IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

United Therapeutics Corporation, Plaintiff, v. Liquidia Technologies, Inc., Defendant.	Civil Action No. 23-975-RGA

TRIAL OPINION

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ANDREWS, U.S. DISTRICT JUDGE:

Plaintiff United Therapeutics Corporation ("UTC") brought a Hatch-Waxman action for patent infringement against Defendant Liquidia Technologies ("Liquidia") for infringement of U.S. Patent No. 11,826,327 ("the '327 patent").[1] (D.I. 8 at ¶ 1).

At a high level, the '327 patent describes "[m]ethods of treating [pulmonary hypertension] interstitial lung disease ["PH-ILD"][2] . . . wherein the methods include administration of Treprostinil." ('327 patent, abstract). "[Plaintiff] currently markets TYVASO® (treprostinil) inhalation solution . . . and TYVASO DPI® (treprostinil), which . . . is the first marketed dry powder formulation of treprostinil in the United States. [Defendant] seeks approval to market YUTREPIA®, a second dry powder formulation of Treprostinil," which, Plaintiff alleges, infringes the '327 patent. (D.I. 8. at ¶ 2, ¶¶ 52-73).

I held a four-day bench trial from June 23, 2025, to June 26, 2025. (D.I. 442-445).[3] By the time of trial, Plaintiff had reduced its asserted claims to claims 1, 5, 6, 9, 14, and 17 of the '327 patent. Defendant stipulated to both direct and indirect infringement of claims 1 and 14. (D.I. 425 at ¶ 4; Tr. at 28:7-10).

Thus, the following issues, as identified in the parties' post-trial briefing, await resolution:

(1) Whether Defendant infringes claims 5, 6, 9, and 17 of the '327 patent?

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[1] Plaintiff had originally asserted claims of Patent No. 10,716,793 ("the '793 patent") as well, but those claims were invalidated. *See United Therapeutics Corp. v. Liquidia Techs., Inc.*, 2023 WL 8794633 (Fed. Cir. Dec. 20, 2023).

[2] Some notes on terminology: PH-ILD is classified as a species or type of WHO Group III PH (World Health Organization Group 3 Pulmonary Hypertension). PAH (Pulmonary Arterial Hypertension) is classified as a species or type of WHO Group I PH (World Health Organization Group 1 Pulmonary Hypertension). The parties use "iTre" to refer to "inhaled treprostinil."

[3] The trial transcript is consecutively paginated, and I refer to it by the consecutive pagination in the format "Tr. ___."

(2) Whether claims 5, 6, 9, and 17 are entitled to patentable weight?

(3) Whether all the asserted claims are invalid as obvious?

(4) Whether claims 1, 5, 6, 9, and 17 are invalid due to prior sale?

(5) Whether claims 1, 5, 6, 9, and 17 are inherently anticipated?

(6) Whether claim 9 lacks written description support?

I reproduce here the text of the relevant claims, including claim 11 from which claim 14 depends:

Claim 1 reads:

> A method of improving exercise capacity in a patient having pulmonary hypertension associated with interstitial lung disease, comprising administering by inhalation to the patient having pulmonary hypertension associated with interstitial lung disease an effective amount of at least 15 micrograms up to a maximum tolerated dose of treprostinil or a pharmaceutically acceptable salt thereof in a single administration event that comprises at least 6 micrograms per breath.

Claim 5 reads:

> The method of claim **1**, wherein said administering reduces a plasma concentration of NT-proBNP in the patient by at least 200 pg/ml after 8 weeks, 12 weeks, or 16 weeks of the administering.

Claim 6 reads:

> The method of claim **1**, wherein said administering provides a statistically significant reduction of at least one exacerbations [sic] of the interstitial lung disease.

Claim 9 reads:

> The method of claim **1**, wherein said administering provides a statistically significant improves [sic] of forced vital capacity (FVC) in the patient after 8 weeks, 12, [sic] weeks, or 16 weeks of the administering.

Claim 11 reads:

> The method of claim **1**, wherein said administering is performed by a pulsed inhalation device.

Claim 14 reads:

> The method of claim **11**, wherein the pulsed inhalation device is a dry powder inhaler comprising a dry powder comprising treprostinil or a pharmaceutically acceptable salt thereof.

Claim 17 reads:

> The method of claim **1**, wherein said administering increases a 6 minutes walk distance of the patient by at least 10 m after 8 weeks of the administering.

I. DISCUSSION

I begin by addressing the arguments surrounding the validity of the asserted claims before moving on to questions regarding infringement. I will analyze each section by finding the facts and then stating my legal conclusions. *See* Fed. R. Civ. P. 52(a)(1).

A. Invalidity

1. Whether claims 5, 6, 9, and 17 are entitled to patentable weight

> COUNSEL: . . . Dr. Nathan testified that the claims are directed to the intended result of practicing the method of Claim 1. He testified that you do not need to measure any element in 5, 6, 9, or 17 for infringement. And [Plaintiff's counsel] recognized that on infringement. He testified that if you infringe Claim 1, you automatically infringe the dependent claims. That means there's nothing in those dependent claims that you need to do to infringe. If that's the case, then under the law, and we'll brief this, the claims are directed to an intended result of Claim 1. And that's what he said clearly and unambiguously. If they're directed to an intended result and you don't need to do anything for infringement, they're not entitled to patentable weight, and therefore, if Claim 1 is invalid, those claims are also invalid because they cannot be rested upon for patentable weight to try to avoid invalidity if Claim 1 is found invalid.
>
> THE COURT: So it's interesting that you bring that up because the format of these claims, at least some of them, have bugged me since I first learned about them.

(Tr. 978:10-979:5).

As an initial matter, Plaintiff argues that I need not consider Defendant's argument that claims 5, 6, 9, and 17 are not entitled to patentable weight, because Defendant "forfeited its patentable weight arguments by failing to timely assert them." (D.I. 431 at 3). I do not agree that

Defendant waived this argument. I stated at the pretrial conference that this would be "something I will resolve later, so I'm going to deny this with, essentially, leave to raise the same issues in post-trial briefing." (D.I. 380 at 28:13-15). Defendant has done so, and I address its arguments below.

For the reasons that follow, claims 5, 6, 9, and 17 are not entitled to patentable weight.

a. Findings of Fact

Defendant argues that claims 5, 6, 9, and 17 are not entitled to patentable weight because they are directed to the intended results of claim 1 and because they do not manipulate the method of claim 1.

Defendant points to the following testimony of Dr. Nathan, one of Plaintiff's witnesses:

> Q. And you've testified that -- previously in your deposition that as long as a doctor writes a prescription in accordance with Claim 1, they will also infringe Claim[s] 5, 6, 9, and 17.
> A. As long as they write a prescription they will be infringing all of the claims.
> Q. And you even provided opinions that the patient doesn't need to actually achieve the outcomes in 5, 6, 9, or 17 to infringe; correct?
> A. That's correct, because we know from INCREASE that is what happened when patients get inhaled treprostinil.

(Tr. 142:8-18).

> Q. So if they [i.e., doctors] write a prescription for Yutrepia in accordance with Claim 1 as we just discussed, it's your opinion that they automatically infringed Claim[s] 5, 6, 9, and 17?
> A. Yes.

(Tr. at 143:19-23).

Defendant argues that claims 5, 6, 9, and 17

> are only directed to intended results, and no further step [would be] needed to infringe these claims, [so] the same interpretation is required for invalidity and they are not entitled to patentable weight. . . . Accordingly, claims 5, 6, 9 and 17 cannot bear on the validity of the '327 patent and would be invalid if claim 1 is found invalid.

(D.I. 424 at 2) (citation omitted).

Defendant argues that claims 5, 6, 9, and 17 "do not lead to manipulative differences in performing claim 1", because "all the claims are performed by a single step of treating a PH-ILD patient with iTre [(inhaled Treprostinil)] at the claimed dosing." (*Id.* at 2-3). "Claims 5, 6, 9 and 17 do not change the execution of claim 1." (*Id.* at 3).

Plaintiff argues that Defendant misconstrues Dr. Nathan's testimony. Plaintiff notes that Dr. Nathan "did not say that *any* administration according to claim 1 would infringe claims 5, 6, 9, and 17. . . . Rather, Dr. Nathan explained that one specific product—*Yutrepia*—would infringe claims 5, 6, 9, and 17 if the method of claim 1 was performed because of (a) its equivalence with [] Tyvaso and (b) the results of the INCREASE trial." (D.I. 431 at 4). In support, Plaintiff points to the following line of questioning on Dr. Nathan's redirect examination:

> Q. Let's say Pfizer came up with a brand new drug, a brand new version of inhaled treprostinil . . . . and Pfizer then went through their own clinical trials . . . and they sought FDA approval and they got FDA approval. . . . If somebody administered at least 15 micrograms of . . . that treprostinil product, would they necessarily infringe Claim 5?
> A. No, they wouldn't . . . [b]ecause they would have their own dataset and it depends on what their dataset shows. And that might show something a little bit different or quite a bit different, we don't know. But because Yutrepia is reliant entirely on the INCREASE study, we know that Yutrepia will infringe each of these, whereas the hypothetical Pfizer product, which has its own study, we don't know if it would infringe these or not.
> Q. So is that equally true for Claim 6?
> A. That's equally true for all of the claims.

(Tr. at 162:24-163:25).

Earlier, however, on cross-examination, Dr. Nathan gave the following testimony.

> Q. [Yutrepia] uses a different delivery device than the Tyvaso product?
> A. Yes.
> Q. And it has a different formulation than the Tyvaso product?
> A. To my understanding, yes.

(Tr. 135:16-18).

> Q. Do you recall being asked this question [at deposition] and g[iving] this answer: "Sitting here today, do you know how better or how worse the results of the INCREASE trial would have been if they had -- if you had used Yutrepia instead of Tyvaso?" . . . Answer by you: "No. If I had to answer that, I would be entirely speculating with no basis to do that." You were asked that question and you gave that answer; is that right?
> A. That's correct.

(Tr. 136:17-137:2).

In light of this earlier testimony, I am puzzled by Dr. Nathan's redirect testimony. Dr. Nathan conceded that Yutrepia and Tyvaso have different formulations and use different delivery devices. He testified that administering Yutrepia would nevertheless result in the same result as administering Tyvaso, whereas administering a hypothetical Pfizer product would not. If two inhaled treprostinil products with different formulations and different delivery mechanisms are nevertheless supposed to produce the same result, I do not see why a hypothetical third inhaled treprostinil product should be supposed to produce a different one, simply because its development would have been derived from different clinical trial data. Dr. Nathan's argument that the sole reason for this discrepancy would be that the hypothetical product would have "had its own study" and its own dataset appears to me to be a distinction without a difference.

Dr. Nathan's testimony thus does not convince me that the hypothetical Pfizer formulation and the actual Yutrepia formulation should be treated differently. Put another way, I do not credit Plaintiff's argument that "Dr. Nathan did not say that *any* administration according to claim 1 would infringe claims 5, 6, 9, and 17" and that Yutrepia is the sole formulation that would result in automatic infringement, because of "its equivalence [] to Tyvaso and [] the results of the INCREASE trial." (D.I. 431 at 4).

Finally, Plaintiff's counsel argues in its post-trial infringement briefing, "When doctors and patients follow the Yutrepia label to treat PH-ILD, they will directly infringe the Asserted

Claims." (D.I. 426 at 4). The Yutrepia label conforms with the limitations of claim 1 of the '327 patent:

> In patients naïve to treprostinil, therapy should begin with 26.5 mcg 3 to 5 times per day, in 2 breaths based on patient response. . . . Patients transitioning from treprostinil inhalation solution (Tyvaso), can begin YUTREPIA therapy 3 to 5 times per day, in 2 breaths, using the doses specified below. [A table follows with the aforementioned specified doses, indicating dosages ranging from 26.5 mcg to 159 mcg].

PTX-0291.00005.

I take Dr. Nathan and Plaintiff's counsel at their word. I find that writing a prescription in accordance with claim 1 results in automatic infringement of the dependent claims.

b. Legal Analysis

There are four Federal Circuit cases that are relevant to the question whether the additional limitations of dependent claims 5, 6, 9, and 17 are entitled to any patentable weight. I review them in chronological order.

First, there is *King Pharms., Inc., v. Eon Labs, Inc.*, 616 F.3d 1267 (Fed. Cir. 2010). In *King*, the Court of Appeals analyzed the patentability of a medical treatment method patent that required as one step of the method a requirement that the patient be informed of the most effective way of taking the medicine. The Court of Appeals held, "The specific question before us is whether an otherwise anticipated method claim becomes patentable because it includes a step of 'informing' someone about the existence of an inherent property of that method." *Id.* at 1278. The Court held, "[T]he relevant inquiry here is whether the additional instructional limitation of [the dependent claim] has a new and unobvious functional relationship with the known method of administering [the drug]." *Id.* at 1279 (citation omitted). The Court concluded there was no functional relationship because, "[i]nforming a patient about the benefits of a drug in no way transforms the process of taking the drug. . . . Irrespective of whether the patient is

informed about the benefits, the actual method, taking [the drug], is the same." *Id.* "In other words, the 'informing' limitation in no way depends on the method, and the method does not depend on the 'informing' limitation." *Id.* (cleaned up).

Second, there is *Allergan Sales, LLC v. Sandoz, Inc.*, 935 F.3d 1370 (Fed. Cir. 2019). There the claim at issue in relevant part recited:

> A method of treating a patient with glaucoma or ocular hypertension comprising topically administering twice daily to an affected eye a single composition comprising 0.2% w/v brimonidine tartrate and 0.68% w/v timolol maleate, *wherein* the method is as effective as the administration of the 0.2% w/v brimonidine tartrate monotherapy three times per day and *wherein* the method reduces the incidence of one o[r] more adverse events selected from the group consisting of conjunctival hyperemia, oral dryness, eye pruritus, allergic conjunctivitis, foreign body sensation, conjunctival folliculosis, and somnolence when compared to the administration of 0.2% w/v brimonidine tartrate monotherapy three times daily.

Id. at 1372-73.

The two "wherein" clauses were found to be limiting. On appeal, there were two issues: (1) whether the wherein clauses were merely the intended results of the method, and (2) whether the results were "material to patentability." The Court determined that the results "as reflected in the disputed 'wherein' clauses [] were expressly relied on to define the claimed methods and distinguish them from the prior art," and, as such, were "material to patentability and thus limiting." *Id.* at 1376. There was no obvious connection between the dispute in *Allergan* and the earlier *King* case, and *Allergan* had no reason to discuss *King*.

Third, there is *L'Oréal USA, Inc. v. Olaplex, Inc.*, 844 F. App'x 308 (Fed. Cir. 2021).[4] The independent claim at issue in *L'Oréal* reads as follows.

> 1. A method for bleaching hair comprising:
> (a) mixing a bleach powder and a developer to form a bleaching formulation;

[4] I recognize *L'Oréal* is non-precedential, but I nevertheless think it has persuasive value.

> (b) mixing an active agent formulation comprising an active agent with the bleaching formulation to form a mixture, wherein the active agent is maleic acid; and
> (c) applying the mixture to the hair;
> wherein the active agent in the mixture is at a concentration ranging from about 0.1% by weight to about 50% by weight.

Id. at 312.

The patent at issue in *L'Oréal* contained various claims that depended from claim 1. Claim 24, which is illustrative,[5] recites:

> 24. The method of claim 1, wherein following step (c) breakage of the hair is decreased by at least 5% compared to hair bleached with the bleaching formulation in the absence of the active agent.

Id. at 313.

The *L'Oréal* court found that the dependent claims were limiting, because "they 'state specific requirements rather than a general purpose or aspirational result for the claimed method.'" *Id.* at 324 (citing *Allergan Sales*, 935 F.3d at 1379). "The fair[] understanding of these claims is that they limit the options covered by the subject matter defined by the claims on which they depend to options that produce the concretely specified results—thus making a difference in the manipulative steps." *L'Oréal*, 844 F. App'x at 324.

Fourth, there is *Bayer Pharma Aktiengesellschaft v. Mylan Pharms. Inc.*, 152 F.4th 1400 (Fed. Cir. 2025), decided after the trial in this case occurred. *Bayer* was an appeal from the PTAB, which had invalidated a claim that read:

> 1. A method of reducing the risk of myocardial infarction, stroke or cardiovascular death in a human patient with coronary artery disease and/or peripheral artery disease, comprising administering to the human patient rivaroxaban and aspirin in amounts that are *clinically proven effective* in reducing the risk of myocardial infarction, stroke or cardiovascular death in a human patient with coronary artery

[5] "The language of claims 25-28 mirrors claim 24 but covers different percentages of decreased breakage: 'at least 10%' (claim 25); 'at least 20%' (claim 26); 'at least 40%' (claim 27); 'at least 50%' (claim 28)." *L'Oréal*, 844 F. App'x at 313.

> disease and/or peripheral arterial disease, wherein *rivaroxaban is administered in an amount of 2.5 mg twice daily* and *aspirin is administered in an amount of 75-100 mg daily*.

Id. at 1403.

Bayer lies at the intersection of the two doctrines set forth in *King* and *Allergan*.

The Federal Circuit held in *Bayer* that the language, "clinically proven effective," was insufficient to render a claim patentable because it lacked a "'functional relationship' with the claimed method." *Id.* at 1405. "[A] functionally unrelated limitation . . . fails to make the challenged claims patentable," insofar as such a limitation "in no way transforms the process of taking the drug[s] at the amounts and frequencies expressly recited in the claims. Irrespective of whether the [anticipated treatment regime is proven to be clinically effective], the actual method . . . is the same." *Id.* at 1404-05. (cleaned up). The question, then, is whether claims 5, 6, 9, and 17 possess a sufficient "functional relationship" with claim 1 such that they would "transform" the process of administering iTre as laid out in claim 1.

Plaintiff argues that *Bayer* is distinguishable and likens the present case to *Allergan* and *L'Oréal*. Plaintiff notes that *Allergan* stands for the proposition that a clause or claim limitation has patentable weight when it "require[s] particular functional effects that [are] not the necessary result of performing the preceding steps in the claim." (D.I. 456 at 2) (citing *Allergan*, 935 F.3d at 1377-79 (Prost, C.J., concurring)). Similarly, Plaintiff notes that the *L'Oréal* "court held that the dependent claims were entitled to patentable weight because they 'state specific requirements rather than a general purpose or aspirational result for the claimed method.'" (D.I. 456 at 2) (quoting *L'Oréal*, 844 F. App'x at 312). Plaintiff's main argument appears to be that claim 1 of the '327 patent requires "an effective amount of at least 15 micrograms up to a maximum tolerated dose," where "effective amount" is defined as "an amount of compound that is

sufficient to effect treatment." (D.I. 456 at 3) (quoting '327 patent at claim 1, 6:47-52) (emphasis deleted). Claims 5, 6, 9, and 17 "[n]arrow[] the open scope of claim 1 . . . [by] requir[ing] that the method of treatment cause quantifiable efficacy and safety improvements." (D.I. 456 at 3). Thus, "[a]s in *Allergan*, claims 5, 6, 9, and 17 of the '327 patent 'state specific requirements rather than a general purpose or aspirational result of the claimed method'" and are not simply "'an inherent result' of the dosage limitations." (D.I. 456 at 5) (quoting *Allergan*, 935 F.3d at 1378-79).

Defendant argues that *Bayer* controls, because, as in *Bayer*, "none of claims 5, 6, 9, or 17 [of the '327 patent] transform the process of taking treprostinil in claim 1, [and] the recited doses—the method of treatment, as specified in claim 1, remain[] the same." (D.I. 457 at 7). Indeed, Plaintiff's own infringement briefing suggests that infringing claim 1 would result in automatic infringement of the dependent claims, and Dr. Nathan testified that these claims would be "automatically infringed" upon infringement of claim 1. As such, Defendant argues that the dependent claims in question "impart no functional limitation or manipulative difference to claim 1 and have no patentable weight." (*Id.* at 8). Defendant distinguishes *Allergan*, noting that there, "the Federal Circuit determined . . . [t]he patent expressly compared the claimed invention to the prior art and the 'wherein' clause at issue related to whether patients could be safely and effectively treated twice a day rather than three times a day with the claimed formulation. . . . In other words, the language in the claim directly affected and limited the claimed method." (D.I. 457 at 8) (citing *Allergan*, 935 F.3d at 1372-73, 1375). In contrast, Defendant argues that here, as in *Bayer*, the claims "do nothing more than reflect a clinical observation achieved by following claim 1." (D.I. 457 at 9).

I think that Defendant has the better argument. The available evidence persuades me that the administration of iTre, in accordance with claim 1 of the '327 patent, is performed independently of whatever it is that the limitations of dependent claims 5, 6, 9, and 17 require. This case is similar to *Bayer*, where the Federal Circuit held, "Because the claims of the [patent in question] already specify the exact dosages of rivaroxaban and aspirin to be administered to a patient, the additional limitation that the amounts be 'clinically proven effective' does not further define the dosages that are administered." *Bayer*, 152 F.4th at 1405. So too, claim 1 of the '327 patent requires "an effective amount of at least 15 micrograms up to a maximum tolerated dose of treprostinil."[6] ('327 patent at claim 1). The dose is thus specified by the '327 patent: greater than or equal to 15 micrograms, up to a "maximum tolerated dose."

In the '327 patent, the upper and lower bounds of the dosage are not defined in reference to any putative intended effect of the dose. That is, the dosage's lower bound is fixed in reference to a constant, i.e., 15 micrograms, and the upper bound of the dosage is fixed in reference to a variable, determined not by the intended efficacy or result of the drug, but rather by a given "maximum tolerated dose." That fact distinguishes this case from *L'Oréal*. In *L'Oréal*, the intended results constituted limits on "the options covered by the subject matter defined by the claims on which they depend to options that produce the concretely specified results—thus making a difference in the manipulative steps." *L'Oréal*, 844 F. App'x at 324.[7]

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[6] The '327 patent does not explicitly define the dose; the dose exists between a range (15 mcg to maximal tolerance). But that does not mean it does not specify the dose as falling between that range. *See Bayer*, 152 F.4th at 1403, 1405 (holding that a patent "already specif[ied]" the exact dosages of rivaroxaban and aspirin, even though the patent noted that aspirin should be dosed within a range of "75-100 mg daily.").

[7] In *L'Oréal*, that the "concretely specified results" makes "a difference in the manipulative steps" is a logical statement because the described method specifies one of the ingredients—the "active agent formulation"—but does not describe the ratio of the two ingredients in the "bleaching formulation."

Here, there is no indication that specified results (claims 5, 6, 9, and 17) impact whatever the maximal tolerated dose should be. The "effectiveness" of the dose and the "maximal tolerated" amount of the dose are independent and logically distinct. *See King*, 616 F.3d at 1279.

Thus, merely requiring that this dose be an "effective amount," where "effective amount" is defined in reference to the results contemplated by claims 5, 6, 9, and 17, i.e., the results of the INCREASE clinical trial, appears to be analogous to the "clinically proven effective" language with which the Federal Circuit took issue in *Bayer*. The dependent claims result in no difference in the manipulable steps as to dosing, because there is no indication that the administered dose is defined in relation to those results. Indeed, as Plaintiff's counsel admits, "Claims 5, 6, 9, and 17 reflect clinical benefits that were observed on a population basis in INCREASE when Tyvaso was administered to PH-ILD patients." (D.I. 426 at 4).[8]

[8] Although the parties do not make this distinction, it seems to me that there is a better argument for the dependent limitations of claims 5 and 17 to have patentable weight than the dependent limitations of claims 6 and 9. The limitations added by claims 6 and 9 are simply the results of the INCREASE clinical trial as evidenced by the description of the additional limitation as being "statistically significant." One patient cannot produce a "statistically significant" result. Statistical significance is a concept that only makes sense when being used to describe drawing conclusions from some sort of analysis of a population. Thus, when Dr. Nathan says infringement of claim 1 results in the automatic infringement of dependent claims 6 and 9, I think a reasonable interpretation of what he means is that the INCREASE trial showed that the described results were achieved to a statistically significant level. The dependent limitations for claims 6 and 9 could just as well read, "wherein said administering was shown by a clinical trial at accomplishing [some result]." I think this easily falls within the *King/Bayer* line of cases as a limitation that in no way transforms the method described in claim 1 and is therefore entitled to no patentable weight.

On the other hand, claims 5 and 17 look more like limitations that could have patentable weight. The dependent limitations are in the format of, "wherein said administering reduces a plasma concentration . . . in the patient [by a specified amount within a specified time period]" or "wherein said administering increases a 6 minutes walk distance of the patient [by a specified amount within a specified time period]." The INCREASE trial provides a sound basis for concluding that the results described in claims 5 and 17 will be achieved by some percentage of the patients when they are administered iTre according to the method described in claim 1. I would not use the word "automatic" to describe a result that would occur only some of the time.

As such, I think *Bayer* determines the result here. The added limitations of dependent claims 5, 6, 9, and 17 are not entitled to patentable weight.[9] Thus, claims 5, 6, 9, and 17 have identical scope to independent claim 1, and I do not consider these four claims in the remainder of the invalidity analysis.

2. Whether claims 1 and 14 are invalid as obvious

The parties dispute whether claims 1 and 14 are invalid as obvious in light of the '793 patent, the *Faria-Urbina* study, and the *Saggar 2014* study. Defendant argues that "there was ample motivation to treat PH-ILD patients with iTre and a reasonable expectation that such treatment would succeed in achieving the outcomes of the Asserted Claims." (D.I. 424 at 4). Plaintiff argues that Defendant's "obviousness defenses, all of which rely upon the '793 patent, must fail as a matter of law because the '793 patent is not prior art to the Asserted Claims." (D.I. 431 at 5). There thus exist two interrelated questions: (1) Whether the '793 patent is indeed prior art, and (2) whether the previously disclosed studies and the '793 patent (if prior art) render claims 1 and 14 obvious.

Nevertheless, unlike in *L'Oréal*, the very specifically described results do not have any impact on the amounts dosed.

[9] In *L'Oréal*, the Federal Circuit stated of the dependent claims, "[A]ll they do" is "state specific requirements rather than a general purpose or aspirational result for the claimed method," and "they are dependent claims, so to treat the limitations as of no legal effect would be to interpret each of these dependent claims as entirely a nullity. The fairer understanding of these claims is that they limit the options covered by the subject matter defined by the claims on which they depend to options that produce the concretely specified results—thus making a difference in the manipulative steps." *L'Oréal*, 844 F. App'x at 324. The dependent claims here appear superficially similar to the ones in *L'Oréal*, but I think that they nevertheless differ insofar as they state a general purpose or aspirational result for the claimed method as opposed to a specific requirement. That the result is aspirational is made clear by Plaintiff's insistence that the actual results in the treatment of an individual patient are irrelevant (or, as Dr. Nathan testified, following the method steps results in "automatic" infringement). (Tr. at 143:19-23).The dependent claims of the '327 patent do not say, and cannot be fairly read to say, something like, "Titrate upwards from Claim 1 until the additional limitation disclosed by the relevant dependent claim is satisfied," rendering the dependent claims dissimilar to the dependent claims in *L'Oréal*.

For the reasons that follow, I find that neither claim 1 nor claim 14 are invalid as obvious. As Defendant does not argue that claim 14 is invalid under any other ground, I find that claim 14 is not invalid.

a. Findings of Fact

i. Whether the '793 patent and the '327 patent were both owned by Plaintiff at the time of the effective filing date of the '327 patent

Plaintiff and Defendant agree that the relevant inquiry is whether the '793 patent and the '327 patent were both owned by Plaintiff on or before April 17, 2020, the claimed effective filing date of the '327 patent. (D.I. 425 at ¶¶ 13-14; D.I. 432 at ¶ 22).

Defendant's proposed findings on this question are succinct. Defendant argues that Plaintiff did not prove common ownership of the '793 and '327 patents at trial, because "[n]o inventors of the '793 patent testified at trial" to that effect. (D.I. 425 at ¶ 15). Dr. Smith and Dr. Deng, inventors of the '327 patent, did testify at trial, but, according to Defendant, their "testimony did not address ownership of patents or any obligation to assign patents to [Plaintiff]." (*Id.*). Similarly, "[Plaintiff's] patent prosecution counsel, [Mr.] Maebius . . . [and Plaintiff's] VP and associate general counsel of intellectual property, [Mr.] Snader, testified at trial . . . [but their] testimony did not address [Plaintiff's] ownership of patents or any obligations that inventors may have had to assign patents to [Plaintiff]." (*Id.* at ¶ 16).

Plaintiff responds by pointing to testimony given by Dr. Byrd[10] at trial. The following passage is illustrative.

> Q. Can you identify the patents that [Plaintiff] has listed in the *Orange Book* for Tyvaso?
> A. I can. Would you like me to read them?
> Q. Please.

[10] Dr. Byrd is Plaintiff's "vice president of global regulatory affairs." (Tr. at 29:16-17). At trial, there was no objection on any basis to any of his testimony.

> A. 10,376,525; 10,716,793 [the '793 patent]; 1,172,387; 11,826,327 [the '327 patent]; 9,339,507; 9,358,240; 9,593,066; 9,604,901.
> Q. Does [Plaintiff] currently own all the patents listed on the slide?
> A. Yes.
> Q. Has [Plaintiff] always owned the issued patents listed on the slide from the date each one was first filed?
> A. Yes.

(Tr. at 36:13-24).

The '793 patent was filed on January 31, 2020. The '327 patent was filed on April 16, 2021, though the patent notes that the related provisional application No. 63/011,810 ("'810 provisional application") was filed on April 17, 2020. The '810 provisional application identifies Plaintiff as the assignee. (DTX0375.0043).

Defendant notes in response:

> [Dr. Byrd's] testimony relates [only] to ownership as of April 16, 2021 . . . a year after the April 17, 2020 filing date of the '810 provisional application. . . . Dr. Byrd was never asked about ownership as of the '810 provisional application's filing date. Nor was he asked about ownership as of any "issued patent['s]" *effective* filing date. . . . Thus, even if the filing he was referencing was the filing that led to the issuance of the patent, "issued patents" would have been "first filed" on the date for the non-provisional applications.

(D.I. 424 at 7).

This "first filed" date would thus have been April 16, 2021 for the '327 patent. (*Id.*). I don't give Defendant's argument much weight, however, because the '810 provisional application lists Plaintiff as the assignee. (DTX0375.0043). Regardless of whatever Dr. Byrd testified (or failed to testify to), the '810 provisional application establishes Plaintiff's ownership as of April 17, 2020.

I find that Plaintiff owned the '793 patent since January 31, 2020. I find that the '810 provisional application was assigned to Plaintiff on April 17, 2020, and that Plaintiff owned the

'810 provisional application and related '327 patent from at least that date. I find that the effective priority date of the '327 patent is April 17, 2020.[11]

For the reasons laid out below in my section on Conclusions of Law, I find that the '793 patent is not prior art to the '327 patent. As such, I do not consider the '793 patent as part of any obviousness combination.

ii. The State of the Prior Art

Plaintiff and Defendant first dispute what a POSA would have understood the state of the prior art would have been at the time of the publication of the results of the *Faria-Urbina* study.

The parties' proposed definitions of a POSA, as described in the pretrial order, are essentially the same.[12]

Plaintiff's proposed definition reads,

> The person of ordinary skill in the art . . . to which the '327 patent is directed, would have a graduate degree in medicine or a field relating to drug development, such as an M.D. or a Ph.D., with at least two years' experience treating patients with interstitial lung disease . . . including with PH-ILD. The POSA would be part of—and would consult with—a collaborative team, including with, e.g., a biostatistician and/or others having substantial experience with clinical trial design and interpretation.

(D.I. 334-1, Ex. 2 ¶¶ 56-57).

Defendant's proposed definition reads,

> A POSA would have a medical degree with a specialty in pulmonology or cardiology, plus at least two years of experience treating patients with PH as an attending, including PH associated with ILD and including with inhaled therapies, or equivalent degree or experience.

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[11] To be clear, Defendant concedes that the '327 patent has an "April 2020 priority date." (D.I. 424 at 5). Plaintiff agrees. (*See* D.I. 398 at 7).

[12] I adopted the proposed pretrial order, subject to any modifications pursuant to discussions held at the pretrial conference. (D.I. 363). The definition of a POSA was not discussed at the pretrial conference.

(D.I. 334-1, Ex. 3 ¶ 91).

These definitions are similar enough, such that, regardless of which one I adopt, the results of my findings of fact will remain the same.[13]

First, Defendant argues that the state of the prior art indicates a "[d]ecade-long successful off-label use of Tyvaso in PH-ILD." (D.I. 425 at 10). "POSAs were treating PH-ILD patients with Tyvaso soon after its approval for PAH in 2009. [D.I. 425 at ¶¶ 117-122]. These POSAs . . . includ[ed] Drs. Waxman, Tapson, Channick, Hill, and Rajeev and Rajan Saggar." (*Id.* at ¶ 36). In the relevant paragraphs of Defendant's proposed finding of facts (*id.* at ¶¶ 117-122), Defendant merely suggests, "Drs. Hill, Waxman, Tapson, Saggar, and Channick all prescribed Tyvaso" for PH-ILD. (*Id.* at ¶ 122). I accept Defendant's claim that at least five, and possibly six doctors, were treating PH-ILD using Tyvaso. To the extent that Defendant appears to be suggesting that more than these five or, at most, six doctors were treating PH-ILD with off-label use of Tyvaso, I do not think that has been proven. Moreover, I find that the five doctors all possess skill in the art far beyond the level of skill and experience that either party's proposed conception of a POSA should be expected to possess.[14] "[A] POSA is 'presumed to be one who thinks along the line of

[13] The parties do not propose any additional findings of fact arguing which definition of the POSA I should adopt, nor do the parties suggest that the slight differences between the proposed definitions are at all material.

[14] Dr. Channick was the director of medicine at UCLA, had treated "thousands" of PH-ILD patients over a career spanning 35 years, published over 200 articles on PH and PH-ILD, and participated in over 100 clinical trials, including 12 involving PH-ILD alone. (Tr. 166:16-170:16). Dr. Rajan Saggar was the director of the pulmonary hypertension program at UCLA and oversaw a program treating approximately 1500 patients suffering from PH Groups 1 to 5, including PH-ILD. (Tr. 253:23-255:12). Dr. Tapson moved from Duke Medical Center to Cedars-Sinai in 2014 specifically to start its program in pulmonary hypertension. (Tr. 324:14-325:4). Dr. Hill testified that he had been treating PH-ILD patients for approximately 45 years and served as the chief of the division of pulmonary critical care and sleep at Tufts from 2002 to 2023; by the time of trial, he was serving as the director of Tufts's pulmonary research and the pulmonary hypertension center. (Tr. 587:12-588:5). Dr. Waxman's 2018 CV reveals that he received a PhD in 1987 from Albany Medical College and an MD in 1992 from Yale University

conventional wisdom in the art and is not one who undertakes to innovate, whether by . . . research or by extraordinary insights.'" *Onyx Therapeutics, Inc. v. Cipla Limited*, 613 F.Supp.3d 817, 850 (D. Del. 2020) (citing *Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985)). Thus, while the five doctors meet the definition of a POSA, their real-life activities are not meaningful evidence that a POSA would have thought to treat PH-ILD with Tyvaso off-label before April 2020.

Second, Plaintiff and Defendant dispute the extent to which a POSA would have considered using a Group 1 pulmonary arterial hypertension (PAH) drug to treat Group 3 PH-ILD in light of the prior state of the art. Plaintiff argues, "Prior to April 2020, six double-blind, multicenter, placebo-controlled, randomized trials investigating the safety and efficacy of Group 1 pulmonary vasodilators in PH-ILD failed, creating 'widespread skepticism' and discouraging the use of PAH drugs" to treat PH-ILD. (D.I. 432 at ¶ 26). A presentation given by Dr. Rahagi, a member of Defendant's PH-ILD Advisory Board, described the state of the field before INCREASE as follows: "None of this stuff [oral PAH treatments for PH-ILD] really worked, and so this created a kind of nihilism on the part of the community of ILD physicians." (PTX-0250.00007;).

This atmosphere of general skepticism among PH-ILD physicians is supported by the available literature describing the discouraging results of drug trials employing PAH therapies to treat PH-ILD. To give one example, the *Hoeper* study describes using Riociguat[15] to treat PH-

School of Medicine. (DTX0297.0001). He worked as an Associate Physician at Brigham and Women's Hospital since 2009, served as Director of Massachusetts General Hospital's Pulmonary Vascular Disease Program from 2005 to 2009, and served as Director of Brigham and Women's Hospital's Pulmonary Vascular Disease Program since 2009. (DTX0297.0002).

[15] Riociguat is a drug "approved for Group 1 and Group 4 pulmonary hypertension." (Tr. 781:9-10).

ILD patients; the study concluded "[R]iociguat appears to be well tolerated by the majority of patients with PH-ILD. It is associated with a substantial increase in cardiac output . . . and may have the potential to improve exercise capacity in some patients." (PTX-0436.00008). A few years later, Dr. Nathan's RISE-IIP study, which characterized *Hoeper* as the motivating "pilot study", was published. (PTX-0141.00002, PTX-0141.00010 at n. 28). RISE-IIP sought to examine the effects of treating PH-ILD[16] patients with Riociguat on a larger scale, but the "study was terminated early . . . owing to increased serious adverse events . . . and mortality in patients receiving [R]iociguat, and the absence of efficacy signals in the [R]iociguat group." (PTX-0141.00001).

Failed studies, such as RISE-IIP, prompted commentary within the field such as the following: "Considering the track record of vasoactive[17] agents approved . . . [for PAH] that have been evaluated in clinical trials for [PH-ILD], one could suggest that if a clinician is tempted to treat such a patient with a vasoactive agent, Hippocrates' advice, 'First do no harm,' should come to mind." (PTX-0768.00002). Another paper analyzing RISE-IIP and other similar studies noted that the use of "PAH-specific therapy in WHO Group III PH patients is controversial," (PTX-0783.00001) and asserted that "the recent premature termination of the RISE-IIP trial . . . further raises safety concerns for use of PAH-specific therapy in ILD-PH." (PTX-0783.00007).[18]

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[16] Specifically, the study population consisted of "PH-ILD patients with . . . IIP [idiopathic interstitial pneumonia]." (Tr. 781:1-6).

[17] Treprostinil is a vasoactive agent. "Treprostinil is a stable analogue of prostacyclin, which promotes direct vasodilation of pulmonary and systemic arterial vascular beds and inhibits platelet aggregation." ('327 patent at 27:33-36).

[18] Though I have focused on studies analyzing unsuccessful trials of one just one drug, Riociguat, in treating PH-ILD, I note separately that studies of other PAH drugs in treating PH-ILD (or a subtype of PH-ILD, idiopathic interstitial pneumonia (*see* D.I. 425 at ¶ 170)) led to similarly inconclusive or negative results. (*See* PTX-0139 (Sildenafil), PTX-0414 (Bosentan), PTX-0418 (Iloprost), PTX-0447 (Ambrisentan)).

Dr. Wertheim testified that RISE-IIP "was yet another example of failure. It was preceded by a[] . . . pilot study that looked promising, and it led to a lot of nihilism in the field." (Tr. 781:21-24). In light of the prior art, I think a POSA would be extremely hesitant to use iTre off-label to treat PH-ILD.

Defendant's attempt to paint a rosier picture of the prior state of the art does not convince me otherwise. Defendant characterizes the art prior to April 2020 as primarily consisting of "*Agarwal*, *Parikh*, and Dr. Waxman's public John Vane presentation, which all confirm the actual treatment of PH-ILD patients with Tyvaso and support a motivation and reasonable expectation of success with respect to claim 1." (D.I. 425 at ¶ 38).

"*Agarwal* is an abstract" of a presentation given publicly in 2015. (*Id.* at ¶ 39; DTX0161.0008) (bolding removed). As it is an abstract, it is very concise, taking up only approximately one-fourth of a page. It examines "35 WHO Group-3PH [patients] treated with iTre for 6 months," notes that they appeared to experience various positive results from this treatment, and concludes, "Inhaled Treprostinil may offer a well-tolerated treatment in advanced lung disease patients complicated by pulmonary vascular remodeling. A prospective clinical trial is indicated." (DTX0161.0008). Defendant itself characterizes *Agarwal* as, at most, a pilot study. (*See* D.I. 425 at ¶¶ 49, 55). As noted previously, *Hoeper* (PTX-0436), first published online in 2012, was the pilot study for RISE-IIP, which ultimately had to be terminated out of concerns arising from adverse effects among the study population. *Hoeper* studied Riociguat, a drug which, like Treprostinil, was at this time approved for PAH and was being investigated for possible use in treating PH-ILD. In light of the ultimate failure of Riociguat for these purposes, I do not think that a POSA would put much faith in seemingly promising results in a pilot study. Given the paucity of evidence or analysis laid out in *Agarwal*, and in light of Defendant's own

admission that it constitutes results from a "pilot study", I do not think that it would have much impact on a POSA's confidence in treating PH-ILD with iTre.

Parikh is even less convincing. This study, entitled "Safety and Tolerability of High-dose Inhaled Treprostinil in Pulmonary Hypertension," was designed to "determine the safety and tolerability of inhaled treprostinil . . . titrated to [a] target maintenance dose higher than the labeled dose for PAH." (DTX0051.0001). The study thus does not appear to have been designed to study the safety and efficacy of iTre in relation to PH-ILD patients in particular. Out of a study population of 80 individuals, 41 of them, a slight majority, suffered from Group 1 PAH. (DTX0051.0002-0003). Only 25 Group 3 sufferers were included within the study, and only 6 out of these 25 were identified as suffering from PH-ILD. (DTX0051.0003).

Parikh reported two follow-up visits for the study population, at which adverse effects and efficacy parameters in response to high-dose iTre administration were logged. (DTX0051.0002-0003). One of these efficacy parameters involved tracking exercise capacity by performing a 6MWD (six-minute walk distance) test. (DTX0051.0003). Of the original population of 80 subjects, only 49 subjects were available for the initial follow-up, and this number shrunk down to 39 at the time of the second follow-up. (*Id.*). As Dr. Tapson, one of the study's authors, testified, there was no indication in *Parikh* whether any of the subjects who performed the 6MWD test (at least in the second follow-up) actually suffered from PH-ILD. (Tr. 349:18-20). The paper itself contains no disaggregated data indicating that any subject with PH-ILD performed the 6MWD test even at the first follow-up.

Defendant makes much of the following of *Parikh*'s conclusions: "[W]e report a favorable safety and tolerability profile among PH WHO group 3 patients . . . and iTre may provide benefit in this patient population." (D.I. 425 at ¶ 45, DTX0051.0004). Defendant reads

too much into this statement. Of the 25 Group 3 subjects in this study, 13 suffered from "obstructive disease," 6 from "mixed pattern," and only 6 from "[ILD]/Fibrosis." Without disaggregation of the data, I think it would be unclear for a POSA reading this study to determine whether the commentary concerning "safety" and "tolerability" concerning Group 3 patients specifically referred to PH-ILD patients, and much less as to whether subjects in this particular subpopulation had even experienced an improvement in exercise capacity. *Parikh* simply would not have moved the needle.

Finally, Defendant points to a 2017 presentation given by Dr. Waxman, entitled "Is there a therapeutic opportunity for prostacyclins in patients with pulmonary hypertension secondary to primary pulmonary disease?" (DTX0140.0001). Defendant emphasizes the following line in this presentation, "[P]athways that are active in patients with PAH [Group 1] are also active in patients with Group 3 and even Group 2 and Group 4 and even Group 5." (*Id.* at 3:20-22). At trial, Dr. Waxman testified that he meant by this statement, "if we have a drug that works in one form, we should be able to repurpose it to another." (Tr. 382:22-23).

I assume a POSA would have understood Dr. Waxman's remarks the way he intended them. They do not, however, present even a hint to a POSA that iTre specifically, a PAH-approved drug, would have been safe or efficacious in improving exercise capacity among PH-ILD patients. By April 2020, numerous studies had already been conducted on a series of PAH drugs to determine their safety and efficacy in treating Group 3 PH-ILD (or a subset of it, IIP), and all these studies had ended inconclusively or in failure. (*See* PTX-0139 (Sildenafil), PTX-0141 (Riociguat), PTX-0414 (Bosentan), PTX-0418 (Iloprost), PTX-0447 (Ambrisentan)). I don't think that a statement expressing the theory that a PAH therapy could be repurposed to treat PH-ILD would have, by itself, been groundbreaking at this time, a fact to which the bevy of

studies attempting to investigate PAH therapies for that purpose can attest. Without specific results, and in light of much of the evidence to the contrary, a POSA would not at all be convinced by Dr. Waxman's presentation to consider using iTre to treat PH-ILD with anything approaching a reasonable expectation of success.

In consideration of the above, I find that the state of the art would have discouraged a POSA from using iTre to treat PH-ILD.

iii. Faria-Urbina

Defendant's obviousness challenge to claims 1 and 14 depends solely on *Faria-Urbina*. (DTX0518).[19] *Faria-Urbina* is a "retrospective study [presenting] data from 22 patients with PH associated with lung disease treated with inhaled treprostinil [] and followed up clinically for at least 3 months." (DTX0518.0001). The patients in the study "received iTre at 3 breaths (18[mcg]) four times daily (72 [mcg]/day)." (DTX0518.0002). The results showed an "improve[ment] . . . [in] 6MWT [six minute walk test] distance, without deleterious effects on resting SpO_2." (DTX0518.0006). These results are supposed to "suggest that iTre is safe in patients with Group 3 PH . . . [and is] well-tolerated." (*Id.*). Nevertheless, the study cautions, "The potential role of PH-specific drugs in Group 3 PH should be further assessed in larger prospective studies." (*Id.*). At base, Plaintiff and Defendant disagree about whether a POSA would have thought it was possible to draw any meaningful conclusions from *Faria-Urbina*.

Plaintiff says that a POSA would find the following major problems in *Faria-Urbina*. First, it "does not provide enough information to verify which patients (if any) had PH at least in part due to ILD. . . . Some patients [in the study] may properly be classified [as] Group 1 PAH

[19] Defendant only refers to *Saggar 2014* in relation to its obviousness arguments for claims 5, 6, and 9. (D.I. 424 at 17-20). As I have already found that the additional limitations in these claims are not entitled to patentable weight, I do not need to consider *Saggar 2014*.

patients under guidelines governing as of the priority date." (D.I. 432 at ¶ 34). Second, "All functional data in *Faria-Urbina* . . . were reported on a population (or sub-population) basis, and individualized data is only provided for three patients, so the POSA is unable to discern the impact of inhaled treprostinil on the PH-ILD patient population." (*Id.* at ¶ 36). Third, it "reported reductions in both [forced vital capacity] and SpO_2 [pulse oxygen saturation], demonstrating potential harm." (*Id.* at ¶ 37). Finally, its "dataset is too small to draw meaningful conclusions and the paper concludes that its hypothesis 'should be further assessed in larger prospective studies.'" (*Id.* at ¶ 38).

Defendant contends, "Of the 22 Group 3 PH patients [identified in the study], 9 were identified as PH-ILD, and 5 were identified as PH-CPFE—a subtype of PH-ILD." (D.I. 425 at ¶ 21). Defendant argues that I should disregard Dr. Nathan's testimony given at trial attempting to discredit *Faria-Urbina*, given that this study "provided the rationale for INCREASE." (*Id.* at ¶ 27). Defendant also responds directly to Plaintiff's critiques of *Faria-Urbina*'s reliability, noting:

> [Plaintiff's claim that the study's] dataset is "too small" and obscures disease-specific effects . . . highlights [Plaintiff's] improper "predictive" requirement for obviousness and is incorrect because the Asserted Claims do not require *all* patients to experience the claimed improvements—only "one or more." *Faria-Urbina* shows unequivocally that one or more PH-ILD patients improved their exercise capacity after Tyvaso treatment.

(D.I. 435 at 5).

Defendant reiterates that *Faria-Urbina* should be credited, because one of Plaintiff's own witnesses "admitted that [*Faria-Urbina*] was the rationale for INCREASE." (*Id.* at 6).

I find Defendant's lack of a good response to many of Plaintiff's criticisms of *Faria-Urbina* telling. For example, Defendant admits that of the 22 subjects studied in *Faria-Urbina*, only 14 of them were identified as suffering from PH-ILD. (D.I. 425 at ¶ 21). In response to the

fact that the dataset includes only 22 subjects in all, Defendant simply argues that *Faria-Urbina* nevertheless shows that "one or more" patients improved their exercise capacity after Tyvaso treatment. I think Defendant misses the point. Although it is true that I construed the term, "a" or "the" in the phrases "a patient" or "the patient" to mean "one or more" in the '327 patent (D.I. 155), my claim construction has no bearing on the degree of reliability of data that a POSA might attribute to a study such as *Faria-Urbina*. Defendant's point, driven to its logical conclusion, would seem to imply that if even a single patient out of a population of some arbitrarily large number of patients were to improve their exercise capacity in a given study, that given study would then be deemed sufficiently reliable by a POSA so as to render the '327 patent obvious. Such a conclusion is untenable.

Moreover, arguments in favor of the reliability that a POSA would accord *Faria-Urbina* strain credulity, given that *Faria-Urbina* disclosed potential negative side effects as a result of iTre administration to PH-ILD patients. For instance, Dr. Thisted testified that after application of iTre, "in *Faria-Urbina*, the forced vital capacity measure actually did not improve. It got worse for the patients *Faria-Urbina* reported on." (Tr. at 750:22-24). Dr. Nathan agreed: interpreting the results of the study (DTX0518.0005), he noted that it showed that of the 16 subjects who underwent pulmonary function testing, their "FVC [] went down from 67 to 59 percent predicted" (Tr. at 843:9-10) and that of the 11 patients who underwent 6 minute walk testing, the subjects' SpO_2 "went from 82 to 76[,] . . . a 6 percent drop."[20] (*Id.* at 845:5-6).

[20] As previously noted, *Faria-Urbina* concluded that iTre caused no "deleterious effects on resting SpO_2." (DTX0518.0006). Earlier, the study characterized iTre as causing "no significant changes in resting SpO_2." (DTX0518.0004). Another paragraph of the study describes iTre as causing no "significant deleterious effect on SpO_2." (DTX0518.0006). Dr. Nathan's testimony that the subjects' SpO_2 nevertheless decreased by six percent following iTre administration is supported by the data that *Faria-Urbina* discloses. (DTX0518.0005). Dr. Nathan testified that a POSA would react to this six percent decline by concluding as follows: "Oh, gosh, maybe they

I note too that *Faria-Urbina* began with an initial population of 61 subjects with lung disease, of which 39 were excluded from the study, resulting in the ultimate dataset of 22 subjects. (DTX0518.0003). This winnowing occurred because, as Dr. Nathan testified, the 39 excluded patients "required hospitalization. They required lung transplant. They required more therapy, so it's quite obvious they were not doing well." (Tr. at 840:16-18). As such, a POSA looking at the *Faria-Urbina* study would be unable to draw "a meaningful conclusion because the final 22 analysis group is like saying if you take out all the patients who did poorly, you might have a subgroup of patients who might respond" well to iTre. (Tr. at 840:22-25). A POSA looking at this refined set of 22 subjects simply wouldn't be able to draw a confident conclusion from the available data; as Dr. Nathan further testified, "we had all those patients drop out, patients who were hospitalized, patients who needed more medications. We don't know why those patients were hospitalized, if it was an adverse event from the inhaled treprostinil." (Tr. at 846:15-19). I credit Dr. Nathan's testimony; even if all 22 of the final subjects had actually shown uniformly positive results, I think a POSA would be hesitant to rely upon a data set that had been attained after a certain degree of selection bias.

Finally, I note that *Faria-Urbina* couched the results of its study in careful language, noting, "The potential role of inhaled PH-specific drugs should be further assessed in larger prospective studies. Until then, its use in Group 3 PH should be cautiously evaluated in specialized PH Centers, after an individualized assessment and risk-benefit consideration." (DTX0518.0006). Given this language, I credit Dr. Nathan's testimony that "the results are

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walked a little further, but, gosh, their oxygen level went down. So I'm really not sure if we're doing anything. And, you know, you'd be worried about things like we discussed them before, ventilation, perfusion, mismatch." (Tr. at 846:1-5).I hesitate to think that a POSA would find *Faria-Urbina*'s contradictory characterizations of the effects of iTre on SpO_2 convincing.

hypothesis-generating at best." (Tr. at 853:17-18). Defendant argues that "even hypothesis-generating results confirm the '327 patent invention was ready for patenting, as they indicate that the treatment produced positive results that lay the foundation for further research." (D.I. 425 at ¶ 132). I don't think it likely that a POSA would be motivated to treat PH-ILD with iTre on account of "hypothesis-generating results" that merely "lay the foundation for further research" or have a reasonable expectation of success from this "further research." This is especially the case, given the preexisting state of the field with prior failed trials involving the use of PAH drugs to treat PH-ILD, some of which needed to be terminated prematurely as a result of adverse effects in the studied population. (*See*, *e.g.*, PTX-0436).

Faria-Urbina disclosed the dosage amount of iTre and suggested that subjects who had received this dose experienced a measurable improvement in exercise capacity, as shown in an increase their 6 minute walk distance and their WHO functional class.[21] (DTX0518.0006). Given the numerous shortcomings with the study, however, and in consideration of the unpromising state of the prior art at the time of publication, I find that a POSA would not rely upon *Faria-Urbina*, absent further research or more solid evidence, to form a reasonable expectation of success in administering iTre to treat PH-ILD.

b. Conclusions of Law

i. Whether the 35 U.S.C. § 102(b)(2)(C) exception applies to the '793 patent

Plaintiff and Defendant both agree that the '793 patent is prior art to the '327 patent under § 102(a)(2) absent any salient exception. (D.I. 424 at 4; D.I. 431 at 6-7). The only possible

[21] "[F]unctional class" is a scale "which describes from 1 to 4 how limited [a patients'] functioning is." (Tr. 188:22-23). It constitutes "another means [one] can use to determine exercise capacity." (Tr. 189:12-13).

exception is the common ownership exception of § 102(b)(2)(C).[22] The parties dispute whether it applies.

As an initial matter, the parties dispute what the relevant burden of production is. Defendant argues, "Once [Defendant] showed that the '793 patent qualified as prior art under §102(a)(2), the burden shifted to [Plaintiff] to show the §102(b)(2)(C) exception applied." (D.I. 424 at 4). Plaintiff protests that Defendant's arguments "hinge on unfair burden shifting. It is [Defendant's] burden to prove invalidity by clear and convincing evidence, including [that] the references it relies on constitute prior art under § 102. Thus, it was [Defendant's] burden to demonstrate that the '793 patent is prior art and that no exceptions apply, e.g., that there was no common ownership." (D.I. 431 at 7). In the alternative, Plaintiff argues, "even if [Plaintiff] had the burden of invoking § 102(b)(2)(C), it clearly did so with unrebutted evidence." (*Id.*). For the reasons that follow, I agree with Plaintiff's alternative argument. Thus, I will analyze the common ownership topic as though Plaintiff had the burden of production. I find that Plaintiff introduced sufficient evidence to meet this burden.

In order for the common ownership exception to apply, Plaintiff must show that both patents, "not later than the effective filing date of the claimed invention, were owned by the same person or subject to an obligation of assignment to the same person." 35 U.S.C. § 102 (b)(2)(C). Defendant argues that Plaintiff "offered no evidence establishing that any inventor was 'subject to an obligation' to assign any rights in the '793 or '327 patents prior to the effective filing date of the '327 patent." (D.I. 424 at 5). Plaintiff does not appear to contest this claim. (*See* D.I. 431

[22] Section 102(b)(2)(C) reads:

> (2) A disclosure shall not be prior art to a claimed invention under subsection (a)(2) if—
>
> (C) the subject matter disclosed and the claimed invention, not later than the effective filing date of the claimed invention, were owned by the same person or subject to an obligation of assignment to the same person.

at 6-9). The only remaining relevant question is therefore whether Plaintiff "owned both the '793 and the '327 patent since at least the effective filing date of the '327 patent" such that the common ownership exception would apply. (D.I. 431 at 6).

Plaintiff produced evidence through the testimony of Dr. Byrd and introduction of the provisional application for the '327 patent that it owned both the '793 patent and the '327 patent as of the '327 patent's effective filing date of April 17, 2020. As explained below, Defendant's various arguments that Plaintiff failed to meet this burden of production do not convince me otherwise.[23]

Defendant argues five reasons why Plaintiff did not meet its minimal burden as to common ownership. First, Defendant argues that Dr. Byrd's testimony had "no weight on the (b)(2)(C) exception, as [Dr. Byrd] never testified that (1) he spoke to anyone at [Plaintiff] regarding patent ownership; (2) reviewed any documents other than the Orange Book; or (3) had any basis for knowing whether the patents were assigned to [Plaintiff] prior to April 17, 2020." (D.I. 424 at 6). As Plaintiff notes, however, "Defendant chose not to cross-examine [Dr. Byrd] on any of the points it now attacks. . . . Dr. Byrd testified to those facts without objection, and [Defendant] declined to cross-examine him on them." (D.I. 431 at 7). Plaintiff is correct; Defendant has not pointed to any place within the trial transcripts showing that Defendant developed these arguments against Dr. Byrd on cross-examination. There was no evidentiary objection to any of his testimony. Dr. Byrd's testimony on the (b)(2)(C) exception went

[23] "[T]he burden of production . . . is defined as the necessity of making a *prima facie* showing. . . . Therefore the burden of production requires a party [only] to *produce* evidence regarding a fact." *Greenwich Collieries v. Dir., Off. of Workers' Comp. Programs*, 990 F.2d 730, 734 (3d Cir. 1993).

unrebutted at trial. Defendant did nothing at trial to undermine the credibility of Dr. Byrd's testimony. The post-trial arguments are unimpressive. I reject them.

Second, Defendant makes the linguistic argument that Dr. Byrd's testimony as to when the patents were "first filed" is unavailing to Plaintiff, because "[i]ssued patents are not 'filed' with the PTO, but they are 'filed' for listing in the Orange Book. . . . [Dr. Byrd's] testimony can only be interpreted to mean that [Plaintiff] owned the '793 and '327 patents . . . from the time they were 'first filed' in the Orange Book." (D.I. 424 at 6). This is a bad argument. The '793 patent identifies it as having been "filed" on January 31, 2020; the '393 patent identifies it as having been "filed" on April 16, 2021, with the '810 provisional application having been "filed" on April 17, 2020. If Defendant thought that Dr. Byrd's supposedly imprecise use of the language, "first filed," undermined his testimony, in that his use of this term implied that Plaintiff owned these patents only from the date they were first filed in the Orange Book, Defendant was free to develop that line of attack or seek clarification on cross-examination. That Defendant made a strategic decision not to do so is telling. I regard Dr. Bryd's testimony as stating that Plaintiff owned the patents since the dates they were identified to have been filed, as identified on the first page of the '793 and '327 patents.

Third, Defendant argues in a single sentence, "Dr. Byrd did not testify as to any specific date that any particular patent was 'first filed' with either the FDA or the PTO." (*Id.*). I regard this argument as similar enough in spirit to Defendant's second argument discussed above that I reject it for much the same reason.

Fourth, Defendant argues, "Dr. Byrd's testimony critically failed to establish [Plaintiff] owned ***all*** of the rights to any patent, and the timing of any conveyance of ownership rights to [Plaintiff]." (*Id.*). Defendant notes that the Manual of Patent Examining Procedure ("MPEP")

requires that a patent owner, in order to invoke the common ownership exception, "must show that 'the person(s) or organization(s)/business entity(ies) own 100 percent of the subject matter and 100 percent of the claimed invention.'" (*Id.* at 7 (quoting MPEP at 717.02(a))). For similar reasons to those I recited in rejecting Defendant's second argument, I am not persuaded by Defendant's cursory attack on Dr. Byrd's testimony. Defendant was free to challenge Dr. Byrd's testimony on cross-examination during trial, and Defendant did not elect to do so. Dr. Byrd's testimony was that Plaintiff owned the relevant patents from the time they were first filed. The '810 provisional application lists Plaintiff as the assignee and no other entity. (DTX0375.0043). As I indicated in my findings of fact, the best understanding of the evidence is that Plaintiff in fact 100% owned the subject matter and the claimed invention from April 27, 2020. I do not see any reason why I should now consider the argument that maybe Plaintiff was not the 100 percent the owner of the subject matter and claimed invention.

Finally, Defendant argues

> Dr. Byrd was never asked about ownership as of the '810 provisional application's filing date. Nor was he asked about ownership as of any "issued patent['s]" *effective* filing date. He was only asked about ownership as of "issued patents" being "first filed." Thus, even if the filing he was referencing was the filing that led to the issuance of the patent, "issued patents" would have been "first filed" on the date for the non-provisional applications.

(D.I. 424 at 7).

To the extent Defendant argues that Plaintiff failed to show that Plaintiff owned the '810 provisional application and subsequent '327 patent, I dismiss this argument for the same reason I have already dismissed such similar arguments: namely, the '810 provisional application lists Plaintiff as the assignee and no other entity. (DTX0375.0043). To the extent that Defendant seeks to undermine Dr. Byrd's testimony by arguing that his testimony only established that Plaintiff owned the patent as of the actual filing date of the '327 patent, namely, on April 16,

2021, I find myself once again agreeing with Plaintiff that Defendant's "failure to challenge the evidence at trial is fatal to its *post hoc* argument." (D.I. 431 at 9). Defendant could have developed this challenge in cross examination; it did not.

Defendant gestures toward two IPR PTAB decisions, *Pasteur Inc v. Pfizer Inc.*, IPR2018-00188, Paper 10 at 13-14 (PTAB June 5, 2018) and *US Conec Ltd. v. Senko Advanced Components, Inc.*, IPR 2024-00119, Paper 9 at 34-38 (PTAB July 9, 2024), in a final bid to convince me that Dr. Byrd's testimony and the assignment of the '810 provisional application constitute insufficient evidence for the common ownership exception, in the absence of some further evidence of assignment documents or agreements. (D.I. 424 at 7-8). Plaintiff characterizes Defendant's cited PTAB decisions as follows, "[N]either PTAB decision cited by [Defendant] . . . stands for the proposition that assignment documents are *required* to invoke the [common ownership] exception." (D.I. 431 at 8-9). This is, I think, a correct characterization. Defendant's two cited decisions only speak to the *sufficiency* of "assignment agreements and patent office assignment records" or "executed assignments, proof of assignment recordation with [the] PTO, and agreements evidencing obligation to assign patent rights" as evidence for establishing common ownership. (D.I. 424 at 8). I see nothing in these decisions that would imply that such evidence is *necessary* to invoke the common ownership exception.

Even assuming that Plaintiff had the initial burden of production, I find that Plaintiff has sufficiently met this burden to invoke the common ownership exception. I don't think Defendant has successfully challenged Plaintiff's evidence, as Defendant's challenge to the common ownership exception is based entirely on Plaintiff's supposed failure to meet its burden of production. Defendant does not argue that it has independently proved, by clear and convincing evidence, that the common ownership exception fails. *Rsch. Corp. Techs., Inc. v. Microsoft*

Corp., 627 F.3d 859, 870 (Fed. Cir. 2010). ("A patent is presumed valid and the party asserting invalidity has the burden of persuasion to show the contrary by clear and convincing evidence. The challenger has the burden of going forward with invalidating prior art.") (internal citation omitted). Thus, the '793 patent is not prior art and any obviousness combination relying upon it fails.

ii. Whether the '793 patent constitutes applicant admitted prior art

Defendant argues that, independently of the common ownership exception, "the '793 patent and its disclosure also qualify as applicant admitted prior art ("AAPA")." (D.I. 424 at 9). "AAPA is art referenced in a patent application that is admitted by the applicant to be prior art." *Shockwave Medical, Inc. v. Cardiovascular Sys., Inc.*, 142 F.4th 1371, 1378 (Fed. Cir. 2025).

As an initial matter, Plaintiff argues that Defendant waived this argument. (D.I. 431 at 9). Specifically, Plaintiff cites to the Proposed Pretrial Order (D.I. 335-1 at Ex. 5, ¶ 61) to argue that Defendant "admitted in the Pretrial Order that one of the 'issues of law remaining to be litigated' was whether Defendant had proven the '793 patent was *statutory* prior art under 35 U.S.C. § 102(a)." Plaintiff's reason for citing this paragraph of the pretrial order is opaque. This entire paragraph (with citations omitted) simply reads, "Whether [Defendant] has proven, by clear and convincing evidence, that the '327 patent['s] Asserted Claims are not entitled to their earliest claimed priority date of April 17, 2020." (*Id.*). The word "statutory" does not appear in the cited paragraph. I am not certain how this one line in the pretrial order shows that Defendant has waived its AAPA argument. In particular, I do not see any indication here that Defendant has confined its arguments solely to statutory prior art arguments under 35 U.S.C. § 102(a). I reject Plaintiff's waiver argument.

Plaintiff argues that AAPA is a "judge-made doctrine . . . [that] should not apply to patents issued under the [America Invents Act], where it is displaced by clear statutory" language. (D.I. 431 at 11-12). This is an interesting argument, but the Federal Circuit appears to have continued ruling as though AAPA were a valid doctrine. For example, the Federal Circuit recently held, in the context of review of an IPR, "We recently approved the role of AAPA as evidence of general background knowledge of an ordinarily skilled artisan." *Shockwave Medical*, 142 F.4th at 1378. At any rate, given that Plaintiff fails to cite any case from any court deciding AAPA is no longer a relevant doctrine, I am dubious of Plaintiff's argument. Since I agree with Plaintiff on the merits, I do not need to decide whether AAPA has been displaced by the AIA.

On the merits, Defendant argues that the "inventors [of the '327 patent] admitted in the . . . specification that 'pulsed inhalation devices are disclosed, for example, in . . . U.S. Patent No. . . . 10,716,793.'" (D.I. 424 at 9). Plaintiff responds, "[T]he '793 patent had not yet issued when the '810 provisional was filed on Apr. 17, 2020, but it had issued at the time the '327 patent specification was filed as part of a non-provisional application one year later on April 16, 2021. . . . In April 2021, a *present-tense* incorporation of the '793 patent conveys nothing about its prior art status for the '327 patent with a priority date of April 2020." (D.I. 431 at 10). I am persuaded by Plaintiff's argument. The '327 patent has an effective priority date of April 17, 2020. The '793 patent issued on July 21, 2020, which postdates the '327 patent's effective priority date. The fact that the '327 patent's application subsequently incorporated the '793 patent, following the '327 patent's effective priority date, does not persuade me that the '793 patent should be considered as AAPA.[24]

[24] I note that AAPA does not make much sense as overriding the common ownership exception to prior art.

Second, Defendant argues that Plaintiff's counsel, "[u]ntil the trial . . . repeatedly told the Court that the '793 patent was prior art to the '327 patent." (D.I. 424 at 10). Defendant points to various comments made by Plaintiff during the 2024 preliminary injunction hearing (D.I. 463) or to statements in briefing made in connection with the preliminary injunction hearing and argues that these comments constitute "binding judicial admission[s]." (D.I. 424 at 10). The case that Defendant cites to, however, expressly notes, "The District Court has *discretion* to treat a party's statement as a judicial admission and to bind the party to that admission." *Bedrosian v. United States Dep't of Treasury, IRS*, 42 F.4th 174, 184 (3d Cir. 2022) (emphasis added). I will exercise this discretion here to decline to treat Plaintiff's comments as binding judicial admissions, because, as Plaintiff helpfully notes (D.I. 431 at 11), I made clear at the pretrial conference my aversion to treating "anything that happens at [the] preliminary injunction [stage as the] law of the case because it's preliminary. It's subject to revision." (D.I. 380 at 57:23-25). That goes for counsel's remarks that may be offered with less than a complete understanding of all relevant facts. I denied the motion for a preliminary injunction (D.I. 96), so Plaintiff gained no advantage by its remarks.

Third, Defendant notes that Dr. Nathan previously testified that materials "[Plaintiff] withheld from the examiner were 'cumulative' to the '793 patent. . . . Cumulativeness is irrelevant if the '793 patent is not prior art." (D.I. 424 at 10). I don't think this testimony has any significance for present purposes. One, it was made by Dr. Nathan in his Declaration in support of Plaintiff's preliminary injunction. No one suggests that there was any reference to it at trial. Two, the statement's purported significance depends upon an inference from a legal principle. Dr. Nathan is not a lawyer. Three, I am not certain why Defendant argues that statements made by Dr. Nathan should be considered AAPA. "AAPA is art referenced in a patent application that

is admitted by the *applicant* to be prior art." *Shockwave Medical*, 142 F.4th at 1378 (emphasis added). Dr. Nathan was not the applicant for the '327 patent. For that reason alone, I don't think that his statements qualify as AAPA.

As I do not find that the '793 patent constitutes AAPA, and as Defendant has not shown that the common ownership exception is inapplicable, I find that the '793 patent is not prior art to the '327 patent. I will not consider the '793 patent in my obviousness analysis.

iii. Whether the '327 patent incorporates by reference WO2019/237028 and Patent No. 9,339,507 as prior art

Defendant argues that the '327 patent "incorporates by reference other prior art, including WO2019/237028 [and U.S. Patent No. 9,339,507] ["the '507 Patent"] . . . for their disclosures of making and using treprostinil dry powder formulations and [dry powder inhalers]." (D.I. 424 at 15). In Plaintiff's words, it appears that Defendant is attempting to "point[] to other prior art references that purportedly contain the same disclosures as the '793 patent" in the event that I find that the '793 patent does not constitute prior art to the '327 patent. (D.I. 431 at 12-13). If indeed this is what Defendant is attempting to do, I am not persuaded. "Obviousness is a mixed question of fact and law." *Apple Inc. v. Gesture Tech. Partners, LLC*, 127 F.4th 364, 368 (Fed. Cir. 2025). Defendant failed to develop any factual record regarding WO2019/237028 and barely developed any factual record regarding the '507 patent at trial. Of WO2019/237028, Plaintiff notes that it "is not even a trial exhibit." (D.I. 431 at 12). Defendant does not respond to this assertion in its reply brief. (D.I. 435). Similarly, Plaintiff states that Defendant did not "introduce the '507 patent into evidence until the cross examination of [Plaintiff's] final rebuttal expert, Dr. Nathan." (D.I. 431 at 13). I have reviewed the portion of the transcript where Defendant entered the '507 patent into evidence (Tr. at 896:22-898:17), and I agree with Plaintiff that the testimony elicited from Dr. Nathan here, consisting mostly of his repeated protestations that he had never

seen or reviewed the '507 patent before (Tr. at 897:3-4; *id.* at 897:21-22), is not helpful to Defendant. I think the following testimony given by Dr. Nathan on redirect speaks for itself:

> Q. And this is the '507 patent that [Defense Counsel] put in front of you; correct?
> A. Correct.
> Q. Have you ever seen this patent before today?
> A. I have not.
> Q. Did [Defense Counsel], after he put it up and moved it into evidence, ask you any questions about this patent?
> A. He didn't ask specific questions about the patent.
> Q. He just moved it into evidence and moved on; correct?
> A. Correct.

Tr. at 928:10-19.

I decline to consider the '507 patent and WO2019/237028 for one additional reason. I issued two oral orders on May 21 and May 22, 2025, limiting Defendant's invalidity defenses to no more than four, where one obviousness combination counts as one invalidity defense. (D.I. 317, 318). Pursuant to these oral orders, Defendant identified that it would assert obviousness "in view of a combination of *Faria-Urbina* 2018, U.S. Patent No. 10,716,793, and Saggar 2014." (D.I. 361). Defendant did not identify any obviousness defense that relied upon the '507 patent and/or WO2019/237028, and I decline to allow Defendant to make them part of an obviousness combination for the first time in Defendant's post-trial briefing.

iv. Whether *Faria-Urbina* renders claims 1 and 14 obvious[25]

A patent is invalid "if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains." 35 U.S.C. § 103. "Obviousness must be proved by clear and convincing

[25] Defendant proposed *Faria-Urbina* as an anticipatory reference, but before trial I struck that particular use of *Faria-Urbina* because that use had not been timely disclosed. (D.I. 346).

evidence. The burden of proof lies with the challenger[.]" *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1353 (Fed. Cir. 2013). "A party seeking to invalidate a patent as obvious must demonstrate 'by clear and convincing evidence that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success from doing so." *Bristol-Myers Squibb Co. v. Teva Pharms. USA, Inc.*, 752 F.3d 967, 973 (Fed. Cir. 2014) (internal citation omitted). Although "[o]bviousness does not require absolute predictability of success," it does require "that a person of ordinary skill in the art . . . [have] a reasonable expectation of success." *In re Droge*, 695 F.3d 1334, 1338 (Fed. Cir. 2012) (citing *In re Kubin*, 561 F.3d 1351, 1360 (Fed Cir. 2009)). "[I]t is appropriate to consider the knowledge, creativity, and common sense of a skilled artisan in an obviousness determination." *Fleming v. Cirrus Design Corp.*, 28 F.4th 1214, 1223 (Fed. Cir. 2022).

The state of the art before April 2020 was not very promising. Repeated attempts to treat PH-ILD using PAH-approved drugs routinely failed to produce positive results. *Faria-Urbina*, an uncontrolled retrospective study of the effects of administering iTre (then approved solely for PAH treatment) in PH-ILD patients, showed some promise. Due to the numerous limitations associated with this study, however, I think a POSA would be heavily disinclined from treating a PH-ILD patient with iTre absent a follow-up study, especially given that at least one initially promising attempt to treat PH-ILD with another PAH drug had, in the past, resulted in failure due to safety and efficacy concerns. Nor am I convinced by Defendant's argument that the fact that a handful of doctors of extraordinary skill had engaged in "[a] decade of successful off-label treatment" of PH-ILD using Tyvaso should weigh in favor of an obviousness finding. (D.I. 424 at 10). "[O]bviousness [must] be determined from the viewpoint of one of ordinary, not

extraordinary skill." *Rotron, Inc. v. U.S. Int'l Trade Comm'n*, 1988 WL 12108, *4 (Fed. Cir. 1998) (citing *Stewart-Warner Corp. v. City of Pontiac, Michigan*, 767 F.2d 1563, 1570 (Fed. Cir. 1985)).

For the reasons above, Defendant has failed to demonstrate by clear and convincing evidence that a POSA, on the basis of *Faria-Urbina*, in view of the prior art, would "have had a reasonable expectation of success" that administering iTre would have been effective in treating PH-ILD patients. *In re Droge*, 695 F.3d at 1338.

Claims 1 and 14 of the '327 are not obvious in light of the prior art. Defendant's sole argument as to the invalidity of claim 14 is that of obviousness. (*See* D.I. 424 at 15). Therefore, I find that claim 14 is not invalid.

3. Whether claim 1 is invalid as anticipated due to prior sale

A patent is invalid if "the claimed invention was . . . on sale . . . before the effective filing date of the claimed invention." 35 U.S.C. § 102(a)(1). An invention is "on sale" within the meaning of the statute "when it [is] the subject of a commercial offer for sale and [is] ready for patenting." *Helsinn Healthcare S.A. v. Teva Pharms. USA, Inc.*, 586 U.S. 123, 125 (2019).

For the reasons that follow, I find that claim 1 is not proven invalid as anticipated due to prior sale.

a. Findings of Fact

i. *Whether the claimed invention was commercially sold prior to April 2019*

Defendant argues that Tyvaso was used commercially to treat PH-ILD patients prior to April 2019.[26] Defendant submits testimony from various witnesses at trial, including Drs. Hill,

[26] April 2019 is the relevant date, because the effective priority date is April 17, 2020, and "no person is entitled to patent an invention that has been on sale more than one year before filing a

Waxman, Tapson, Saggar, and Channick, that these doctors were prescribing Tyvaso off-label to PH-ILD patients, sometimes beginning as early as in 2009. (Tr. at 595:18-597:20 (Dr. Hill); *id.* at 384:6-386:7 (Dr. Waxman); *id.* at 328:25-330:3 (Dr. Tapson); *id.* at 255:11-257:9 (Dr. Saggar); *id.* at 439:13-440:1 (Dr. Channick)). The witnesses testified that they would prescribe a dose of three breaths, four times a day, titrating up to a maximum dose of nine to twelve breaths, four times a day, where each breath would consist of six micrograms of iTre (Tr. at 286:10-16, 334:24-335:4, 378:5-379:11, 440:11-14, 593:8-13), consistent with the dosing in the 2009 Tyvaso label. (DTX 357.0003).

Plaintiff's sole argument in response to the above is as follows, "The prior art Tyvaso label provides that a patient's initial dosage may start at 1-2 breaths, delivering 6-12 [micrograms] of treprostinil." (D.I. 432 at ¶ 60). I understand Plaintiff to mean by this that the doctors who prescribed a dose of three breaths and then titrated upward did not, in fact, prescribe a dosage consistent with that called for by the 2009 Tyvaso label. Plaintiff's argument is undercut, however, by the plain language of the 2009 Tyvaso label, however, which reads, "Therapy should begin with 3 breaths of Tyvaso . . . per treatment session, 4 times daily. If 3 breaths are not tolerated, reduce to 1 or 2 breaths and subsequently increase to 3 breaths, as tolerated." (DTX0357.0003). Plaintiff's argument that a patient's "initial dosage" may start at 1-2 breaths is contrary to the plain language on the 2009 Tyvaso label itself.

As further evidence that Tyvaso was commercially used to treat PH-ILD patients, Defendant argues that insurers would cover Tyvaso prescriptions for PH-ILD prior to 2019. For example, Dr. Saggar testified that, six months after Tyvaso was first approved in 2009 for Group

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patent application (i.e., before the critical date)." *Sunoco Partners Mktg. & Terminals L.P. v. U.S. Venture, Inc.*, 32 F.4th 1161, 1168 (Fed. Cir. 2022) (internal citation omitted).

1 PAH, he was able to "get[] [Tyvaso] approved for payment by the insurance companies for use in PH-ILD patients." (Tr. at 268:21-25). Similarly, Dr. Hill testified that he was able to convince insurance companies, on appeal in face-to-face peer reviews, to obtain approval to treat PH-ILD using Tyvaso. (Tr. at 604:2-23). Dr. Waxman (Tr. at 381:13-20) gave similar testimony regarding patients securing insurance reimbursement for Tyvaso PH-ILD treatment.[27] Finally, Defendant points to remarks made by Dr. Rothblatt, Plaintiff's CEO, in Plaintiff's Q1 Earnings Call, calling attention to the "the kindness and generosity of certain payers around the country[,] who have gone ahead and upon the initiative of their physicians, were able to enable some WHO Group III patients to benefit" from Tyvaso. (DTX0003.0010).

In response, Plaintiff argues, "Communications with insurers confirmed that physicians prescribed Tyvaso before April 2019 for PAH, not PH-ILD." (D.I. 432 at ¶ 62). I find Plaintiff's citations to the record here generally unconvincing. For example, Plaintiff supports this contention with a citation to the following testimony elicited from Dr. Hill on cross-examination:

> Q. Yes. So let's say before April 2020. Every time that you prescribed Tyvaso, you checked the box on the insurance form saying it was for PAH; correct?
> A. I couldn't say it was every time, but -- first of all, there's been an evolution in how all these things get done. You know, we -- you know, these intermediaries are relatively new. So when I first started using Tyvaso in patients with PH-ILD, I would end up calling the peer at the insurance company to discuss what I was trying to do. And what I relayed to that individual was that the patient had precapillary PH, which is what you see in Group 1, and in general, I was treating people with more severe PH, moderate to severe, because I felt that was the

[27] Defendant proposes as a fact, "Dr. Tapson's nurses . . . facilitated and obtained insurance coverage for the Tyvaso prescribed to his PH-ILD patients." (D.I. 425 at ¶ 126). Dr. Tapson's trial testimony indicated that his nurses handled billing, but that he didn't really know the details. Dr. Tapson testified that his nurses "took care of all that [i.e., insurance coverage for Tyvaso]" and that he'd "assume[d] [his patients would] have to go through insurance to try to get it approved"; as to any difficulties getting payments approved, he testified that his "nurse . . . took care of that. . . . There might have been [difficulties], but I wouldn't know about it." (Tr. at 336:19-337:14). I am unconvinced that Dr. Tapson's testimony proves anything about insurance companies paying for treatment of PH-ILD patients with Tyvaso.

> population that would most likely respond. And I would make it clear to that individual that the patient had interstitial lung disease. So that, to me, is PH-ILD.

(Tr. at 650:20-651:12).

I don't think that this testimony at all "confirms" that physicians prescribed Tyvaso before April 2019 for PAH and not for PH-ILD, and I am unconvinced by Plaintiff's argument to that effect.

One problem for Plaintiff is that Plaintiff's CEO, Dr. Rothblatt, told a different story on Plaintiff's 2018 Q1 Earnings Call than the one Plaintiff now advances. I reproduce the relevant portions of these statements here in full.

> [S]tarting with the COPD and ILD[:] Treprostinil, Tyvaso, is not on label for patients with these indications. And as you would expect, it's not an inexpensive therapy, and payers don't just, like, blindly push the pay button on Tyvaso. . . . Having said that . . . through the kindness and generosity of certain payers around the country who have gone ahead and upon the initiative of their physicians, [we] were able to enable some WHO Group III patients to benefit [and] there were unmistakable signals [from] some of the leading physicians in this field. I called out one of them on the call, Dr. Waxman, but there are many others, who said to [Plaintiff] 'This drug works." In fact, they believe that this drug works even better in that indication [i.e., WHO Group III] than in the Group I indication in terms of, at least, the exercise ability that they saw in their patients.

(DTX0003.0010).

Plaintiff advances a series of arguments to try to downplay the importance of Dr. Rothblatt's statements.

First, Plaintiff argues, "Dr. [] Rothblatt is not a clinician; the POSA would not use treprostinil in PH-ILD based on Dr. Rothblatt's comments on a 2018 investor call." (D.I. 432 at ¶ 68). I think Plaintiff misses the point. The importance of Dr. Rothblatt's comments consists in their evidentiary value for the proposition that Plaintiff itself was aware of the fact that insurers were approving payments for Tyvaso used to treat patients with PH-ILD.

Second, Plaintiff argues, "Dr. Rothblatt's discussion of 'WHO Group III patients' was not specific to PH-ILD and included PH-COPD." (*Id.*). This is probably true, but I fail to see why it matters. Plaintiff can be equally aware of the fact that Tyvaso was being prescribed to treat patients with PH-ILD and PH-COPD; the point, as Plaintiff appears to concede, is that Plaintiff nevertheless was aware of the fact that Tyvaso was being used by some doctors to treat PH-ILD patients and that those doctors were obtaining approval from insurers for that use.

Third, Plaintiff argues, "Dr. Rothblatt's comments were not specific to any individual sale and disclosed nothing about the prescription, the dosing, or indication underlying such sales." (*Id.*). For similar reasons as I laid out immediately above, I fail to see why this is at all relevant. The comments disclose Plaintiff's own awareness that doctors were obtaining insurance approval to use Tyvaso to treat PH-ILD. For that purpose, these remarks, without further elaboration, possess powerful evidentiary value; it is irrelevant that they were not specific to any individual sale and disclosed nothing further.

Defendant presents evidence that Tyvaso prescribed for PH-ILD prior to April 2019 was not given out for free: that is, that the "doctors' treatment of PH-ILD patients with Tyvaso was not experimental nor prescribed as part of a clinical trial." (D.I. 425 at ¶ 128). Dr. Tapson expressly testified that his patients at Duke would have to purchase the Tyvaso he prescribed, as they were not involved in clinical trials. (Tr. at 336:10-22). Dr. Waxman agreed that his treatment did not constitute "clinical trial[s]. This was real-world treating patients." (Tr. at 386:6-8). Furthermore, the fact that insurers themselves were approving payments for Tyvaso demonstrates to me convincingly that this treatment was not being carried out in the guise of experimental procedures or clinical trials. The fact that Plaintiff has a "patient access program

[that] sometimes allows qualifying patients to access Tyvaso for free" (Tr. at 640:20-25) strikes me as wholly irrelevant.

In consideration of the totality of evidence presented at trial, I find that at least some doctors used Tyvaso according to its 2009 label (i.e., that these doctors followed the dosing guidelines) to treat patients' PH-ILD. I find that at least some insurers approved claims for off-label uses of Tyvaso in treating patients with PH-ILD. As such, I find that before the critical date (April 2019), Tyvaso was sometimes used commercially to treat not only PAH but also PH-ILD.

ii. ***Whether the claimed invention was ready for patenting***

Defendant argues that claim 1 of the '327 patent had been reduced to practice. (D.I. 425 at ¶ 130). Defendant points to the testimony of Doctors Hill, Waxman, Tapson, Saggar, and Channick that they had used Tyvaso to treat patients with PH-ILD. (Tr. at 595:18-597:20 (Dr. Hill); *id.* at 384:6-386:7 (Dr. Waxman); *id.* at 328:25-330:3 (Dr. Tapson); *id.* at 255:11-257:9 (Dr. Saggar); *id.* at 439:13-440:1 (Dr. Channick)). Defendant notes, "Doctors confirmed the method of treating PH-ILD patients with Tyvaso worked for its intended purpose by observing improvements in exercise capacity." (D.I. 425 at ¶ 130). Unrebutted testimony at trial supports this argument. The following exchange with Dr. Hill is illustrative.

> Q. Dr. Hill, focusing on Claim 1, based on the testimony you heard regarding physicians who prescribe Tyvaso to PH-ILD patients prior to April 2019, did their patients exhibit an improvement in exercise capacity?
> A. Yes.
> Q. And based on the testimony you heard, when those doctors prescribed Tyvaso to PH-ILD patients, what administration -- route of administration was used?
> A. Inhalation.
> Q. And with respect to the testimony you heard and your own experience, did [you] yourself and the doctors you testified about dose Tyvaso to PH-ILD patients prior to April 2019 consistent with the dosing requirements of Claim 1?
> A. Yes.
> Q. And based on your own experience and the testimony that you heard, did the PH-ILD patients that were treated as of April -- prior to April 2019 experience improvements in exercise capacity?

A. Yes.

(Tr. at 618:24-619:17).

Plaintiff's sole argument in response appears to be that I shouldn't credit Dr. Hill "because he was repeatedly impeached with his prior sworn testimony at his deposition." (D.I. 432 at ¶ 70). The relevant portion[28] of Dr. Hill's deposition is essentially that Dr. Hill agreed with the proposition that "*Faria-Urbina* does not encompass a method of improving exercise capacity through the use or administration of inhaled treprostinil to treat PH-ILD." (Tr. at 667:10-16).[29] At trial, however, Dr. Hill explicitly stated that he didn't agree with the proposition that *Faria-Urbina* did "not encompass a method of improving exercise capacity through the administration of inhaled treprostinil to treat PH-ILD." (Tr. at 665:24-666:3). Faced with his inconsistent deposition testimony, Dr. Hill explicitly disclaimed his deposition testimony at trial. (Tr. 667:23-668:7).

Regardless, I don't think that Dr. Hill's backtracking on his comments regarding *Faria-Urbina* fundamentally undermines his credibility when testifying on whether physicians' use of

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[28] Plaintiff cites other bits and pieces of deposition testimony from Dr. Hill, presumably to impeach his general credibility. For example, Dr. Hill testified at deposition that Dr. Lew Rubin had an aversion "to the study regarding the use of Tyvaso to treat Group 3 patients," but he testified slightly differently at trial, and he could not explain the difference. (*See* D.I. 432 at ¶ 70 (citing Tr. at 673:9-674:8, 674:17-676:3)). Earlier in the trial, Dr. Hill had stated that he disagreed with Dr. Rubin's belief that PAH therapies would work in treating PH-ILD. (Tr. 625:25-626:12). Dr. Hill's deposition testimony is not inconsistent with his trial testimony about his disagreement with Dr. Rubin. I do not regard the deposition testimony as relevant impeachment.

[29] The deposition testimony is, at best, difficult to parse. It went,
"QUESTION: So it's your opinion, then, that Faria-Urbina does not encompass a method of improving exercise capacity through the use or administration of inhaled treprostinil to treat PH-ILD; correct?" And your answer was: "ANSWER: I don't think it's sufficient, no, or correct, yes." (Tr. 667:10-16).

Turned into simpler English, the question was, Does the reference include treating PH-ILD with inhaled treprostinil? The answer was, It does not. At trial, Dr. Hill said his deposition answer "was wrong." (Tr. at 667:24-25).

Tyvaso for PH-ILD patients was done so in accordance with the requirements of claim 1 of the '327 patent. At most, his self-contradictory testimony would cause me to look askance at any testimony Dr. Hill might have given regarding his opinion on what *Faria-Urbina* purports to show. None of this undermines Dr. Hill's testimony as to his own experience or that of what he heard from the other witnesses at trial regarding whether improvements in exercise capacity were brought about by Tyvaso administration. I regard Dr. Hill as essentially credible.

Therefore, I find that doctors prescribed Tyvaso to patients with PH-ILD prior to April 2019. I find that they followed the dosage that was later described in claim 1 of the '327 patent. I find that the PH-ILD patients who were prescribed Tyvaso experienced an increase in their exercise capacity.

b. Conclusions of Law

i. *Whether Tyvaso was prescribed and sold to PH-ILD patients prior to April 2019 to improve their exercise capacity*

Plaintiff advances two primary arguments that the claimed method was not the subject of a prior sale. First, Plaintiff argues that "sales of Tyvaso cannot constitute sales of the claimed method because Tyvaso has more than one use—including treating PAH patients, which was Tyvaso's *only* approved use pre-critical date (April 2019)." (D.I. 431 at 47). Second, Plaintiff argues, "[Defendant's] third-party on-sale defense fails as a matter of law." (*Id.* at 54).

Plaintiff notes, "There was a single approved use for Tyvaso before the critical date: PAH. [Defendant] admits 'without question' that 'PAH' is 'not covered by the asserted claims of the '327 patent.'" (*Id.* at 47). Moreover, Plaintiff argues, "a sale of a *product* cannot invalidate a *method claim* unless the product 'embodies' the method and the two are 'inseparable.'" (*Id.*). Plaintiff cites to *BASF Corp. v. SNF Holding Co.*, 955 F.3d 958, 970-71 (Fed. Cir. 2020) for this proposition, stating that *BASF* held that "equipment did not 'substantially embody the essential

features' of [a] claimed method [when] it 'was capable of numerous [other] uses.'" (D.I. 431 at 47). Plaintiff urges *BASF*'s importance for its first argument, describing it as "the Federal Circuit's foundational case on this issue," and suggesting that "[Defendant's] decision not to address *BASF*'s dispositive holding is telling." (*Id.* at 46-47). In reply, Defendant rather elliptically avers, "*BASF* holds that a license is not a sale." (D.I. 435 at 8).

Defendant is in part correct. The *BASF* court began by referring to an older opinion, *In re Kollar*, 286 F.3d 1326 (Fed. Cir. 2002), and characterized *Kollar*'s holding as relying merely "on the well-established principle that the grant of a license to practice a patented invention, with or without accompanying technical information, does not itself create an on-sale bar." *BASF*, 955 F.3d at 970 (citing *Kollar*, 286 F.3d at 1333). As such, the Federal Circuit held that a license did not constitute a "sale" sufficient to invoke the on-sale bar. Defendant, however, misses the actual thrust of Plaintiff's argument. The *BASF* court independently rejected the appellee's "alternative ground of affirmance . . . that the [sale of] equipment" associated with the license to practice a method "substantially embodies the claimed process." *BASF*, 955 F.3d at 970. Defendant's attempt to limit *BASF*'s holding is therefore unsuccessful.

BASF notes that, only in a limited set of circumstances, "a process may be sold in a manner which triggers the on-sale bar." *Id.* at 969. First, "performing the process itself for consideration is sufficient." *Id.* The *BASF* court cites to *Scaltech, Inc. v. Retec/Tetra, LLC,* 269 F.3d 1321, 1328-29 (Fed. Cir. 2001) in connection with this proposition. In *Scaltech*, the plaintiff itself had offered to perform the process in question for consideration. *See Scaltech*, 269 F.3d at 1328-29. In contrast, Defendant presented no evidence that Plaintiff ever offered to perform the process contemplated by the '327 patent for consideration. Instead, Defendant introduced evidence suggesting, at most, that some doctors had independently decided to use Tyvaso to treat

PH-ILD and that Plaintiff had been aware of that fact. Nothing in *BASF* suggests that this is sufficient to trigger the on-sale bar. Second, the on-sale bar can be invoked by "a patentee's sale of a product made by his later-patented process." *BASF*, 955 F.3d at 969. This is plainly inapplicable to the current case.

Finally, *BASF* suggests that in such circumstances where "a product and methods of using that product may approach each other so nearly that it will be difficult to distinguish the process from the function of the apparatus . . . [such that] a sale of the product is tantamount to a sale of the process performed by that product." *Id.* at 970 (citation omitted). That is, where the product "substantially embodies the claimed process," then the sale of the product alone may be sufficient to trigger the on-sale bar of the process as well. *Id.* In a previous case, *Minton v. Nat'l Ass'n of Secs. Dealers Inc.*, 336 F.3d 1373, 1378 (Fed. Cir. 2003), the Federal Circuit found that the transfer of a "fully operational computer program implement[ed] and thus embod[ied] the claimed method." No evidence was presented, however, that Tyvaso itself "implements" the treatment process of PH-ILD as described in the '327 patent. It does not follow, from the fact that Tyvaso could be used to perform the patented process, that the sale of Tyvaso substantially embodies that claimed process. *See BASF*, 955 F.3d at 970. This is especially the case, given that Tyvaso had a preexisting use, i.e., treating patients suffering from PAH.

I find that Defendant has failed to prove, by clear and convincing evidence, that Tyvaso had been on sale before April 2019 to improve exercise capacity in patients suffering from PH-ILD. Because I find that the '327 patent is not invalid due to the on-sale bar, I do not need to separately consider whether secret (third-party) sales could be sufficient to trigger the on-sale bar.

4. Whether claim 1 is invalid as inherently anticipated

"To show that a patent claim is invalid as anticipated, the accused infringer must show by clear and convincing evidence that a single prior art reference discloses each and every element of a claimed invention." *Silicon Graphics, Inc. v. ATI Tech., Inc.*, 607 F.3d 784, 796 (Fed. Cir. 2010). "A patent claim is invalid as anticipated if every limitation in a claim is found in a single prior art reference, either explicitly or inherently." *Impax Lab'ys, Inc. v. Aventis Pharms. Inc.*, 468 F.3d 1366, 1381 (Fed. Cir. 2006). "Under the principles of inherency, if the prior art necessarily functions in accordance with, or includes, the claimed limitations, it anticipates." *Atlas Powder Co. v. Ireco, Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999).

a. Findings of Fact

The parties dispute whether a protocol for a study, published by Plaintiff in 2017, ("the 2017 Protocol"), accurately describes the INCREASE study as it was conducted.[30] Because I find that the discrepancy in dosage instructions is sufficient to establish that the 2017 Protocol does not accurately describe the INCREASE study, I will focus solely on the question of dosage.

Plaintiff argues that the 2017 Protocol "does not disclose the same dosing as the final INCREASE study protocol . . . or the claims of the '327 patent." (D.I. 432 at ¶ 72). "The 2017 [Protocol] dosing starts at one breath (6 [mcg]), significantly less than both the three-breath (18 [mcg]) starting dose for INCREASE and the 15 [mcg] minimum dose required by the" '327 Patent. (*Id.*). Plaintiff is correct. The 2017 Protocol describes the hypothetical dose as follows:

> Active Treprostinil for inhalation solution . . . delivered via an ultrasonic nebulizer which emits a dose of approximately 6 mcg per breath. Inhaled four times daily and titrated up to a maximum of 12 breaths four times daily[.] . . . Inhaled treprostinil (6 mcg/breath) administered four times daily[.]

[30] The parties do not dispute that the INCREASE study led to the claims of the '327 patent, and unrebutted testimony at trial establishes this fact. (*See* Tr. at 134:18-135:9).

(DTX0008.0010).

Meanwhile, the INCREASE study and the '327 patent both describe higher doses than that which was described in the 2017 Protocol. The '327 patent describes a dose of "an effective amount of at least 15 micrograms up to a maximum tolerated dose of treprostinil . . . in a single administration event that comprises at least 6 micrograms per breath." ('327 patent at claim 1). Similarly, the INCREASE protocol describes a dosage of "3 breaths [of inhaled treprostinil] (18 mcg) 4 times daily." (DTX0401.0008).

In spite of this fact, Defendant argues that the dosage laid out in the 2017 Protocol is identical to the dosing in INCREASE. Defendant concedes, "Dr. Nathan testified that the dosing of the 2017 Protocol did not specify the starting dose of three breaths that was actually used in INCREASE." (D.I. 425 at ¶ 152). As literally quoted above, the 2017 Protocol does not describe the starting dose of three breaths. (DTX0008.0010). Defendant nevertheless tries to describe away this discrepancy.

First, Defendant argues, "Dr. Nathan acknowledged that in 2017, doctors understood from the 2009 Tyvaso label that '[t]herapy should begin with three breaths of Tyvaso.'" (*Id.* (quoting Tr. at 920:11-23)). I have reviewed this portion of Dr. Nathan's testimony, and I think Defendant mischaracterizes it. The quoted portion of the testimony in question is not Dr. Nathan's independent opinion; rather, Dr. Nathan was reading out loud, at the request of Defendant's counsel on cross examination, verbatim what the 2009 Tyvaso label said. In fact, Dr. Nathan immediately afterward expressly distinguished his own opinion from the literal words of the 2009 Tyvaso label, noting that the label "does allow physicians leeway. So it really doesn't change my interpretation of the 2017 protocol." (Tr. at 920:19-20). I agree with Dr. Nathan; the fact that a Tyvaso label published in 2009 calls for the application of Tyvaso with

three breaths does not mean that a doctor would understand that a different protocol, published in 2017, should also require the application of three breaths of Tyvaso.

Second, Defendant argues, "Dr. Hill . . . further testified that prior to April 2020, doctors . . . dosed PH-ILD patients with Tyvaso according to the 2009 Tyvaso label." (D.I. 425 at ¶ 152). I don't think that Dr. Hill's testimony about what some doctors did is relevant as to what the 2017 Protocol says. Dr. Nathan testified that the 2017 Protocol "is a new protocol. It's not necessarily following the label of the 2009 label." (Tr. 920:1-2). It does not appear to make logical sense to assume that a clinical researcher, reading the 2017 Protocol, would implicitly understand from the given language, "a dose of approximately 6 mcg per breath," that the language should actually be construed as "a dose of approximately 6 mcg per breath, repeated three times per administration event for a total dose of >18 mcg, as per the 2009 Tyvaso label." (DTX0008.0010). Yet Defendant's argument, that the 2017 Protocol and the conduct of the INCREASE trial are "identical," requires just such a convoluted reading.

For the aforementioned reasons, I find that the 2017 Protocol is not "identical" to the INCREASE trial. I find that the 2017 Protocol describes a minimum dose of 6 mcg, that the INCREASE trial describes a minimum dose of 18 mcg, and the '327 Patent describes a minimum dose of 15 mcg of inhaled Treprostinil.

b. Conclusions of Law

Defendant argues, "Because [the] results [of the INCREASE trial] were the necessary and inevitable result of the method of treatment disclosed in the 2017 Protocol, the 2017 Protocol inherently anticipates claim[1]. *See Hospira*, 946 F.3d at 1329." (D.I. 424 at 31). In *Hospira*, the Federal Circuit held, "Inherency is established . . . when the limitation at issue necessarily must be present, or [is] the natural result of the combination of elements explicitly disclosed by the

prior art." *Hospira, Inc. v. Fresenius Kabi USA, LLC*, 946 F.3d 1322, 1329 (Fed. Cir. 2020) (citation omitted). Given that the minimum dosage described in the 2017 Protocol is different, by orders of magnitude, from that which was actually used in the INCREASE trial and that which is described by claim 1 of the '327 patent, it is not at all clear that the results of the INCREASE trial were either necessarily present in or the natural result of that which was disclosed by the 2017 Protocol.

Moreover, as I have previously held, "Experiments that do not follow the prior art procedure alleged to inherently anticipate cannot show inherent anticipation." *Salix Pharms., Ltd. v. Norwich Pharms., Inc.*, 2022 WL 3225381, at *6 (D. Del. Aug. 10, 2022) (cleaned up), *aff'd*, 98 F.4th 1056 (Fed. Cir. 2024). The 2017 Protocol contemplates a minimum dose of 6 mcg, whereas INCREASE contemplated a minimum dose of 18 mcg. INCREASE did not follow the prior art procedure, and that prior art procedure cannot now be used to show inherent anticipation.

I find that Defendant failed to prove, by clear and convincing evidence, that claim 1 of the '327 patent is invalid as inherently anticipated.

5. Whether claim 9 lacks written description support

I have determined that claim 9 is not entitled to patentable weight, so I decline to determine whether, in the alternative, claim 9 is invalid as lacking written description support.

B. Infringement

Since Defendant has stipulated to infringement of claims 1 and 14 of the '327 patent, and as claims 1 and 14 have not been shown to be invalid, I find that Defendant has infringed claims 1 and 14 of the '327 patent. As for claims, 5, 6, 9, and 17, because I found that they are not

entitled to patentable weight, I need not separately consider whether Defendant has infringed them.

II. CONCLUSION

The parties should submit an agreed upon form of final judgment within one week.