

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 BIO-RAD LABORATORIES, INC.,

6 Petitioner,

7 v.

8 CALIFORNIA INSTITUTE OF TECHNOLOGY

9 Patent Owner

10
11 Case No. IPR2024-01451

12 U.S. Patent No. 11,827,921 B2

13
14
15 VIDEOTAPED DEPOSITION OF KEVIN STRUHL PH.D., a
16 witness herein, pursuant to notice, the witness being duly
17 sworn by TERI C. GIBSON, Notary Public in and for the
18 State of Massachusetts, the witness physically located at
19 JONES DAY, 100 High Street, Floor 21, Boston, MA 02110, at
20 9:00 a.m., July 24, 2025, and the proceedings taken down
21 by Mechanical Stenography and computer-aided transcription
22 by TERI C. GIBSON, CSR, RPR, CRR.

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25

APTUS COURT REPORTING401 West A Street, Suite 1680San Diego, California 92101
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16 *****

I-N-D-E-X

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E X H I B I T S

NUMBER	DESCRIPTION	PAGE
Exhibit 1001	U.S. Patent, Kartalov et al. Patent Number US 11,827,921 B2. Date of Patent: Nov. 28, 2023.	67
Exhibit 1002	Declaration of Carl A. Batt, PH.D. in support of Petitioner for Inter Partes Review.	26
Exhibit 1004	U.S. Patent Application Publication, Saxonov et al. US 2013/0040841 AI. Pub. Date: Feb. 14, 2013.	162
Exhibit 1012	11,827,921 Infringement Claim Chart	108
Exhibit 1017	U.S. Patent Application Publication. Larson et al. US 2011/0250597. Pub. Date: Oct. 13, 2011.	117

E X H I B I T S

NUMBER	DESCRIPTION	PAGE
Exhibit 1043	Petition for Inter Partes Review of U.S. Patent Number 11,827,921 B2.	21
Exhibit 2001	Declaration of Kevin Struhl, PH.D. Bio-Rad v. California Institute of Technology. U.S. Patent 11,827,921. Case Number IPR2024-01451.	106
Exhibit 2018	Supplemental Declaration of Kevin Struhl, Ph.D. IPR2024-01451. Bio-Rad Laboratories, Inc., v. California Institute of Technology.	13

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

2 (Time: 9:00 a.m.)

3 VIDEOGRAPHER: One moment, please, while I get
4 the camera rolling.

5 We are now on the record.

6 This begins Videotape Number 1 in the deposition of
7 Professor Kevin Struhl in the matter of Bio-Rad
8 Laboratories, Inc., Petitioner, versus California
9 Institute of Technology, Patent Owner.

10 This case is currently pending before the patent
11 trial and appeal board. Case Number IPR2024-01451. U.S.
12 Patent Number 11, 827, 921 B2.

13 Today is Thursday, July 24, 2025. The time is
14 approximately 9:01 a.m. This deposition is being taken at
15 100 High Street in Boston, Massachusetts, at the request
16 of Jones Day.

17 The videographer is David Hanrahan of Magna Legal
18 Services, and the court reporter is Teri Gibson of Aptus
19 Court Reporting.

20 And if we can have all the attorneys present please
21 introduce themselves and who they represent.

22 MR. WALTER: Derek Walter of Jones Day for
23 Petitioner, Bio-Rad.

24 MR. SALEN: This is Jesse Salen for Sheppard
25 Mullin on behalf of the Patent Owner, Caltech, and with me

1 is Jaime Choi, also from Sheppard, Mullin.

2 VIDEOGRAPHER: Teri, you can swear in the
3 witness.

4 (Witness sworn.)

5 THE WITNESS: Yes.

6 KEVIN STRUHL, PH.D.

7 Called as a witness, having been first duly
8 sworn to tell the truth, the whole truth, and nothing but
9 the truth, was examined and testified as follows:

10 EXAMINATION

11 BY MR. WALTER:

12 Q. Good morning, sir.

13 Could you please state your name and address
14 for the record?

15 A. Kevin Struhl. 80 Meadowbrook Road.
16 Weston, Massachusetts.

17 Q. I'm going to go over a few reminders before
18 we get into the substance of the questioning. You
19 understand there is a court reporter that is here
20 taking everything down?

21 A. Yes.

22 Q. And so you understand that the court
23 reporter can't take down two people at once, so it's
24 important that we not talk over each other?

25 A. Yes.

1 Q. Okay. So in that regard --

2 A. I will try.

3 Q. Okay. And in that regard, I will ask that
4 you let me finish my question before you begin your
5 answer.

6 Do you understand that?

7 A. Yes.

8 Q. Okay. You understand your counsel might
9 object from time to time?

10 A. Yes.

11 Q. And you understand you still need to answer
12 the question?

13 A. Yes, unless he tells me not to.

14 Q. Is there any reason that you can't provide
15 your best most complete and accurate testimony here
16 today?

17 A. No. I will do my best testimony.

18 Q. Okay. Are there any medical issues that
19 might interfere with your testimony here today?

20 A. Well, I don't know. Probably not, but you
21 never know.

22 I mean, I do have a heart -- I do take
23 heart medication. My heart rate was a little high,
24 but now it's pretty base -- it's okay now.

25 Q. What did you do to prepare for your

1 deposition today?

2 A. Well, I had a couple of days of deposition
3 prep with these two, with Jesse and Jamie.

4 Q. When were those days of deposition prep?

5 A. The last two days, yesterday -- Tuesday and
6 Wednesday.

7 Q. Did you meet with anyone else besides
8 Mr. Salen and Ms. Choi?

9 A. Not in the last two days.

10 Q. Did you have meetings to prepare for your
11 deposition prior to the meeting over the last
12 two days.

13 A. Say that again.

14 Q. Did you have any meetings to prepare for
15 your deposition prior to the meetings in the last
16 few days?

17 A. In terms of deposition prep, no.

18 Q. You said you met with Mr. Salen and
19 Ms. Choi on Tuesday of this week. How long did you
20 meet with them on Tuesday?

21 A. It was most of the day.

22 Q. And then you also met with them on
23 Wednesday, yesterday, to help prepare for the
24 deposition. How long was your meeting yesterday?

25 A. Most of the day.

1 Q. So is it accurate then that you spent the
2 better part of two working days in preparing for your
3 deposition with Mr. Salen and Ms. Choi?

4 A. That's accurate.

5 Q. Okay. Did you do any additional
6 preparation on your own, independent of the time you
7 spent with Mr. Salen and Ms. Choi to prepare for your
8 deposition?

9 A. I re-read my declaration last -- yesterday.

10 Q. Any other independent preparation that you
11 did?

12 A. No.

13 Q. Now, when you say you re-read your
14 declaration, what declaration are you talking about?

15 A. There are two.

16 Q. Okay. You re-read both of them?

17 A. Yeah. I mean, I didn't read them, you
18 know, in incredible detail, but I looked them over.

19 Q. Now, to prepare for your deposition today,
20 did you review documents?

21 A. Yes, I looked at some documents in the last
22 two days if that is what you are asking.

23 Q. Okay. Now, on one of the documents that's
24 at issue in this case, is a patent. It's U.S. Patent
25 Number 11,827,921.

1 Are you familiar with that patent?

2 A. I think so. I don't usually know them by
3 the number, except the '921, I do know, if that's the
4 one you are talking about.

5 Q. Did you review that to prepare for your
6 deposition today?

7 A. Yes.

8 Q. That's something you are familiar with?

9 A. Yeah.

10 Q. And your two declarations, you said you
11 reviewed those to prepare for your deposition today?

12 A. Yeah.

13 Q. So you are familiar with those
14 declarations?

15 A. Yeah, generally.

16 Q. Now, how much time do you think you spent
17 reviewing those declarations?

18 A. You mean yesterday?

19 Q. Either yesterday, the day before, or in any
20 of your time that you spent on your own to prepare for
21 this deposition.

22 A. Well, the only time I prepared for the
23 deposition was the last two days. I wouldn't call
24 anything I did before that preparing for the
25 deposition. So I spent, like, maybe a half an hour

1 total. It was really just to glance over them. I
2 wasn't reading them in detail.

3 Q. Okay. So over the last two days, you
4 probably only spent about a half hour reviewing your
5 two declarations; is that right?

6 A. By myself -- I was with counsel the whole
7 two days.

8 Q. Okay. All right. So you spent additional
9 time with counsel with the declarations.

10 A. Say that again.

11 Q. You spent additional time with counsel
12 reviewing your declarations, beyond the half hour that
13 you spent reviewing on your own?

14 MR. SALEN: I just interject, just a quick
15 objection to if anything calls for attorney-client
16 privilege. You can talk about how much time you spent
17 reviewing things, just please don't disclose anything that
18 was discussed between counsel.

19 A. I told you we spent most of two days
20 talking with counsel about the whole thing.

21 Q. And roughly how much time did you spend
22 over those two days reviewing your declarations?

23 A. I have no idea.

24 I mean, the declaration is part of the -- I
25 sound like I sat there with the declaration and that's

1 not what we did; that's not how it worked.

2 Q. Sitting here today, you feel comfortable
3 that you are very familiar with the content of your
4 declaration; is that fair?

5 A. Yeah. I haven't memorized it, but I'm
6 familiar with the -- with what I wrote.

7 Q. Now, your review of the declarations, that
8 you've done over the last few days preparing for this
9 deposition, did you come across anything in those
10 declarations you wish to change?

11 A. No.

12 Q. There are no errors?

13 A. Not that I can catch.

14 Q. Okay.

15 A. There might be some, you know. I'm not --
16 I'm not a professional proofreader.

17 Q. Did you review the prior art references
18 that are at issue in this case?

19 A. Which references are you talking about?

20 Q. How about the Larson reference; did you
21 review that?

22 A. There is a Larson reference; that was part
23 of what we were talking about.

24 Q. And that's something you are familiar with?

25 A. Again, I'm not having memorized it.

1 Q. But you are able to testify on that?

2 A. Yes.

3 Q. Something you studied?

4 A. Yes.

5 Q. Okay. Now just a reminder, let me finish

6 my question before you start your answer.

7 A. Okay.

8 Q. Pause a moment.

9 How about the Saxonov reference; is that one

10 you reviewed to prepare for your deposition today?

11 A. Yes.

12 (Reporter requested clarification.)

13 MR. WALTER: Saxonov, S-A-X-O-N-O-V.

14 (Exhibit 2018 previously marked for identification,

15 supplemental declaration of Kevin Struhl, Ph.D.)

16 (Document tendered to counsel and the witness.)

17 Q. All right. Dr. Struhl, I've handed you a

18 document that's been previously marked as

19 Exhibit 2018. What is this document?

20 A. This looks like -- of course I'm not

21 looking at every single page, but it does look like a

22 declaration of mine.

23 Q. Okay. Let's go to Paragraph 17 of your

24 declaration. This is the declaration -- let me -- let

25 me ask a preliminary question before that.

1 Actually, let me ask a few preliminary
2 questions. This declaration -- this is your declaration
3 in this case that presents your opinions regarding the
4 '921 patent?

5 A. It does.

6 Q. Okay. Now, the front page is styled as a
7 supplemental declaration.

8 A. Yes.

9 Q. Okay. Why did you entitle it as a
10 "Supplemental Declaration"?

11 A. Because I had a previous declaration.

12 Q. Now, are there any additional opinions that
13 this declaration presents, Exhibit 2018, the
14 supplemental declaration that are not present in the
15 original declaration?

16 A. I haven't compared them, one directly to
17 each other.

18 Q. Okay. Sitting here today, can you think of
19 any opinions that are in your supplemental declaration
20 that are not in your original declaration?

21 A. I would have to -- I don't know what you
22 mean by opinions, exactly. My opinions are basically
23 the same, but there are slight differences. There
24 might be, but not in the basic opinion, no.

25 Q. Can you think of anything specific that

1 changed ongoing from your original declaration to your
2 supplemental declaration?

3 A. Off the top of my head, no.

4 Q. Now let's go to Paragraph 17 of your
5 declaration, Exhibit 2018.

6 A. Okay.

7 Q. And this is in the section that deals with
8 the "Person of Ordinary Skill in the Art," correct?

9 A. That's what it's about, yes.

10 Q. And it states in the Paragraph 17, that you
11 adopted Petitioner's definition for the level of
12 ordinary skill in the art.

13 Do you see that?

14 A. Yes, I see that.

15 Q. Actually, that's in Paragraph 18. Just to
16 make the record clear. Paragraph 18 is where you
17 state --

18 A. Oh, you are right. The adoption is 18.

19 Q. So you reviewed Petitioner's definition of
20 the level of ordinary skill in the art?

21 A. Well, this is what I just wrote down, what
22 it is. So of course I -- I reviewed it.

23 I mean, I adopted it because I read it if
24 that's what you mean.

25 Q. Okay. You are familiar with Petitioner's

1 definition of the level of ordinary skill in the art?

2 A. Well, now that I see it. I don't remember
3 it off the top of my head, but I see it here.

4 Q. So when you reviewed it, do you recall if
5 there was anything in the definition that you
6 disagreed with?

7 A. No. Definitions are vague anyway.

8 Q. So there was nothing you disagreed with in
9 Petitioner's definition?

10 A. Of this thing, I don't remember
11 particularly agreeing or disagreeing, but I adopted
12 it.

13 Q. You were comfortable with adopting it?

14 A. Yes. Obviously, I put it up for --

15 THE COURT REPORTER: I wouldn't have?

16 A. I wouldn't have written that I adopted it
17 if I wasn't comfortable adopting it.

18 (Document tendered to counsel and the witness.)

19 BY MR. WALTER:

20 Q. All right. I have handed you a document
21 that is entitled, "Petition for Inter Partes Review of
22 U.S. Patent Number 11,827,921."

23 A. Okay.

24 Q. This is the document that you reviewed to
25 identify Petitioner's definition of a level of

1 ordinary skill in the art?

2 A. I would have to look and see if I reviewed
3 this document. I don't remember this off the top of
4 my head.

5 Q. Well, take a moment, and see if it's
6 something you are familiar with.

7 A. I have to look at the list of documents I
8 looked at.

9 Q. You are not able to look at the document
10 and see if it's something you recognized?

11 A. I mean, I -- it has a familiar look, but I
12 don't, you know, I don't know exactly what is in this
13 document.

14 Q. Okay.

15 A. I mean, so if it's in my list of documents,
16 I looked at it. I -- you know, I looked at a lot of
17 documents. So I don't always remember exactly which
18 one was which.

19 Q. Okay. Do you know if this is one you
20 looked at?

21 A. I said I have to look at my list.

22 Q. Okay.

23 A. What is this exhibit number?

24 Q. Why don't you just let me know if this is
25 the document you are familiar with. If you can answer

1 that, go ahead; and if you can't answer it, just let
2 me know.

3 A. I -- the only way I'm going to know is to
4 look and see. I don't remember this document from
5 something that might look like it or whatever. If you
6 are asking me specifically about this document, I need
7 to see what number it is and whether I --

8 MR. WALTER: Why don't you take your time with
9 the document, Dr. Struhl. Just take a look at it to
10 familiarize yourself.

11 A. What is this called here?

12 Does this have an exhibit number?

13 Q. Why don't you go ahead and see if you can
14 answer my question which is --

15 A. I just told you I can only answer your
16 question if I can see that I've looked at it. It
17 looks vaguely familiar, yes, but -- you know -- is it
18 exactly the same document? I don't know. That's --

19 MR. SALEN: Okay. Can I just interject and just
20 say, Dr. Struhl, just take a minute. Read the title, read
21 the -- like, familiarize yourself with what the -- on the
22 document, just look at the title and -- just so you know
23 what the title is.

24 MR. WALTER: No more of that.

25 MR. SALEN: I'm just pointing him to read. I

1 want him to read the document.

2 MR. WALTER: No more. No more, Jesse.

3 MR. SALEN: Derek, I'm going to make sure that
4 he's looking at the exhibits you give him, okay.

5 MR. WALTER: I'm not going to allow that. I'm
6 not going to let you give guidance on your witnesses and
7 how they answer the questions.

8 MR. SALEN: I am telling him to look at the
9 exhibit because he is a little nervous. Okay. So I'm
10 just making sure --

11 MR. WALTER: We both know what is going on here,
12 okay, so no more of that.

13 THE WITNESS: I don't.

14 MR. SALEN: I'm sorry. Derek, if you disagree,
15 you are welcome to state it on the record, and I'm telling
16 him to look at the exhibit, and that's what you want him
17 to do, too. So --

18 MR. WALTER: I just want him to answer the
19 questions.

20 MR. SALEN: Okay. That's fine.

21 MR. WALTER: I will call the Board.

22 MR. SALEN: Okay. Go for it.

23 BY MR. WALTER:

24 Q. Just go ahead, and let me know if this
25 document that is entitled, "Petition for Inter Partes

1 Review of U.S. Patent Number 11,829,921," is something
2 you think you've looked at before. And if you can't
3 answer that question, let me know. If you don't know,
4 let me know that as well.

5 A. Well, it looks familiar, but I don't see it
6 on my list, so I don't really know how to answer the
7 question.

8 Q. Okay. Let's go to Paragraph 17 of your
9 declaration, Exhibit 2018.

10 A. Okay.

11 Q. And then if you look at the end of the
12 first sentence of Paragraph 17, there is a citation to
13 "Petition," comma, "9-10," and then the paragraph
14 continues with a few more citations to what is
15 identified as petition.

16 Do you see that?

17 A. Yes.

18 Q. Do you have any idea what you're citing
19 when you cite to the petition?

20 A. Well, I have seen a petition. I don't
21 remember if it's exactly this document or not.

22 Q. So when you say, this document -- maybe we
23 should mark this as an exhibit, just so that we can
24 refer to it as an exhibits as we look at what the
25 document is. This is going to be 1043. I guess I

1 will put the sticker on.

2 (Exhibit 1043 marked for identification, petition for
3 inter partes review.)

4 BY MR. WALTER:

5 Q. Exhibit 1043 is the document entitled,
6 "Petition for Inter Partes Review of U.S. Patent
7 Number 11,827,921."

8 A. Okay.

9 Q. Okay. And you are not sure if you reviewed
10 that document; that's Exhibit 1043. Is that fair?

11 A. I'm not sure. As I said, I have seen
12 things like this, but I don't remember if it's exactly
13 this.

14 Q. And on Page 17 of your -- Paragraph 17 of
15 your declaration when you cite the petition, you are
16 not sure what it is you are citing to; is that right?

17 A. I don't remember, which --

18 MR. SALEN: Object. Misstates his testimony.

19 A. I -- you know, it's a little vaguely
20 written in there as to exactly which petition it is.
21 It could be this petition.

22 Q. Do you think it could be some other
23 petition?

24 A. I don't know how many petitions got filed
25 altogether.

1 Q. Okay. What -- what -- do you have any
2 idea -- if you had -- if you had to make your best
3 guess as to what it is you are citing, when you refer
4 to "petition" in paragraph 17 of your declaration,
5 what would it be?

6 A. It could be this, but I don't know that it
7 is exactly this.

8 Q. What is your best guess as to what it is?

9 A. Why would I want to guess?

10 Q. What do you think it most likely is?

11 A. I mean, that's why -- I don't really want
12 to guess.

13 Q. Okay.

14 A. I think I told you, I just -- I told you
15 now that this is something that is similar to what I
16 have seen. It's a petition. This is a petition. It
17 could have been the same thing, but it might have been
18 a different document. I can't -- I can't tell from
19 that. I don't know how many petitions got filed.

20 Q. In reviewing your declarations to prepare
21 for your deposition testimony, did you ever come
22 across your citations to petition and ask yourself:

23 Hey, I wonder what that is maybe I should
24 find out what it is I'm citing?

25 A. I didn't. There is so many places of

1 citing. I -- when I was writing it, I -- when we were
2 writing it, you know, I would look at the citation,
3 but that was ages ago.

4 Q. Okay. And you don't recall what it was
5 when you were helping to write this, that you were
6 citing to when you cited the petition in Paragraph 17?

7 MR. SALEN: Object. Misstates his testimony.

8 A. I said at the time when I'm citing
9 something, I looked; but now I don't remember
10 specifically what it is. That's why I can say, "This
11 looks familiar in a general sense," but I can't swear
12 that's exactly the same thing.

13 Q. Okay. Let's go ahead and take a look at
14 Exhibit 1043. I might do this a little differently.

15 I will do it this way.

16 Let me just ask this question with respect to
17 Exhibit 1043, can you describe for me what you
18 understand this document to be?

19 A. Well, to the extent I understand, this is a
20 legal document, so I am not an expert about legal
21 documents, but it looks like it's a petition.

22 Q. Okay. Can you be any more specific than
23 that?

24 A. Well, Bio-Rad, the opposing side, has
25 obviously sent something to the patent board,

1 petitioning for getting it reviewed.

2 Q. Okay. And do you have any idea what the
3 role of Exhibit 1043 is in this case that you are
4 sitting here to be a witness in?

5 A. Well, only in the sense that it's part of
6 the argument that one side is making against the
7 other; that has to be judged by the patent office.

8 Q. Okay. And to the extent you've cited
9 something that's called a petition in your
10 declaration, you don't know if it's Exhibit 1043; is
11 that right?

12 A. I already said this about four times.
13 It's -- this looks familiar. This is a petition. I
14 can't swear that this is exactly the same thing that I
15 was citing, but it's -- it could be because it is a
16 petition, and I cited a petition.

17 Q. Okay. And just to be clear, sitting here
18 today, you don't recall what it is you are referring
19 to when you cited petition in your declaration
20 Exhibit 2018?

21 A. Right now, I don't remember. I don't
22 remember every citation as to what exactly it was
23 being cited to.

24 Q. And that's true with regard to the
25 citations to petition in your declaration, correct?

1 A. I just -- I don't know how to keep
2 saying -- I'm saying the same thing over and over
3 again. I told you. I've cited, "Petition." This is
4 a petition. It looks familiar. I can't swear that
5 it's exactly the same thing that I was citing to, but
6 it could be. I don't know how many times I can say
7 the same thing over and over again.

8 Q. Just let me do this one more time. When
9 you cited, "Petition" in Paragraph 17, what do you
10 think you were citing to?

11 A. I was citing a petition that was sent by
12 Bio-Rad to the patent office.

13 Q. Can you be any more specific than that?

14 A. If you're asking me which document it is;
15 is it this document?

16 I keep telling you the same thing. I don't
17 know how to say it again.

18 Q. When you say, "this document," you are
19 referring to Exhibit 1043?

20 A. Yes. If you are asking me is this exactly
21 what I cited, I told you that it looks familiar, and
22 it is a petition. I cited to a petition. It could
23 be -- it could be this particular document, but it
24 might not be this particular document. I don't
25 remember this document versus any other petition

1 document, and I don't know if there are other petition
2 documents or not.

3 (Document tendered to counsel and the witness.)

4 (Exhibit 1002 previously marked for identification,
5 declaration of Carl A. Batt, PH.D.)

6 Q. All right. Let's do it this way. I've
7 handed you a document; that's been marked as
8 Exhibit 1002. Is this the document you reviewed in
9 preparation for your testimony today?

10 A. Well, I've certainly reviewed a declaration
11 of Carl Batt; that's what that -- I have reviewed, a
12 declaration of Carl Batt. And if this is what his
13 declaration is, then that's what I reviewed. If
14 he's -- okay. I don't know how many -- I don't know
15 how many declarations he did. I only -- I only saw
16 one declaration of Carl Batt. And if this is that
17 one, then I reviewed this.

18 Q. You want to take look at it real quick and
19 just flip through it, and see if this is the one?

20 A. Do you want me to read the entire document?

21 Q. No. I didn't say that. I said, I want you
22 to flip through it and see if you recognize this and
23 can confirm that this is in fact the declaration from
24 Dr. Batt that you reviewed.

25 A. It looks familiar. I mean, I am not on a

1 page by page basis, but it looks familiar, and I did
2 review a declaration of Carl Batt.

3 Q. How about if you look at your list in your
4 declaration, and see if that will help you confirm?

5 A. I don't even have to for that. I mean, I
6 can, but I reviewed the declaration for Carl Batt;
7 that's definitely true. This looks familiar. This
8 looks like it.

9 What I'm saying is, that I don't know how
10 many declarations he wrote. So he wrote four
11 declarations, I can't tell you that this is one of the
12 four I read. I don't know how many declarations he
13 wrote. I do know that I reviewed a Carl Batt
14 declaration.

15 Q. Okay. And you can't say one way or the
16 other, whether this Carl Batt declaration, that's been
17 marked Exhibit 1002, is the one you reviewed in
18 connection with this case. It might have been another
19 one?

20 A. If you want to be precise about it, to do
21 that, I have to see the documents, compare them word
22 by word, which you obviously don't want me to do.

23 (Court reporter requested a break.)

24 VIDEOGRAPHER: We are now going off the record
25 at 9:28 a.m.

1 (Off the record at 9:28 a.m.)

2 (On the record at 9:33 a.m.)

3 VIDEOGRAPHER: One moment, please, while I get
4 the camera rolling.

5 We are back on the record at 9:33 a.m.

6 BY MR. WALTER:

7 Q. All right. Dr. Struhl, why don't we go
8 to --

9 A. Can I just make one additional comment
10 about this, that thing. I actually now had the time
11 to look, and I do list it. I do list it as the thing,
12 and it is the same one. It's got the same exhibit
13 number. So it is this one, assuming that this is
14 really the right thing but -- I mean, this exhibit
15 number is the same as the exhibit number that I
16 reviewed. I didn't -- I looked at the list.

17 Q. Okay. Very good.

18 Let's go to Paragraphs 68 and 69 of
19 Dr. Batt's declaration, Exhibit 1002. And you can see
20 in those paragraphs, Dr. Batt is expressing his opinion
21 as to the level of ordinary skill in the art?

22 A. Uh-huh.

23 Q. Okay. This is -- this is the definition in
24 Paragraph 68 and 69 that you reviewed and are adopting
25 for the purposes of this declaration?

1 A. Whose declaration, my declaration?

2 Q. Your declaration, yes, Exhibit 2018.

3 A. I don't think it was based on that
4 statement.

5 Q. It wasn't?

6 A. I think it was based on -- I think it was
7 based on -- who did I say it was based?

8 Where is my thing?

9 Let me see where it said it was based. It
10 was Paragraph 17, if I remember.

11 Yeah. I don't contest Petitioner.

12 He is not the Petitioner.

13 Q. Okay. Now, I'm just trying to figure out
14 where you got this definition that you reviewed. You
15 got it from -- let's try it this way.

16 Let's go to Exhibit 1043, which is the
17 document entitled, "Petition for Inter Partes Review."
18 And let's take a look at the text on pages 9 and 10
19 under the header, "Level of Ordinary Skill in the Art of
20 the '921 patent."

21 A. Where are you looking now?

22 Q. It's on pages 9 and 10, the text under the
23 header, "Level of Ordinary Skill in the Art of the
24 '921 patent," Exhibit 1043.

25 Is this the definition of the level of

1 ordinary skill in the art that you reviewed and adopted
2 for the purposes of --

3 A. The definition is here.

4 Q. Hold on. Let me finish. Let me finish the
5 question, okay.

6 Is the definition for the level of ordinary
7 skill in the art that appears on pages 9 and 10 of
8 Exhibit 1043, the Petitioner's definition of the level
9 of ordinary skill in the art that you reviewed and
10 adopted for the purposes of your opinions in this case?

11 A. I think I stated where I got my thing from,
12 the Petitioner, and so it could have been this. I am
13 a little bit confused. I don't understand what you
14 are asking.

15 Q. The question is actually very
16 straightforward. Just take a moment and review the
17 section, "Level of Ordinary Skill in the Art of the
18 '921 Patent," on pages 9 and 10 of Exhibit 1043, and
19 let me know when you are done.

20 A. That's a perfectly reasonable description.

21 Q. Okay. Is that definition that appears
22 there on pages 9 and 10, is that the one you reviewed
23 and adopted for the purposes of your opinions in this
24 case; can you say one way or another?

25 A. I don't specifically remember exactly where

1 I got that.

2 ZOOM ANNOUNCEMENT: You are in the meeting now.

3 A. I don't know if I got -- what I wrote was
4 directly from this particular thing or something very
5 much like it. It's basically pretty much the same
6 thing as far as I'm concerned.

7 Q. Okay. So with that in mind, that you think
8 it's pretty much the same thing as what you have
9 adopted for the purposes of this declaration, let me
10 ask this question. There is a series of competencies
11 that are listed on the bullet point from Page 9 to 10.

12 Do you see those?

13 A. Yes.

14 Q. These are the competencies that a POSA, a
15 Person of Ordinary Skill in the Art, would have had
16 under the definition you've adopted for the purposes
17 of your opinions in this case?

18 A. They would have understood these things, if
19 that's what it says here, you would understand them.

20 Q. Okay. Now, let go to Page 19, Paragraph 19
21 of your declaration.

22 A. Uh-huh.

23 Q. You state that you are a Person of Ordinary
24 Skill in the Art under this definition as of the
25 priority date.

1 Do you see that?

2 A. Yes.

3 Q. Okay. Do you know what the priority date
4 is for the '921 patent in this case?

5 A. Not really. I've not paid attention to
6 priority dates. It's not my job.

7 Q. Okay. Do you know if it's before or after
8 2005?

9 A. I said it's -- it's not my job to know.
10 That's a legal thing. I don't know legal stuff.

11 Q. Okay. So when you were referring to the
12 priority date in Paragraph 19 of your declaration,
13 what were you referring to?

14 A. Well, any -- no matter what the priority
15 date was, the Person of Ordinary Skill in the Art
16 definition refers to the priority date. So it doesn't
17 matter what it is. It's whatever the priority date
18 is; that's what's relevant.

19 Q. What is the priority date for the '921
20 patent?

21 A. I told you, I don't know what date it is.
22 I'm not a lawyer. I don't -- that's a legal question.

23 Q. Did the lawyers tell you what the priority
24 date should be?

25 A. I don't remember. Maybe they might have,

1 but I don't remember. And as I said, I am not a
2 lawyer. I don't pay attention to priority dates.
3 That wasn't my job. I'm a scientific expert, not a
4 priority date expert.

5 Q. Do you have any idea what the priority date
6 might be relevant to -- with regard to the issues in
7 this PRC proceeding?

8 A. Well, my understanding -- and, again, I am
9 not a lawyer -- is that when you have a -- whatever
10 the priority date is, that's when someone, a person
11 of -- the thing that that person who is of ordinary
12 skill in the art, that's the date that their knowledge
13 is relevant.

14 If they know something many years later,
15 that doesn't count. So it doesn't matter what the
16 date is. I mean, in terms of the definition, it
17 matters. It does matter because whatever the date is,
18 that Person of Ordinary Skill in the Art has to know
19 the relevant things.

20 Q. Do you know what the term "priority date"
21 refers to? What does it mean?

22 A. Well, I have a layman's view of it.
23 I don't -- again, I am not a lawyer. Like I said, I
24 am not a lawyer. That's the -- the official date when
25 the patent is, like, officially considered, you know,

1 the date when the patent sort of starts in some sense,
2 but you are asking me a question that I'm not really
3 capable of answering. I am not a lawyer.

4 Q. Priority date is the issue date of the
5 patent?

6 MR. SALEN: Objection. Misstates his testimony.

7 A. Now you are asking me even more legal
8 questions. I'm not a lawyer. I don't know the answer
9 to these questions legally.

10 Q. Okay. Is the priority date, the date that
11 the invention was made?

12 A. You are asking me a question that, again, I
13 don't know. I don't know the law.

14 Q. Is the priority date, the date the patent
15 application was -- that led to the patent was filed?

16 A. You are asking me another legal question.
17 Again, ask me all legal questions you want, I don't
18 know the answers to them, and I'm not going to answer
19 them because I'm not going to start guessing.

20 Q. Do you know if the priority date was
21 before -- I'm just trying to bracket here. Do you
22 know if the priority date was before or after 2000?

23 A. No. I don't know what any of the priority
24 dates are. I would be a little surprised if it was --

25 Oh, after 2000?

1 I would imagine it would be that based on
2 my knowledge of the field, okay.

3 Q. Do you know if it was before or after 2005?

4 A. When you start getting to that level, I
5 can't tell you.

6 Q. Do you know if it was before or after 2010?

7 A. I just said when you can't -- I'm not going
8 to answer that. That you are asking me a legal
9 question again.

10 Q. Do you know if the priority date was before
11 or after 2015?

12 A. That's the same question.

13 Q. Okay. Now, what would you describe as the
14 field of art of the '921 patent that's at issue in
15 this IPR proceeding?

16 A. It's basically a -- it's a multiplex PCR
17 patent.

18 Q. Now, was -- did the field of multiplex PCR,
19 was that a field that had changed between 2005 and say
20 2015?

21 A. I don't know what you mean by that.

22 Q. Had there been technological developments?

23 A. Yes. General concept of multiplex PCR,
24 people did it different ways over -- over -- and they
25 improved it over time.

1 Q. And were those improvements things that
2 were happening between 2005 and 2015?

3 A. I couldn't tell you exact years. I mean,
4 my lab did multiplex PCR long before. My lab was
5 doing multiplex -- my lab did multiplex PCR reactions
6 in 2002 or published at least three papers I can think
7 of, that we did that, and there were 2002, 2003, 2005.
8 So multiplex PCR as an overall concept, that is,
9 multiple PCR reactions in the same tube. That was
10 around at least as long as since we were doing, it and
11 I'm not sure -- I don't know if we were the first. I
12 doubt it, but I don't actually know.

13 Q. I'm asking something different. Would you
14 say that the field of multiplex PCR you said -- you
15 said the '921 patent pertained to multiplex PCR.
16 Would you say that was a rapidly developing field from
17 your perspective as an expert in the decade between
18 2005 and 2015?

19 A. It's like any other field. It developed.
20 People improved it. They do things that they are
21 better than what was done before. The way we did it,
22 people don't do anymore at least generally.

23 Q. Okay. How did the field change over the
24 time frame 2005 to 2015?

25 In other words, what were some of the

1 improvements that you were aware of?

2 A. Well, this patent is an improvement over
3 what we did. The Larson patent is an improvement over
4 what we did. So there are improvements, you know.

5 Q. Now, let's go to Paragraph 19. It states,
6 "I would qualify at least -- as at least a POSA at all
7 relevant times for purposes of this proceeding,
8 including at least as early as the priority date of
9 the '921 Patent."

10 Now, you refer to the priority date of the
11 '921 patent. We've confirmed that you don't know what
12 that is.

13 Was there a date that you had in mind, you
14 know, where you were trying to say, I would have been a
15 POSA at least as early as of a certain date?

16 A. Yes. We were doing these experiments
17 ourselves. I mean, I'm a serious expert in doing PCR.

18 Q. I guess my question is more specific. What
19 date -- what date did you have in mind?

20 You said at least as early as the priority
21 date. You don't know what the priority date is.

22 A. I know it's got to be after 2000 -- 2002 or
23 2003.

24 Q. Okay. So what date did you have in mind
25 for your -- for the date when you say "the priority

1 date"?

2 A. I didn't have date. I just knew it was way
3 after when we were doing the things ourself. I have
4 been an expert in this area for, you know, since 2002.

5 Q. Okay. So let me ask this question: At
6 what point in time would you have said that you would
7 have understood the competencies that are part of
8 Petitioner's definition of the level of ordinary skill
9 in the art?

10 A. I would say that I would be a Person of
11 Ordinary Skill in the Art in like 2002, 2003.

12 Q. Okay. That's when you would have
13 understood the competencies that are listed in
14 Petitioner's --

15 A. Yeah. We were doing it.

16 Q. I appreciate it. Just let me finish my
17 question.

18 A. It's a habit. I apologize.

19 Q. Okay.

20 Okay. So -- and it's hard for me now,
21 because I lost my train of thought.

22 Okay. So the techniques that are listed in
23 Petitioner's definition for the level of ordinary skill
24 in the art, those are things that you and your coworkers
25 were doing in the lab in the 2002, 2003 time frame?

1 A. Yeah. It varies to exactly which things
2 were done when. I couldn't give you an exact number,
3 but we were about -- we were about as early as it gets
4 in doing PCR reactions for various purposes.

5 Q. Okay. Let's talk about some of these
6 things. One of the competencies that's listed in the
7 first bullet point, Petitioner's definition is
8 multiplex PCR and its application detecting and
9 measuring polynucleotide analytes.

10 When did you first start doing multiplex PCR?

11 A. Our first published paper that used it, I
12 believe, was 2002. I think the 2002 paper has it in
13 there. 2003 paper definitely has it in there.

14 Q. Okay. And how many targets were you
15 multiplexing in the same reaction?

16 A. I think either -- a few. I think it was
17 like three or five. Some number like that.

18 Q. What were the purposes of those
19 experiments?

20 A. Well, if you really want to know, the
21 experiments had to do with -- we were very interested
22 in translation elongation of the RNA polymerase
23 transcription -- I'm sorry-- of RNA polymerase
24 elongation where the preliminary starts and it ends,
25 and we were interested in following it down the gene.

1 And so we had a setup where we had a very long gene.
2 We had five PCR probes that marked various positions
3 in the gene, and we did a reaction with all five prior
4 pairs in the reaction. So we were assaying all five
5 things at the same time. And we separated them by a
6 gel, so we can see the five different products. It's
7 quite a nice method.

8 Q. Okay. And in 2000 -- so you said you were
9 doing this in 2002, 2003?

10 A. There are two papers. There are three
11 papers I can think off the top of my head that did
12 this; 2002, 2003, 2005. Paul Mason in my lab is the
13 guy who was doing all of it.

14 Q. And when you went to 2000 -- when you were
15 in 2005, how many targets were you doing?

16 A. Well, for multiplex PCR, we were typically
17 doing, I'd say, probably -- five was probably what we
18 usually routinely did. Maybe sometimes there might
19 have been fewer but --

20 Q. Did you ever do more?

21 A. I don't think so, but I don't -- you know,
22 I don't think so.

23 Q. Okay.

24 A. Because -- well, we didn't because we, you
25 know, we wound up doing different things for different

1 reasons over time.

2 Q. Now, were other researchers besides you and
3 your coworkers in your lab also performing multiplex
4 PCR in the 2005 time frame?

5 A. Probably.

6 Q. Can you say one way or the other?

7 A. Well, I don't think we invented the
8 technique, but it's a pretty obvious technique,
9 actually. There's a lot of techniques that are
10 conceptually similar to that, even if they don't
11 develop PCR.

12 Q. In the 2005 time frame, what's the largest
13 number of targets that you are aware of having been
14 analyzed in a multiplex PCR reaction?

15 A. I don't think I ever thought about it from
16 the way you just asked the question.

17 Q. Okay.

18 A. I don't think anybody would say, "Well, he
19 did seven." I don't think anyone would have cared.

20 Q. Why do you say that?

21 A. Because we could have -- we -- we did five
22 because that was what we wanted to do. If we wanted
23 to do seven, we would have done seven. You know. I
24 don't know what, you know, some technical limit you
25 have to do this, depending on a million and one things

1 and -- but -- so I don't think anybody would have paid
2 attention. The way you had phrased the question, I
3 don't think that is something anybody would be
4 interested in.

5 Q. Okay. Now, you said if -- you had done
6 five. If you wanted to do seven, you would have done
7 seven. Why are you confident in 2005, you would have
8 done five or seven?

9 A. It's not magical.

10 Q. How about 10. Could you have done 10?

11 A. At some point you have to be able to
12 separate all the bands on the gel. So there's a limit
13 there, you know, depending on what kind of gel you ran
14 that would, you know, depend on that.

15 There are issues where you have to make
16 sure the primers are all compatible, so they don't
17 make a mess out of the products.

18 At some point that would be a problem. I
19 can't tell you when that would be. Five, obviously,
20 wasn't a problem. I doubt seven would be. If you had
21 said 200, that might be a problem.

22 Q. In the 2005 time frame, were there
23 techniques available for trying to select primer, so
24 you could avoid these kinds of negative primer
25 interactions?

1 A. People tried those things. There were
2 various versions of people trying to do that. Some
3 people were better than others.

4 Q. How about you guys, did you guys do that?

5 A. Yeah. We have to do that to do the
6 experiment. That's ultimately only trial and error.
7 You can use whatever program you want, but in the end,
8 you have to test it out to make sure that it actually
9 works the way you want it to.

10 Q. And were you doing it for five?

11 A. We were doing it for -- five is, I think,
12 most standard experiment we did.

13 Q. You were confident in 2005, you could have
14 gone up to 10?

15 A. I guess we probably could have, but we
16 never tried it because we didn't have any reason to
17 try it. It's not like a magical thing.

18 Q. Why do you say it's not like a magical
19 thing?

20 MR. SALEN: I object. I object to this line of
21 questioning. It's outside his scope of -- his opinions in
22 this case and Dr. Batt's opinions in this case.

23 Q. Okay. Go ahead.

24 A. So what was the question again?

25 Q. Why do you say it wasn't a magical thing

1 to, like, go up to 10?

2 A. Because the concept is very simple. So
3 it's just a matter of, like, whether it would work or
4 not, and the only way you're going to know if it works
5 is if you try it. It's no reason that it wouldn't
6 work, but -- you know -- it might be problematic.
7 That any experiment is like that.

8 Q. Okay. Were you fairly confident that you
9 could work through the issues? You could optimize the
10 primers and get a set of primers that would work for
11 10?

12 A. I think we probably could have, but we
13 never tried it, so who knows.

14 Q. All right. Now, you know, you talked about
15 how, you know, sometimes there might be, you know,
16 negative interactions between primers when you are
17 trying to do a multiplex PCR. Do you know if there
18 was discussion of how to overcome those issues in the
19 '921 patent?

20 A. I don't recall if there is or isn't,
21 actually.

22 Q. Okay.

23 A. That's all trial and error, though.

24 Q. Okay. Now, the second bullet, that's part
25 of Petitioner's definition, lists the design and use

1 of fluorescent labeled oligonucleotide probes,
2 including the use of quenchers and used in conjunction
3 with multiplex PCR.

4 You see that?

5 A. Yes.

6 Q. Okay. When was that something you became
7 familiar with?

8 A. I couldn't tell you the year. Whenever the
9 probes became available is when I knew about them.

10 Q. You don't know if it was before or after
11 2005?

12 A. I don't know when the probes became
13 available off the top of my head.

14 Q. Okay. Can you put a ballpark range on when
15 the probes became available?

16 A. Not really. I -- not really.

17 Q. I mean, you can do better than that. If I
18 asked you this question: Did the probes become
19 available for the first time last week, you would say
20 no.

21 MR. SALEN: Objection. Ask your question.

22 MR. WALTER: I'm trying to move it along
23 quicker.

24 A. If you give me a very recent date or a very
25 old date, I can tell you because it's kind of obvious.

1 If you are going to get me to try to pinpoint it down
2 to this or that year, there is just no way.

3 Q. How about this; how about a five-year
4 interval? Do you know if --

5 A. That's not good enough.

6 Q. Okay. You couldn't say whether you are
7 aware of fluorescent oligonucleotide probes, including
8 quenchers for multiplex PCR in the 2005 to 2010 time
9 frame?

10 A. Whenever they became available is when we
11 knew about them.

12 Q. Okay. And you can't say whether it was
13 during the 2005 and 2010 time frame that you knew
14 about them?

15 MR. SALEN: Object. Asked and answered.

16 A. I told you, I don't know when it is,
17 because I -- we don't -- we didn't routinely use them.
18 We have used them, but we don't -- we do -- you're
19 asking what my lab does. You know, we -- whenever it
20 became available, that was an option that we
21 considered and we even tried.

22 Q. Okay. For the purposes of your opinions in
23 this case, did you investigate when those probes with
24 the quenchers became available for use with multiplex
25 PCR?

1 A. I don't know think I specifically looked at
2 exactly when they became available, because I don't
3 see the relevance of that.

4 Q. Okay.

5 Okay. Now, are you familiar with how those
6 TaqMan probes work?

7 A. Yes.

8 Q. Okay. And do you know when you became
9 familiar with the concept of how those worked, whether
10 it was before or after 2010?

11 A. Your attempts to keep putting a year on it
12 is not going to work. Well, I told you, I don't know
13 what years these things happened. I don't memorize
14 what year that -- no one thinks like that.

15 Q. Can you -- can you be -- can you give me a
16 general time frame?

17 A. Yeah. It was after 2000, and it was before
18 2020.

19 Q. That's as specific as you can be?

20 A. 2001 and 2019, but at some point it's going
21 to not be possible.

22 Q. What is the -- what's the most specific you
23 can be?

24 A. Well, we weren't using them in 2005. So
25 I -- so I don't -- we weren't considering using them

1 in 2005. I don't remember when we started doing cyber
2 green stuff, which is what we have done, like an
3 unbelievable amount of. But whenever this cyber --
4 whenever the TaqMan probes came out, they were, you
5 know, a trendy cool things. Lots of people used them.
6 A lot of people really liked them. There were a lot
7 of nice things about them. One nice thing about them
8 is that they are expensive.

9 Q. Okay. And, you know, be as specific as you
10 can be in terms of what time frame you would be
11 comfortable stating you became aware of those TaqMan
12 probes.

13 A. I would say between 2005 because we weren't
14 using them then. So we would have known about them if
15 they had existed. I probably didn't know about it.
16 Actually, probably closer to 2004. The paper was
17 published in 2005, so we were doing the experiments
18 probably in 2004.

19 And, obviously, these patents are talking
20 about TaqMan probes. So clearly I knew about them. I
21 knew about them before, you know, these guys obviously
22 knew about them. I would have known about them
23 probably the same time. These were quite publicly
24 well-known things. Everyone knew about TaqMan probes
25 when they got invented.

1 Q. Okay. Did you say -- I don't want to put
2 words in your mouth, but I thought you might have
3 suggested that your 2005 publication on multiplex PCR
4 used TaqMan probes; is that --

5 A. No.

6 Q. They did not?

7 A. No, did not.

8 Q. Okay. And so the detections scheme that
9 you used in your 2005 publication was based on gel
10 electrophoresis?

11 A. Fragments were five PCR products were
12 of different sizes and you could separate on the gel.

13 (Reporter requested clarification.)

14 A. Five different PCR products were different
15 in size, and they could be separated with a gel, and
16 that's what our data was with tons of gels in these
17 papers showing that.

18 Q. Okay. And do you know when your lab
19 started moving to optical detection of PCR products?

20 A. Not exactly no.

21 Q. Do you know if it was before or after 2010?

22 A. Off the top of my head, I couldn't tell
23 you.

24 Q. When would a Person of Ordinary Skill in
25 the Art have become aware of the concept of adjusting

1 the intensity of light that might be admitted from a
2 probe such as a TaqMan probe; do you know?

3 A. Do you mean -- I'm not sure I understand
4 what you mean by that.

5 Q. Okay. Let me ask this.

6 Is it possible to adjust the intensity of
7 light that is admitted from a TaqMan probe?

8 A. Well, a TaqMan probe is a particular
9 chemical, so on a molar basis, it's going to be the
10 same no matter what. If you use less of it in making
11 your oligo, it'll be less per oligo, so it depends on
12 how you made them.

13 Q. When you say you used less of it, what do
14 you mean by that?

15 A. Well, you could take a TaqMan probe and
16 dilute it with a similar -- the same probe without the
17 thing or you could use less -- when you are making the
18 probe, you can use less of the labeled material when
19 you stick it on the oligo, so --

20 Q. Okay. So you are suggesting that someone,
21 a person skilled in the art, would understand that you
22 could modulate the intensity coming from your TaqMan
23 probe by using a lower concentration of probe; that's
24 actually got a fluorophore label?

25 A. I don't know. So I don't think anybody

1 would have -- the way you phrased it, I don't think
2 anybody would have thought that. I mean, people just
3 bought the probes that existed.

4 Q. Okay. When people bought the probes, were
5 they aware that you could adjust the intensity that
6 you were detecting from that particular probe by
7 changing the concentration of the probe that you are
8 using?

9 MR. SALEN: Object to the form of the question.

10 A. I think when -- I think when most people
11 bought the probe, they just used them as is. And the
12 idea of doing different intensities was an interesting
13 innovation from the beginning of the first TaqMan
14 probe.

15 Q. Okay. And do you know when that idea of
16 using different intensities was first suggested?

17 A. Actually, I don't. I certainly both --
18 certainly the -- certainly all the relevant art here,
19 like Larson and Saxonov of the patent all do that,
20 okay. That's when I first heard about it. I didn't
21 -- I hadn't heard about it until then.

22 Q. Were people of skill in the art aware when
23 TaqMan probes were available, that you could adjust
24 the intensity of light being admitted by a TaqMan
25 probe by including more or less fluorophores in the

1 TaqMan probe?

2 MR. SALEN: Object to the form of the question.

3 A. I would say that the idea of using -- the
4 idea of using multiple colors on the same probe or
5 different intensities on the same -- of the same probe
6 was a -- was a -- was a development from the original
7 TaqMan probe. The original TaqMan probe people didn't
8 do that.

9 Q. Now, when did people start to use multiple
10 colors or using multiple fluorophores to modulate the
11 intensity; do you know when?

12 A. All I know is what I've read in these. I
13 did not go, and do a history of this. So it it's
14 clear that the '921 patent and the Saxonov and Larson
15 reference they do that at some level, and that's where
16 I first heard about it. I don't know the history of
17 that. I don't know if there is a paper before that
18 saying you could do this, the other thing.

19 Q. Did you go and investigate any of that for
20 the purposes of your testimony in this case?

21 A. Investigate what?

22 Q. When scientists and researchers interested
23 in multiplex PCR first began using multiple probes on
24 the same fluorophore with multiple -- excuse me --
25 multiple colors, multiple fluorophores in the same

1 probe or modulating the intensity of a probe by
2 adjusting the number of fluorophores, did you ever
3 investigate when that first started being used?

4 MR. SALEN: Hold on. I object to the form.

5 Go ahead.

6 A. I did not do a historical perspective of
7 that particular issue.

8 Q. Okay.

9 A. I -- my knowledge of that comes from the
10 patents, so I don't know where they got the idea from.

11 Q. When did you -- did you hear of the Larson,
12 and Saxonov references before you began your work in
13 this case?

14 A. No, I've never heard of them.

15 Q. Okay. How about -- how about the
16 ChromaCode patents that are at issue --

17 A. No.

18 Q. -- in this case, never heard of them?

19 A. No, never heard of them.

20 Q. Okay. You ever heard of Axel Scherer
21 before you were working on this case?

22 A. I don't think so. I can't -- I know people
23 named Scherer. I can't remember if I know an Axel
24 Scherer versus somebody else. It doesn't ring a bell
25 particularly.

1 Q. Emil Kartalov?

2 A. No.

3 Q. Never heard of him. How about Deitra
4 Rodrick Cabral [phonetic]?

5 A. No.

6 Q. Did you ever hear of the company ChromaCode
7 before working on this case?

8 A. No. I heard of Caltech though. I almost
9 took a job there.

10 Q. That's better than me. They wouldn't even
11 let me in for college.

12 A. Oh.

13 Q. So there you go.

14 A. I went to MIT instead of Caltech.

15 Q. MIT probably wouldn't have let me in,
16 either.

17 All right. The third bullet under the -- the
18 third bullet that's listed in Petitioner's definition
19 for the "Level of Ordinary Skill in the Art," on Page 9
20 refers to, "The quantitative detection and measurement
21 of polynucleotide analytes using fluorescent-labeled
22 oligonucleotide probes in multiplex applications"?

23 A. Yes.

24 Q. When was that something that was first
25 known to scientists and researchers?

1 A. I can't tell you the year again, but once
2 you have TaqMan probes in multiple colors, pretty
3 obvious, but I don't know when that was exactly.

4 Q. You know it was present in Larson though,
5 right?

6 A. Well, all of the relevant things that I
7 looked at involved multicolored detection.

8 Q. Okay. How about the fourth bullet
9 techniques for labeling probes and detecting multiple
10 targets using fewer differently colored fluorophores
11 and polynucleotide targets.

12 Do you see that one?

13 A. Yes. So that's the essence of the
14 material, basically being able to see more than one
15 color, more than one color per thing. It haven't
16 heard about that until I was involved in this case.

17 Q. Okay. So you never -- you never heard of
18 that at all before you became involved in this case;
19 is that right?

20 A. Right. Right. Because I was not paying
21 attention to it. I would have understood it if
22 someone told me about what they were doing, I would
23 have understood it. I would have understood it. I
24 understood -- as soon as I read these things, I would
25 have known what they were talking about.

1 Q. But you adopted this as a competency of the
2 level of the Person of Ordinary Skill in the Art as
3 the priority date for the purposes of an opinion in is
4 this case, correct?

5 A. Well, they would have understood the
6 technology. It's not actually doing it. They would
7 have -- if someone said that, they would have
8 understood it.

9 Q. Okay. When did -- let me just ask this
10 question. When did you first become aware of the
11 concept of using different intensities of a single
12 signal to distinguish different targets?

13 When did you first become aware of that?

14 A. When I got them during this patent
15 because --

16 Q. When you say, "during this patent," you
17 mean in connection with this case?

18 A. In connection with the case, yes, the case
19 we are talking about --

20 Q. Okay.

21 A. -- because -- and the reason I was not
22 familiar with this before is because -- it's
23 actually -- it's actually a very kind of specialized
24 application with this technique, and we never did
25 that. So that's why I never really paid attention to

1 it.

2 Q. Okay. It's not something you would have
3 been thinking about as part of your work until you got
4 involved in this case?

5 A. Right. Because, in fact, even now knowing
6 this, doesn't -- would not affect what my lab does at
7 all. I'm not saying it's not useful. I'm just saying
8 that my lab wouldn't use it. It's not something that
9 we do. It wouldn't have any benefit.

10 Q. When did you first become aware of the
11 concept of using combinations of colors to identify
12 targets?

13 And it doesn't need to be a multiplex PCR.
14 It could be in related disciplines. When did you first
15 become aware of that?

16 MR. SALEN: Object to form.

17 A. Again, the idea that you would basically
18 have a given, you know, thing that you are testing for
19 by using multiple colors to test, to get a signal for
20 your favorite thing, I learned that here.

21 Again, that's a very specialized use, which
22 these patents are meant for. My lab wouldn't do that.
23 And my lab -- as I said, my lab doesn't really use
24 these kind of probes that often, because they are
25 really expensive.

1 And so, you know, when you run a research
2 lab, you're limited in money. And it's not -- there's
3 no benefit. The way we used to do things was far --
4 there's actually a lot of ways, just as good and much
5 cheaper.

6 Q. Did you ever do any investigation to figure
7 out when scientists and researchers first become aware
8 of the concept of using multiple colors to identify a
9 single target.

10 A. As I said, I didn't do a historical
11 perspective at all.

12 Q. And did you have a historical perspective
13 sitting here today?

14 A. No because I didn't look at it, and, you
15 know, I read these things.

16 And I said, "Oh, okay. That's what they
17 are doing. Cool."

18 I mean --

19 Q. When you say "these things," what are you
20 referring to?

21 A. Well, the fact of using different
22 intensities, probes of different intensities, and the
23 fact that you could basically use multiple colors for
24 a given -- for a given analyte, for example.

25 Q. And what are the publications you looked at

1 in connection with this case that you think were doing
2 that?

3 A. It was mostly -- it was the patent. It was
4 the patents, really.

5 Q. "The patents," what are you talking about?

6 A. Well, the main patents were certainly the
7 '921 patent, obviously. There are some other patents
8 I looked at. I can't possibly remember the numbers of
9 and what the differences were. And then there are the
10 Larson one and the Saxonov one, and there are probably
11 a few others that I don't remember off the top of my
12 head, but they are all related to a patent case. They
13 are not related to a scientific history of the
14 subject.

15 Q. Okay. Now, let's go to -- let's continue
16 with that fourth bullet, actually.

17 I'm trying to ask a general question
18 similarly to what I asked before, but it's a little bit
19 different. Do you know when it became known and
20 understood in the field how to detect PCR products using
21 optical means?

22 A. I don't -- I'm telling you, I can't give
23 you a year. When TaqMan probes came out, that was --
24 that might -- I don't even know if that was the first,
25 but TaqMan probe certainly was that, Okay.

1 Q. You don't have a historical perspective on
2 when that was?

3 A. No because why would I care exactly what
4 year that was?

5 Q. Okay. How about the different fluorophores
6 that are used in connection with these TaqMan probes;
7 do you know when the FAM fluorophore was something
8 that became available for use?

9 A. I don't -- I don't know the -- you know --
10 the fluorophore as far as I've heard of colors, I
11 don't know the names of the chemicals.

12 And, again, I don't pay attention to what
13 colors they are. You know. You have multiple colors,
14 and you can detect them; that's all that a Person of
15 Ordinary Skill in the Art cares about. They don't
16 memorize the names of the compounds.

17 Q. Okay. So you don't have any idea when
18 scientists and researchers began using the FAM
19 fluorophore in connection with multiplex PCR?

20 A. Specifically, the FAM fluorophore, I don't
21 have the slightest idea.

22 Q. Okay. Cy3, same thing?

23 A. You know, some of them -- some of the
24 things have names I vaguely have heard of, and others
25 I haven't. But your typical Person of Ordinary Skill

1 in the Art is not paying attention to things like
2 names. They just know that, we can do multiple
3 colors. How many colors can I do? That's all they
4 care about. They don't even know the names of the
5 compounds.

6 Q. I mean, just -- just try to answer my
7 question as directly as you can.

8 A. I was trying to.

9 Q. Okay. Do you know when the Cy3 fluorophore
10 became known to scientists and researchers for use
11 with multiplex PCR?

12 A. I couldn't tell you a year.

13 Q. Okay. How about a range, a time range?

14 A. Well, if you're talking about multiplex
15 PCR, I told you, it's after 2000. It's before 2020.

16 Q. Is that as specific as you can be?

17 A. Because I don't really know when it was
18 but -- so I know that it can't possibly be before. If
19 you are talking for multiplex PCR, it can't be --
20 well, actually even that I am not a hundred percent
21 sure of. I don't know. For all I know, people were
22 doing multiplex PCR before we were. They probably
23 were. I just don't know.

24 Let's put it this way, when we did
25 multiplex PCR in our papers, we never said we were

1 doing multiplex PCR. We were doing it. We just
2 didn't name it, because it didn't really seem like
3 anything. Just sticking multiple things in the tube
4 and doing it at the same time, that is not a major
5 concept.

6 Q. How about the ROX, CY, if I were to ask you
7 about the ROX, CY5, and Cy5.05 dye, would you give the
8 same questions as to when those dyes became available
9 for use --

10 A. No --

11 Q. Let me finish. It's really important that
12 you let me finish.

13 A. I appreciate it. I'm sorry. It's a habit.
14 I try -- I'm trying my best not to indulge in it.

15 Q. Okay. How about the ROX, CY5 and the CY5.5
16 dyes, if I were to ask those same questions that I
17 asked earlier about when those dyes became known to
18 scientists and researchers for use with multiplex
19 applications, you wouldn't have any perspective on
20 that; is that right?

21 MR. SALEN: Object to form.

22 A. I have not done historical analysis of when
23 things were first done.

24 Q. How about dyes that were, you know, let's
25 put aside a specific dye. Let's put them aside.

1 Let's just talk about colors.

2 When did it become known to scientists and
3 researchers that red, blue, green and yellow dyes were
4 available for use with multiplex PCR?

5 Do you know when that was?

6 MR. SALEN: Object to form.

7 A. I keep telling you, when you're asking me
8 for years, I don't remember. At the time I wouldn't
9 have remembered, and I don't -- I certainly don't know
10 now. I didn't do a historical perspective. No normal
11 person cares about that.

12 I mean, people who are -- if people are
13 patenting individual dyes, they would care, and they
14 would be patent cases about it, but a Person of
15 Ordinary Skill in the Art doesn't care.

16 Q. Now, how about the instruments for
17 detection, for doing optical detection. Do you have
18 any experience with the instrumentation for doing the
19 optical detection like the -- the, you know, the
20 photo -- photomultiplier, the filters, and that sort
21 of thing?

22 MR. SALEN: Object to form.

23 A. Again, the Person of Ordinary Skill in the
24 Art is not into the detail of the various machines.
25 They just know this machine can do that, and this

1 machine can do that. And so, you know, you eventually
2 say, Oh, this machine can detect whatever it can
3 detect, and some of them can detect more colors than
4 others. And I couldn't tell you one machine from
5 another.

6 When you -- when a person of ordinary
7 skill, like me, for example in our lab, when we were
8 buying machines to do optical detection, which we did,
9 we just looked at what the -- what you could do with
10 the machines. We didn't really pay attention to what
11 year, when it came out, when we bought that particular
12 machine. We only cared that, Oh, this machine can
13 read whatever.

14 Q. Do you know what a bandpass filter is?

15 A. A bandpass -- no. As I said and to put
16 another way, the inner workings of these machines are,
17 to a Person of Ordinary Skill in the Art, are not
18 important.

19 Q. Have you ever heard the term "bandpass
20 filter" before today?

21 A. No.

22 Q. In the context of optical detection of PCR
23 targets, have you ever heard the term "channel"?

24 A. Are you sure -- about "optical channels,"
25 is that what you mean.

1 Q. Yes.

2 A. Yes.

3 Q. Do you know what that refers to?

4 A. Only in a very crude way.

5 Q. Okay. What is your crude understanding of
6 what "optical channel" refers to?

7 A. Well, as I said, I don't know the inner
8 workings of the machines, but an optical channel in a
9 Person of Ordinary Skill in the Art view of the world,
10 is part of the machine is working, and it's when
11 detecting, let's say, green. So it's whatever
12 wavelength it is, that's the channel on which you see
13 green.

14 And I don't know -- again, the details of
15 that is something that the person who is doing these
16 experiments doesn't pay attention to.

17 Q. Okay. Now, for the purposes of your
18 opinions in this case, was there any particular time
19 point, you know, any particular historical time point
20 that you used as the baseline time point for when you
21 needed to render your decisions as of?

22 You understand my question?

23 A. No.

24 Q. You don't understand what I might be
25 getting at?

1 A. No.

2 Q. Okay. Was there any historical time point
3 that you had to -- that you had to put yourself in, as
4 the time point for rendering your opinions on
5 invalidity?

6 A. I was looking at the patent, what the
7 patent said, and what some of the other prior art,
8 particularly patents, said in deciding what the
9 differences were and what was relevant. I wasn't
10 paying attention to years because that was -- again,
11 if you are starting to talk about years that becomes
12 legal. I'm not -- I am not a lawyer.

13 So, you know, if a document was relevant
14 because of the year, I would see it. If it wasn't, I
15 didn't see it. I wasn't making that decision because
16 the fact is, I don't know how to make that decision.

17 Q. Do you have any idea when the '921 patent
18 was filed for?

19 A. Well, I think -- I can look in the patent.
20 I can probably -- it probably says when it was.

21 Q. Sitting here today, do you have any idea
22 when that was?

23 A. Off the top of my head, no.

24 Q. All right. Let's take a look at
25 Paragraph 43 of your declaration. Exhibit 2018.

1 Take a moment to review Paragraph 43, and let
2 me know when you are done.

3 A. Okay.

4 (Witness reviewing the document.)

5 A. Okay.

6 Q. Now, here you discuss an approach where
7 individual targets you're analyzing are encoded with
8 intensities that have a geometric progression of 1, 2,
9 4, 8, 16, and so on; is that correct?

10 A. Yes.

11 Q. Okay. I'm going to show you now the patent
12 that we have been talking about a little bit.

13 (Document tendered to counsel and the witness.)

14 (Exhibit 1001 previously marked for identification,
15 U.S. Patent, Kartalov et al.)

16 Q. I've handed you Exhibit 1001, Patent
17 Number 11,827,921. Okay. What I want you to do is, I
18 want you to go to Column 22, Lines 18 to 37.

19 Go ahead, and review that, and let me know
20 when you are done.

21 (Witness reviewing document.)

22 A. Okay.

23 Q. Okay. Now, is this coding scheme, that's
24 laid out here, is this something that can be used with
25 the claimed invention in the '921 patent?

1 A. You mean what's in the patent?

2 Q. The passage I just had you read at
3 Column 22, yes.

4 A. Oh. Basically, column 22 is pretty much
5 what I wrote. It's pretty -- it's very long-winded
6 here, but the basic idea is pretty obvious. I saw it.
7 Clear, obvious. I made a mistake there.

8 Q. Paragraph 43, when you say what is in
9 Column 22 is what I wrote, that is in paragraph 43 of
10 your declaration; is that what you were trying to say?

11 A. I was saying my Paragraph 43 is essentially
12 a summary of what's in here. This goes into gory
13 detail in the patent, but the idea is clear, what they
14 are doing.

15 Q. Okay. Now, is this idea, that's laid out
16 in Column 22 and in Paragraph 43, is that an approach
17 that can be used for the claimed invention of the '921
18 patent?

19 A. Yes.

20 Q. Do you know?

21 It is?

22 A. Yes. I don't see why not. Why you
23 wouldn't -- you couldn't do that.

24 Q. Okay. Now, is this a scheme that can be
25 used for just two analytes, wherein you use an

1 intensity of 1 for one analyte and 2 for a second
2 analyte?

3 MR. SALEN: Object to form.

4 A. Well, the patent has a claim, and I forget
5 what the claim is. It needs to have -- you need to
6 have more -- excuse me -- I will even read you the
7 claim.

8 Q. I don't want you to read me the claim. I
9 was just asking a question. The schema we are talking
10 about in Column 22, you can just answer this directly.
11 Is that a schema you can use for just two analytes or
12 you use an intensity of 1 for one analyte and 2 for a
13 second analyte?

14 Can you do that? Is it possible?

15 MR. SALEN: Objection.

16 A. Well, I can only look at this thing with
17 respect to what's in -- what the patent is actually
18 claiming.

19 Q. Well, I'm asking you about the approach set
20 forth in Column 22, Lines 18 to 37 that I just had you
21 review.

22 A. Yeah.

23 Q. And my question to you is a simple one.
24 Could you use that for just two analytes.

25 Did you give the first analyte an intensity

1 of 1 and the second analyte an intensity of 2; would you
2 do that?

3 Would that work? Do you know?

4 MR. SALEN: Object to form.

5 A. If you only had two analytes, and you had
6 them at different levels -- if you -- if you followed
7 the way the patent is done, if you did what the patent
8 does, it would work. If you -- if you -- if you did
9 it that way, if you did what -- if you basically did
10 what the patent did.

11 Q. Okay. So you could use the scheme in
12 Column 22, Lines 18 to 37, for just two analytes,
13 fair?

14 A. Well, that would not be covered. The
15 patent is not -- requires more than that.

16 Q. Okay. We'll come back to that, but I'm
17 just asking about Column 22, Lines 18 to 37. You
18 could do that with two analytes, right?

19 A. You could put two different intensities in,
20 yes.

21 Q. You could put the first intensity, 1, and
22 the second intensity, 2, right?

23 A. Yeah, you could. You put the two
24 intensities in there, but this has to be done in the
25 context of a whole bunch of analytes floating around

1 in there.

2 Q. Okay. Now, let's go back to the front page
3 of the patent, and you see there's the date of
4 November 28, 2023.

5 Do you see that?

6 A. Yes.

7 Q. Do you know if that was the date that you
8 had to use for evaluating the state of the art for the
9 purpose of rendering your opinions?

10 A. I told you, I was not dealing with dates.

11 Q. Okay. How about -- there is a filing date
12 in Paragraph 2020?

13 A. I didn't pay attention to any of the filing
14 dates. That's all legal mumbo jumbo. I didn't pay
15 attention to that stuff.

16 Q. Okay. Do you -- do you know what date you
17 needed to use for evaluating the state of the art for
18 the purposes of rendering your opinions?

19 A. No because the opinions are the opinions,
20 whether the state of the art is -- I'm judging by what
21 I'm reading in the patents, okay. The dates don't
22 matter for that.

23 Q. Okay. All right. Let's go to Paragraph 21
24 in your declaration. Take a look at Paragraph 21. Go
25 ahead and review that, and let me know when you are

1 done.

2 (Witness complied.)

3 A. Okay.

4 Q. Now, you refer in the second line of this
5 paragraph to something called "Phillips," that's in
6 italics. Do you see that?

7 A. Yes.

8 Q. Do you know what Phillips is?

9 A. No but --

10 Q. Do you have any idea what you were
11 referring to?

12 A. This is a legal statement that I was
13 informed of. I don't really know completely what it
14 means. I don't know what the Phillips standard is,
15 other than what it says here.

16 Q. Okay. Do you know any idea what Phillips
17 might be when you refer to Phillips in your
18 declaration?

19 A. Just what's in this paragraph. This is --
20 the whole point of this paragraph is that I don't
21 actually know anything about the legal stuff. So I
22 have been informed about stuff. That is called the
23 Phillips thing; it's called the Phillips thing. It's
24 beyond me. I don't know anything more than that.

25 Q. You don't have any idea why it's -- what

1 Phillips is when you refer to Phillips?

2 A. I assume it's a person.

3 Q. It's a person?

4 A. I'm guessing, but I don't really know.

5 Q. Now, what is the Phillips standard?

6 A. It says right here what it is; that's all I
7 know. What it says here is what I know. I don't know
8 anything else about this. I -- I'm not a lawyer. I
9 keep saying that. I'm not a lawyer. I don't know any
10 of the legal stuff, except what people tell me it is.
11 So if this is correct, it's correct. If it's
12 incorrect, it's incorrect. I have been informed of
13 it. I don't know. I have no judgment on my own.

14 Q. And what is the purpose of the Phillips
15 standard? Do you know what it's for?

16 A. Well, I mean, again, it says here,
17 "Phillips standard, which claims are" supposed "to be
18 given their ordinary and customary meaning." It says
19 what it is here. That's all I know. I don't know
20 anything beyond that.

21 Q. Okay. Is the Phillips standard a set of
22 rules for evaluating whether a patent is invalid?

23 A. I don't know. This is all I know.

24 Q. Is the Phillips standard a set of rules for
25 determining whether a patent is infringed?

1 A. I don't know what the Phillips standard --
2 you have what I know. This is what I know, and I
3 don't even know. What I know, I've just been told it.

4 Q. Do you know if the Phillips standard is a
5 set of rules for how one interprets patent claims?

6 A. That's what it says here.

7 Q. That's what you understand it to be?

8 A. I only understand what it says here. I
9 don't know anything more. I don't know anything about
10 it. I never heard about the Phillips rule until I --
11 until I was informed about it.

12 Q. Is the Phillips -- is sitting here today
13 the first time you've heard about the Phillips rule?

14 A. I actually don't know the answer to that
15 question because I have done other patent cases, and
16 maybe it has come out. I don't remember.

17 Q. But the only time you remember with any
18 clarity of having heard of the Phillips rule, is when
19 we first began discussing it here today; is that
20 right?

21 MR. SALEN: Objection. It misstates his
22 testimony.

23 A. I said I -- in various cases I have done,
24 there are always legal issues that come up such as
25 this, and I don't know the legal issues. I'm not a

1 lawyer. I'm a scientist. It seems that is not as
2 important as the legal stuff in these cases, and I get
3 told stuff.

4 Q. Okay. Can you -- can you put into words
5 what your understanding is of the Phillips standard?

6 A. I just put it in words.

7 Q. Well, I thought was what the attorneys put
8 into words for you. Did you write this, or did the
9 attorneys give you this?

10 A. The attorneys told me what it is. I mean,
11 how would I know otherwise?

12 Q. Okay. So Paragraph 21, that came from the
13 attorneys; is that fair?

14 A. That's fine.

15 Well, no. Actually -- it's actually more
16 of a combination really because they're -- they are
17 telling me what I need to know.

18 Q. Okay.

19 A. So in fact, I very often do that. It's a
20 pretty common thing. I don't want to be on record
21 making legal conclusions when I don't know anything
22 about the law.

23 Q. Okay. So if I were to ask you again, what
24 your understanding is of the Phillips standard, you
25 wouldn't be able to do anything more than reiterate

1 the last -- the second -- the last two sentences of
2 Paragraph 21; is that fair?

3 A. My total knowledge is summarized in that
4 paragraph. I don't know anything more.

5 Q. Okay. Now, in this paragraph, you say that
6 claim construction analysis --

7 A. Well, I didn't say that.

8 Q. That's not what you said. Let's say what
9 you -- let's read it carefully. In the second
10 sentence of Paragraph 21 of your declaration, you
11 state:

12 "I understand that this analysis is
13 performed by primarily looking to the
14 patent's claims, specification, including
15 drawings, and prosecution history (the
16 'intrinsic' evidence)."

17 Do you see that?

18 A. Yes.

19 Q. Okay. Now when you say, "this analysis,"
20 what analysis are you referring to?

21 A. I assumed the analysis is of what the
22 claims mean.

23 Q. Okay. And you say you look primarily to
24 the patent's claims, specification, and prosecution
25 history.

1 Do you see is that?

2 A. Yes.

3 Q. Okay. With regard to the claim language
4 specification and prosecution history, do you have any
5 understanding as of which of those three things is of
6 primary importance?

7 A. Whatever it says here. I -- you know, this
8 is not my -- this is not my thing. I'm not a lawyer
9 so...

10 Q. If you know, if you have any understanding
11 of which of those things is of primary importance, the
12 claims, specification, and prosecution history, let me
13 know.

14 A. No. I don't know. I was not involved in
15 claim construction here. I've never been involved in
16 claim construction before, and not in this case,
17 either.

18 Q. Do you have any understanding with regard
19 to the specification and the examples in a
20 specification, what their role is in claim
21 construction?

22 A. No, other than they are at some point
23 relevant, but I couldn't tell you there. I don't
24 really know how relevant they are, and what -- how
25 important they are. That I can't tell you.

1 Q. Is it your understanding that claims should
2 be limited to examples in the specification?

3 A. I have no idea. You are asking legal
4 questions now.

5 Q. Okay. When if ever should the claims be
6 limited to examples in the specification; do you know?

7 MR. SALEN: Object to the form of the question.

8 A. I don't have -- I don't know.

9 Q. Okay. Let's go to Paragraph 80 of your
10 declaration. Here you state that, "My
11 analysis below is based on and consistent
12 with Patent Owner's proposed claim
13 constructions set forth at Exhibit 1003,
14 Exhibit 2011, and Exhibit 2012. In
15 particular, I understand that Patent
16 Owner proposes that 'degenerate' and
17 'degeneracy' generally describe a
18 situation where a legitimate result is
19 not definitive, because it can indicate
20 more than one possibility in terms of the
21 presence or absence of an analyte."

22 Do you see that?

23 A. Yes.

24 Q. Do you know where those definitions from
25 "degenerate" and "degeneracy" came from?

1 A. Off the top of my head, no. I'm sure they
2 are defined by the Patent Owner, but I don't know
3 where they define them, specifically.

4 Q. Okay. Now, you say, quote, "generally
5 described a situation where a legitimate
6 result is not definitive, because it can
7 indicate more than one possibility in
8 terms of the presence or absence of an
9 analyte."

10 Do you see that?

11 A. Uh-huh.

12 Q. So you agree that a situation where a
13 legitimate result is not definitive, because it can
14 indicate more than one possibility in terms of the
15 presence or absence of an analyte is degeneracy; is
16 that right?

17 A. Well, degeneracy can mean a lot; of
18 different things that is one use of the term.

19 Q. Okay. Now, you used the word "generally"
20 in your definition?

21 A. Uh-huh.

22 Q. Okay. Is the term "generally" intended to
23 convey that degeneracy can be something other than a
24 situation where a legitimate result is not definitive
25 because it can indicate more than one possibility in

1 terms of the presence or absence of analytes; is that
2 what -- is that why you use the word "generally"?

3 A. No. I think the word "generally" there is
4 because degeneracy can mean a bunch of different
5 things, and it has -- it has many different meanings.
6 And so in this particular context, if you are talking
7 about the ambiguity between -- you get a result and
8 it's ambiguous as to what it means, that is a way --
9 you could use degeneracy that way. That is a good way
10 to use it, but there are other ways you can use
11 degeneracy.

12 Q. In the context of this patent, what are the
13 other things degeneracy can mean besides the situation
14 where a legitimate result is not definitive because it
15 can indicate more than one possibility in terms of the
16 presence or absence of an analyte?

17 MR. SALEN: Object to form.

18 A. I haven't thought about it the way you just
19 phrased the question.

20 Q. Can you think of anything else it could be
21 in the context of this patent, other than that?

22 MR. SALEN: Same objection.

23 A. Yeah. I don't know if you would use the
24 term this way, but you could. You could, if you were
25 talking about having multiple analytes in are a single

1 droplet, you could sort of view that as degenerate. I
2 don't think that is the way they used the term, but
3 that's -- you could use the term that way, because
4 degeneracy means a lot of different things.

5 Q. In the context of this patent?

6 A. I think in the context of this patent, it
7 is pretty much what it says here.

8 Q. Could it mean a lot of different things in
9 the context of this patent?

10 MR. SALEN: Object. Asked and answered.

11 A. Yeah. I -- you know, I haven't really
12 looked at it from that point of view. It's pretty
13 clear what this sentence means.

14 Q. Okay. And so let me just ask this
15 question. In the context of this patent, what does
16 the term "degeneracy" means?

17 A. I said if you -- this is a good definition
18 of what it means.

19 Q. Okay. Give me that definition. Put it on
20 the record with words.

21 A. I'll use the words I've used, "a
22 legitimate result is not definitive,
23 because it can indicate more than one
24 possibility in terms of the presence or
25 absence of an analyte."

1 Q. Okay. Anything else it could mean, besides
2 that, that you can think of in the context of this
3 patent?

4 A. Off the top of my head, I haven't thought
5 about it.

6 Q. Can you sitting here today, can you think
7 of anything else it can mean besides that?

8 MR. SALEN: Object to form.

9 A. Now you are asking me to, like, span the
10 universe of the entire patent for a particular thing.
11 I can't do that sitting here.

12 Q. And what is the -- your use of your word
13 "generally" in Paragraph 80 attempting to convey?

14 A. I -- as I said, I think the word
15 "generally" here is to mean it's -- that this is what
16 it's usually used for.

17 Could it be used for something else? Maybe
18 it could.

19 Was it used for -- I don't actually even
20 know, but it's just a qualifier. It's a minor
21 qualifier.

22 Q. And why did you feel it was important to
23 have that qualifier?

24 A. I have to say I didn't spend a lot of time
25 thinking about whether the word "generally" should be

1 in there or not.

2 Q. Would you be okay eliminating it?

3 MR. SALEN: Object to form.

4 A. I haven't thought about that. That would
5 be -- you know, if I were to rewrite this thing, and
6 we were really thinking about this as something
7 important, which I certainly didn't think about it,
8 you know.

9 Discussion with these guys, Jesse and
10 Jaime --

11 MR. SALEN: Okay. Object.

12 Just don't -- please don't reveal privileged
13 information you have. Just talk about your -- give your
14 answer, sir.

15 THE WITNESS: Okay.

16 Q. All right. Other than degeneracy, are
17 there any other terms in any of the claims in the '921
18 patent for which you believe construction was
19 necessary?

20 A. That's beyond my expertise.

21 Q. It is?

22 A. A claim construction?

23 Q. Okay. You don't have opinions on claim
24 construction in this case?

25 A. No. I haven't thought about it.

1 Q. Okay. Are you familiar with the concept of
2 disallow or disclaimer of claims scope?

3 A. Not really.

4 Q. In your declaration, did you identify any
5 disavow or disclaimer of claim scope in the
6 specification?

7 A. I don't remember that I did. If you can
8 find it for me -- that term is something I'm not
9 familiar with.

10 Q. Okay. How about the concept of
11 lexicography; do you know what that is?

12 A. No.

13 Q. Okay. Let's go to claim Paragraph 46 of
14 your declaration where you list claim 1 of the '921
15 patent.

16 THE COURT REPORTER: Where you list the?

17 MR. WALTER: Claim 1 of the '921 patent.

18 BY MR. WALTER:

19 Q. Go ahead and let's -- let me just ask you
20 this: In Claim 1, F is the number of wavelength
21 components.

22 Do you see that?

23 A. Yes.

24 Q. And M is the number of analytes.

25 Do you see that?

1 A. Yes.

2 Q. There is a requirement in the claim where M
3 is greater than F, right?

4 A. Right.

5 Q. Okay. And do you agree that F is a
6 positive integer?

7 A. Yes, F is a positive -- F is a positive
8 integer.

9 Q. Okay. Now, is there anything in the claim
10 language that places any further constraints on the
11 value of F?

12 MR. SALEN: Object to the form. Calls for a
13 legal conclusion.

14 A. I don't think in the claim right here,
15 there is no -- there is no number to put the M and F.

16 Q. Okay. So you agree that in the claim, as
17 the claim is written F can take on a value of 1?

18 MR. SALEN: Objection to form.

19 A. According to -- in this claim, F could be
20 1.

21 Q. And then M could be 2?

22 A. M could be 2, yes.

23 Q. Let's take a look at Column 20 --

24 MR. SALEN: Can we take a break in a few? If
25 you have a couple more questions, that's fine.

1 MR. WALTER: Yes, let me just do a few more
2 questions, and then we will take a break.

3 BY MR. WALTER:

4 Q. Let's go to Column 20 --

5 A. Uh-huh.

6 Q. -- of the patent, and what I want you to
7 review is Lines 11 to 26.

8 A. I have the patent. Oh, here it is.

9 Q. Column 20, Lines 11 to 26.

10 (Witness complied.)

11 A. Lines 11 to 26.

12 Okay. That's the thing, right? Ends right
13 above Table 6; is that right?

14 Q. Yeah.

15 (Witness reviewing the document.)

16 A. Yeah. Okay.

17 Q. Okay. Now, take a look at Column 19, Lines
18 50 to 58. Review that, and let me know when you are
19 done.

20 A. Where does that start?

21 I can't count the lines.

22 Q. Well, there is column -- so there is line
23 numbers listed along --

24 A. Oh, I didn't see those.

25 Okay. 50 to 58.

1 (Witness reviewing the document.)

2 A. Okay.

3 Q. Now, in the specification, is there any
4 upper limit on the number of targets that can be
5 analyzed?

6 MR. SALEN: Object to the form.

7 A. In theory, no.

8 Q. Okay. And what does the specification tell
9 you the upper limit is, if there is any upper limit on
10 the number of targets that can be analyzed?

11 A. I don't think it tells -- I don't think it
12 has an upper limit. I mean a theoretical upper limit.

13 Q. Okay. Does it contemplate doing an
14 infinite number of targets?

15 MR. SALEN: Object to the form of the question.

16 A. It does -- the theory, you could do an
17 infinite number of targets.

18 Q. Okay. Does the specification contemplate
19 that?

20 MR. SALEN: Object to the form.

21 A. The specification doesn't talk about a
22 maximum.

23 Q. Okay. Let me point you real quickly to
24 Column -- Column 19 --

25 A. Uh-huh.

1 Q. -- Lines 21 to 25.

2 (Witness reviewing the document.)

3 A. Okay.

4 Q. States a coding scheme may have an infinite
5 number of tiers.

6 Do you see that?

7 A. Yes.

8 Q. Is it accurate that the patent contemplates
9 an infinite number of targets?

10 MR. SALEN: Object. It's outside the scope of
11 this direct testimony.

12 A. I don't know what you mean by the word
13 "contemplates." If you mean contemplates in theory
14 could you do more, yes, but that doesn't mean you
15 could necessarily do it. It just means in theory you
16 could do it.

17 Q. Okay. The patent suggests that -- suggests
18 an infinite number of targets, fair?

19 MR. SALEN: Object to form. Object to -- object
20 that it's outside the scope of his declaration and direct
21 testimony.

22 A. I think this patent speaks for itself.
23 It's -- it does not put an upper limit on the number
24 of tiers.

25 Q. Well, it's more than that. It actually

1 suggests that infinite number of tiers and hence an
2 infinite number of targets, right?

3 MR. SALEN: Same objection. Object to form.
4 Object as outside the scope of his deposition.

5 A. I think that theoretically, you could do
6 what it says here. That's what this is. This is not
7 a practical thing.

8 What I mean, I mean -- I don't mean it's
9 not practical, that you couldn't do it. I'm saying
10 this is not a statement of practical stuff. This is a
11 statement of theory.

12 Q. And what is it that you believe is being
13 theoretically suggested here?

14 MR. SALEN: Object to form. Object as outside
15 the scope of his direct testimony.

16 A. Well, the coding scheme can go on -- on --
17 on infinitum if you put -- the coding scheme has
18 nothing to do with -- it's a theoretical coding
19 scheme. It has nothing to do with what you would do
20 in practice.

21 Q. Okay. Now, in the '921 claim that you
22 looked at, is there any -- is there any upper limit on
23 the number of targets?

24 A. I didn't see it.

25 Q. How about in Claim 14, is there any limit

1 in the Claim 14?

2 A. Let me look at Claim 14.

3 MR. SALEN: Object to form and object that it
4 calls for a legal conclusion and object to outside the
5 scope of his direct.

6 A. This doesn't have any numbers. There are
7 no specific numbers in here.

8 Q. Were there any claims you recall that set
9 an upper limit on the number of targets?

10 MR. SALEN: Same objections.

11 A. I don't remember uploading this, no.

12 Q. Okay.

13 MR. WALTER: All right. Let's go ahead and take
14 a break.

15 VIDEOGRAPHER: Now going off the record at
16 10:56 a.m.

17 (Off the record.)

18 VIDEOGRAPHER: One moment, please.

19 We are back on the record at 11:08 a.m.

20 BY MR. WALTER:

21 Q. All right. Let's go back to the patent,
22 and I want you to take a look at Column 10, Lines 13
23 to 19. Let me know when you are done.

24 A. Say the lines again.

25 Q. Column 10, Lines 13 to 19.

1 (Witness reviewing the document.)

2 A. All right.

3 Q. This is providing a definition of component
4 in the context of a signal; is that fair?

5 A. Yeah. I would say so.

6 Q. Okay. And then let's go to Column 12,
7 Lines 11 to 35.

8 Go ahead and review that, and let me know
9 when you are done.

10 A. What lines, again? It was 13 to whatever?

11 Q. 11 --

12 A. 11 to what?

13 Q. 11 to 35. So --

14 A. Yeah, yeah.

15 Q. Through Table 1.

16 A. Yeah. Okay.

17 Q. All right. So on Lines 12 and 13, it
18 states, "Each analyte is encoded as a value in each of
19 two components of a fluorescence signal."

20 Do you see that?

21 A. Yeah.

22 Q. Okay. And now let's look at the table.

23 Is it accurate that the two components for
24 "A" are for the analyte "A" or blue wavelength and blue
25 intensity; is that what you understand?

1 A. Well, "A" is -- yes. So "A" is -- analyte
2 "A" is blue and 1.

3 Q. Okay. So the two components, the text says
4 that each analyte is encoded as two components, right?

5 A. Right.

6 Q. Okay. So for analyte "A," the two
7 components are blue wavelength and blue intensity; is
8 that right?

9 A. Right.

10 Q. Okay.

11 A. Well, intensity 1, whatever that means.
12 Blue is not an intensity.

13 Q. Okay. So for analyte "B," it's green
14 light, and the intensity of that green light?

15 A. Is whatever it is, yes. It's 1. Whatever
16 1 means.

17 Q. Okay. And yellow, the two components are
18 yellow wavelength, and the intensity of the yellow
19 light?

20 A. Yes. Referring to 1.

21 Q. And for red it's the red wavelength and
22 intensity of the red light?

23 A. Yes.

24 Q. Okay. Now, let's go to Table 5, and this
25 is a more complex example.

1 A.

2 MR. SALEN: That will be Table five?

3 THE WITNESS: Yes.

4 MR. WALTER: Now, is it accurate -- take a
5 moment and review Table 5. Familiarize yourself with it,
6 and let me know when you are ready to talk about Table 5.

7 THE WITNESS: Yes. Okay.

8 (Witness complied.)

9 BY MR. WALTER:

10 Q. Okay. Now, is it accurate that the
11 mycobacterium is encoded by four components, intensity
12 in green, green wavelength; intensity in red, and then
13 the red wavelength; is that accurate?

14 MR. SALEN: Object to form.

15 A. Each -- there's --

16 Q. I might have made a mistake. I think I
17 meant to say 6 components. No. Sorry.

18 Go ahead. Let me just ask the question.

19 How many components is mycobacterium encoded
20 by?

21 A. Well, it depends if you count zero as a
22 component. I mean zero is a component in a sense.

23 Q. Okay. You know, based on the definition
24 you reviewed on the patent how many components would
25 you say mycobacterium is encoded by?

1 MR. SALEN: Objection to form.

2 A. You can make a case for six or eight?

3 Q. Six or eight.

4 A. Well, if you want to count zero as a
5 component, it's certainly a relevant consideration.

6 Q. And then how many components would you say
7 that the dengue virus is encoded by?

8 A. By one definition, they are all eight, for
9 everything you have a color because there are four
10 colors and you have -- everything here is just, you
11 know, they are just two numbers. So there are two
12 choices. So it's four times two.

13 Now, if you are excluding zero as a
14 component, because you want to do that, you could do
15 that if you want. Then there will be less, obviously.

16 Q. Okay. So let's try to -- let's see if we
17 can get to the bottom of this. Let's go back to
18 Table 1.

19 A. Yeah.

20 Q. And if you recall, with regard to Table 1,
21 the specification states that each target is encoded
22 by two components.

23 Do you see that?

24 A. "Every target is encoded by," yes. There
25 is always a color and intensity.

1 Q. Okay. So given that the patent tells you
2 that the analytes in Table 1 are each encoded by two
3 components, what do you understand the patent to be
4 saying with regard to whether the zeros should count
5 as components?

6 MR. SALEN: Object to form.

7 A. Well, I would say it's actually a little
8 bit ambiguous, and it's basically meaningless.

9 Okay. You know, if you -- if something
10 doesn't -- if something has a value of zero, that's an
11 actual value. If you decide that it's not a component
12 of the color, because it's not there, you can say it
13 doesn't count.

14 Q. Okay.

15 A. That's just -- that's just semantics. It
16 has no meaning.

17 Q. Okay. So following the patent, how many
18 components would you say are used to encode the "A"
19 target in Table 1?

20 A. Well, every target has two components.

21 It's -- I mean -- sorry -- every -- every
22 ABC or D has ultimately eight components in the sense
23 that you're -- if you have four colors and you are
24 measuring four colors, and there are two -- there are
25 two -- you can either be yes or no. So that's eight

1 possibilities, but that's if you are counting zero as
2 counting. And that, I think, is ambiguous,
3 meaningless, because in the real world, if it's zero,
4 it's zero. That's what you care about. So whether
5 you want to call that a component or not, that's
6 the -- kind of ambiguous and basically meaningless.

7 Q. Okay. What do you understand the patent
8 to -- do you understand one way or the other whether
9 the patent is counting those zeros as components?

10 A. They count them as zero.

11 Q. Do they count them as components?

12 A. I don't think the patent is really
13 concerned about number of components. It's concerned
14 what the final answer is.

15 Q. Okay. So would you say that the "A" target
16 in Table 1 is encoded by eight components of a
17 fluorescent signal?

18 A. I just said, you can do it either way you
19 want to do it. If you want to count zero as a
20 component, then it's eight. If you don't want to
21 count zero as a component, it's two, and it's
22 arbitrary and meaningless. When you get the data,
23 when you get the answer, you know what it is.

24 Q. Okay. Let's go to Paragraph 46 of your
25 declaration.

1 A. 46.

2 Okay. I didn't know it's 46.

3 All right. I'm at 46. All right.

4 Q. Let's go to the claim term that recites --

5 It's the second claim term, where it

6 sites, "each of said at least M analytes

7 is encoded as a value of one component of

8 a fluorescent signal."

9 Do you see that?

10 A. Yeah.

11 Q. Okay. What do you understand that to mean

12 when it says that each analyte is encoded by one

13 component?

14 MR. SALEN: Object. Misstates the document.

15 A. Okay. I'm not sure what you are asking.

16 Q. Well, it says -- it says, "each of said at

17 least M analyte is encoded as a value of one component

18 of a fluorescent signal," it says. So each of the

19 analyte is encoded as one component of a fluorescent

20 signal. How might you do that?

21 A. I mean, the analyte is encoded by the

22 components that are the light and the intensity.

23 Q. Well, this says, "one component." What do

24 you understand it to be referring to when it says,

25 "one component"? Do you know?

1 A. I must say I don't really completely
2 understand what this -- this particular sentence
3 means. I understand what the patent is doing. I
4 understand the basic idea. I'm not sure what they
5 meant by "one component," because there are typically
6 the coding scheme for --

7 (Reporter requested clarification.)

8 A. Each analyte has a coding scheme, which has
9 got to do with the colors and the intensity, and
10 that's clear. So I'm not sure what their -- the way
11 this is written, I'm not sure what they meant.

12 Q. Okay. All right. Let's go to the '921
13 patent, and I want to have you take a look at another
14 claim.

15 A. Okay.

16 Q. It's not listed in your declaration, but
17 take a look at Claim 2, and let me know when you are
18 done.

19 (Witness reviewing the document.)

20 A. I see that. Okay.

21 Q. Okay. Now, Claim 2 states, each of said
22 analyte is encoded as at least one 1st value and a
23 first component of said florescent signal and at least
24 one 2nd value, and a second component of said
25 florescent signal.

1 Do you see that?

2 A. Uh-huh.

3 Q. And this uses the word "at least."

4 Do you see that?

5 A. Yes.

6 Q. Okay.

7 A. So I think I can -- now I think I'm
8 understanding your previous question. I think I now
9 understand why they had at least one component in
10 there.

11 Q. Well, Claim 1 doesn't refer to at least one
12 component.

13 A. Yeah.

14 Q. Okay. When you said, "I think I understand
15 why they had at least one," what were you referring
16 to?

17 A. Well, if you are not counting zeros as a
18 component, which as I said is arbitrary, but if you
19 are not -- if you are deciding that you are doing
20 that, then you could have the control, for example,
21 which will have, you know, you will have a blue and a
22 1. That's -- you could call that 1 if you wanted to,
23 okay, because that's the -- if you have a particular
24 wavelength you only have one value; that's 1, and
25 this -- this Claim 2, which I haven't actually even

1 analyzed, is being -- is narrowing that down.

2 Q. Okay. Well, let me ask about that.

3 Claim 1 says that each analyte is encoded
4 by -- has a value of one component, right?

5 A. Yeah.

6 Q. Okay. And then Claim 2 says, each of the
7 analytes is encoded as at least -- at least one first
8 value, and then first component of a fluorescent
9 signal, and at least one 2nd value and a second
10 component; that's what it says, right?

11 A. Yeah.

12 Q. It used the word "at least," right?

13 A. Yes.

14 Q. Okay. So you are aware that this claim,
15 Claim 2, is not limited to encoding each -- this is --
16 this is -- this Claim 2 is not limited to encoding
17 each analyte with one component, fair?

18 MR. SALEN: Object to form and outside the scope
19 of his declaration.

20 A. Yeah. I don't know what you are getting
21 at. I -- in fact, I probably shouldn't even be
22 opining on Claim 2 since I never looked at it before.
23 I looked at it, but I didn't opine on it.

24 Q. You never looked at Claim 2?

25 A. I said I looked at it, but I didn't opine

1 on it.

2 Q. Okay. Do you know how Claim 2 is different
3 from Claim 1?

4 MR. SALEN: Object. That is outside the scope
5 of his declaration. Object to form.

6 A. They are obviously different. You look at
7 them, they're different.

8 Q. Is it accurate that Claim 2 broadens out
9 Claim 1 to encompass not just one component but two
10 components?

11 MR. SALEN: Object to form. Calls for a legal
12 conclusion. Outside the scope of his declaration.

13 A. I don't think it -- I mean, I don't think
14 it broadens it; if anything, it's restricting it.
15 That's why it's Claim 2 and not Claim 1.

16 Q. Okay. How does it restrict things relative
17 to Claim 2?

18 MR. SALEN: Object to form. Calls for a legal
19 conclusion. Outside the scope of his declaration.

20 A. I'm not going to get into the difference
21 between Claim 1 and 2. I haven't analyzed Claim 2.

22 Q. Okay. Claim 1 is each analyte is encoded
23 by one component, correct?

24 A. Yes.

25 Q. Okay. And Claim 2 is a minimum of two,

1 right?

2 MR. SALEN: Object to form. Outside the scope
3 of his declaration.

4 A. I said I wasn't going to talk about
5 Claim 2. I haven't thought about Claim 2.

6 Q. Okay. Do you understand Claim 2?

7 MR. SALEN: Object to form. Outside the scope
8 of his declaration.

9 A. Vaguely, but not in any sense that I would
10 be willing to give you an opinion about.

11 Q. Okay. Okay. Do you know one way or the
12 other whether Claim 2 broadens out or narrows Claim 1?

13 MR. SALEN: Object to form. Outside the scope
14 of his declaration. Asked and answered.

15 A. I was going to say the same thing. I just
16 told you I wasn't going to start opining on the
17 difference between 2 and 1. I haven't given it -- I
18 haven't given 2 any thought before. It's not in my
19 declaration.

20 Q. Did you consider Claim 2 when you were
21 rendering your opinions on Claim 1?

22 A. I don't know what you mean by the word
23 "consider." If you mean did I see it, yes.

24 Q. Okay. Did you think about what implication
25 Claim 2 might have with regard to the meaning of

1 Claim 1?

2 A. I don't think I --

3 MR. SALEN: Object to form.

4 A. I don't think I spent time thinking about
5 that. You are asking a question, I don't think I was
6 considering it, thinking about it all in the way you
7 just phrased it. I didn't do that for Claim 3 or 4,
8 either.

9 Q. Let's go to Paragraph 43 of your
10 declaration.

11 A. 43.

12 (Witness complied.)

13 Q. You have a sentence in there where you
14 state: "This design is non-degenerate
15 because for N analyte molecules, there
16 are 2^N states, and with each analyte
17 molecule uniquely encoded by a $\log_2$
18 encoding intensity value (1, 2, 4, 8, 16,
19 et cetera)?

20 A. Uh-huh.

21 Q. Is this the complete sentence you wished to
22 write?

23 A. What?

24 Q. Is that the complete sentence you wished to
25 write? It seems like a sentence fragment to me, and I

1 wanted to know if that's what you wanted to write?

2 A. Where are you seeing this?

3 Say that again. I don't get it.

4 Q. Okay.

5 A. Where -- could you repeat what sentence you
6 are talking about?

7 Q. The sentence that reads, "This design is
8 non-degenerate because for N analyte
9 molecules, there are 2^N states, and with
10 each analyte molecule uniquely encoded by
11 a $\log_2$ encoding intensity value (1, 2, 4,
12 8, 16, et cetera.)"

13 Is that what you intended to write?

14 A. I guess. So it looks all right to me.

15 Q. Okay. Let's take a look at Page 4 of your
16 declaration.

17 A. Page 4.

18 (Witness complied.)

19 A. All right.

20 Q. You see on Page 4, you reviewed
21 Exhibit 1012?

22 A. Yeah.

23 Q. Okay. Those are "Infringement Claim Charts
24 from Infringement Contentions."

25 Do you see that?

1 A. Yeah.

2 Q. Okay. Do you know if those are Caltech's
3 or Bio-Rad's infringement contentions?

4 A. Off the top of my head, I don't know.

5 Q. Okay.

6 A. I didn't spend almost any time on
7 infringement so I -- I don't remember any of this
8 particularly.

9 Q. If you go to Page 7 --

10 A. I'm on Page 7.

11 Q. On Page 7, it shows -- states that you
12 reviewed Exhibit 1039 and Exhibit 1040?

13 A. That's not Page 7.

14 Q. Page 7, yes. Page 7 of your declaration.

15 A. Oh, oh, sorry. There is a 7 -- there are
16 two separate pages here. I'm confused.

17 MR. SALEN: For the record, counsel, there are
18 two page numbers. You may just want -- there is a page on
19 this declaration, and there's also the exhibit page number
20 which is a different page number so --

21 Do you want to clarify?

22 A. There is a page here and a page here.

23 Q. Oh, yes. I see. I'm talking about the
24 page numbers in the middle of the page at the bottom.

25 A. That's why. That's why I was confused

1 about it.

2 Q. Okay. Page 7, the original page numbering
3 in the middle of the page, you state that you reviewed
4 Exhibit 1039, Exhibit 1040. Those are infringement
5 claim charts from infringement contentions.

6 Do you see that?

7 A. I do.

8 Q. Those are documents you reviewed as well?

9 A. Very cursory. I said I didn't spend almost
10 any time on infringement.

11 Q. Do you know if those are Caltech's or
12 Bio-Rad's infringement for drugs?

13 A. Again, I said I didn't spend almost any
14 time on infringement. I really don't know who is
15 doing what about --

16 Q. Why did you review those infringement claim
17 charts?

18 A. I don't remember, actually.

19 Q. Okay.

20 A. I'm not sure I reviewed that.

21 I mean, you know, I saw the documents. I
22 spent almost no time on infringement. I have no
23 opinions on infringement. So I really don't remember
24 anything about it.

25 *****

1 (Exhibit 2001 previously marked for identification,
2 declaration of Kevin Struhl, PH.D.)

3 Q. All right. I'm going to give you a
4 document that's been marked as Exhibit 2001.

5 (Document tendered.)

6 Q. This is your original declaration that you
7 prepared in this case.

8 A. Okay.

9 Q. And if you go to Page 4, again using the
10 page numbering at the bottom.

11 A. Yeah.

12 Q. Exhibit 1012 is listed. Those are the
13 infringement claim charts?

14 A. Yes.

15 Q. And Exhibit 1039, Exhibit 1040 are again
16 listed on Page 7. Those are the infringement claim
17 charts again.

18 A. Yeah.

19 Q. Okay. So you reviewed them when preparing
20 your initial declaration in this case, and then
21 reviewed them again when you did your supplemental; is
22 that fair?

23 A. Well, it depends on what you mean by
24 review. I spent almost no time on them.

25 Q. Do you remember why you reviewed them in

1 connection with your original declaration?

2 A. No idea. I said I spent virtually no time
3 on infringement, so I don't remember anything about
4 it.

5 (Exhibit 1012 previously marked for identification,
6 an infringement claim chart.)

7 Q. Okay. Let's take a look at -- let's look
8 at Exhibit 1012.

9 (Document tendered to counsel and the witness.)

10 Q. All right. I've handed you Exhibit 1012.

11 Dr. Struhl, these are the infringement
12 contentions that you reviewed for this case, and my
13 first question to you is:

14 Do you recall when you reviewed these
15 contentions, that there was anything in here that you
16 thought was wrong or that you thought needed to be
17 changed?

18 A. I don't believe I have any comments in my
19 declarations about infringement.

20 Q. Okay.

21 A. I really spent next to no time on
22 infringement. I barely know that -- all I know is
23 that there is some infringement stuff going on; that's
24 about it.

25 Q. Okay. My question was a little different.

1 When you reviewed them, when you reviewed
2 these infringement contentions, did you identify
3 anything that you thought was erroneous or needed to be
4 changed?

5 A. I reviewed these so cursorily. This was
6 not really -- it's not really my thing. We are not
7 doing -- I was not involved in the infringement
8 things, whatever they are. So I didn't pay much
9 attention to this. I certainly didn't read it cover
10 to cover in any detail. It wasn't any point to doing
11 that.

12 Q. Okay. Let's go to Page 10.

13 A. Of the infringement thing?

14 Q. Yes, the infringement thing.

15 (Witness complied.)

16 Q. Okay. Let's actually go to Page 30.

17 (Witness complied.)

18 A. Okay.

19 Q. You see there, there is an encoding scheme
20 for the "SARS-CoV-2 Kit"?

21 A. I have not seen -- I have not paid
22 attention to this before. I'm not even sure I have
23 seen it.

24 Q. Okay. Go ahead and look at it.

25 Do you see that encoding scheme there for the

1 three different analytes?

2 A. Yeah. I'm not willing to comment on this.
3 I don't know what this -- this is out of context.

4 Q. Well, let me ask you this, you reviewed
5 this for your declaration, right?

6 A. It's not in my declaration.

7 Q. Yes, it is.

8 A. Where is it?

9 Q. We just looked at it. It's under the list
10 of materials considered.

11 A. I agree that it's under the list, but it's
12 not -- where in my declaration is it that I have any
13 opinion about any of this or even commented on any of
14 this. I don't think there is.

15 Q. Okay.

16 A. Maybe you can find it. Maybe I forgot it,
17 but I don't know where it is. I told you, I basically
18 spent no time on infringement. I'm not going to spend
19 it now.

20 Q. Let me just ask you this: This analyte
21 that is identified as N^2 --

22 A. Yes.

23 Q. -- do you have any idea how many components
24 of the fluorescent signal are used to --

25 A. I have no idea.

1 MR. SALEN: Let him finish his question.

2 THE WITNESS: I'm sorry.

3 Q. Do you have any idea as to how many
4 components of the fluorescent signal are used to
5 encode that analyte?

6 MR. SALEN: Objective to form. Object. It's
7 outside the scope of his declaration and opinions in this
8 case.

9 A. I told you I'm not giving you an opinion on
10 this. I didn't review it. I didn't have any comments
11 about infringement. I don't know what these kits are.
12 I am not going to give you an opinion without -- you
13 know, this would take a long time to give a real
14 opinion. Infringement cases are serious business. I
15 had no part of it.

16 Q. Okay. Then why did you review the
17 infringement contentions for your case?

18 A. I actually don't know the answer. Maybe
19 just to know that there was an infringement case. I
20 don't really know why. You know, I don't produce the
21 documents on my own. So, you know, if I was going to
22 have an opinion about an infringement, I would be -- I
23 would have a major opinion about infringement. As you
24 can see, I don't have anything about infringement in
25 my declaration.

1 Q. Did you review Dr. Batt's declaration in
2 this case?

3 A. The 1002, yes.

4 Q. Okay. Do you know if he said anything
5 about the infringement contentions?

6 A. I have to look. Maybe -- I don't know if
7 he did or he didn't.

8 Q. Okay. But one thing for sure, If he said
9 something about the infringement contentions, you
10 don't have a responsive opinion on that because you
11 hardly spent any time looking at those, right?

12 MR. SALEN: Object to form.

13 A. I told you, I didn't spend any time on
14 infringement. That's a whole separate case.

15 Q. Okay?

16 A. Maybe multiple cases, for all I know, and
17 so I didn't spend any time on it. So anything said
18 about that, he -- I just didn't pay attention to it
19 because I didn't comment on it.

20 Q. Okay. And the same thing was true to the
21 extent the Petitioner relied upon Caltech's
22 infringement contentions in this case, you paid no
23 attention to that?

24 MR. SALEN: Object to form.

25 A. My role in this case was a scientific

1 evaluation of what the patent was, and in
2 consideration of other patents that were, you know,
3 considered relevant. That's it. I had nothing to do
4 with infringement.

5 Q. Okay. To the extent Dr. Batt rendered
6 opinions based on Patent Owner's infringement
7 contentions, did you present any rebuttal?

8 MR. SALEN: Object to form.

9 A. I don't remember discussing anything about
10 infringement in my responses.

11 Q. Okay. That's something a little different.

12 A. Not really.

13 MR. SALEN: Okay. Let him ask his questions.

14 THE WITNESS: Okay.

15 BY MR. WALTER:

16 Q. To the extent Dr. Batt presented opinions
17 related to validity that relied upon Caltech's
18 infringement contentions, you didn't present any
19 rebuttal to those opinions, fair?

20 MR. SALEN: Object to form.

21 A. That's a very confusing question.

22 Q. Do you understand the question?

23 A. No, I don't really.

24 Q. Okay. I will ask it one more time.

25 To the extent Dr. Batt presented opinions

1 related to invalidity that relied upon Caltech's
2 infringement contentions, you didn't weren't any
3 rebuttal to those opinions; is that fair?

4 MR. SALEN: Object to form and misstates the
5 record.

6 A. My comments about Batt were related to
7 invalidity. I don't care where he got them from.

8 Q. To the extent Dr. Batt's opinions were
9 based upon positions that Caltech had taken in their
10 infringement contentions, did you ever respond to
11 those opinions from Dr. Batt based upon Caltech's
12 infringement contentions?

13 A. I responded that Dr. Batt's --

14 MR. SALEN: Object to form.

15 THE WITNESS: Okay.

16 MR. SALEN: Go ahead.

17 THE WITNESS: I responded to Dr. Batt's comments
18 that relate to validity, period. Put it a different
19 way --

20 MR. SALEN: There is no question pending.

21 THE WITNESS: You are right. You are right.

22 BY MR. WALTER:

23 Q. Let's go back to the invalidity
24 infringement contentions, Exhibit 1012. Let's take a
25 look at Page 30.

1 A. I'm on Page 30.

2 Q. You see there is a table there for the
3 SARS-Co -- COVID 2 wastewater quantification kit?

4 A. I see there is a table.

5 Q. Have you ever seen that table before?

6 A. I don't remember.

7 MR. SALEN: Object. It's outside the scope of
8 the declaration.

9 A. I don't remember because I didn't pay
10 attention to this. I keep telling you, I didn't pay
11 attention to the infringement stuff. I doubt -- I
12 mean, I have seen the document as a document. I
13 didn't really read it very carefully.

14 Q. Let's go to Page 21.

15 A. Of what?

16 Q. Of Exhibit 1012.

17 A. Oh.

18 Q. There is a table there for the SARSCoV-2
19 Kit at the top of the page for analytes N1 and N2 and
20 RP.

21 Do you see that?

22 A. I see there is a table, yes.

23 Q. Have you ever seen that table before?

24 MR. SALEN: Object. That's outside the scope of
25 his declaration.

1 A. I don't remember. I told you I didn't read
2 this very carefully. I barely read it. I was not
3 concerned with infringement.

4 Why would I read this?

5 Q. How about the table below it on Page 21?

6 MR. SALEN: Same objection.

7 A. No different than the table above. It's
8 the same thing.

9 Q. Okay. That wasn't my question. My
10 question was, have you ever seen the table before.

11 MR. SALEN: Same objection.

12 A. I don't think I've seen it. I may have
13 seen it. I certainly didn't pay attention to it.

14 Q. Let's take a look at Page 18.

15 A. Of the same thing?

16 Q. Yeah. And there is a plot with four blobs
17 on it.

18 Do you see that?

19 A. I do.

20 Q. Do you understand what is being shown
21 there?

22 MR. SALEN: Object. It's outside the scope of
23 his declaration.

24 A. I'm not going to do that. It's not my -- I
25 did not look at this before. I'm not going to spend

1 time on it here now.

2 (Document tendered to counsel and the witness.)

3 (Exhibit 1017 previously marked for identification,

4 US. Patent Application, Larson et al..)

5 BY MR. WALTER:

6 Q. Okay. I've handed you Exhibit 1017, which
7 is the Larson reference. This is one you can say you
8 confidently looked at and reviewed, right?

9 A. Let me just make sure we have got the right
10 numbers. I agree to the Larson reference.

11 Yes, it's the right number, okay.

12 Q. Okay. Take a moment and then review
13 Paragraphs 15 to 18. Let me know when you are done.

14 A. Oh, wait. Paragraph 15 or 18, where?

15 Q. 15 to 18. It's on Page 2. This document
16 has paragraph numbers in front of each paragraph.

17 A. Oh, I see. You mean what field of
18 invention is that; is that what you are talking about?

19 I am not sure where the paragraph numbers
20 are.

21 Q. Okay. There are bolded numbers before each
22 paragraph.

23 A. Yeah. I see one, 0002.

24 Q. Okay. Go to the one that starts with 15?

25 A. 15, okay.

1 Q. And review 15 to 18.

2 A. (Witness complied.)

3 MR. WALTER: And you -- okay. We'll do that
4 after lunch.

5 THE COURT REPORTER: Okay.

6 (Realtime stopped due to cache problem.)

7 BY MR. WALTER:

8 Q. Okay. You reviewed paragraphs 15 to 18.

9 A. I did.

10 Q. Now, paragraph 15 discusses polymerase
11 errors, correct?

12 A. Yes.

13 Q. Okay. And what is polymerase errors?

14 Is that a situation where the polymerase is
15 doing the amplification, and it introduces an error?

16 A. Yeah.

17 MR. SALEN: Object. It's outside the scope of
18 his direct testimony.

19 Q. Okay. The answer is yes?

20 A. Well, what -- I mean, what the general
21 term, I don't know -- I don't know how they are using
22 in the context of that, but when you do PCR, you can
23 introduce errors.

24 Q. Okay.

25 A. Not usually a big deal.

1 Q. And that's what Paragraph 15 is talking
2 about, a situation where the polymerase makes an error
3 and then introduces an error, correct?

4 MR. SALEN: Object. It's outside the scope of
5 his direct.

6 A. It's about -- the paragraph, it's about
7 polymerase errors, yes. I can read it, yes.

8 Q. And what happens, you get the error, and
9 the error looks like it's a mutant allele when it's
10 really just an error that was introduced from a normal
11 wild type; is that fair?

12 A. An error just means when you copy something
13 that you didn't copy it faithfully. It's actually
14 quite uncommon.

15 Q. Okay. But this is talking about -- it's
16 talking about false positives, right?

17 MR. SALEN: Object as to outside the scope of
18 his direct.

19 A. I must say, I don't really understand why
20 this paragraph is here. I mean, I don't know why
21 there is such a big emphasis on this.

22 Q. You don't understand why it's there?

23 A. I don't understand why they are making a
24 big deal out of something that is not a big deal.

25 Q. Okay. Let's go on, okay. Paragraph 16

1 then goes on to talk about forming droplets, correct?

2 A. Yes.

3 Q. Okay. And then Paragraph 17 talks about
4 doing amplification and droplets, right?

5 A. Yes.

6 Q. Okay. And Paragraph 17 is talking about
7 droplets that have a variant in droplets that have the
8 actual target.

9 Do you see that?

10 A. Say this again. I'm not sure I get what
11 you are saying. Say that again.

12 Q. It's in Paragraph 17.

13 A. What are you referring to?

14 Q. It's the sentence that bridges Page 2 and
15 Page 3.

16 A. Yeah, I see that.

17 Q. Okay. And do you have any idea where the
18 variant is going to come from in those droplets that
19 have both the wild type and the variant?

20 MR. SALEN: Object. That's outside the scope of
21 his direct.

22 A. I'm not sure what they are getting at, but
23 they -- I think they are getting at an error that
24 happens during PCR. I'm not sure why that's relevant
25 to anything.

1 Q. Okay. And then the patent goes on and
2 talks about how you can exclude those droplets that
3 have the normal and then the PCR error together; is
4 that fair?

5 A. It says it, but I didn't really pay
6 attention; that's why it's not on my -- it's not in my
7 declaration because I don't -- I didn't pay attention
8 to that because I don't really think it's much of a
9 problem.

10 Q. Okay. So this whole discussion here in
11 Paragraph 15 to 18, that's something you didn't pay
12 much attention to in your declaration because this
13 whole issue of PCR errors is not a problem?

14 A. PCR errors are, like, 1 in 1,000. They are
15 not very common.

16 Q. I just want you to answer my question.
17 This passage in Paragraph 15 to 18 that we
18 looked at; that's not something you paid a lot of
19 attention to because this whole issue of PCR error is
20 not a problem?

21 MR. SALEN: Object. Asked and answered. It's
22 outside the scope of his direct.

23 A. As I said -- first of all, 15 and 18 don't
24 only talk about PCR errors, so I'm not saying I didn't
25 pay any attention to them, what's in 15 to 18. But on

1 the particular question of PCR error, I didn't pay
2 very much attention to it, because I don't think it's
3 much of an issue.

4 Q. Okay. Now paragraph 18, it's talking about
5 droplets containing a heterogeneous population of
6 amplicons that are excluded. That is the first
7 sentence. It says --

8 A. Yes.

9 Q. And that is talking about what is going on
10 in Paragraph 17, right?

11 MR. SALEN: Object. That's outside the scope of
12 his direct.

13 A. So I find this paragraph a little bit
14 confusing.

15 Q. Which paragraph?

16 A. Well, PCR error is different than a
17 variant; that is like an allele. That is like a real
18 allele. That's not the same thing.

19 Q. Okay. Which paragraph do you find
20 confusing?

21 A. I -- it's not so much the paragraph. It is
22 the -- it is sloppily written with respect to a PCR
23 error versus to variant. They are using the word
24 "variant" both way, and that's confusing.

25 Q. All right. Now, Paragraph 18, it states --

1 I'm sorry -- Paragraph 18.

2 It states, "Generally, the presence of
3 droplets containing only the variant is
4 indicative of a disease, such as cancer."

5 Do you see that?

6 A. Yes. That's sloppy. That's sloppy
7 English.

8 Q. Okay. Now, why wouldn't the droplets that
9 have both the wild type, and the variant be indicative
10 of cancer?

11 MR. SALEN: Object. That it's outside the scope
12 of his opinions.

13 A. I don't get what you are saying. They're a
14 variant if it's a real allele. That's a real allele,
15 okay. That could be predictive of cancer. That has
16 nothing to do with this.

17 Q. Okay. Well, here is what it says in this
18 passage. It says --

19 It says, "Generally, the presence of
20 droplets containing only the variant is
21 indicative of a disease, such as cancer."

22 Do you see that?

23 A. Well, if you -- if you are analyzing a
24 single molecule that has the cancer variant, then
25 that's the cancer variant.

1 Q. Okay. Now, my question is different. It
2 uses the word "only."

3 Why does it say the only droplets that are
4 indicative of a disease are the ones that contain only
5 the variant?

6 MR. SALEN: Object to form. Object as outside
7 the scope of his direct.

8 A. Well --

9 MR. SALEN: And object that it misstates the
10 document.

11 A. When you do the way that they do everything
12 in Larson, which is doing a lot dilutions so you wind
13 up with single molecules; that you're assaying each
14 individual drop, then you either will be one allele or
15 the other, and if you can tell them apart, which you
16 can by the right PCR factors you will know that if you
17 -- because if the only allele in there is the cancer
18 allele, that's the cancer allele.

19 Q. Now, in this -- in this scenario that is
20 being posited in Paragraphs 15 to 18 of Larson, why is
21 it that if you find a droplet, that has both the
22 variant and the wild type, it might not be actually
23 indicative of cancer?

24 MR. SALEN: Object to the form of the question
25 and object that it's outside the scope of his direct

1 testimony.

2 Q. Do you know why?

3 MR. SALEN: Object. Same objections.

4 A. I mean, it would depend on how you set up
5 the experiment, especially if you have multiple -- it
6 depends on what will alleles are. It depends on, you
7 know, it depends on how you set up the experiment. I
8 can't give you an answer.

9 Q. Is it possible that if you have a droplet
10 that has both the variant and the wild type, what
11 they're calling the variant might be from a PCR error
12 and not an actual copy of the cancer causing variant?

13 MR. SALEN: Object to form. Object as outside
14 the scope of his direct.

15 A. That would be really, really rare. That's
16 like -- now you are talking about, like, 1 in the
17 millions.

18 Q. That's what they are positing in this
19 example in Paragraphs 15 to 18, right?

20 MR. SALEN: Object to form and object to outside
21 the scope of his direct.

22 A. If that's what they are positing, it makes
23 no sense.

24 Q. That's what it's saying.

25 MR. SALEN: Object to form and outside the scope

1 of his direct.

2 A. I don't find this paragraph making a whole
3 lot of sense.

4 Q. Which paragraphs don't make a whole lot of
5 sense?

6 A. I don't find the whole discussion of PCR
7 error to be very meaningful.

8 Q. Okay. Take a moment and review
9 Paragraphs 168 to 173, and let me know when you are
10 done.

11 (Witness reviewing the document.)

12 A. How far do you want me to go? What was it?

13 Q. 173.

14 A. Okay. I've read it.

15 Q. Okay. Now, this whole section that I had
16 you review, that whole section is under the header,
17 "Polymerase error correction," correct?

18 A. Yes. That's right.

19 Q. This is describing a situation similar to
20 what we looked at in Paragraphs 15 to 18 where a
21 target gets loaded into droplet and the polymerase
22 makes an error, and it looks like you've got two
23 targets when all you've really got is the mixture of
24 the normal stuff and then some PCR errors; is that
25 right?

1 MR. SALEN: Object to form. That's outside the
2 scope of his direct.

3 A. I want to just emphasize that last point.
4 This is outside the scope of my testimony, and my
5 declaration, and outside for a reason. I didn't think
6 this was worth talking about, that polymerase error
7 rate is really low and even says it what it is here.
8 It's incredibly low. And so even if you had an
9 occasional bad droplet somewhere, it wouldn't matter.
10 And never even dawned on me why this is relevant to
11 anything, and why I didn't opine on it, and I'm not
12 going to sit here and opine on it now.

13 Q. Okay. So these passages, Paragraphs 168 to
14 173, this is subject matter that you don't believe you
15 opined on?

16 MR. SALEN: Object, and it misstates his
17 testimony.

18 A. I don't remember having any significant
19 discussion about polymerase error.

20 Q. I was asking something different. The
21 section in Paragraphs 168 to 173, you don't recall
22 opining on any of these paragraphs?

23 MR. SALEN: Object. It misstates his testimony.

24 A. Off the top of my head, I don't remember
25 opining on it. I mean, anything relating to

1 polymerase error, I don't remember, recall opining
2 upon. And as I said, I don't think it's very
3 important, which is why I didn't opine on it.

4 Q. Okay. But this passage we are looking at,
5 it is talking about a situation where you had a
6 droplet and you loaded it up with one target, and then
7 the polymerase makes an error, and so it looks like
8 you got two targets?

9 A. Yeah.

10 Q. When in reality you just have one, and
11 there was a mistake; is this what this is talking
12 about?

13 A. Yeah.

14 MR. SALEN: Object. Object to form, and then
15 it's outside the scope of his direct.

16 Q. Go ahead. Answer.

17 A. Well, the way you've given me a
18 circumstance, which is probably what was contemplated
19 here. I'm assuming, but that in the odds of finding a
20 droplet like that is very low, so it's not going to
21 influence anything.

22 Q. Okay. So this is a situation where you are
23 starting out with one target in the droplet, correct?

24 MR. SALEN: Object to form, and outside the
25 scope of his direct.

1 A. Well, if you -- the whole Larson patent is
2 designed to get only one molecule per droplet so
3 that's the goal, okay.

4 Q. Okay. And so these examples -- these
5 examples of 168 to 173, you wouldn't call those
6 multiple occupancy situations where you are starting
7 out with two targets in the droplet before your
8 amplification? You wouldn't call it that, would you?

9 MR. SALEN: Object to form. It's outside the
10 scope of his direct.

11 A. Errors are a part of any nucleic acid
12 thing. People don't usually refer to them as two --
13 you wouldn't refer to it as two targets. Everything
14 is an error. You know, when you -- human being makes
15 errors every generation, too.

16 So when people talk about targets, they are
17 talking about the, you know, the vast majority class.
18 They are not talking about this incredibly rare event
19 and calling it a different thing. Of course it's a
20 different thing. It's a mistake. It's what happened.
21 There is nothing special about this.

22 Q. Okay. And that's what's being dealt
23 with in Paragraphs 15 to 18 and Paragraphs 168 to 173
24 of Larson, correct?

25 MR. SALEN: Object to form, and that is outside

1 the scope of his direct.

2 MR. WALTER: The objections are too much.

3 MR. SALEN: No, it's not.

4 MR. WALTER: It's too much.

5 MR. SALEN: You keep asking him questions that
6 are outside the scope of his direct and that --

7 MR. WALTER: If you think this is outside the
8 scope of this direct, you have got another thing coming.
9 This is not outside the scope of his direct, and I will
10 take this up with you off line, okay, because I think the
11 objections are getting to be too much.

12 We are going to take a break. I'll tell you why this
13 is not outside the scope of his direct. But it's getting
14 to be too much, because it's interrupting the flow of the
15 answers. It's making it really hard for him to answer.

16 MR. SALEN: I think the questions are making it
17 hard for him to answer. You want to keep having an
18 argument with me over it. I'm going to state my
19 objections on the record.

20 MR. WALTER: What I want to do, I would like to
21 have -- I would like you to leave the room for a moment.
22 Then Mr. Salen and I are going to have an on-the-record
23 meet and confer about why this is not outside the scope of
24 direct. I don't want to have that objection anymore; and
25 if you do make it, I want to be able to tell the board the

1 objections are improper.

2 (Witness left the proceedings room.)

3 MR. WALTER: Okay. Let me tell you on the
4 record why that objection is improper.

5 He's actually relied upon these paragraphs in this
6 section a lot in his opinions to try to establish that
7 these paragraphs are about excluding populations of
8 droplets that were loaded with two targets, and that's not
9 what these paragraphs are about.

10 These paragraphs are about a polymerase error in a
11 situation where there was only a single target. And so,
12 you know, to object that this is outside the scope of
13 direct, I think, is wrong. He's opined on these
14 paragraphs a lot.

15 MR. SALEN: He's opined on Paragraphs 172 and
16 173.

17 MR. WALTER: Okay.

18 MR. SALEN: But you are asking him different
19 questions about -- about the initial paragraphs, and he
20 didn't give an opinion on that.

21 MR. WALTER: Okay.

22 MR. SALEN: Nor did he give an opinion on 15 --
23 I would like to talk. You can finish, right.

24 He didn't give an opinion on anything in 15 through
25 18, and he didn't give opinions about errors. So I'm

1 going to keep stating the objection. I can state a blanket
2 objection if you feel like it's interfering with the flow.
3 I'm not trying to do that to you, but I do want to reserve
4 my objections.

5 MR. WALTER: Okay. It's a bad objection. I
6 think you should state a blanket objection. I do plan to
7 call it out to the board that you're telling -- telling
8 them that it's outside of the scope of the direct because
9 it's not. It totally appropriate.

10 MR. SALEN: If you want -- if you want to
11 connect it then you can connect it, but so far, I haven't
12 seen you connect it, and what you just told me -- I
13 understand where you are going, but the initial paragraphs
14 that you are talking about, about the error, are not part
15 of his opinion.

16 MR. WALTER: I'm really glad I have your
17 position on the record. I think you should make the
18 blanket objection, and we will call him back in, and we
19 will proceed.

20 VIDEOGRAPHER: I will get him.

21 We are now going off the record at 12:10 p.m.

22 (Off the record at 12:10 p.m.)

23 (On the record at 12:14 p.m.)

24 VIDEOGRAPHER: One moment, please.

25 We are back on the record at 12:14 p.m.

1 MR. WALTER: Okay. Go ahead and state your
2 blanket objection.

3 MR. SALEN: So just to smooth the flow, I just
4 want -- of the questioning and answering, I'm going to
5 state a blanket objection on the record that to the extent
6 you haven't given an opinion on these paragraphs that
7 we're talking about now, 168 through 173, I'm objecting,
8 that the questions are outside the scope, but subject to
9 connection, so we will let counsel keep asking questions.

10 BY MR. WALTER:

11 Q. Okay. So the -- let's go back and make
12 sure it's clear on the record. The situation with the
13 Paragraphs 168 to 173, we are talking about situations
14 where a single target gets loaded into a droplet. And
15 then the polymerase makes an error, and it looks like
16 you have two, and in reality you only start out with
17 one, right?

18 A. I wouldn't say you have two. That's not
19 the way a normal geneticist calls it. If you have an
20 error, it accumulates some low frequency. In fact,
21 the number here is -- the number here is actually the
22 overall mutation rate not a mutation rate to a
23 particular change. So you are talking about super
24 rare. You want to call it a second analyte. I don't.
25 I wouldn't agree that that's what it is.

1 Q. Okay. What you are saying it is, you do
2 agree It's a situation where only a single target gets
3 loaded into the droplet?

4 A. You defined it that way, so I can't argue
5 with that. You defined it that way.

6 Q. Okay. Now, let's go to Paragraph 141.

7 Paragraph 141, it states, "Generally,
8 without wishing to be constrained by
9 theory, the above three methods for
10 higher-plex dPCR are simplistic to
11 implement under conditions of terminal
12 dilution, that is when the probability of
13 multiple different target molecules
14 co-occupying the same droplet is very low
15 compared to the probability of any single
16 target occupying a droplet."

17 Do you see that?

18 A. Yes.

19 Q. And it says, "With multiple occupancy
20 arises the complexity of simultaneous
21 assays competing within the same --
22 within the same reaction droplet."

23 Do you see that?

24 A. Yes.

25 Q. Okay. That reference there, "multiple

1 occupancy," that is talking about the situation where
2 multiple targets get loaded into the droplet at the
3 same time; is that fair?

4 A. That's right.

5 MR. WALTER: Okay. Let's take a break.

6 VIDEOGRAPHER: Okay. We are now going off the
7 record at 12:17 p.m.

8 (Off the record at 12:17 p.m.)

9 (On the record at 12:51 p.m.)

10 VIDEOGRAPHER: One moment, please, while I get
11 the camera rolling.

12 We are back on the record at 12:51 p.m.

13 BY MR. WALTER:

14 Q. Let's go back to the Larson reference,
15 Exhibit 1017, and what I'd like you to do is review
16 Paragraph 130 and paragraph 131, and let me know when
17 you are done. You'll probably need to review
18 Figure 11 in connection with that.

19 A. What figure was it?

20 Q. Figure 11. Figure 11A to be precise.
21 That's what is referred to in the text. That's why I
22 thought you might want to look at it.

23 A. Where are the figures. Oh, it's up front.

24 (Witness reviewing the document.

25 A. All right.

1 Q. Okay. So these Paragraphs 130 and 131,
2 these are discussing assays for the test for both, the
3 BCKDHA and SMN2 targets?

4 A. That's what it says. By the way, I did not
5 consider this in my declaration. I don't remember
6 this figure at all.

7 Q. Okay. You looked at Larson for your
8 opinions in this case?

9 A. As I said, but I don't remember all of it,
10 and I didn't opine on this.

11 Q. It's one of the primary PRI reference --
12 it's the primary PRI reference in this case right now,
13 right?

14 A. That's true, but I didn't do every single
15 second -- section of it.

16 Q. Very good.

17 Okay. So let's take a look at Paragraph 131.

18 A. All right.

19 Q. And there's three-different samples in
20 Paragraph 131. There is a sample with no template, a
21 sample with only BCKDHA, and a sample with both of
22 those two things, correct?

23 A. I guess. As I said I haven't -- this is
24 the first time I have seen this in ages. I haven't
25 opined on this.

1 Q. Okay. Are you able to tell from reviewing
2 130 and 131 that there are three samples?

3 I will just read it to you together.

4 A. I can read it, but I haven't thought about
5 it. That's not the same thing.

6 Q. All right. And this example of the
7 invention, histograms of the droplet for 10Cs are
8 shown in Figure 11 for three different templet DNA
9 samples.

10 Do you see that?

11 A. Yeah.

12 Q. Okay. There is a "no template control"?

13 A. Yeah.

14 Q. Dotted line. There is "BCKDHA only"?

15 A. Yeah.

16 Q. That is the solid line?

17 A. Yeah.

18 Q. And there is the one-to-one, BCKDHA to
19 SM2 -- SMN2, dash line? Do you see that?

20 A. Yeah, but I don't know what those things
21 are.

22 Q. Okay. Do you understand that those are
23 targets, BCKDHA?

24 A. Yes, but I don't know what they are.

25 Q. Okay. Now let's take a look at Figure 11.

1 Figure 11A. You can see the "No template
2 control." Only shows one peak at about 0.1.

3 Do you see that?

4 A. This all looks the same to me. I can't --

5 Q. Well, you can see in the upper right-hand
6 corner, they separate the three graphs?

7 A. I see, but these things are -- I'm a little
8 bit confused by what this is.

9 I -- this is -- reproduced probably. I'm
10 not sure I see what is what here. Is that what this
11 is?

12 Q. You have to be a little bit more precise.

13 A. Well I don't know. These things all look
14 pretty similar to me. So I can't -- there is a single
15 trace here. It looks like a single trace on the
16 bottom, and then there are these -- what look like, I
17 guess, three traces on the top.

18 Q. Yeah. Why don't we take a look at
19 Paragraph 131 so we can kind of convolute those?

20 A. I can see what the Paragraph 131 is the
21 same as here. (Pointing.) Those are the same three
22 things they are talking about. I don't know what the
23 three things are.

24 Q. Okay. So there's -- there's -- there's a
25 curve for each of the three samples, right?

1 A. I -- I -- these are the -- these things
2 right here, are these what the three samples are
3 talking about?

4 Q. Yes.

5 A. Okay.

6 Q. You can see that in the legend. You see
7 the legend?

8 A. I don't see a legend.

9 Q. Okay. There is a legend right next to the
10 three traces. It says, "No template control."

11 A. Oh, this thing. (Pointing.)

12 Q. Yeah, that's the legend. You see that?

13 A. That's not what I call a legend. I see
14 that, yes.

15 Q. Okay. And so you see that the trace on the
16 bottom is the "No template control."

17 Do you see that?

18 A. Yes.

19 Q. Okay. And that has one peak?

20 A. It has one peak, yes.

21 Q. Okay. And then you have the BCKDHA only
22 curve right above that.

23 Do you see that?

24 A. Yeah.

25 Q. Okay. And that has one peak as well, and

1 that's for the BCKDHA target.

2 Do you understand that?

3 A. Yes.

4 Q. And then there is the curve above that, and
5 that's the sample that has both BCKDHA and SMN2?

6 Do you see that?

7 A. Yeah. Actually, the second one has two
8 peaks.

9 Q. Okay. That's right. The second one has
10 two peaks. The first peak is the one that's really
11 low and corresponds to the droplets with no targets.

12 Do you understand that?

13 A. No.

14 Q. Okay.

15 A. I understand what I -- if I understand
16 this, as I said, I haven't seen this before. I have
17 seen it probably somewhere, but I didn't really pay
18 attention to this. It's not in my declaration. I'm
19 still a little confused. So if I understand this
20 right -- I don't really understand it. That's the
21 problem -- is the one that's on the very bottom, which
22 I think is the "no template control," there is a big
23 peak around .2, and then there -- that's it.

24 Q. Uh-huh.

25 A. And then the next one, BCKDHA, if I have it

1 right, there is a peak that's around a little higher
2 than .2, a big peak, around 2.5 or .25, and then there
3 is a smaller peak around .65 or .7, right?

4 Q. Yeah.

5 A. And then the third one has also a very big
6 peak around .3, and then it has a peak at around .4, a
7 little more than .4, another, let's say, .75 or
8 something. I see the peaks. I don't know what they
9 stand for, but I see them.

10 Q. Okay. Now let's look at the text. It
11 states in the text in Paragraph 131, it refers to a
12 dominant feature at 0.08 V. Okay. That's the big
13 peak that we are seeing?

14 A. That's -- which peak is that?

15 Is that this one?

16 Q. The tallest one.

17 A. The one -- this tallest one? (Pointing.)

18 Q. Yes.

19 A. That's separate from the other three.

20 Q. Yes.

21 A. Okay. I see a big peak there, yes.

22 Q. The specification tells you that those are
23 PCR minus droplets, correct?

24 A. So that's what it says.

25 Q. Okay. And so if we look at the trace above

1 the "no template control," that has two peaks. The
2 largest peak are the PCR minus droplets, and the
3 second smaller peak is where -- the BCKDHA target.

4 Do you understand that?

5 A. No.

6 Q. You're just totally incapable of
7 understanding that?

8 MR. SALEN: Object. That's not what he says.

9 A. As far as I can see, the "no template
10 control," the big peak at .08, I don't even know where
11 that comes from. This is not marked. If I look at
12 what I think is the "no template control," I see a
13 decent size peak at around .02, and that's all I see.

14 So you were saying something about two
15 peaks. I don't see two peaks.

16 Q. Okay. You think that "no template
17 control," that trace that's in the upper right-hand
18 corner, you think that is 0.2?

19 A. There is a peak in what I think is the no
20 template control, there is a series of three traces;
21 that is not the bottom trace. There is a bottom race
22 that's separate, and there are three traces that are
23 sort of very close together.

24 Q. Okay.

25 A. And the bottom of those, the one that has

1 the lowest numbers, are the "no template control," and
2 as far as I can see, the "no template control" has a
3 peak around .2. One peak around .2. That's it.

4 Q. Okay. Let's go through it together --

5 A. Okay.

6 Q. -- because I'm pretty sure you are capable
7 of getting this.

8 Okay. In Paragraph 131, it states, "In this
9 example of the invention, histograms of
10 the droplet and fluorescence intensities
11 are shown in figure 11A for three
12 different template DNA samples: A no
13 template control (dotted line), BCKDHA
14 only (solid line), and 1:1 BCKDHA to SMN2
15 (dashed line)."

16 A. Okay.

17 Q. Okay. So you understand that there are
18 three samples in Figure 11A?

19 A. Well, there's three samples, but there are
20 four traces.

21 Q. Okay. Let's look at that. The passage
22 goes on and states, "For clarity, the
23 histograms are shown both overlapped to
24 highlight the similarity for certain
25 peaks, and offset from each other to

1 reveal all of the features."

2 Okay. Do you see that text?

3 A. Yeah. I don't know what that means.

4 Q. You don't understand what it means?

5 A. That's really cryptic.

6 Q. Okay. Let me try to explain it to you, and
7 if you still insist that you don't really understand
8 what is going on, then maybe I will move on.

9 A. I simply do not understand.

10 Q. Just can't understand it.

11 A. It's too hard, okay. It's too hard.

12 MR. SALEN: Object. Hold on a second.

13 MR. WALTER: I'm objecting, too, because I
14 don't -- I don't think this is genuine that he can't
15 understand.

16 MR. SALEN: That's fine. You are testifying,
17 and you're harassing the witness. Just ask questions.
18 Ask questions. He'll answer them.

19 MR. WALTER: Okay. Well, I'm not sure he is
20 answering.

21 BY MR. WALTER:

22 Q. So let's look at it.

23 A. I tried to. I really -- this is -- I do
24 not understand what this bottom thing is.

25 Q. Okay. If I were to tell you that that

1 bottom thing is the graphs for all three of the
2 samples, shown right on top of each other, would you
3 understand that?

4 A. Yeah, but I don't know how -- if you say,
5 it I understand that, but it don't look like that.

6 Q. Well, actually it does. Okay. So what you
7 do now is, if you go in the upper right-hand corner,
8 what the passage says, Paragraph 131, it states:

9 "For clarity, the histograms are shown
10 both overlapped," that's the lower trace,
11 "to highlight the similarity for certain
12 peaks, and offset from each other to
13 reveal all of the features."

14 And those are the three graphs that are shown
15 above the lower trace. Do you understand that?

16 A. Now I get it.

17 Tell you one thing, somebody in my lab
18 wrote a figure like this, it wouldn't be published;
19 that's for sure

20 Q. Okay. So now we understand what we are
21 looking at?

22 A. Now I think I understand what this is.

23 Q. Okay. So we have our first sample, the "no
24 template control." We see one peak, and that
25 corresponds to droplets with no targets.

1 Do you understand that?

2 A. Yes. So the thing I don't understand is --
3 so Number 3 is just sort of not real -- is real data,
4 but it's whatever. I assume that these values are the
5 same values for all three samples.

6 Q. Yes.

7 A. Okay. So that -- that when you are
8 measuring whatever you are measuring, .2 is .2. Even
9 though on here, it doesn't look like that. This is
10 just -- it's really confusing, okay.

11 Q. Okay. So in the "no template control," we
12 see one peak at about 0.08, and those are the no --
13 the droplets with no template?

14 A. Yeah.

15 Q. Okay. And then for the BCKDHA only,
16 sample, we see the peak that corresponds to no
17 droplets?

18 A. Yes.

19 Q. And we see the peak that corresponds --
20 excuse me -- the peak that corresponds to droplets
21 with no targets?

22 A. Uh-huh.

23 Q. And we see the peak that corresponds to
24 droplets with the BCKDHA target, correct?

25 A. Can you repeat that. I didn't catch that.

1 Q. All right. The middle trace is the sample
2 that has the BCKDHA only target, correct?

3 A. The middle trace of it, yes.

4 Q. And that has two peaks, one that
5 corresponds to droplets with no targets?

6 A. Yeah, okay. Yeah, Yeah. I see that now.

7 Q. And then a second peak that corresponds to
8 the droplets with the BCKDHA.

9 A. Yeah, I get that now, and that's now drawn
10 over here, is the one that's over -- this is that.
11 (Pointing.)

12 Q. It's in the middle. It's the one -- it's
13 the trace in the middle.

14 MR. SALEN: I'm just going to object. Please
15 ask questions. Please answer the questions. You are
16 going the other way.

17 So, Derek, you can ask questions and stop testifying.

18 MR. WALTER: Well, he is asking me questions.

19 MR. SALEN: I know.

20 THE WITNESS: I'm not understanding what you are
21 saying.

22 BY MR. WALTER:

23 Q. Okay. We will get through it, eventually.

24 Now, the trace on top; that's the trace for
25 the sample that has BCKDHA and SMN2.

1 Do you see that?

2 A. Yes.

3 Q. Okay. And that has three peaks, correct?

4 A. Yes.

5 Q. It has the first large peak, which is for
6 the droplets with no sample, no target?

7 A. Yes.

8 Q. And it has the second peak over to the
9 right, which is the SMN2 target, correct?

10 A. Yeah.

11 Q. And then it has the peak furthest to the
12 right, which is the BCKDHA 2 target, correct?

13 A. You just lost me. That last sentence, you
14 lost me.

15 Q. Okay. The top trace, the peak that's
16 furthest to the right, that peak is for droplets that
17 have the SMN2 target, correct?

18 A. Well, one presumes that because it's -- I
19 mean, it's -- again, this is so poorly done, but I
20 think that that's what they're getting at, I think.

21 Q. All right. Now let's go back to
22 Paragraph 131, and it states in Paragraph 131, it.
23 states the following:

24 It states, "The peak at 0.71 V was
25 assigned to BCKDHA since it was the sole

1 feature arising with the addition of just
2 BCKDHA, and the peak at 0.27 V, appeared
3 on subsequent addition of SMN2,
4 completing the assignment."

5 Do you see that?

6 A. I see such a quote.

7 Q. Okay.

8 A. There is something -- so if you look at the
9 bottom trace, which is actually the -- which is not
10 the ones where they are all in set. There are three
11 peaks, and if I understand the way they are doing --
12 ah! I had it actually backwards. I see, okay. Yes,
13 I had it backwards. Now I -- now I --

14 Okay. So I see. So this -- this far peak
15 is the BCDH 1. This one, the far one, .7 because you
16 can see that in the -- yeah. Okay. I think I get it
17 now. It's such a bad presentation.

18 Q. Very good, and then the passage goes on,
19 and it states, states the following:

20 "A very small peak appeared at about
21 0.9 V, not visible on the scale of
22 Figure 11 [sic], that corresponded to
23 droplets occupied by both genes."

24 Do you see that?

25 A. I see that they say it. I don't see the

1 peak.

2 Q. Okay. You don't see the peak, but they
3 tell you the peak is there.

4 A. Okay.

5 Q. Okay. And those -- um -- that peak
6 corresponds to droplets having two targets, correct?

7 A. I guess.

8 Q. Okay.

9 A. I -- that's what they say it is. I mean,
10 how do I know, especially because I can't even see it.

11 Q. Okay. Now, how does the experiment in
12 which you identify that peak having two droplets, how
13 does that experiment differ in any way from the method
14 that is recited in Claim 1 of the '921 patent?

15 A. It's not a single sample value, and the
16 whole thing is -- the whole thing about '921 is you
17 are detecting multiple analytes in a single sample
18 volume.

19 Q. Okay. Now let me -- let me ask you about
20 that. The peak at .9 V, those are the droplets that
21 have two target, correct?

22 A. Right, but the teaching of the patent is
23 the opposite. That's you don't want those.

24 Q. Okay. But it identifies them in the
25 patent, the droplets with two targets, correct?

1 A. It says it is, but it doesn't provide any
2 evidence.

3 Q. Okay. So it does identify the two targets
4 in the single sample?

5 MR. SALEN: Object. Misstates his testimony.

6 A. It doesn't identify anything. It says what
7 it is. It's their interpretation with no evidence.

8 Q. Okay. Well, the -- the figure, it
9 discloses a control sample with no targets, and they
10 identify that peak, and then they introduce the one
11 target, and they find the peak that comes from the
12 target they introduce. And they introduce the second
13 target. They identify that peak, individually, and
14 then they introduce both targets and the peaks line up
15 and then they find the third target. It's further
16 down stream.

17 Isn't that evidence?

18 A. It's -- I wouldn't call it conclusive
19 evidence, especially when you can't see it.

20 Q. Okay. They told you it was there.

21 A. There are a lot of things that can be
22 there. There is also a peak at 1.3. How do I know?

23 Q. Okay. Assuming they're not lying and
24 assuming they actually did identified that peak --

25 A. The proof is on them. If I can't see the

1 peak and they're telling me it's a peak -- no
2 scientist would accept that.

3 Q. Well, assuming that the peak is there, and
4 they identified it properly, and they are not lying to
5 you, how is the experiment that's depicted in
6 Figure 11A different from what is in Claim 1?

7 MR. SALEN: Object to form.

8 A. Claim 1 -- the whole point of Claim 1 is
9 detecting multiple analytes and multiple targets, and
10 this method in general can't do that. In a specific
11 case, I think they -- it might even have mentioned
12 somewhere, but I don't remember exactly, that there
13 may be a case where when you have two different
14 analytes in a -- in a droplet, you might be able to do
15 with the addition, okay, but you generally can't do
16 that. That's not -- the patent is asking about, you
17 know, all possible combinations of analytes. It's not
18 what this is.

19 Q. Okay. Well, in this experiment, they are
20 able to distinguish the droplets. They're able to
21 identify the droplets that have no targets, correct?

22 A. Yeah. They can identify no targets.

23 Q. They are able to identify the droplets that
24 have only the BCKDHA targets, correct?

25 A. Yes.

1 Q. And they are able to identify the droplets
2 that had only the SMN2 target, correct?

3 A. No, they didn't actually do that. I'm
4 actually surprised at that. They didn't put the
5 obvious of the experiment here. They didn't put SMN
6 by itself.

7 Q. Okay. So this peak over here on the top
8 trace that is over 0.7, you don't think that is SMN2?

9 A. That's -- they didn't do a proper
10 experiment. It probably is, but that's not an
11 acceptable experiment.

12 Q. Okay. So they correlated that with SMN2?

13 A. Correlate, yes.

14 They didn't do the right experiment.

15 Q. Okay. And then they are able to also
16 identify the droplets that have both targets?

17 A. I'm sorry. This does not pass my test of
18 science. They don't do a key experiment and have an
19 invisible thing that you call something. That's not
20 what I call science.

21 Q. But it wasn't invisible. They said they
22 were able to see it.

23 A. It's invisible to -- the burden of proof is
24 on the people who do it. I can't write a paper and
25 say, By the way, there are six things you didn't see

1 here. That's not science. No one accepts that.

2 Q. Okay. Is there any -- other than your
3 contention that the experiments aren't adequate, and
4 they haven't met their burden of proof --

5 A. It's pretty serious.

6 Q. Okay. Is there any way in which the
7 experiment to Figure 11 doesn't -- is there any
8 element of Claim 1 of the '921 patent that is not part
9 of Figure 11?

10 MR. SALEN: Object. Object. It's asked and
11 answered.

12 A. The patent, Larson patent, goes out of its
13 way in multiple times to avoid this, and it does say
14 that you might be able to detect a situation like
15 this, but it goes specifically out of its way to say
16 that you generally can't do that. And so it's -- it's
17 a totally different thing, and that's on top of the
18 fact that this is a pathetic experiment.

19 I mean, I can't believe they didn't do the
20 control of the M whatever it is by itself and saying
21 that there is a band somewhere or a thing somewhere
22 where you can't see it, what kind of stuff is that?

23 How do we know they didn't make it up?

24 I'm not accusing them of being dishonest,
25 but that's not the point. The point is that you have

1 to provide evidence. There is no evidence here.

2 Q. And that's why you think 11A fails?

3 A. Figure 11A fails period as just a figure.
4 It's not a serious experiment.

5 Q. Okay. All right. Let's go to
6 Paragraph 108 and 113.

7 Let's go ahead and review paragraphs 108 to 113 of
8 Larson. Let me know when you are done.

9 A. 108 to 113?

10 Q. Yes.

11 A. Oh, I see. It's not as long as I thought
12 it was.

13 (Witness reviewing you the document.)

14 A. There is a Figure 5 -- should look at --

15 Q. Yes.

16 A. I read it.

17 Q. Okay. Now this is an experiment where you
18 are looking for 5 targets, correct?

19 A. I think that's what it is, five different
20 loci they are looking at.

21 Q. Because three of them you detect using VIC?

22 A. Yeah. Whatever it says.

23 Q. Day 2, using FAM?

24 A. Yes.

25 Q. And then at the end of Paragraph 113, it

1 states, "The number of droplets, each
2 having one or more sequences selected
3 from TERT, RNaseP, Ela, SMN1, and SMN2,
4 can be determined from the scattered
5 plot."

6 Do you see that?

7 A. Yes.

8 Q. Okay. Now, it refers to quote, each
9 droplet having quote, "one or more sequences,"
10 correct?

11 A. Yes.

12 Q. Okay. So this is referring to the
13 possibility of the droplets having one target,
14 correct?

15 A. Yes.

16 Q. And it's also referring to the possibility
17 of the droplets having more than one target, correct?

18 A. That's what it says.

19 Q. Okay. Let's take a look at Paragraph 116.
20 Go ahead and review Paragraph 116.

21 (Witness reviewing the document.)

22 A. Yes, okay.

23 Q. Okay. This states in that paragraph, "The
24 number of droplets each having one or
25 more sequences selected from TERT,

1 RNaseP, Ela, 815A, and 815G, can be
2 determined from the scattered plot."

3 Do you see that?

4 A. Yes.

5 Q. This refers to the possibility of the
6 droplets having one target, correct?

7 A. Yes.

8 Q. And it refers to the possibility of the
9 droplets having more than one target, correct?

10 A. Right, but it's the ones that have more
11 than one target are not unambiguous. They haven't
12 been -- they don't show a demonstration if that's what
13 they actually are.

14 Q. Okay. Well, you know, we can -- we can
15 dispute that, but this does contemplate the
16 possibility of more than one target in the droplet,
17 correct?

18 A. Well, the fact that you are doing droplets
19 in a process like this, you're always going to have
20 things that add.

21 Q. Okay.

22 A. So that's part of it. That's part of the
23 method.

24 Q. And it also tells you that you can
25 determine how many droplets have more than one target

1 from the scatter plot correct?

2 A. Not unambiguously and not all possible
3 combinations.

4 (Reset realtime due to cache problem.)

5 Q. Okay. But you will agree that this is
6 contemplating droplets with more than one target and
7 it's telling you that you can distinguish these
8 droplets that have more than one target from some of
9 the other droplets on the scatter plot, right?

10 A. No. It doesn't say that. First of all,
11 the fact that you will have droplets with multiple
12 targets is intrinsic to any droplet method, so that is
13 not to be contemplated. This is just first principles
14 obviously, and the idea that you can tell -- you know,
15 you can distinguish all the different possible
16 combinations of two droplets, It's definitely not
17 shown for this.

18 Q. Okay. Now, in Figure 11, you agree the
19 droplets that had the two targets or the different
20 peak, different position in the scatter plot from the
21 droplets that had one part, you agree with that,
22 right?

23 A. Say it again, which -- that's the one that
24 had the -- the one I had a lot of trouble figuring out
25 what it was?

1 Q. Yeah. That graph you agree that the
2 droplets that have one target were at different
3 positions from the droplets that had two targets,
4 correct?

5 A. No, I don't agree to that. I think it's
6 exactly the opposite. The two-target droplet was the
7 hallucinated one you can't see.

8 Q. Okay. Assuming it's not hallucinated,
9 assuming that they weren't lying, and they weren't
10 hallucinating, and that they were analyzing their data
11 properly and they said, Yes, here is a peak here of
12 0.9 --

13 A. When you see a peak -- when you see
14 something in any experiment --

15 MR. SALEN: Let him finish the question.

16 He didn't finish his question.

17 THE WITNESS: Oh, he didn't?

18 MR. SALEN: Let him finish his question.

19 BY MR. WALTER:

20 Q. Assuming they are not hallucinating, they
21 are not lying when they say, There is a peak at 0.9 V.
22 It's got both targets, assuming they were correct in
23 that, and that figure distinguished the droplets that
24 have two targets from the droplets that have only the
25 first target, the droplets have only the second target

1 and droplets that have no targets.

2 A. If I assume that that's what it is for
3 which they provide zero evidence, that still doesn't
4 mean you could tell all the different combinations.

5 Q. What other combinations are there?

6 A. Well, that particular thing, there aren't
7 any other combinations but -- but there is no way for
8 them to -- even if that peak exists, there is no
9 evidence that that's what the peak is; that peak can
10 be anything.

11 Q. Okay. All right. Let's go to Paragraph 61
12 of your declaration.

13 A. All right.

14 Q. Here you have a discussion of Larson's
15 definition of the term "occupancy"?

16 A. Yes.

17 Q. Do you see that?

18 A. Uh-huh.

19 Q. You are discussing the situation where
20 Larson discusses the term of "10 percent occupancy"

21 A. Right.

22 Q. And this is the situation where 1 percent
23 of the droplets are two targets?

24 A. That's true.

25 Q. Okay. And then you state, "Larson teaches

1 that in a duplex system (an assay for two
2 analytes), the contribution from each
3 probe can be recovered from a droplet
4 that contains both of the analytes, based
5 on the increased intensity from such
6 droplet relative to droplets containing
7 only a single analyte."

8 Do you see that?

9 A. Yes.

10 Q. What are you referring to there?

11 A. I think that's pretty straightforward.

12 I mean, I don't know what you mean by that.

13 What you want me to say beyond what it says
14 here.

15 Q. Okay. I will take it as written.

16 A. What's written is written; that's all I'm
17 saying. I can't add to it.

18 Q. We will go ahead and take it as written.
19 It's good enough for me.

20 A. I think everything in here should be taken
21 as written; that's what I wrote.

22 MR. SALEN: There is no question pending.

23 THE WITNESS: Okay.

24 MR. WALTER: All right.

25 (Document tendered to counsel and the witness.)

1 (Exhibit 1004 previously marked for identification,
2 patent application for Saxonov et al.)

3 MR. WALTER: I hand you a document marked as
4 Exhibit 1004.

5 (Witness reviewing is the document.)

6 BY MR. WALTER:

7 Q. All right. What is this document,
8 Dr. Struhl?

9 A. This looks like a patent from Saxonov.

10 Q. Okay. Is this the Saxonov reference that
11 you viewed in this case?

12 A. I'm just checking to make sure the numbers
13 are the same. I did review a Saxonov patent.

14 (Witness reviewing the document.)

15 A. Yes. 10,000 -- 1004.

16 Q. Okay. Go ahead and review Paragraph 19 of
17 Saxonov, and let me know when you are done, and review
18 Paragraph 20 as well. It will be Paragraphs 19 and
19 20.

20 (Witness reviewing the document.)

21 A. Yes. All right.

22 Q. Okay. The first sentence of Paragraph 19
23 is talking about detecting two or more different
24 targets in a single channel. See that?

25 A. Yes.

1 Q. What do you understand that to be referring
2 to when it's talking about detecting two or more
3 targets in a single channel?

4 A. Well, you have two targets, and the probes
5 you are using are in the same optical channel, but
6 they differ in some -- they differ in some respect
7 such as the intensity. That's if you are talking
8 about intensity. It can also differ in color.

9 Q. Okay.

10 A. So that's not a single optical channel.

11 Q. In terms of tuning those probes to have
12 different intensity, when was that technique a
13 technique that was known to the Person of Ordinary
14 Skill in the Art.

15 A. As I said earlier, I did not do a
16 historical perspective on that.

17 Q. Okay. It states further on in that
18 paragraph, kind of the middle of the way
19 through it says, "The contents of each
20 sample or sample partition may then be
21 determined: those with no targets, those
22 with a first assay (assay 1) target --

23 A. Let me find this first.

24 Q. Okay. When you find it, let me know, and
25 I will start again.

1 A. I see. Okay.

2 Q. "The contents of each sample or sample
3 partition may then be determined: those
4 with no targets, those with a first assay
5 (assay 1) target, those with a second
6 assay (assay 2) target, and those with
7 both, in a two-target assay."

8 Do you see that?

9 A. Yes.

10 Q. Okay. So this is telling you that you can
11 look at multiple targets in a single channel?

12 A. Single channel, yes.

13 Q. And you can look at multiple targets in a
14 single partition; is that fair?

15 A. Not really, no.

16 Q. Okay. It states, "The total number of
17 droplets" -- it says, "The contents of
18 each sample or sample partition" correct?

19 A. Yeah.

20 Q. Okay. So this is telling you that you can
21 identify multiple targets in the same sample
22 partition?

23 A. Yes. I don't see how you can do that,
24 actually.

25 Q. You don't see how it's possible to do it?

1 A. Not when -- unless you are doing either
2 single molecule detection with a special case or where
3 you have -- which was the thing you had me read
4 before, from my own declaration about Larson.

5 Q. To your knowledge, does the Saxonov include
6 a disclosure of detecting multiple targets in the same
7 droplet?

8 A. I don't know what you mean by disclosure.
9 There may be special cases where you could do that,
10 but it's not -- that's not the essence of the method
11 at all. It's the opposite.

12 Q. What is the essence of the method in
13 Larson?

14 A. The essence of the method in both of
15 them --

16 Q. Excuse me. I meant to say Saxonov.
17 What is the essence of the method in Saxonov?

18 A. The essence of the method in Saxonov. Let
19 me just see what the title is.

20 Yeah, two or more targets in the same
21 optimal channel. So the essence of both of these
22 methods involve dilution, so you are essentially
23 looking at single molecules. And when you have a
24 single molecule, you can say, Oh, it's this intensity
25 or that intensity, and so then you can tell.

1 Q. So your view is that Saxonov is focused on
2 only a single target per droplet?

3 MR. SALEN: Object. Misstates his testimony.

4 A. That is -- it is teaching you -- they're
5 teaching you to do that, yes.

6 Q. And my question was a little different.
7 Your view is that Saxonov is focused only on a single
8 target per droplet?

9 MR. SALEN: Same objection.

10 A. I don't know what you mean by focused.
11 That's what -- that's the essence of the design.

12 Q. Okay.

13 A. I don't know what you mean by focus.

14 Q. The essence of the Saxonov reference, is it
15 at 1004? Is it one target per droplet?

16 A. That's the ideal setup.

17 Q. Okay. You would -- you would feel
18 comfortable calling that the essence of Saxonov?

19 A. A significant part of it.

20 Q. Would you call it the essence?

21 A. That's kind of a -- too big a term.

22 Q. Okay. Do you know if there is disclosure
23 in Saxonov, detecting multiple targets per droplets?

24 A. Not unambiguously detecting all the targets
25 that you're testing, no.

1 Q. Now review Paragraph 20, and let me know
2 when you are done.

3 (Witness reviewing the document.)

4 A. Yeah, okay.

5 Q. Okay. Now, this paragraph contemplates
6 even more than the analysis of two targets in the same
7 channel, right?

8 A. You mean because you can use a different
9 channel, you mean?

10 Q. No. Let's read it together. It state,
11 "In some embodiments, the assays may
12 involve analysis of more than two targets
13 in the same channel."
14 That's what it says, right?

15 A. The channel is an optical channel.

16 Q. Yes. And it says you can do more than two
17 targets in a single optical channel, right?

18 A. Yes, but that's using the single molecule
19 approach, exactly.

20 Q. You can do a minimum of three targets in
21 the same channel, right?

22 A. Depends. Three different intensities, you
23 could do that.

24 Q. Now, it goes on and states, "an assay
25 for three targets may generate eight

1 clusters or populations of data,
2 separated by intensity."

3 Do you see that?

4 A. Yes.

5 Q. Okay. Where does the Number 8 come from in
6 the context of three targets; do you know?

7 A. Well, yes. You will have three different
8 things. You have -- you have because the second --
9 the second channel is a different optical channel. So
10 you can have two blues and a red, that would be what
11 that is referring to, and each one can be either yes
12 or no. So you could have eight -- you would expect to
13 find eight spots.

14 Q. Let me do this. Let me do it a little
15 differently. Let's go back to the second sentence of
16 the paragraph, and let's say -- let's read the
17 sentence that says:

18 "For example, an assay for three targets
19 may generate eight clusters or
20 populations of data, separated by
21 intensity."

22 Do you see that sentence?

23 A. Yes.

24 Q. Okay. So tell me again, why are there
25 eight clusters or populations of data? We have three

1 targets.

2 A. Because for each target you are either plus
3 or minus.

4 Q. Okay. And you are saying that if you have
5 three targets, you can have eight combinations of plus
6 or minus across the three targets?

7 A. Yeah. You either have a target or you
8 don't, and there are three of them.

9 Q. Okay. So what are -- what are the eight
10 possibilities? Can you enumerate them real quickly on
11 the record?

12 A. Yeah. You could be none of them, one of
13 them, three versions of two of them, and one version
14 of three of them.

15 Q. Okay. And so there are three versions of
16 one of them?

17 A. Yes.

18 Q. So it's none of them, three versions of one
19 of them, three versions of two of them, and one
20 version of three of them?

21 A. Right.

22 Q. Okay. That's eight?

23 A. Uh-huh.

24 Q. And it states here that those "eight
25 clusters or populations of data."

1 Are there any other combinations when you
2 have three targets?

3 A. I can't think of any.

4 Q. Okay. Now it says that those "eight
5 clusters or populations of data" can be "separated by
6 intensity."

7 Do you see that?

8 A. Yes. If it's all done by intensity, it
9 would be separated by intensity, that's right.

10 Q. Okay. And so what do you understand it to
11 mean when it states that the "eight clusters or
12 populations of data" can be "separated by intensity,"
13 what do you understand that to mean?

14 A. It's not clear to me from that sentence you
15 could separate all eight, especially considering that
16 those the zero one doesn't have any intensity at all.

17 So how would you see it?

18 So I don't know what that actually means.
19 It certainly can conceptually separate.

20 Q. Okay. All right. And so what do you
21 understand it to mean from the conceptual level when
22 you say, "separated by intensity"?

23 A. The way that this would be done normally
24 and the way they are doing it, and also the way Larson
25 would do it, it's all single molecule detection.

1 So you -- when you get a single molecule in
2 your droplet, it's only going to be one of those three
3 things. So you will know in each case that, okay,
4 this was such and such intensity. Let's just consider
5 intensity. With three intensities, it will know which
6 intensity it is.

7 Q. Okay. This passage we are looking at in
8 paragraph 20 of Larson, this is -- this is
9 contemplating populations that have three targets in
10 the droplet, right, not just one?

11 A. Not really. I don't think so.

12 Q. Okay. Well, we just went through this.

13 It talks about an assay for three targets and
14 they generate eight clusters or populations of data.
15 One of those populations of data was for the situation
16 where you have three targets together, correct?

17 A. Well, if you don't control the amount of --
18 if you use a lot of material you can have -- any
19 individual sample could have the three possibilities.

20 Q. Okay.

21 A. But you are detecting them by detecting
22 individual droplets.

23 Q. Okay. And you agree that in Saxonov, it is
24 contemplated that you can have more than one target in
25 a droplet, correct?

1 A. It's contemplated by anybody; doing
2 droplets, that's got nothing to do with the method.

3 Q. And Saxonov actually teaches how you can
4 distinguish droplets that have multiple targets from
5 those that don't, correct?

6 A. No, not generally it doesn't.

7 Q. Okay. Let's go back to Paragraph 20.

8 Do you agree with me that what's being
9 contemplated in Saxonov, Paragraph 20, is a possibility
10 that you might have partitions with three targets
11 altogether?

12 A. You're always going to have that
13 possibility. That's just inherent in any -- that's
14 inherent in any experiment.

15 Q. And that's -- that's what Larson is --
16 that's what Saxonov, Paragraph 20, is saying, right?

17 A. It certainly acknowledges that they exist
18 because of course they exist. Any droplet of
19 technology does that.

20 Q. And it says you that you can distinguish
21 the targets that have -- excuse me -- the partitions
22 that have all three targets from the other
23 combinations?

24 A. It doesn't actually tell you that.

25 Q. Well, it says they can be separated by

1 intensity. Doesn't it say that?

2 A. Yeah, but they -- the experiment is
3 separating things by intensity, but they don't talk
4 about that it would be additive, for example. They
5 don't say anything about that. The fact that the --
6 when you have multiple -- the fact when you have
7 multiple guys and a single droplet, those are going to
8 exist.

9 And the frequency at which they exist will
10 depend on, you know, how much you've diluted things.
11 But that doesn't tell you that -- how you would go
12 about doing that.

13 Q. Okay. And so are you saying that this
14 disclosure fails, because Saxonov doesn't enable --
15 distinguish any of those populations by intensity?

16 MR. SALEN: Object calls for a legal conclusion.
17 and form.

18 A. I don't -- the way I understand this patent
19 as a scientist and as a person of ordinary skill, is
20 that the whole point of it is to get down to single
21 molecule droplets, because that's the power of the
22 method; that's what you are trying to do.

23 The fact that you have some other things
24 that get in the way is just an impediment. It's not
25 helping you.

1 Q. That's how you understand Saxonov?

2 A. Yes.

3 Q. Okay. All right. Let's go to your
4 original declaration in this case, Exhibit 2001.
5 Let's go to Paragraph 80.

6 (The witness complied.)

7 A. Okay.

8 Q. What is being shown in Paragraph -- go
9 ahead and review Paragraph 80.

10 A. And Figure 4. Figure 4, yes.

11 Yes, okay.

12 Q. Okay. What is being shown in Figure 4?
13 Can you describe it for me?

14 A. First of all, Figure 4 is not real data.
15 So what it actually would look like is anybody's
16 guess, but the way it's portrayed is that you see, you
17 know, 108 is target 1.

18 Let's see. Sorry. 106 is no target.

19 108 is target 1 but not target 2.

20 110 is target 2 but not target 1.

21 And 112 is both.

22 Q. Okay. 112 are droplets that have both
23 targets?

24 A. Yes.

25 Q. Okay. The droplets that are -- have no

1 targets, that's 106. That is like intensity zero?

2 A. Yes.

3 Q. And then 108 with one target is like
4 intensity 1?

5 A. Yes.

6 Q. And 110 with the other target, that's like
7 2, intensity 2?

8 A. Yes.

9 Q. And then 112 is both targets; that's like
10 3?

11 A. Yes.

12 Q. Okay. Now, let's take a look at the
13 description in the patent of Figure 4.

14 Does Saxonov describe this experiment as like
15 a -- something that just gets in the way of things?

16 A. I don't remember exactly whether Saxonov
17 was that way.

18 Q. All right. Let's take a look at
19 Paragraph 53 to 59.

20 Go ahead and review 53 to 59.

21 (Witness reviewing the document.)

22 A. Yes, okay.

23 Q. Okay. Now, is there anywhere in Paragraphs
24 53 to 59 where Saxonov describes the experiment with
25 multiple targets and the droplets where he says:

1 Hey, these droplets with two targets are
2 crappy droplets that we don't want. We
3 should just throw them out, because
4 that's not the essence of our method?

5 A. I don't think he says that, but it's
6 unnecessary. You don't need them. They don't provide
7 any information.

8 You know, the fact that you have multiple
9 droplets, and that some multiple droplets you might be
10 able to disentangle, doesn't matter. You don't need
11 the multiple droplets. They are irrelevant. You do
12 what -- if you do what this is actually set up to do,
13 the single droplets are all you need.

14 Q. Do you have any explanation then for why
15 Saxonov has a figure and six paragraphs of text where
16 he tells you how you can identify the droplets that
17 have --

18 A. Yes.

19 Q. Hold on. Let me finish the question.

20 A. Sorry.

21 Q. Do you have any explanations for why he's
22 got a figure and six paragraphs worth of text for how
23 you can distinguish droplets that have two targets
24 from other droplets?

25 A. The reason he has it there is because it's

1 inevitable that you're going to have multiple
2 droplets, so it would be totally reasonable to discuss
3 multiple droplets because even if you don't use them,
4 they are going to exist. You don't need to use them.
5 They don't add anything.

6 Q. Okay.

7 A. If you are interested in knowing that your
8 sample has analyte A or analyte B, it doesn't matter
9 whether you see them in the same droplet or not --
10 single -- the basic essence of --

11 THE COURT REPORTER: Hold on. It doesn't matter
12 that you see them in the same droplet?

13 THE WITNESS: In the same droplet.

14 A. So it's unnecessary. On the other hand,
15 and this I would give them points for in terms of at
16 least scientifically saying things, when things
17 happen, that are inevitably going to happen, that is
18 to say multiple targets in a droplet, it's worthy of
19 commentary about what they are, but it's not a method
20 for doing it.

21 Q. Okay. Now, when you say it's because there
22 is no data?

23 A. Well, this is not data, but that's a
24 different issue.

25 Q. Okay. That's a different issue.

1 Now, in your previous answer, you referred
2 multiple times to multiple droplets. Did you intend to
3 say multiple targets per droplet?

4 A. I don't know. You have to tell me what
5 sentence I'm talking about. I don't remember.

6 Q. Okay.

7 A. Multiple target -- targets -- multiple
8 targets and multiple targets per drop are two separate
9 things. I don't know which one I said when.

10 Q. You just referred to multiple droplets.
11 Now we need to get this fixed. I'm sorry. I need to
12 read back what he said.

13 (Off the record.)

14 BY MR. WALTER:

15 Q. I asked the question, now is there anywhere
16 in paragraphs 57 to 59 where Saxonov described the
17 experiment with multiple targets and droplets, where
18 he says the droplets with two targets, the crappy
19 droplets that we don't want, we should just throw them
20 out, because that's the essence of our method.

21 And you stated, I don't think it says that,
22 but it's unnecessary. You don't need them. They don't
23 provide any information. You know, the fact that you
24 have multiple droplets, and that some multiple droplets,
25 you might be able to disentangle doesn't matter.

1 A. So I should have said multiple targets and
2 droplet; that's just a misspoken -- that's
3 misspeaking.

4 Q. That's what I just wanted.

5 A. Okay. Thank you.

6 A. All right. Now, in Figure 4, the droplets
7 with the different combinations of targets is
8 distinguished from one another by intensity; is that
9 correct?

10 A. Yes.

11 Q. Okay. Do you know how that's done?

12 A. How that's done?

13 What do you mean by "how that's done"?

14 Q. How you -- how you set up the experiments,
15 you can distinguish the different droplets with the
16 different targets by intensity.

17 A. Well, the optical reader reads wavelength
18 and intensity.

19 Q. Okay.

20 A. That's what the optical readers do.

21 Q. How can you set -- how do you set up your
22 experiment so that the probe that goes along with
23 target 1, gives a different intensity than the probe
24 that goes along with target 2?

25 A. How do you actually design the probes to be

1 that way?

2 Q. Yes.

3 A. There are couple ways you could do it. I
4 don't know the way they specifically do it. You could
5 use two different fluorophores that have different --
6 they are in the same wavelength and the same optical
7 channel, but they give you different intensities.
8 That's one way to do it.

9 Another way to do it is when you make the
10 probe, you -- I think this would work. You can use,
11 you know, there's always a ratio of the fluorophore to
12 the -- to the primer, so you could vary that. That
13 would give you a lower specific activity of the
14 primer. So I don't specifically know how they do it,
15 but I'm guessing one of the two.

16 Q. Okay. And when were those methods you just
17 identified known to those with the skill in the art?

18 A. I told you, I did not do a historical thing
19 of any of this.

20 Q. Is it something that people with the skill
21 in the art would have known when TaqMan became
22 available?

23 A. Would they have known -- I would say when
24 TaqMan probes first came out, the user would just buy
25 them and use them. The idea that you might muck

1 around with them and do something a little bit
2 different, would have come after the very first -- I
3 don't know when that would have been. It would have
4 been two months later or a year later or five years.
5 I have no idea.

6 Q. You didn't investigate that for the
7 purposes of your declaration?

8 A. I told you, I did not do any historical
9 analysis for anything.

10 Q. Okay. All right. Let's go to Paragraph 43
11 of your declaration.

12 A. Which one? The original declaration or the
13 newer one?

14 Q. The newer one.

15 Now, this is the scheme we were talking about
16 earlier, where each target is encoded according to
17 geometric progression; 1, 2, 4, 8, 16; do you recall
18 that?

19 A. Yes.

20 Q. Okay. Now, when you use this scheme, let's
21 say we only have two targets present. Your maximum
22 signal is going to be 3, correct?

23 A. Say that again.

24 Q. When you only have -- if you're using this
25 scheme, and you only have two targets, the maximum

1 signal is going to be 3; 1 plus 2, correct?

2 A. If you use a 1 plus 2 situation, you get 3,
3 that's right.

4 Q. And if you add another target, if you want
5 to analyze another target, that target is going to
6 have to have associated with it an intensity of 4?

7 A. Yeah.

8 Q. Okay. And so it can be distinguished from
9 the situation where both of your first two targets are
10 present, correct?

11 A. Say that again.

12 Q. Okay. If you add another target, if you
13 want to analyze the third target, that target is going
14 to have associated with it an intensity of 4?

15 A. Okay.

16 Q. And do you need to do that so that you can
17 distinction that target from a droplet that's got
18 targets 1 and 2 present?

19 A. That's correct.

20 Q. Okay. So the separation between two
21 targets, 1 and 2, and the third target is just one
22 unit, okay, correct?

23 A. Yeah, okay. Could be 3, yes. All right.

24 Q. And then the next possible signal is 5,
25 okay, after the signal of 4, and that's target 1 and

1 target 3 being present, because target 1 has a signal
2 of 1 and target 3 has a signal of 4, so that is a
3 signal of 5?

4 A. That's right.

5 Q. Okay. So the interval between
6 progressive -- between consecutive signals is going to
7 be a single -- single unit, correct?

8 A. Well, ultimately, in theory you can detect
9 signal unit differences.

10 Q. Okay. So let's go to Table 4 of the
11 patent.

12 A. Which patent?

13 Q. The '921 patent.

14 A. Figure 4, you said?

15 Q. Well, let's -- let me just ask the
16 question.

17 You do agree that when you're using this
18 scheme, this geometric progression scheme, the
19 difference from consecutive signals is going to be a
20 signal unit; is that right?

21 A. It doesn't have to be, but it could be.

22 Q. Well, ultimately, it's going to be -- you
23 can make your unit bigger, but, ultimately, it's going
24 to be one interval?

25 A. I mean, however you set it up, is how you

1 would set it up. Frequently, it will be a difference
2 of one, yes.

3 Q. Now, let's take a look at Table 4.

4 A. Table --

5 (Darren Ficklin left the Zoom.)

6 A. Here is Table 4, right.

7 Q. Hold on one second.

8 Okay. So in Table 4, there is a blue signal?

9 A. Yes.

10 Q. What is the purpose of that blue signal?

11 A. I think the purpose of the blue signal, if
12 I remember right, is it's essentially controlled PCR
13 reactions, to make sure the PCR reactions are working.

14 Q. It does a little more than that, right?

15 It allows you to supposedly count the number
16 of analytes; is that right?

17 A. I don't see how it counted the number of
18 analytes. Why does it do that?

19 Q. Okay. Let's look at Table 4. If you look
20 at the situation, where only the control is present,
21 you get a signal of 1, right?

22 In the blue column, do you see that?

23 A. No. What you are talking about?

24 Oh, oh. Wait, wait, wait. I'm sorry. I
25 didn't realize we're starting over here, okay.

1 Oh, I see. So -- well, blue is included in
2 all of them.

3 Q. Yeah, okay. The intensity of the blue is
4 an indicator of the total number of analytes present.
5 Do you understand that?

6 A. I don't agree with that. I don't see why.

7 Q. Let's look at it. Let's look at the first
8 row. No analytes are present.

9 A. Oh, now I see what you are getting at. All
10 right.

11 Yeah, okay. Now I see what you are getting
12 at, okay. I didn't understand what you meant before.

13 Q. Okay. So the blue signal, the intensity is
14 an indicator of the overall number of analytes that
15 are present; is that fair?

16 A. Yeah, yeah. That would be.

17 Q. The intensity of the blue signal, for
18 instance, distinguishes between target D and both
19 targets A and B being present, correct?

20 MR. SALEN: Object to form.

21 A. First of all, the signal 2 versus 3 can be
22 a number of different things. It's not just that.
23 There are a lot of different things. There are a lot
24 of blue 2s and a lot of the blue 3s and just knowing
25 there is a blue 2 and blue 3. Doesn't tell you which

1 one it is.

2 Q. Okay. The signal profile, the accumulative
3 assay result for target D being present as a 1 and
4 yellow and red, correct?

5 A. Yes. It's 2011.

6 Q. And the accumulative assay result for
7 targets A and B being present has a 1 and yellow and
8 red, just like analyte D, correct?

9 A. The P -- AB you said?

10 Q. Yes.

11 A. Yes, AB and D have -- yes, okay. Yeah, I
12 see what you are saying.

13 Q. Okay. So AB is distinguished from D on the
14 basis of the blue signal, correct?

15 A. Yes.

16 Q. Now, the difference between these
17 consecutive blue signals is a single intensity
18 interval, correct?

19 A. Yes, the difference between 2 and 3,
20 exactly.

21 Q. Okay. So you can see that from the single
22 target situation, the blue intensity is 2, correct?

23 A. Yes.

24 Q. And for the 3 target -- 2 target situation,
25 the blue intensity is 3, correct?

1 A. Correct.

2 Q. So that's a 50 percent increase?

3 A. Yes.

4 Q. Okay. And then when you go to three
5 targets, the blue intensity is 4, correct?

6 A. Yes, that's right.

7 Q. That's a 33 percent increase?

8 A. Right.

9 Q. And then you go to 4 targets, the blue
10 signal is 5?

11 A. Yes.

12 Q. That's a 25 percent increase?

13 A. That's right.

14 Q. Now, if we extrapolate, when you go from 99
15 to 100 targets, there is only going to be a 1 percent
16 increase in the intensity of the blue signal; is that
17 right?

18 A. Yes.

19 Q. Okay. Now, I don't know the 2010 time
20 frame. How big of a percent difference in intensity
21 would there need to be between two signals of the same
22 color, so that you could confidently distinguish them?

23 MR. SALEN: Object to form.

24 A. I have no idea. That's a question of the
25 quality of your detector, and that's something I don't

1 know. That's a practical number.

2 Q. Do you know if -- you know sitting here
3 today, even sitting here today, you can distinguish
4 between if you can make out a 1 percent difference?

5 A. No. I don't. I have no -- that all
6 depends on the quality of the detectors, and the
7 sensitivity of the detectors, and that's going to
8 change over time, and I can't tell you any given time
9 frame what it could do.

10 Q. Is that something you have any experience
11 with?

12 A. Well, the idea that you are raising, I
13 certainly have thought about it because in terms of
14 the patent at some point, theoretically, you're not
15 going to be able to distinguish between 1,000, and
16 1,001, for example, to give an exaggerated thing.
17 Where that line falls, I don't know, and that would be
18 changing over time. The concept is correct. It's --
19 but ultimately, you know, what you could actually
20 really, really use in the real world, that's going to
21 depend on the specifics of the detector.

22 And I'm not -- I'm not a detector expert in
23 that regard. I don't know what level they would be
24 able to do, but they clearly can do some levels. I
25 just don't know where -- I don't know where it stops,

1 and as I said, as the machines get better, you
2 probably can do more.

3 Q. Do you have any idea how many you can do in
4 the 2010 time frame?

5 A. I told you, I don't have the expertise. I
6 don't have the historical thing, and second of all, I
7 am not an expert in detection machines, so I can't
8 tell you what their sensitivity differences are.

9 The kind of things I have done in the past
10 that involved detection, you can -- I mean,
11 quantitative piece of your reactions, you can follow
12 in real-time, and so you see, you know, you see nice
13 curves, and so you really can see pretty different
14 things. So I don't know what -- I just don't have a
15 way of assessing.

16 Q. You agree that the schemes in the '921
17 patent as you go to bigger and bigger targets,
18 requires you to distinguish smaller percentage
19 differences in signals?

20 A. Yes, that's true.

21 Q. Okay.

22 MR. WALTER: Okay. I don't have any more
23 questions.

24 THE WITNESS: We are done completely?

25 MR. WALTER: I might have questions after he

1 asks.

2 THE WITNESS: No, I know that, but I'm just --

3 MR. SALEN: Let's go off the record and take a
4 break if that's all right.

5 VIDEOGRAPHER: We are now going off the record
6 at 2:08 p.m.

7 (Off the record at 2:08 p.m.)

8 (Back on the record at 2:27 p.m.)

9 VIDEOGRAPHER: One moment, please, while I get
10 the camera rolling.

11 We are back on the record at 2:27 p.m.

12 EXAMINATION

13 BY MR. SALEN:

14 Q. All right. Dr. Struhl, if we could just
15 take a look at your declaration, Exhibit 2018, do you
16 have that?

17 A. Yes.

18 Q. Can you see paragraph 1? Start at the
19 beginning of Paragraph 1.

20 A. Yes.

21 Q. And just quickly review Paragraph 1.

22 A. Oh, okay.

23 Q. Okay. And I just want to clarify something
24 from earlier. I think you were asked some questions
25 about the word "petition" or what a petition, and you

1 didn't remember what that referred to in your
2 declaration, and I just want to ask you if you have
3 any clarifications to your answer about what petition
4 you may be referring to?

5 A. I see it in my own document. My point was
6 before that I didn't see it in my list, so I didn't
7 see it on my list, but now I'm seeing it in my
8 document, so it's obviously there.

9 Q. So which -- which -- so just to clarify,
10 what -- what document were you referring to, do you
11 refer to in your declaration when you cite to a
12 petition?

13 A. It's this document. Whatever. It's, you
14 know, IPR2024-01451.

15 Q. And specifically -- specifically which
16 document in that proceeding -- you say, "petition," do
17 you know -- do you know what document you are talking
18 about?

19 A. I don't know. I don't understand. It's a
20 petition for inter partes review of this patent if
21 that's what you are asking me.

22 Q. Okay. All right. And Mr. Walter marked an
23 Exhibit 1043.

24 A. Right here. Yeah, this is the same thing,
25 okay. I just -- I just -- it wasn't in my original

1 list. It's not in the list. I couldn't find it in
2 the list of things I reviewed, but obviously, I do
3 remember seeing, as I said, I saw something -- I
4 remember something like it. Now I see it's exactly
5 the same thing.

6 Q. Okay. All right. And then let's -- so we
7 can get your declaration. If we could turn to
8 Paragraph 12. So we are back on Exhibit 2018. And
9 Paragraph 12 appears on Page 9 which -- Page 9 of your
10 declaration, but it's at Page 12 of Exhibit 2018.

11 A. Paragraph 12, right?

12 Q. Paragraph 12.

13 And we talked earlier, I believe you
14 testified about some -- some legal concepts, like
15 priority date, correct?

16 A. Yes.

17 Q. Where did you get your understanding of the
18 legal concepts that you used in preparing your
19 petition -- I mean your declaration?

20 A. Ultimately, from you guys.

21 Q. When you say, "you guys," who do you mean?

22 A. I mean you. I don't remember who
23 specifically told me what, but I mean, it would be
24 you, Jamie, and maybe there were some other people. I
25 can't remember earlier on.

1 Q. You don't have an opinion about legal
2 concepts, do you?

3 A. About what?

4 Q. About any legal concepts, do you?

5 A. No. I just listen to what the lawyers tell
6 me.

7 Q. Okay. And -- and then right below in
8 paragraph -- right below Paragraph 12, do you see that
9 subheading there, A?

10 A. Yes.

11 Q. Subheading A says, "a person having
12 ordinary skill in the relevant skill during the
13 relevant time."

14 Do you see that?

15 A. Yes.

16 Q. And then I would like you to -- and this is
17 a section that talks about your understanding of who a
18 person of ordinary skill in the art is, correct?

19 A. Uh-huh.

20 Q. Okay. Can you review Paragraph 13 and 14
21 for me, and then I have a question about it.

22 A. Okay.

23 Q. And earlier there is -- you had some
24 testimony about -- about dates and priority dates, and
25 you didn't recall, right?

1 And I just want to ask you, do you have an
2 understanding now or what is your understanding of what
3 the relevant time is that you refer to in subheading A?

4 A. Well, see -- um -- at the time it's the --
5 oh, okay. It's in my patent. I forgot about this,
6 okay. It says, "at the time of the invention," which
7 I understand is on February 3rd, 2012.

8 Q. Okay.

9 A. As I don't -- didn't remember that because
10 I didn't remember it, but I was informed of this. I
11 didn't -- I certainly couldn't judge it on my own.

12 Q. Okay. That's fine.

13 And then recall, we went through several
14 bullet points, the four bullet points --

15 A. Yes.

16 Q. -- that Mr. Walter showed you about the
17 understanding of a person of the ordinary skill in the
18 art?

19 A. Yes.

20 Q. Did you have those four bullet points,
21 would you have understood those concepts as of
22 February 3, 2012?

23 A. Yeah, because that's what I was judging it
24 upon, and I would have judged it on that.

25 Q. Okay. And --

1 A. I think my testimony was that I didn't know
2 off the top of my head when it was, and I certainly
3 did not have the expertise to know when it was. I had
4 to be told when it was.

5 Q. Okay. Let's look at Paragraph 46 of your
6 declaration on Exhibit 2018.

7 A. Okay.

8 Q. And you recall testifying earlier,
9 Mr. Walter asking you questions --

10 A. Yeah.

11 Q. -- about the Paragraph 46 and the claims?

12 A. Yes.

13 Q. Those are the Claim 1 and 14 of the '921
14 patent?

15 A. Yes.

16 Q. And I just -- could you just briefly review
17 just for -- for context, paragraphs 47 and 48 that
18 follow?

19 Let me know when you are done.

20 (Witness reviewing the document.)

21 A. Okay.

22 Q. Okay. You recall earlier talking about or
23 testifying about what -- what F was in Claim 1?

24 A. Right.

25 Q. And what is your opinion about what the

1 minimum value of F is?

2 A. Well, it's -- the minimum value is -- I was
3 referring when I said what I said before, I was
4 referring to the literal statement there, but in terms
5 of everything else, which I had forgotten about it,
6 but in the moment, my testimony is, as it says right
7 here in 47 and 48, which I'm not changing, is that F
8 is at least 2, and that M is at least 3.

9 Q. Okay. Let's look at Claim 1 again --

10 A. Uh-huh.

11 Q. -- which is in paragraph 46.

12 A. Yes.

13 Q. And there is -- Claim 1 has a preamble,
14 that starts with "An assay," and then a "wherein"
15 clause after that, and then another "wherein" clause.
16 I'm looking at the second "wherein" clause now.

17 A. Oh, wait, wait, wait.

18 This -- okay. Yes. I see what you are
19 saying.

20 Q. Yeah.

21 A. It says, the second one "wherein said
22 fluorescent signal comprises F wavelength components"?

23 Q. Correct.

24 And is your opinion about the minimum value
25 of F, is that consistent with that, with that reading of

1 that "wherein" clause?

2 MR. WALTER: Objection, leading.

3 A. Okay. Yes, because all of the examples in
4 there have F -- in the patent are all F, at least 2.

5 Q. I got a leading objection. Let me ask it a
6 different way.

7 After reading that, what is your
8 understanding of what the value of F is in the claim?

9 A. After reading what I wrote, I basically --
10 What? Reading 46 or reading --

11 Q. In view of the claim language, what is your
12 understanding of what a minimum value of F is?

13 A. I mean, it says it right here, F equals 2
14 or is greater than 2.

15 Q. Okay. All right.

16 MR. SALEN: All right. I don't have any further
17 questions.

18 MR. WALTER: Let me follow up on a few
19 questions.

20 VIDEOGRAPHER: Your microphone there.

21 FURTHER EXAMINATION

22 BY MR. WALTER:

23 Q. Let me follow up on a few of those
24 questions. So let me pick up where you left off on
25 this F is equal to 2 as the minimum value. You base

1 that on some examples in the specification; is that
2 right?

3 A. Well, yeah, not exclusively, but mostly.

4 Q. Okay. So is it your understanding that
5 claims should be limited to the examples in the
6 specification?

7 A. That's beyond my -- that's a legal thing.
8 I don't know the answer to that question.

9 Q. Okay. In rendering your opinion that F
10 should be equal to 2, based on the examples in the
11 specification, did you ever investigate whether it's
12 appropriate for claims to be limited to examples in
13 the specification?

14 A. That's a legal thing. I did not do
15 legal -- I did not do legal stuff.

16 Q. Did the attorneys tell you that claims
17 should be limited to the examples in the
18 specifications?

19 A. I don't think they ever said anything that
20 specific. I don't remember.

21 Q. Okay. So sitting here today, you don't
22 really understand what the role of examples in the
23 specification is in interpreting claims, right?

24 MR. SALEN: Object to form.

25 A. I'm not a lawyer. So if you are asking me

1 a legal question -- that's a legal question.

2 Q. Okay. Now, you said for your
3 interpretation that F should be -- have a minimum
4 value of 2?

5 A. Yes.

6 Q. You didn't rely exclusively on the examples
7 of the specification. What else did you rely upon if
8 it wasn't -- if it wasn't the examples in the
9 specification for the idea that F has to take on the
10 minimum value of F is 2?

11 A. Off the top of my head, I can't think of
12 anything.

13 Q. Okay. Now, let's go back to a question I
14 asked earlier.

15 Is there anything in the claim language that
16 prevents F from taking on a value of 1?

17 (Witness reviewing the document.)

18 A. Well, it says, "F wavelength components";
19 that is plural. So I would say plural is not 1.

20 Q. Okay. Your understanding is that plural --
21 when it uses the plural, that that doesn't encompass
22 the singular?

23 A. As I said, yeah, just pure reading of it,
24 it read likes a plural, yes.

25 Q. Okay.

1 A. I mean, you would not say, Detection of one
2 wavelength component. So that doesn't make sense.
3 That is not English.

4 Q. Okay. Anything else?

5 A. What?

6 Q. Anything else in the claim language that
7 you think prevents F from taking on the value of 1?

8 A. It seems good enough to me right now. I
9 mean, may be other things I haven't thought about.

10 Q. Are you familiar with whether there is any
11 rules in claim construction about whether the
12 singular -- whether the plural is something that
13 encompasses the singular?

14 A. It's a mixture of legal and grammatical
15 stuff now. It's doubly bad for me to answer your
16 question.

17 MR. WALTER: All right. Okay. I don't have any
18 more questions.

19 MR. SALEN: Okay. Neither do I.

20 VIDEOGRAPHER: Being there are no further
21 questions and no more statements, we are now concluding
22 the deposition today at 2:42 p.m.

23 THE COURT REPORTER: Counsel, before you leave,
24 we just want to put the transcript order on my record.

25 MR. WALTER: Okay. I need a rough and then

1 let's get the expedited video.

2 VIDEOGRAPHER: Anywhere in that vox --

3 MR. WALTER: I don't need the --

4 VIDEOGRAPHER: Yeah.

5 MR. WALTER: -- I don't need that any time soon.

6 We will call when need it.

7 Yes, so give me a rough, and then I want the final
8 expedited.

9 THE COURT REPORTER: Monday delivery?

10 MR. WALTER: Tuesday is fine.

11 THE COURT REPORTER: Tuesday, okay.

12 MR. WALTER: Even Wednesday is fine.

13 THE COURT REPORTER: You tell me.

14 MR. WALTER: Wednesday if fine.

15 MR. SALEN: We will just do the same.

16 THE COURT REPORTER: Mr. Salen, your order,
17 please.

18 MR. SALEN: I will do the same, rough and
19 Wednesday, three day. Is that three-day?

20 THE COURT REPORTER: Three day.

21 Okay. Thank you.

22 (Off the record at 2:46 p.m.)

23

24

25

E R R A T A S H E E T

I, KEVIN STRUHL, do hereby certify that I have read the foregoing transcript of my testimony, and further certify that it is a true and accurate record of my testimony (with the exception of the corrections listed below).

PAGE	LINE	CORRECTION
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[illegible]

Signed under the pains and penalties of perjury this _____ day of _____, 2025.

Witness:

C E R T I F I C A T E

COMMONWEALTH OF MASSACHUSETTS

SUFFOLK, SS.

I, TERI C. GIBSON, a CSR, RPR, CRR, and a
Notary Public within and for the Commonwealth of
Massachusetts do hereby certify:

In the 24th day of July 2025, before me, the
undersigned Notary Public, personally appeared KEVIN
STRUHL, who proved to me through satisfactory evidence
of identification, which was a MASSACHUSETTS DRIVER'S
LICENSE; that the witness whose testimony is
hereinbefore set forth, was duly sworn by me, and that
such testimony is a true and accurate record of my
stenotype notes taken in the foregoing matter, with use
of mechanical stenography, computer-aided transcription,
to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF, I have hereunto set my
hand this 2nd day of August 2025.



TERI C. GIBSON, CSR, RPR, CRR

Notary Public - My Commission Expires: 1/29/2032