers. It is likewise not disclosed whether all saccharides in the 13-valent vaccine are to be present in conjugate form. However, to arrive at a 13-valent paediatric vaccine with saccharides 19A and 19F both conjugated to an identical second carrier, these selections are required in addition to the selection of DT or CRM197 from the carriers listed. Therefore, document D1 does not directly and unambiguously disclose the embodiments pointed out by the opposition division.

10. It follows from the foregoing that the board also does not find convincing the respondents' argument that the skilled person reads DT as the preferred first carrier and at most needs to select the second carrier from a list, arriving at compositions encompassed by claim 1 at issue. Indeed, the only embodiment in document D1 comprising all the 11 saccharides listed in claim 1 is the 13-valent paediatric vaccine. As discussed in the previous point, this passage does not specify whether the vaccine consists of conjugated saccharides only or whether the second carrier is the same and whether for the choice of carriers concept (i) applies. However, this information is required to arrive at a vaccine where serotype 6B saccharide is conjugated to DT and 19A and 19F saccharides are both conjugated to CRM197.

11. The respondents argued, with reference to page 1 of document D1, that a proper reading of this document included the disclosure that for the paediatric vaccine, all saccharides were present in conjugate form. The board has a different view, for the following reasons. Firstly, page 1 sets out the background to the invention and the issues the invention is intended to address; it does not, in the case at hand, concern the solutions provided, and thus does not imply that the solution follows in any way the prior art. Secondly, the passage disclosing the 11-valent and 13-valent vaccines, on page 5, third paragraph, is immediately preceded by a passage on the number of saccharides that may be included in a vaccine, which states that "*[p]referably it is 11, 13 or 16 different serotypes. In another embodiment of the invention, the vaccine may comprise conjugated* S. pneumoniae *polysaccharides and unconjugated* S. pneumoniae *polysaccharides*" (see page 5, second paragraph). Thus, from pages 4 and 5 read together, the board concludes that for multivalent vaccines, including those consisting of 11, 13 or 16 different serotypes, both options were envisaged, i.e. vaccines where all saccharides were conjugated and vaccines where the saccharides were partly conjugated and partly unconjugated.

12. In a further line of argument, the respondents referred to an embodiment where the serotype 19A saccharide was conjugated to pneumolysin. In the board's view, this embodiment can only result from even further selections from the disclosure in document D1. It does not follow the respondents' line of argument addressed above, according to which the preferred first carrier was DT and only the second carrier, for both serotypes 19A and 19F, needed to be selected from the list on pages 4

to 5. Rather, it can only result from a selection of the first carrier from the list on page 4, penultimate paragraph, and the second carrier or carriers chosen independently from the list on page 4, last paragraph to page 5, first paragraph. Since each of these lists contains 12 alternatives, the choice of pneumolysin as one of the carriers and DT or CRM197 as the other is not directly and unambiguously derivable from the document.

13. In conclusion, the subject-matter of claim 1 is novel in view of the disclosure in document D1.

Inventive step (Articles 100(a) and 56 EPC)

Closest prior art

14. Document D1 discloses 11 and higher valent vaccines in which the saccharides may be present in conjugate or non-conjugate form, provided that saccharides of serotype 6B, and optionally 23F and 19F, are conjugated to a first carrier and the other saccharides are conjugated to one or more second carriers. The carriers may be chosen from the lists provided on page 4, penultimate paragraph to page 5, first paragraph. DT is preferred for the first carrier. In a further preferred embodiment, the second carrier is identical for all saccharides. Further, all saccharides may be present in conjugate form. Specifically disclosed is a 13-valent paediatric composition comprising all saccharides in claim 1 of the main request before the board (page 5, lines 18 to 19). Therefore, no selection from different embodiments in this document is required to include saccharide 19A. However, this passage does not define whether all saccharides are conjugated or to which

carrier proteins they are conjugated (as set out above when addressing novelty - see point 9.). Thus, the difference between the claimed composition and this disclosure lies in the choice of carriers for serotypes 19A and 19F and in the choice of the conjugated form for all saccharides.

15. The board does not agree with the appellant that the average size of the 19A saccharide constitutes an additional difference. Document D1 discloses that the capsular saccharides have sizes in the range 100 to 500 kDa (see page 5, lines 20 to 21). This passage immediately follows the passage disclosing the 13-valent paediatric vaccine, and there is no reason to read in it a restriction on some of the saccharides only. The board is of the view that this size range applies to all *S. pneumoniae* capsular saccharides to be included in the vaccines specifically disclosed in the document and thus also to the saccharide of *S. pneumoniae* serotype 19A. The appellant's reference in this context to a separate document, in the current case to document D3, cannot change the disclosure content of document D1.

Technical effect and objective technical problem

16. According to the appellant, the application showed technical effects associated with the carriers listed in claim 1 as follows: (i) DT is superior to protein D as a carrier protein for serotype 19F saccharide (based on example 4 for an 11-valent vaccine); and (ii) serotype 19A saccharide conjugated to pneumolysin or DT "*combined well*" with 19F-DT in a 13-valent vaccine (based on examples 8 to 10).

Example 4 in the patent

17. As can be seen from its title, this example concerns the selection of a carrier protein for serotype 19F saccharide. Four 11-valent compositions were tested, all comprising conjugates of the same saccharides (see table 4) and differing as follows: one composition comprised all saccharides conjugated to protein D and three compositions comprised some of the saccharides conjugated to DT instead - for composition "19F-DT Form 3", serotype 19F was conjugated to DT, for the compositions "Form 1" and "Form 2", additional saccharides were conjugated to DT. For the current purposes, the relevant compositions are thus the all-protein D composition and the "19F-DT Form 3" composition, representing the invention. However, these compositions further differ from each other in two aspects: the amount of adjuvant and the amount of 19F saccharide, which is 1 µg for the all-protein D composition versus 3 µg for the "19F-DT Form 3" composition (see also page 35, line 34). The immune response one month after primary vaccination in children was measured by serotype-specific antibody concentrations determined by ELISA assay and by opsonophagocytosis (OPA activity) (results in tables 8 and 9).

18. From the results in table 9, showing increased OPA activity for the composition where serotype 19F is conjugated to DT versus protein D, the appellant concluded that DT is a better carrier for serotype 19F saccharide. However, the board does not agree with this conclusion because the experiments are not directly comparable. From example 4, it cannot be ascertained whether the effect on the immune response is due to the feature at issue, i.e. the carrier protein, since not

only the carrier but also the amount of saccharide differed between the experiments. Since it is the immune response to the saccharide that is at issue, and its amount was increased in the composition showing an increased immune response, the effect of the increased amount of antigen (saccharide) and a different carrier is indistinguishable.

19. According to the case law of the boards of appeal, if comparative tests are chosen to demonstrate an inventive step on the basis of an improved effect, the nature of the comparison with the closest state of the art must be such that the alleged advantage or effect is convincingly shown to have its origin in the distinguishing feature of the invention compared to the closest state of the art (see T 197/86, Headnote, and further decisions cited in "Case Law of the Boards of Appeal of the EPO", 10th edn., 2022, I.D.4.3.2.). Accordingly, no technical effect can be attributed to selecting DT over any of the other carriers, for example, carriers known from document D1.

Examples 8 to 10 in the patent

20. Examples 8 to 10 report experiments with 13-valent saccharide conjugate compositions which include all the saccharides listed in claim 1 of the main request. In each example, 13-valent compositions are compared to an 11-valent composition. Compared to the 11-valent composition (group 1), which comprises saccharide 19F conjugate, the 13-valent compositions (groups 2 to 6) additionally include conjugates of serotypes 19A and 22F. The saccharide of serotype 19F is conjugated to DT in all tested compositions; the saccharide of serotype 19A is conjugated to detoxified pneumolysin (groups 2 to 5) or DT (group 6). The other saccharides are

conjugated to protein D, tetanus toxoid or PhtD, depending on the serotype. Example 8 concerns the testing of the compositions in old mice; example 9, in young mice. The antibody levels determined 42 days after the first immunisation are shown, for each saccharide, in tables 15 and 16, respectively. Both examples conclude that the immune response induced against the other saccharides was not negatively impacted when conjugates to serotypes 19A and 22F were included in the 13-valent vaccine. Example 10 concerns testing in guinea pigs. The antibody levels are shown in table 17.

21. From the foregoing, it is apparent that examples 8 to 10 do not allow for a comparison of the carriers in claim 1 with other carriers also suggested in document D1 because all compositions used DT as the carrier for serotype 19F and either pneumolysin or DT for serotype 19A.

22. The parties disagreed on whether these results showed an immune response to serotype 19A without affecting the immune response to the other serotypes and whether the results could be seen to be good immune responses. However, even if the immune response reported in examples 8 to 10 were considered a technical effect beyond the technical effects that may be attributed to the prior-art 13-valent paediatric vaccine, this immune response could not be extrapolated to all embodiments defined in claim 1 for the following reasons. It is undisputed that the choice of carrier for a given saccharide is relevant for the immune response to the conjugated saccharide as well as to other saccharides. For example, the teaching of document D1 is that the immune response may be affected not only by the number of saccharides conjugated to identical carrier proteins

but also by which saccharides are conjugated to a different (second) carrier protein. This is shown in D1 for serotype 6B which modulated also the immune response to some of the other serotypes (see summary of document D1 in point 8. above; see document D1, page 3, second paragraph, page 19, antepenultimate paragraph, and page 21, lines 17 to 20). From the appellant's argument that the choice of DT instead of protein D as the carrier for serotype 19F is associated with a technical effect (see point 18. above), it cannot be inferred that only the choice of carriers for 19A and 19F serotype is of relevance, and this cannot be inferred from the examples in the patent either. In conclusion, at least for the reason that all compositions tested in examples 8 to 10 used three or four different carrier proteins, their results cannot be extrapolated to substantially all embodiments claimed. The board refers to the wording of claim 1, which merely limits the carriers for serotype 19A and 19F saccharides and allows for a composition where all conjugates have the same carrier protein.

23. In line with the established case law of the boards of appeal, a technical effect can only be taken into account for the formulation of the objective technical problem if it is credible that this technical effect is achieved by substantially all embodiments claimed (see T 939/92, Reasons 2.5.4 and 2.6, and further decisions cited in "Case Law of the Boards of Appeal of the EPO", 10th edn., 2022, I.D.4.1.3.). Accordingly, no technical effect can be attributed to selecting DT, pneumolysin or CRM197 over any other carriers known, for example, from document D1.

Objective technical problem

24. In view of the differences from the closest prior art and the technical effects that may the attributed to those differences, the objective technical problem is the provision of a further multivalent paediatric composition comprising *S. pneumoniae* saccharides.

Obviousness

25. As summarised above (see point 8.), the central teaching of document D1 is that multivalent vaccines resulting in improved immune responses can be provided by conjugating the saccharides to at least two different carriers and selecting the carrier for each saccharide. Providing all the saccharides in conjugate form is a possibility disclosed in D1 (see page 4, lines 17 to 24) and therefore the skilled person would envisage conjugating all saccharides. The board is of the view that the carriers may be selected from the lists provided on page 4, penultimate paragraph (for the first carrier) and the paragraph bridging pages 4 and 5 (for the second carrier). These lists include the carriers pneumolysin, DT and CRM197 specified in claim 1 of the main request. The skilled person seeking to provide alternative compositions for eliciting an immune response against *S. pneumoniae* would implement the teaching of D1 with any of the listed carriers, including those specified in claim 1 of the main request. Therefore, the skilled person would arrive at the embodiments defined in claim 1.

26. In one line of argument, the appellant submitted that the skilled person would implement the 13-valent paediatric vaccine following the preferred alternatives, which were for serotype 19A, the

conjugation to a second carrier, the preferred choice being protein D, and for the serotype 19F, the conjugation to a first carrier, with the preferred choice being DT. The skilled person would therefore provide as a solution to the objective technical problem a composition where serotype 19A is conjugated to protein D and serotype 19F to DT. Such a composition, however, would not fall within claim 1. In other words, it does not make obvious any embodiment claimed.

27. The board is not convinced by this reasoning because it has a different reading of document D1. The skilled person seeking to solve the objective technical problem is not restricted to the choice of carriers put forward in the appellant's argument for two reasons. Firstly, exemplified embodiments, such as example 7, where the second carrier is protein D, do not eliminate the remainder of the teaching, which in the case of document D1 is much broader than the preferred embodiments in the examples. Secondly, the objective technical problem the skilled person is seeking to solve is the provision of a further multivalent paediatric composition comprising *S. pneumoniae* saccharide. Therefore, the skilled person is not faced with the problem of eliciting an improved immune response but merely an immune response against *S. pneumoniae* which is comparable to the closest prior art.

28. In light of the foregoing, the board came to the conclusion that Article 100(a) EPC in combination with Article 56 EPC prejudices the maintenance of the patent as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairwoman:

A. Vottner M. Pregetter

Decision electronically authenticated