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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BIOFRONTERA INC., BIOFRONTERA BIOSCIENCE GMBH,
BIOFRONTERA PHARMA GMBH, and BIOFRONTERA AG,
Petitioner

V.

SUN PHARMACEUTICAL INDUSTRIES, INC.,
Patent Owner.

Case IPR2024-01312
Patent 11,697,028

Virtual Deposition of ROBERT GROVE, Ph.D.

Thursday, September 11, 2025

9:05 a.m. CST

Job No.: 598792

Pages: 1 - 66

Reported Stenographically by:
Tiffany M. Pietrzyk, CSR RPR CRR

1 Virtual deposition of ROBERT GROVE, Ph.D.,
2 pursuant to notice, before Tiffany M. Pietrzyk, a
3 Certified Shorthand Reporter in the States of
4 Illinois, Texas, and California, Registered
5 Professional Reporter, Certified Realtime Reporter,
6 and a Notary Public in and for the State of
7 Illinois.

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ALSO PRESENT:

Joshua Tubbs, Planet Depos Remote Technician

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C O N T E N T S

EXAMINATION OF ROBERT GROVE, Ph.D.	PAGE
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By Mr. Landmon	63

E X H I B I T S

(Retained by counsel unless otherwise specified.)

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Exhibit 1001 U.S. Patent Number	57
11,697,028	
Exhibit 1026 Supplemental Expert	17
Declaration of Robert E.	
Grove, Ph.D., For Inter	
Partes Review of U.S.	
Patent No. 11,697,028	
Exhibit 1031 Trial transcript from ITC	22
Number 337-TA-1411, dated	
7/2/25	
Exhibit 2013 Article entitled, "Visible	26
Light Communications	
Technology"	

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E X H I B I T S (Cont.)

DEPOSITION EXHIBITS

PAGE

Exhibit 2088

Deposition of Hermann

60

(Attached)

Leubbert, Ph.D., dated

12/13/2024

1 P R O C E E D I N G S

2 (Witness sworn.)

3 WHEREUPON:

4 ROBERT GROVE, Ph.D.,
5 called as a witness herein, having been first duly
6 sworn, was examined and testified as follows:

7 EXAMINATION

8 BY MR. HABBAZ:

9 Q. Good morning, Dr. Grove.

10 A. Good morning, sir.

11 Q. We've met before, but my name is Raymond
12 Habbaz of Desmarais LLP. I represent patent owner,
13 Sun Pharma. With me remotely is my colleague
14 Bridget Belcher who is also with Desmarais LLP.

15 Can you state your full name for the record.

16 A. Yes. First name Robert, middle name Earle,
17 E-a-r-l-e, last name Grove, G-r-o-v-e.

18 Q. And where are you today?

19 A. I am located in Pleasanton, California,
20 P-l-e-a-s-a-n-t-o-n, California, which is about
21 40 miles east of San Francisco.

22 Q. Okay. And you were last deposed in

1 connection with this IPR back in May of this year;
2 is that right?

3 A. I believe that's correct.

4 Q. And you gave testimony in the related ITC
5 proceeding in July of this year; right?

6 A. Yes, that's correct. Yeah, late June, early
7 July -- sorry.

8 Q. Have you been --

9 A. Sorry. Go ahead.

10 Q. That's okay. Late June, early July; right,
11 sir?

12 Sorry. So that was -- the related ITC
13 proceeding you --

14 A. Yeah.

15 Q. -- provided testimony in late June, early
16 July; right?

17 A. Yes, that's correct. Sorry. Yes, that's
18 correct.

19 Q. Have you been deposed or given testimony
20 between your deposition in May in any proceedings or
21 cases other than the ITC proceeding in late June,
22 early July?

1 A. No, I have not.

2 Q. Is there any reason you cannot provide full
3 and truthful testimony today?

4 A. There is no reason why I cannot provide true
5 and accurate testimony.

6 Q. Okay. And my question was slightly
7 different. So is there any reason you can't give
8 full and truthful testimony today?

9 A. No, there's no reason why I can't give full
10 and truthful testimony today.

11 Q. Thank you.

12 Is there anyone else in the room with you
13 today?

14 A. There is not.

15 Q. Okay. And do you have any documents with
16 you?

17 A. Yes. I'm sitting at my desk, and in front
18 of me I have only the binder provided by our
19 counsel. The cover states, "Grove Deposition Prep
20 Documents IPR 2024-01312." And as Chad mentioned, I
21 believe it contains, most likely, all of the
22 exhibits that we would need to address today.

1 Hopefully, that's the case.

2 Q. Okay. And can you list for me the exhibits
3 that are included in the binder that was provided to
4 you by counsel?

5 A. I certainly can. The -- I was looking for a
6 table of contents, but I don't believe there is one,
7 so I'll just walk through it.

8 So the first one is Exhibit 1001, which is
9 the '028 patent.

10 The second document is -- it's listed as IPR
11 2024-01312 Patent Owner Response.

12 The third document says Exhibit 1015, Grove,
13 Robert, with the number 97618449V1. That's V as in
14 Victor.

15 The next document is labeled --

16 Q. And sorry, Dr. Grove, not to interrupt, but
17 Exhibit 1015 that says Grove, Robert, is that the
18 declaration you submitted in this IPR proceeding?

19 A. It is the expert declaration and it was
20 Exhibit 1015. And this particular expert
21 declaration -- I'm looking at the back to see the --
22 see if I -- it's --

1 Q. I have it as page 93 has the date on it.

2 Maybe that's the same for --

3 A. That's exactly right, yes. It says --
4 that's right. That's the -- it says, Expert
5 Declaration of Robert E. Grove, Ph.D., for IPR
6 review of U.S. Patent 11,697,028.

7 Q. Okay. Perfect. Thank you, Dr. Grove.

8 Can you continue with the list of exhibits
9 in the binder?

10 A. Yes. The next one is labeled IPR
11 2024-01312, Reply to POR Final, and it's -- this is
12 the reply to patent owner's response. And that was
13 dated August 13, 2025.

14 And the next --

15 Q. Okay.

16 A. -- section is the declaration of Nan Marie
17 Jokerst, Ph.D. It's Exhibit 2050. That is her
18 declaration.

19 And the next one, it's Exhibit 1014, it's
20 U.S. 6,223,071, which is the '071 Lundahl patent.

21 The next one is --

22 Q. Okay.

1 A. -- U.S. 2005/0075703, which is Exhibit 1004,
2 and it is the Larsen patent application publication
3 ending in '703.

4 Q. Okay. Are there any other documents with
5 you other than the ones you've listed?

6 A. Yes, there are. I'm a little more than
7 halfway through the binder. So there are several
8 more.

9 So the next one is Exhibit 200 -- sorry --
10 EX2011, which is the Bourget article.

11 And then the next one is Exhibit 1031, which
12 is entitled ITC Trial Day 3 Transcript Open
13 Sessions.

14 Then the next one is entitled -- the tab is
15 IPR 2024-01312 Grove Depo Transcript Mini, and this
16 was the remote deposition and I see that it's dated
17 the front, May 13 of 2025.

18 And then just two to go.

19 Q. Okay. Just for housekeeping. So I have
20 your deposition as an exhibit which is Exhibit 2084,
21 and it's a full, not a mini. If you want to keep --
22 the content is the same. So if you want to keep

1 your paper copy if we have to refer to that, it will
2 just be my page number, but you'll just use the mini
3 pages, if that makes sense.

4 A. That would be fine, yeah. It's actually
5 easier in the mini form to move quickly from one end
6 of it to the other, so it's fine with me if that's
7 okay with you.

8 Q. Yep. Okay. Please continue.

9 A. Okay. So the -- as I mentioned, I think the
10 remote deposition was the one I just mentioned.

11 And then two remaining.

12 The next one is an article that, it's
13 Exhibit 2013, and the author is a gentleman by the
14 name of, something pronounced like Dijon. It's N, D
15 as in David, J as in Jack, i-o, N as in Nancy, G as
16 in George, u-e. That's the first author of this
17 paper entitled Visible Light Communications, or VLC,
18 Technology.

19 And then finally, last but not least, is the
20 tab that's entitled supplemental Grove Declaration,
21 Signed, and it is listed on the front page of that
22 supplemental expert declaration as Biofrontera

1 Exhibit 1026. It's about a 16-page supplemental
2 expert declaration.

3 And those are the -- that's the entirety of
4 the documents within this binder and those are the
5 only documents of any kind in front of me today.

6 Q. Okay. Thank you.

7 A. You're welcome.

8 Q. And you're accessing this deposition by your
9 computer; correct?

10 A. That's right.

11 Q. And are there any files open on that
12 computer related to your work on this case?

13 A. No. The only files that are open -- the
14 only thing that is open on my computer is actually
15 this audiovisual deposition associated with this
16 call. Nothing else is open on my laptop.

17 Q. Okay. And do you have any other computers
18 or devices in the room with you that have
19 information related to your work on this case?

20 A. I do have my iPhone in a drawer, which I'm
21 happy to move to another room. It's off. I think
22 there are probably copies of some of these documents

1 somewhere buried as an attachment on an email. It's
2 possible. But I'm happy to either leave it in the
3 drawer or take it to another room.

4 Q. Leaving it is fine thank you.

5 Will you agree with me to limit your review
6 of any documents during the deposition to documents
7 that we discuss and that are marked as exhibits or
8 shown to you during this deposition?

9 A. Yes, I agree to that.

10 Your audio is not perfectly clear, but I
11 think I can understand you well enough. So I may
12 have to ask you to repeat a question or two, just
13 for clarity on the audio. But for now, it's okay.

14 MR. HABBAZ: Okay. And just checking with
15 the court reporter, does the audio work for you?

16 (Discussion had off the record.)

17 BY MR. HABBAZ:

18 Q. I apologize for the muffled audio. Doing my
19 best with the technical issues today.

20 A. No problem.

21 Q. I know that you said that your cell phone is
22 turned off.

1 Do you have any text messaging or any other
2 open communications with any other person active at
3 this time?

4 A. I do not.

5 Q. Will you refrain from using any form of
6 communication while you are giving your deposition
7 today?

8 A. Yes, I agree to refrain from any other form
9 of communication.

10 Q. And you understand now that you've been
11 sworn in, you cannot communicate with anyone about
12 the substance of your testimony during your
13 deposition, even at breaks; right?

14 A. I understand that, yes.

15 Q. Okay. What did you do to prepare for your
16 deposition today?

17 A. I primarily reviewed the documents that we
18 just went over in this binder and had discussions
19 with counsel regarding reviewing some of the aspects
20 of this particular case.

21 Q. Okay. And who did you meet with from
22 counsel?

1 A. I'm sorry. There was some verbiage over
2 that. Could you repeat that, please?

3 Q. Sure. Who did you meet with from counsel?

4 A. The -- it was all remote all through Zoom
5 and it was, as I recall, Mr. Landmon, Kendall
6 Gurule, and also Mr. Corey Casey, Dr. Casey, all
7 from Polsinelli.

8 Q. Okay. Did you meet with anyone else besides
9 your counsel?

10 A. No. No one in any way related to this case.

11 Q. Okay. And about how long did you prepare
12 with counsel for the deposition?

13 A. I would say we -- I believe we met twice,
14 most recently I believe yesterday for five or six
15 hours, and then I believe perhaps two weeks before
16 that we met briefly. But in the past week or ten
17 days, I would say about five or six hours all on
18 Zoom.

19 Q. And other than the documents you've listed
20 that you have with you today, did you review any
21 other documents in preparing for your deposition
22 today?

1 A. No, I did not.

2 Q. And did -- since submitting your
3 supplemental declaration, have you reviewed any
4 materials to prepare for your deposition today that
5 you have not previously reviewed?

6 A. No.

7 Q. And earlier, you referenced the '028 or the
8 '028 patent. If I refer to the Sun Pharma patent
9 that's at issue in this IPR as the '028 patent,
10 you'll understand what I'm referring to; correct?

11 A. Yes, I will.

12 Q. And you signed two declarations that contain
13 the opinions you're offering in this case; right?

14 A. Yes, I believe that's correct. The most
15 recent being the supplemental expert declaration.

16 Q. And if we can turn to Exhibit 1026, and if
17 we have the tech on, we can put this up on the
18 screen if we'd like. We can mark that as deposition
19 Exhibit 1026. Let me know when you have that.

20 (Exhibit 1026 was marked for
21 identification and retained by counsel.)

22 A. And Mr. Habbaz, for ease of finding it, is

1 that my original declaration?

2 Q. The second one.

3 A. Oh, the most recent one?

4 Q. Yes.

5 A. Okay. Let me find that. I was there, but
6 for some reason I didn't recognize it as that
7 number. Let me dig it back out again.

8 Okay. So yes, this is Exhibit 1026; is that
9 correct?

10 Q. Yes.

11 A. Yes. Okay. I have that in front of me.
12 Sorry for the delay.

13 Q. No worries. So Exhibit 1026 is your
14 supplemental declaration of the IPR for the '028
15 patent; true?

16 A. Correct.

17 Q. If we turn to page 16, that's your signature
18 on Exhibit 1026; right?

19 A. That is an electronic version of my
20 signature, yes, that's correct.

21 Q. And you signed your supplemental declaration
22 under oath on August 13, 2025; true?

1 A. That's true.

2 Q. Your supplemental declaration accurately
3 reflects your testimony; true?

4 A. That's true as well.

5 Q. There is nothing you want to change in your
6 declaration at this time; correct?

7 A. That's correct.

8 Q. Did you draft all of the pages in your
9 supplemental declaration?

10 A. I drafted the supplemental declaration in
11 consultation with counsel.

12 Q. Okay. And who did the first draft of your
13 declaration?

14 MR. LANDMON: Objection. That calls for
15 attorney work product in the drafting process. I'll
16 instruct the witness not to answer.

17 Q. Are you following your counsel's
18 instruction?

19 A. I am.

20 Q. Are there any sections of your declaration
21 that you drafted?

22 MR. LANDMON: Objection. Asked and

1 answered.

2 A. As I said, the document was drafted in
3 consultation with counsel.

4 Q. Okay. And you can identify any sections
5 that you drafted as a first draft; is that right?

6 MR. LANDMON: Objection. Again, calls for
7 attorney work product. Going to instruct the
8 witness not to answer.

9 A. Okay.

10 MR. HABBAZ: I'll note for the record,
11 Mr. Landmon, that in the previous deposition, you
12 allowed questions about the drafting process,
13 including allowing the witness to answer about which
14 sections he drafted.

15 MR. LANDMON: Okay.

16 MR. HABBAZ: Are you now claiming privilege
17 over that process?

18 MR. LANDMON: Yes.

19 MR. HABBAZ: Okay. We believe that
20 privilege has been waived in the first deposition
21 and is waived as to the supplemental declaration.

22 I'll ask the witness.

1 BY MR. HABBAZ:

2 Q. Are you following your counsel's instruction
3 not to answer the question?

4 A. I am following my counsel's instructions.

5 Q. Okay.

6 MR. HABBAZ: I'll move on, but I'll note my
7 objection to the privilege claim, for the record.

8 Q. Just a few more questions on this, and I
9 understand the objection.

10 But I'll ask for the record, did you
11 personally decide which arguments to include in your
12 supplemental declaration?

13 A. Those --

14 MR. LANDMON: Again, just let me get the
15 objection out, Dr. Grove.

16 Object to the extent it calls for attorney
17 work product and communications with counsel.

18 I'll instruct the witness not to provide any
19 information or details about communications the
20 witness had with counsel.

21 If you can answer the question without
22 providing that information, you can do so, but

1 otherwise, I'd instruct you not to respond to the
2 question.

3 A. Okay. My response is that as I said before,
4 it was prepared in consultation with counsel.

5 Q. Okay. And my question was, did you
6 personally decide which arguments to include in your
7 supplemental declaration?

8 MR. LANDMON: So same objection,
9 instruction, and objection. Asked and answered.

10 A. I have no response to that question.

11 Q. Okay. Because of your counsel's objection;
12 is that right?

13 A. That's correct.

14 Q. Okay. If we could take a look at
15 Exhibit 1031, which is the July 2, 2025, trial
16 transcript from the related ITC proceeding. I
17 believe it's in your binder, Dr. Grove.

18 Do you have that?

19 (Exhibit 1031 was marked for
20 identification and retained by counsel.)

21 A. Yes. This is the one we were speaking about
22 before where I have the mini version; is that

1 correct?

2 Q. I think that -- I'm not sure if that's
3 right. I think that was the deposition. Just let
4 me know if you have a document that's marked
5 Exhibit 1031 in front of you. If not, we'll pull it
6 up on the screen.

7 A. Yeah, I'm sure I have it here. Let me --
8 they're marked somewhat differently on these tabs,
9 so I apologize.

10 1031, indeed, this is the ITC proceedings,
11 and it is marked as Exhibit 1031, correct. I have
12 it in front of me now.

13 Q. Okay. Thank you.

14 MR. HABBAZ: So we'll mark deposition
15 Exhibit 1031 as the ITC trial proceedings transcript
16 for July 2, 2025.

17 Q. And, Dr. Grove, if you can turn to your
18 examination in this transcript, which I believe
19 starts -- it's page 556. On my PDF copy, it's
20 page 59. Let me know if you're there.

21 A. These pages are marked just in the
22 upper-right with numbers, and I'm actually on the

1 one that's marked 556. So I think that numbering
2 will work well for both of us.

3 Q. Okay. And starting at page 556, that's your
4 testimony that you provided in the related ITC
5 proceeding; right?

6 A. Yes, that's correct.

7 Q. The testimony that you gave in the ITC
8 proceedings set forth in Exhibit 1031 is truthful
9 and accurate; true?

10 A. True.

11 Q. Your testimony in Exhibit 1031 accurately
12 reflects your opinions regarding the '028 patent and
13 the prior art at issue; true?

14 A. True as well.

15 Q. You don't have anything to correct in your
16 testimony in Exhibit 1031; right?

17 A. Not to my knowledge at this time.

18 Q. Your testimony in the ITC in Exhibit 1031
19 accurately reflects your opinions today; true?

20 A. True.

21 Q. Okay. You can set that aside for now.

22 A. Okay.

1 Q. You also -- I think you have this in your
2 binder, Exhibit 2013. Can you let me know when
3 you're there?

4 A. Yes, which is what document?

5 Q. It's -- I believe you had -- it's one --
6 it's the second article that you had in your binder,
7 I believe. It says "Visible Light Communications
8 Technology" on the front?

9 A. Yeah, right. And with apologies to this
10 author, I'm pronouncing his name Dijon, like the
11 mustard. I'm sure that's not correct. But I
12 believe that's -- in fact, that is Exhibit 2013. So
13 give me one --

14 Q. And --

15 A. -- sorry. Give me one moment to turn to the
16 exhibit.

17 Okay. I have it now.

18 Q. Okay.

19 MR. HABBAZ: And we'll mark as deposition
20 Exhibit 2013 the article titled, "Visible Light
21 Communications Technology."

22 ///

1 (Exhibit 2013 was marked for
2 identification and retained by counsel.)

3 Q. Dr. Grove, you reviewed Exhibit 2013 in
4 connection with your opinions in this IPR; true?

5 A. Yes, that is true.

6 Q. And it's your opinion that the description
7 of the light output from LEDs in Exhibit 2013 is
8 consistent with a POSITA's understanding; right?

9 A. Yes, that's correct. Give me one moment
10 here to just page through this article.

11 Yeah. Yes, that is true.

12 Q. And if you can turn to page 7 of the
13 article, Exhibit 2013?

14 A. I have it.

15 Q. And I should mention I'm using the page
16 numbering that's written out in Exhibit 2013,
17 page 7.

18 Do you see that?

19 A. I do, yes. It's marked as page 7 in the
20 middle of that page. So I assume you're going by
21 the page numbers in the middle of the bottom of the
22 page; is that right? Or --

1 Q. On that -- we'll do it this way. I'm at
2 Section 2.3.2, "Distribution of Light from LEDs."

3 Are you there?

4 A. I am.

5 Q. Okay. Do you see the third sentence that
6 begins, "The ideal LED optical model"?

7 A. I do.

8 Q. Okay. And so in Exhibit 2013, under
9 Section 2.3.2, "Distribution of Light from LEDs," it
10 states, "The ideal LED optical model is a perfect
11 Lambertian, meaning that the intensity of
12 propagation is proportional to the cosine of the
13 viewing angle. But in the real world, some LEDs can
14 be represented by an imperfect Lambertian."

15 Do you see that?

16 A. I do.

17 Q. In real life, LEDs do not have a perfect
18 Lambertian output; true?

19 A. I think that is a correct statement.

20 Q. And if we can turn to the next page, page 8
21 of Exhibit 2013?

22 A. Yes.

1 Q. Do you see the paragraph all the way at the
2 bottom of the page that starts, "In the design"?

3 A. I do.

4 Q. So page 8 of Exhibit 2013 states, "In the
5 design of the light distribution by LEDs, some other
6 parameters to be thoroughly analyzed are the
7 luminous spatial intensity distribution, the optical
8 power, and the spectral density."

9 Do you see that?

10 A. I do.

11 Q. And you agree that there are multiple
12 factors that go into the design of LED light
13 distribution; true?

14 A. Yes.

15 Q. And one of those factors is luminous spatial
16 intensity distribution; right?

17 A. That's correct.

18 Q. And luminous spatial intensity is the
19 concentration of light emitted for solid unit of
20 angle; true?

21 A. Yeah, I think that's a fair definition. It
22 refers to the divergence of the output of the LED.

1 Q. Okay. And can you explain what you mean by
2 "divergence of the output of the LED"?

3 A. Yes. The -- among optics technology people,
4 the divergence is a way to describe what actually is
5 defined technically, as was stated here, I think, on
6 the previous page, as a Lambertian output. So
7 the -- for LEDs, as they are manufactured, certainly
8 as they were manufactured prior to 2015, although
9 the output is not a perfect Lambertian, which would
10 mean that the emitted intensity falls off precisely
11 as the cosine of the angle between the normal to the
12 LED and the angle pointed back toward the LED, it
13 very closely approximates that formula.

14 And so when I talk about the divergence, I'm
15 talking about the spread of light emitted from the
16 LED.

17 Q. Okay. And when you say, "the spread of
18 light emitted from the LED," that's, as I understand
19 it -- well, let me strike that and ask my question
20 this way.

21 The intensity of light can be different at
22 each angle from the LED; right?

1 A. Yes. It is, in fact, different at each
2 angle with the highest intensity directly below, if
3 you will, the LED. And then the intensity decreases
4 as you move one side or the other, looking back
5 toward the LED. And that decrease in intensity is
6 what follows the simple formula, which is that the
7 intensity is equal to the intensity directly below
8 the LED times the cosine of that angle.

9 Q. Now -- I'm going to -- you can set that
10 aside.

11 A. Thank you.

12 Q. I'm sorry. I can't see you on video, but I
13 assume you have it open in front of you, so you can
14 set that aside.

15 A. Yeah. I do have it open in front of me,
16 yeah.

17 Q. Okay. It's your opinion that you can
18 achieve the 60 percent uniformity required by the
19 '028 patent using Lundahl's basing of light sources
20 as applied to LEDs; true?

21 A. Yes, I would say that the -- it's my
22 professional opinion that a POSA would be able to

1 quite readily replicate at least the uniformity
2 demonstrated by Lundahl while replacing those
3 U-shaped fluorescent tubes with rows of LEDs.

4 Q. Thank you.

5 And if we can turn to Exhibit 1014 to -- I
6 pronounce it Lundahl --

7 A. Okay.

8 Q. -- for the witness' name, but that's fine.

9 Do you have Exhibit 1014 in front of you?

10 A. I do.

11 Mr. Lundahl. If you've heard him testify,
12 and he says Lundahl, let's go with Lundahl.

13 Q. So --

14 A. I do.

15 Q. Let me know when -- okay. Can you turn to
16 column 1, line 8, and just let me know when you're
17 there.

18 A. I am there. It begins with, "The present
19 invention"?

20 Q. Yes. And so the first sentence in Lundahl
21 at column 1, line 8, states, "The present invention
22 is directed to photodynamic therapy using an

1 illuminator that provides a uniform distribution of
2 visible light."

3 True?

4 A. True.

5 Q. And the second and third sentences read, "In
6 particular, the present invention is directed to an
7 apparatus and method for photodynamic treatment
8 (PDT) or diagnosis (PD) of actinic keratosis of the
9 scalp or facial areas of a patient. The present
10 invention is also directed to an apparatus and
11 method for PDT and PD of other indications (e.g.,
12 acne) and other areas of the patient (e.g., arms,
13 legs, etc)."

14 Do you see that?

15 A. I do.

16 Q. Lundahl describes photodynamic therapy using
17 an illuminator that provides a uniform distribution
18 of light for treating the scalp, face, arms and
19 legs; true?

20 A. He describes it generally in that way, but
21 the -- virtually all of the subject matter of the
22 patent is -- including the drawings are directed

1 toward treatment of the head of a patient, more
2 specifically the face.

3 Q. Right. And I understand that there are more
4 drawings directed to the face, but my question was
5 slightly different. I just want to make sure we're
6 on the same page, so I'll ask it again.

7 Lundahl describes photodynamic therapy using
8 an illuminator that provides a uniform distribution
9 of visible light for treating the scalp, face, arms,
10 and legs; correct?

11 MR. LANDMON: Objection. Asked and
12 answered. Sorry. Objection. Asked and answered.

13 A. I'll proceed by repeating the sentence you
14 read which is, "The present invention is also
15 directed to an apparatus and method for PDT and PD
16 of other indications and other areas of the patient
17 (e.g., arms legs, etc.)."

18 That is the extent, I believe, to which
19 other areas are addressed in this patent.

20 Q. Okay. Are you not able to answer my
21 question "yes" or "no"?

22 MR. LANDMON: Objection. Asked and

1 answered. And argumentative. He did answer your
2 question.

3 A. Could you repeat the question, please?

4 Q. Sure. My question is, are you able to
5 answer my question "yes" or "no"?

6 A. And my question is, could you repeat that
7 question for me, please.

8 Q. Oh, of course. I wasn't sure if you could
9 hear me or not.

10 Lundahl describes photodynamic therapy using
11 an illuminator that provides a uniform distribution
12 of visible light for treating the scalp, face, arms,
13 and legs; correct?

14 A. In a general sense, yes.

15 MR. LANDMON: Asked and answered.

16 Q. Can you turn to column 6, line 62 of
17 Exhibit 1014.

18 A. Column 6, I have that.

19 Q. Lundahl discloses a reflector in its device;
20 right?

21 A. He does.

22 Q. And that reflector is bent to approximately

1 conform to the configuration of the tubes; right?

2 MR. LANDMON: Just want to get an objection
3 on the record to this entire line of questions. It
4 goes beyond the scope of his supplemental
5 declaration. Counsel, we're here today for a
6 deposition based on his supplemental declaration. I
7 assume your questions will be directed to that. So
8 I want to object to this line of questions and have
9 a standing objection for things that go beyond the
10 scope of his supplemental -- Dr. Grove's
11 supplemental declaration.

12 MR. HABBAZ: Okay. And for the record, his
13 supplemental declaration in paragraph 14, which
14 we've already referenced, says that in Dr. Grove's
15 opinion he can achieve the 60 percent uniformity
16 using Lundahl's spacing of light sources.

17 BY MR. HABBAZ:

18 Q. So Dr. Grove, you can answer the question.
19 I can reask it if you need.

20 A. I believe the question was, does this
21 reflector that you refer to, is it shaped to
22 approximately follow the U shape of Lundahl's

1 fluorescent tubes. And the answer to that question
2 is yes.

3 Q. Thank you.

4 And it's Lundahl's disclosure that the
5 reflector is placed behind the tubes in order to
6 increase the uniformity of the output distribution;
7 right?

8 A. That's one of the reasons why there is a
9 reflector.

10 Q. And if we can show Exhibit 5B of Lundahl.
11 Let me know when that's up or when you turn there.

12 A. I'm sorry. Exhibit -- is this a drawing
13 you're referring to?

14 Q. Sorry. Figure -- I said exhibit.

15 A. Oh, sorry.

16 Q. Figure 5B of Lundahl.

17 A. Sorry. Yes, I have figure 5B.

18 Q. And this shows a detailed view of the
19 reflector that we saw in the text description in
20 Lundahl; right?

21 A. This is a drawing of the reflector
22 referenced in Lundahl's patent, correct.

1 Q. Lundahl discloses particular angles and
2 distances for each of the segments of the reflector;
3 true?

4 A. Yes.

5 Q. Lundahl provides measurements for those
6 segments to the thousandth of an inch; true?

7 A. Yes, that appears to be correct.

8 Q. And in your combination of Lundahl and
9 Larsen, you are not using Lundahl's reflector; true?

10 A. There's no need for it. That's correct.
11 We're not using a reflector.

12 Q. And you're not using a reflector disclosed
13 in Larsen either; true?

14 MR. LANDMON: Just want to note my standing
15 objection. Counsel, I don't know if I need to make
16 it every question, but I'll note this is a standing
17 objection, it's beyond the scope. And frankly these
18 same line of questions were asked in his previous
19 deposition for this IPR proceeding.

20 MR. HABBAZ: I understand your objection,
21 Counsel. I ask that you keep the speaking
22 objections to a minimum.

1 I can reask the question.

2 MR. LANDMON: I -- I wasn't making a
3 speaking objection. I just want to know if I needed
4 to make an objection for every question or if we can
5 just leave it as a standing objection.

6 MR. HABBAZ: I understand your objection to
7 the questioning. I'm also going to note that you
8 should not be making speaking objections, which is
9 the other part of your colloquy just there.

10 BY MR. HABBAZ:

11 Q. I can reask the question, Dr. Grove. In
12 your combination which you said achieves the
13 uniformity required by the claims, you are not using
14 a reflector as disclosed in the Larsen reference;
15 true?

16 MR. LANDMON: Objection. Beyond the scope.

17 A. True.

18 Q. And in your combination, you're maintaining
19 the same light distribution pattern Lundahl utilized
20 for fluorescent tubes for the light sources in the
21 combination of your PDT device; right?

22 MR. LANDMON: Objection. Asked and

1 answered. And beyond the scope of this deposition.

2 A. Approximately.

3 Q. Just give me a moment.

4 Okay. And if we can look at figure 2 of
5 Lundahl. Let me know when you're there.

6 A. I have it.

7 Q. The fluorescent tubes are labeled 10(1)
8 through 10(7); true?

9 A. Yes.

10 Q. And in the text of Lundahl, Lundahl
11 discloses the lateral spacing of those tubes; right?

12 A. He gives approximate dimensions, correct.

13 Q. And if we turn to column 6 starting at
14 line 48 to line 55, let me know when you're there.

15 A. I have it.

16 Q. Here Lundahl provides approximate dimensions
17 for the lateral spacing between the tubes; right?

18 A. Yes.

19 Q. And specific measurements are provided for
20 the distances between each of the tubes such as
21 7 centimeters, 5 centimeters, 3 and a half
22 centimeters and so on; correct?

1 MR. LANDMON: Objection. Beyond the scope
2 of the deposition and asked and answered in multiple
3 depositions.

4 A. Yes.

5 Q. There are not another set of distances in
6 alternative embodiments in Lundahl that provide
7 different dimensions for the lateral spacing of
8 tubes; true?

9 MR. LANDMON: Same objection.

10 A. Not that I am aware of.

11 Q. And you're not relying on dimensions or
12 measurements for the spacing of light sources from
13 Larsen in your combination; right?

14 MR. LANDMON: Same objections.

15 A. The spacing in the combination involves
16 spacing between rows of LEDs, and those are
17 approximately the spacings Lundahl describes in this
18 patent for his fluorescent tubes.

19 Q. Okay. And my question was about Larsen, so
20 I'll reask.

21 You're not relying on dimensions or
22 measurements for the spacing of light sources from

1 Larsen; true?

2 MR. LANDMON: Same objections.

3 A. I think that's a fair statement.

4 Q. Okay. If you can turn to column 5, line 38
5 of Lundahl. And let me know when you're there.

6 A. Yes, I'm there.

7 Q. And if you could just read to yourself the
8 paragraph running from 38 to 46 and let me know when
9 you're done.

10 A. Okay.

11 I've read that.

12 Q. Okay. Lundahl discloses that the maximum
13 visible light emitting area is 36 centimeters high
14 by 46 centimeters wide; correct?

15 A. He states that that's the maximum visible
16 light emitting area, yeah, with a minimum
17 therapeutically active area 30 centimeters by
18 46 centimeters wide.

19 Q. Okay. I just need a clean record,
20 Dr. Grove, so I'll -- I'm going -- apologies for
21 repeating myself. I'll just ask it again.

22 Lundahl discloses that the maximum visible

1 light emitting area is 36 centimeters high by
2 46 centimeters wide; true?

3 MR. LANDMON: Objection. Asked and
4 answered.

5 A. True.

6 Q. The area of the maximum visible light
7 emitting area is approximately 2,850 centimeters
8 squared; right?

9 A. I assume he did the math correctly.

10 Q. So the answer to my question is yes?

11 A. One moment.

12 Q. Can I ask what you're consulting?

13 A. Yeah, I'm just at a calculator. Sorry. I
14 was just -- the 2,850 centimeters squared presumably
15 is, based on Lundahl's text, an area corresponding
16 to 36 centimeters high by 46 centimeters wide. And
17 your question, as I understand it, was is that
18 2,850 centimeters squared.

19 I see that that is the value stated in the
20 text, and I was simply checking on a calculator to
21 see if 36 centimeters by 46 centimeters, in fact, is
22 2,850 centimeters.

1 Q. Okay. Well, I can make this simpler.

2 Lundahl discloses that the area of the
3 maximum visible light emitting area is approximately
4 2,850 square centimeters; true?

5 A. That is what he states in the text, correct.

6 Q. Lundahl -- thank you.

7 Lundahl discloses that the area of the
8 minimum therapeutically active area is approximately
9 1,350 square centimeters; right?

10 A. Yes.

11 Q. And can you turn to Claim 5 of Lundahl?
12 Sorry. Claim 15 of Lundahl.

13 A. Yeah, one moment, please.

14 I have it.

15 Q. Lundahl discloses, quote, The illuminator,
16 according to Claim 1, wherein said plurality of
17 light sources provide a maximum total emitting area
18 of approximately 2,850 square centimeters and a
19 minimum therapeutically active emitting area of
20 approximately 1,350 square centimeters; true?

21 A. True.

22 Q. Lundahl discloses both a maximum total

1 emitting area and a minimum therapeutically active
2 emitting area; true?

3 A. That's correct, stated in this Claim 15,
4 correct.

5 Q. Lundahl does not disclose any intermediate
6 area between the maximum total emitting area and the
7 minimum therapeutically active emitting area; true?

8 A. Not that I'm aware of, no.

9 Q. Can you turn back to column 6 line 10,
10 please?

11 A. I have it.

12 Q. And do you see the sentence that starts
13 around line 16, "To avoid uniformity problems"?

14 A. I do.

15 Q. And that section reads, "To avoid uniformity
16 problems, one embodiment of the present invention
17 utilizes a plurality of U-shaped tubes 10(1)-10(7).
18 This arrangement allows the cathodes and their low
19 output area to be located outside the active
20 emitting area (effectively behind the patient's
21 ears). Only the more uniform center portion of the
22 tube output is used for patient treatment."

1 Do you see that?

2 A. I do.

3 Q. And if we can turn to column 15 now, do you
4 see the paragraph that starts, "It has been found
5 that around" -- column 15, line 21, 22?

6 A. Yes, I have it.

7 Q. Lundahl discloses -- okay. Thank you.

8 Lundahl discloses that "the measured output
9 over the active emitting area is within 70 percent
10 of the measured maximum"; true?

11 A. Yes, that's -- that's correct.

12 Q. Lundahl's only disclosure of the measured
13 output is -- sorry. Let me reask -- let me ask this
14 again.

15 Lundahl only discloses that the measured
16 output is within 70 percent of the measured maximum
17 over the active emitting area; true?

18 A. "When measured with a cosine response
19 detector at distances of 4 inches and 2 inches,"
20 correct.

21 Q. And we saw earlier, that active emitting
22 area is approximately 1,350 centimeters -- square

1 centimeters; true?

2 A. I believe that was the figure in the text.

3 Q. And so the answer to my question is yes?

4 A. I could refer back to the text, but for now,
5 I'll assume you read that correctly, yes.

6 Q. Okay. And you're not aware of anywhere in
7 Lundahl where Lundahl uses the term "forehead" or
8 "chin"; true?

9 A. Not to my recollection.

10 Q. Okay. All right. You can set aside Lundahl
11 for now.

12 A. Okay.

13 Q. Dr. Grove, LEDs are discrete point source
14 directional illuminators; true?

15 A. They are generally considered point sources,
16 and they are directional in the sense that unlike a
17 fluorescent tube that emits light forwards,
18 backwards, left and right, the light from an LED is
19 forward-directed.

20 Q. Thank you.

21 Fluorescent tubes have different light
22 output characteristics than LEDs; right?

1 A. Yes, absolutely.

2 Q. You agree that when comparing light output,
3 LEDs will typically have a more narrow distribution
4 of light outputted as compared to fluorescent tubes;
5 right?

6 A. No. You need to be clearer what you're
7 referring to as narrow.

8 Q. My question was about the narrow
9 distribution of the light outputted. I'm talking
10 about -- I think you used divergence before.

11 Would that be a better term to use?

12 A. Yes. The -- as I said, the light output
13 from all LEDs is forward-directed, unlike
14 fluorescent tubes, which emit light in a 360-degree
15 circle.

16 Q. Okay. So in that respect, you agree that
17 the distribution of light that is outputted from an
18 LED is more narrow as compared to a fluorescent
19 tube.

20 A. No. I would not agree with that statement.

21 Q. Okay. If you can turn to your supplemental
22 declaration, which is at Exhibit 1026, and let me

1 know when you're there.

2 A. I have it.

3 Q. And can you turn to paragraph 12, which I
4 have it on page 5.

5 A. I have it.

6 Q. And there's a figure on the next page,
7 page 6.

8 Do you see that?

9 A. I do.

10 Q. And here, you're drawing an illustration of
11 LEDs with a wider divergence angle than Dr. Jokerst
12 did in her illustration; right?

13 A. Yes.

14 Q. And how did you come up with the angles
15 represented in the drawing in paragraph 12?

16 A. The -- the gray angles are what Dr. Jokerst
17 drew as the emitted light from LEDs. The pinkish
18 color or purplish color is the correct drawing of --
19 or the correct representation of a Lambertian
20 source.

21 Q. Okay. And how did you calculate the exact
22 angles you used in your illustration?

1 A. The LEDs, which produce near Lambertian or
2 almost perfect Lambertian output, as stated by
3 Dr. Jokerst, are drawn showing a spread or a
4 divergence angle where each ray, for example,
5 looking at the LED represented by the black box next
6 to that right arrow -- red arrow, the lines
7 emanating from that LED to the left and the right
8 are shown at an angle which represents an intensity
9 that is exactly half of the intensity or the
10 radiance, which would be measured directly
11 underneath the LED.

12 So a Lambertian source is always shown with
13 a divergence angle represented like this, if it's
14 done exactly to the definition of Lambertian
15 emitter.

16 Q. Okay. And if you go back to the prior page,
17 you have an equation in that last sentence there.

18 Do you see that?

19 A. Yes, I do.

20 Q. Okay. And what is that equation?

21 A. Excuse me. It is the equation that I just
22 referenced verbally, which is that the rays shown

1 represent an intensity along that ray, which is
2 exactly half of the intensity that would be measured
3 directly below the LED.

4 Q. Okay. And so the lightly black shaded line
5 in your drawing at the edges of the pink
6 distribution, those are the rays you're referring to
7 which has an intensity that's half of the intensity
8 directly under the LED; is that right?

9 A. Those rays are drawn at an angle, which is
10 60 degrees from the vertical, if you will, or
11 60 degrees from directly below the LED, and the
12 cosine of 60 degrees is one-half, so your statement
13 is correct.

14 Q. Okay. And in you're equation, I represents
15 the intensity of the light; is that right?

16 A. That's right.

17 Q. Is that I_0 or I_0 in the right-hand side of
18 the equation?

19 A. Yeah, this formula states mathematically
20 that the intensity, at a particular viewing angle,
21 which is represented by the capital I , is equal
22 to -- well, in case of the ray that I showed, it is

1 equal to the intensity directly below the LED
2 divided by 2. And that is the appropriate formula
3 for an angle of 60 degrees.

4 So the general formula is I equals I_0 cosine
5 θ , where θ is the angle between the ray in
6 this drawing vertical -- vertically below the LED
7 and out to some angle to one side or the other.
8 When that angle --

9 Q. Okay.

10 A. -- reaches 60 degrees, it's -- the cosine of
11 60 degrees is one-half, and you get the formula
12 I equals I_0 divided by 2.

13 Q. Thank you. And I appreciate the
14 explanation. My question is a lot simpler.

15 I_0 represents the intensity directly
16 underneath the LED; true?

17 A. Yes, that's -- correct, yes.

18 Q. Thank you.

19 If you can turn to paragraph 15, which
20 starts on page 6. I'm interested in the drawing
21 that's on page 8.

22 Let me know when you're there.

1 A. I have it.

2 Q. Okay. And here, you are illustrating the
3 divergence angles, which are in red, that overlap at
4 the treatment surface on the bottom of the
5 illustration; right?

6 A. Yes.

7 Q. And earlier in the paragraph 15, you state
8 that, "a POSITA would simply ensure that the
9 divergence angles of the adjacent LEDs overlap at
10 the desired treatment distance to ensure no 'gaps'
11 between the light emission of the individual LEDs";
12 right?

13 A. I'm sorry. You were reading from
14 paragraph 15?

15 Q. Yeah, just the text right above.

16 A. Yeah. One moment here.

17 Yeah, "a POSA would simply ensure that the
18 divergence angles of the adjacent LEDs overlap at
19 the desired treatment distance to ensure no 'gaps'
20 between the light emission of the individual LEDs."

21 Correct.

22 Q. And the divergence angles you're drawing in

1 paragraph 15, those are, again, the 60-degree angles
2 that we were discussing earlier; right?

3 A. Yes.

4 Q. And the intensity at those divergence angles
5 will be half of the intensity directly underneath
6 the LED; right?

7 A. From that particular -- from an individual
8 LED. Obviously, the intensity on this treatment
9 surface is the sum of the radiance produced by a
10 particular LED and all of its neighbors.

11 Q. Right. And you haven't calculated the
12 intensity of light received at the treatment surface
13 in the example you're providing in figure -- in
14 paragraph 15; true?

15 A. I have not calculated it mathematically, but
16 from the drawing it's easy to estimate a degree of
17 uniformity.

18 Q. Okay. You have not provided an estimate of
19 the degree of uniformity for the illustrations
20 you've provided in your declaration; right?

21 A. No, I have not.

22 Q. Okay. And again, looking at the text just

1 above your drawing, you stated that a POSA would
2 simply ensure that the divergence angles of the
3 adjacent LEDs overlap at the desired treatment
4 distance to ensure no "gaps" between the emission --
5 the light emission of the individual LEDs; right?

6 A. Correct.

7 Q. That's what you state here?

8 In your opinion, it's simple to achieve
9 gap-free illumination at the treatment surface using
10 LEDs; right?

11 A. If the treatment surface is located at a
12 distance that's, for example, not immediately
13 adjacent to the LEDs, that statement is true.

14 Q. At a treatment distance of about four
15 inches, your statement is true; right?

16 A. It's true at distances of -- if it's true at
17 two inches, then it's true, very likely, at
18 four inches because you get simply further overlap
19 from adjacent LEDs.

20 Q. Okay. So let me say it this way. In your
21 opinion, it's simple to achieve gap-free
22 illumination at the treatment surface using LEDs at

1 distances of around two inches to four inches;
2 right?

3 A. Yes, that's true.

4 Q. And your drawing here in paragraph 15
5 depicts a flat treatment surface; right?

6 A. I attempted to replicate what Dr. Jokerst
7 drew in her drawing, yes.

8 Q. Right, but the drawing that you're providing
9 your opinions on in your declaration, that drawing
10 shows a flat treatment surface; right?

11 A. Yes.

12 Q. And in the PDT context, the treatment
13 surface such as a face is often not a flat surface;
14 right?

15 A. True.

16 Q. It's your opinion that the amount of
17 experimentation and testing necessary to achieve a
18 specific design goal increases when the treatment
19 surface is not flat; right?

20 A. In general, that's true, yes.

21 MR. HABBAZ: I think we can take a break now
22 if that works for you, Dr. Grove.

1 THE WITNESS: Sure.

2 MR. HABBAZ: Okay.

3 (A short break was had.)

4 BY MR. HABBAZ:

5 Q. Dr. Grove, welcome back.

6 A. Thank you.

7 Q. During the break, did you discuss the
8 substance of your testimony with counsel?

9 A. I did not.

10 Q. Okay. If you -- do you still have
11 Exhibit 1026 open, the supplemental declaration?

12 A. I will in one second here.

13 Yes, I have it open. The tab is -- has the
14 number 105391, but yes, it is Exhibit 1026 and I
15 have it in front of me.

16 Q. Okay. If we could go back to paragraph 14
17 on page 6.

18 A. I have it.

19 Q. And here you're discussing how to achieve
20 the uniformity required by the '028 patent using
21 Lundahl's spacing and Larsen's disclosure of LEDs;
22 right?

1 A. Yes.

2 Q. Okay. And if we could go back to the '028
3 patent, which is Exhibit 1001.

4 (Exhibit 1001 was marked for
5 identification and retained by counsel.)

6 A. I have it.

7 Q. Okay. And if you can look at Claim 1.

8 A. I have it.

9 Q. Okay. In the second limitation in Claim 1
10 reads, "light sources disposed on surfaces of the
11 five panels, the illuminator being configured to
12 uniformity illuminate the treatment surface of the
13 patient via the light sources."

14 Right?

15 A. Yes.

16 Q. Okay. And there's similar language in each
17 of the claims of the '028 patent; right?

18 A. Yes, certainly the independent claims I
19 believe have similar language.

20 Q. For the '028 patent, the light sources being
21 used to uniformly illuminate a treatment surface are
22 disposed on surfaces of the five panels; right?

1 A. That is my understanding, yes.

2 Q. Lundahl's PDT device has a single panel;
3 right?

4 A. I wouldn't describe it as a single panel,
5 no. It's a U-shaped continuous surface.

6 Q. Okay. And so it's your testimony that
7 Lundahl does not have a single panel?

8 A. I don't believe "panel" is the right
9 description, especially in this context, because
10 there are illuminators for PDT that have a single
11 flat panel. Lundahl has a U-shaped illuminator that
12 follows the shape of the fluorescent tubes.

13 Q. Okay. Lundahl does not disclose a PDT
14 device with five panels; true?

15 A. True.

16 Q. For the portion of this limitation that
17 requires light sources disposed on the surfaces of
18 the five panels, your combination relies on Larsen;
19 true?

20 A. It relies on combining Larsen with Lundahl,
21 correct.

22 Q. Right, but you're relying on Larsen for that

1 portion of the limitation light sources disposed on
2 the surfaces of the five panels, right, not Lundahl?

3 A. That's true.

4 Q. Okay. If we can turn back to your
5 declaration, 1026. So let me know when you have
6 Exhibit 1026, paragraph 17 open. It should be on
7 page -- bottom of page 8.

8 A. Paragraph 16 I have in front of me.

9 Q. Sorry. 17.

10 A. Sorry. 17 as well.

11 Q. Okay. It's your opinion that the physical
12 space between adjacent panels resulting from the
13 attachment of adjacent panels via hinges or other
14 means is easily addressed; right?

15 A. Correct.

16 Q. It's your opinion that for a PDT device, the
17 gaps created by having multiple panels is easily
18 addressed; true?

19 A. Yes, it can be easily addressed.

20 Q. Okay. And Dr. Grove, you've reviewed the
21 deposition testimony of Biofrontera's CEO,
22 Dr. Hermann Luebbert; right?

1 A. I believe I have in the past some time ago.

2 Q. You're aware that Dr. Luebbert testified
3 about the problems associated with a multipanel PDT
4 device as compared to a single panel device; right?

5 A. I don't recall specifically, but that sounds
6 like he might very well have pointed out that that
7 aspect needs to be addressed.

8 Q. Okay.

9 MR. HABBAZ: And if we can mark as
10 Deposition Exhibit 2088.

11 And Joshua, please let me know when you're
12 able to get that up on the screen. Thank you. And
13 if we can turn to page 199.

14 (Exhibit 2088 was marked for
15 identification and is attached to the
16 transcript.)

17 A. I don't believe I have this in hard copy,
18 but I'm happy to review it on the screen.

19 Q. Okay. On page 25 of the PDF, okay, and if
20 you could read the testimony to yourself on page 199
21 and let me know when you're done. It continues to
22 the next page, so we can scroll.

1 A. Okay. So I'm starting with, "Okay. So
2 we've talked about"?

3 Q. Yes. Page -- so we're in Exhibit 2088,
4 page 199, line 12 until page 200, line 14.

5 A. Yeah, okay. On my screen, the page numbers
6 aren't visible, but that's not a problem. I can
7 see -- I'll just start with line 12 which says,
8 "Okay, so we've talked about."

9 So give me a moment to read this page and
10 then I'll have you scroll down.

11 Okay. You can scroll down to the next page.
12 I've read it.

13 Q. Okay.

14 MR. HABBAZ: And Joshua, are you able to put
15 both pages up simultaneously in a two-page view?

16 REMOTE TECHNICIAN: Yes. One moment.

17 Q. Okay. Dr. Grove, can you still read that?

18 A. I can.

19 Q. Okay. Dr. Luebbert testified that a bend
20 structure does not pose some of the issues that a
21 panel structure with several panels; true?

22 A. True.

1 Q. Dr. Luebbert testified that "To get
2 homogeneity in the corners or in an arrangement that
3 has automatically a different distance at the edge.
4 So if you're a round structure, you won't have these
5 issues."

6 True?

7 A. That is what he states here, correct.

8 Q. And when Dr. Luebbert was asked at page 200,
9 line 9, "So if you have a single curved structure,
10 you don't have the issues that are caused by, I'll
11 call them, the gaps between individual connected
12 panels. That's what you're referring to?"

13 Dr. Luebbert responded, "Yes."

14 Correct?

15 A. He did.

16 MR. HABBAZ: Okay. I pass the witness at
17 this time.

18 Thank you, Dr. Grove.

19 MR. LANDMON: Okay. If we can go off the
20 record.

21 (A short break was had.)

22 ///

1 EXAMINATION

2 BY MR. LANDMON:

3 Q. Dr. Grove, if I can get you to turn to your
4 supplemental expert declaration, it's Exhibit 1026.

5 A. I have it.

6 Q. And if I can get you to turn to, it's the
7 end of paragraph 12. Really it's right above
8 paragraph 13. You've got a figure there that you
9 were asked questions about.

10 Do you recall that?

11 A. Yes. Right above paragraph 13, correct.

12 Q. And counsel asked you various questions
13 regarding the intensity of light coming from the
14 LEDs and the spacing and the intensity at various
15 divergence angles. I guess the question I wanted to
16 ask is, knowing what you've said about the intensity
17 of light from directly underneath the LEDs and
18 across the divergence angles you were asked about,
19 would a POSA have a reasonable expectation that such
20 an arrangement would achieve uniform illumination of
21 the treatment service as required by the claims of
22 the patent?

1 MR. HABBAZ: Objection. Leading the witness
2 and outside the scope.

3 A. Absolutely.

4 MR. LANDMON: Thank you, Dr. Grove. I have
5 no further questions.

6 MR. HABBAZ: Okay. Thank you, Dr. Grove,
7 for your time.

8 (Off the record at 10:50 a.m.)
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1 CERTIFICATE OF COURT REPORTER - NOTARY PUBLIC

2
3 I, TIFFANY M. PIETRZYK, Certified Shorthand
4 Reporter No. 084-004371, CSR, RPR, CRR, and a Notary
5 Public within and for the State of Illinois, do
6 hereby certify:

7
8 That ROBERT GROVE, Ph.D., the witness whose
9 deposition is hereinbefore set forth, was duly sworn
10 by me before the commencement of such deposition and
11 that such deposition was taken before me and is a
12 true record of the testimony given by such witness.

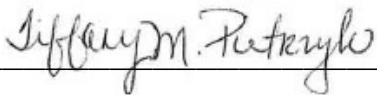
13
14 I further certify that the adverse party,
15 BIOFRONTERA, was represented by counsel at the
16 deposition.

17
18 I further certify that the deposition of
19 ROBERT GROVE, Ph.D. occurred virtually, via Zoom
20 videoconference, on Thursday September 11, 2025,
21 commencing at 9:05 a.m. CST to 10:50 a.m. CST.
22

1 I further certify that I am not related to
2 any of the parties to this action by blood or
3 marriage, I am not employed by or an attorney to any
4 of the parties to this action, and that I am in no
5 way interested, financially or otherwise, in the
6 outcome of this matter.

7
8 IN WITNESS WHEREOF, I have hereunto set my
9 hand and affixed my notarial seal this 12th day of
10 September, 2025.

11
12 My commission expires: February 28th, 2028

13
14 _____

15 NOTARY PUBLIC IN AND FOR THE
16 STATE OF ILLINOIS

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