

Brigham and Women's Hospital - EXHIBIT 2022
PreOmics GmbH and Biognosys AG v. The Brigham and Women's Hospital, Inc.
IPR2024-01473

THE BRIGHAM AND WOMEN'S)
HOSPITAL, INC.,)
)
Patent Owner.)

A P P E A R A N C E S

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1 BE IT REMEMBERED that the deposition upon oral
2 examination of JESSICA VARGAS, PH.D., was taken on June
3 25, 2025, at 9:00 a.m., at 125 South 309th Street,
4 Federal Way, Washington, 98003, before Judith A.
5 Robinson, CCR, Notary Public in and for the State of
6 Washington, residing at Federal Way, Washington.

7 Whereupon, the following proceedings were had,
8 to-wit:

9 * * * * *

10 JESSICA VARGAS, PH.D.

11 Having been first duly sworn on oath was examined and
12 testified as follows:

13 E X A M I N A T I O N

14 BY MR. MILLS:

15 Q. Please state your name for the record.

16 A. Jessica Renee Vargas.

17 Q. Please state your correspondence address.

18 A. Jvargas, V-A-R-G-A-S, @exponent.com.

19 Q. Okay. Can you give -- that was your e-mail.

20 Can you give us a physical address?

21 A. Oh, sorry about that. I am at 23445 North
22 19th Avenue, Phoenix, Arizona. That's Exponent,
23 Phoenix.

24 REPORTER: Hold on. Okay. Oops. Okay.

25 Excuse me. Go right ahead. Excuse me.

1 BY MR. MILLS:

2 Q. Is that your current location today as well?

3 A. Yes.

4 Q. Are you currently in a conference room?

5 A. I am.

6 Q. Is anyone else present with you in the
7 conference room?

8 A. No.

9 Q. If at any point anybody enters the conference
10 room with you during the deposition today, you'll let us
11 know; correct?

12 A. Yes.

13 Q. Okay. Are you currently communicating with
14 anyone through any means whatsoever other than me as I
15 speak to you in the deposition right now?

16 A. My only correspondence is through this Zoom
17 link.

18 Q. Okay. And even through this Zoom link, I want
19 to make sure you don't have a side chat communicating
20 with counsel for petitioners; correct?

21 A. Correct.

22 Q. I just want to make sure because this is a
23 virtual deposition, we need to make sure that all of the
24 answers are coming from you. They're not coming from
25 any other source. So if at any point anyone tries to

1 communicate with you during the deposition, other than
2 out loud speaking through the Zoom communication, you'll
3 let us know; is that correct?

4 A. I will.

5 Q. Okay. Have you ever been deposed before?

6 A. Yes.

7 Q. How many times?

8 A. Two other times.

9 Q. When was the most recent time?

10 A. I believe it was either late April or May of
11 this year.

12 Q. And at a general level, what was the subject
13 matter of that deposition?

14 A. It was about alleged infringement.

15 Q. And when you say alleged infringement, you're
16 referring to a patent infringement?

17 A. Yes.

18 Q. Were you providing an opinion on infringement?

19 A. I was.

20 Q. Were you providing an opinion that there was
21 infringement or that there was not infringement?

22 A. My opinion is that there was not infringement.

23 Q. At a general level, what was the subject
24 matter of the technology issue?

25 A. It was a pharmaceutical preparation.

1 Q. Can you provide a little bit more detail?

2 A. Yes. The compound at issue was a
3 pharmaceutical and a matter related to its formulation.

4 Q. Okay. What was the nature of your testimony
5 regarding the pharmaceutical composition?

6 A. My testimony was related to the presence of
7 impurities.

8 Q. What was the class of compound that was at
9 issue?

10 A. It was a protein.

11 Q. You mentioned that there was another
12 deposition before that. When was that approximately?

13 A. That was approximately early 2024.

14 Q. At a general level, what was the subject
15 matter of that deposition?

16 A. That subject matter was related to personal
17 injury, and my testimony was related to chemical testing
18 was conducted related to the issue.

19 Q. Was there another deposition before that?

20 A. No.

21 Q. So because you've been deposed a couple times,
22 you should hopefully know most of the rules. I do want
23 to just go through them just to make sure we're all on
24 the same page. So one of the most important rules is
25 that the court reporter is writing everything down. So

1 it's very important that none of us speak over one
2 another. Do you understand that?

3 A. Yes.

4 Q. And it's important that all of your answers be
5 given verbally because only the words that you say will
6 show up on the transcript. Do you understand that?

7 A. Yes.

8 Q. If at any point that you don't understand the
9 question I'm asking, will you tell us?

10 A. Yes.

11 Q. So will it be fair to say that if you answer
12 the question that we should believe that you understand
13 the question?

14 A. Yes.

15 Q. Is there any reason that you can't give your
16 best and truthful testimony in response to my questions
17 today?

18 A. No.

19 Q. You understand that any questions that I ask,
20 unless your counsel instructs you not to answer the
21 question, even if he objects, you're still obligated to
22 provide your answer to my question?

23 A. Yes.

24 Q. If you need to take a break at any point
25 during the deposition, the rule is that you don't take a

1 break while the question's been asked but not answered.
2 You answer it first and then we take the break. Can you
3 agree to that?

4 A. Yes.

5 Q. Okay. And then during the breaks, you're not
6 allowed to discuss your testimony with counsel. Do you
7 understand that?

8 A. Yes.

9 Q. Do you -- on your computer, you have zoom
10 running -- are there any other programs running that
11 would allow you to access information or manipulate any?

12 A. No. I have no other applications open on my
13 computer.

14 Q. If at any point you do open anything else on
15 your computer, you tell us; is that correct?

16 A. Yes.

17 Q. I'm not suggesting that you should be opening
18 things. I'm just -- the default position is you're not
19 doing anything other than speaking with me and you're
20 not, you know, looking up answers on ChatGPT or
21 something like that. Does that make sense?

22 A. Understood.

23 Q. You were retained by the petitioners in this
24 matter; is that correct?

25 A. Yes.

1 Q. When were you first approached by petitioners
2 to work on this matter?

3 A. I believe it was early to mid 2024.

4 Q. By whom were you approached to work on this
5 matter.

6 A. I was approached by counsel at Reichman
7 Jorgensen.

8 Q. At any point during your work on this matter,
9 have you spoken with anyone about this case, about the
10 subject matter of this case other than counsel that you
11 just identified?

12 MR. COLSHER: I just -- I would just throw an
13 objection and caution the witness not to reveal any work
14 products communications I may have had with her.

15 Otherwise, you can answer the question,
16 Dr. Vargas.

17 A. Can you repeat the question?

18 BY MR. MILLS:

19 Q. So I'm not asking you for the contents of any
20 conversations you may have had with counsel. I'm just
21 asking you, other than counsel, did you speak with
22 anyone else about the case?

23 A. I spoke with some colleagues about the case,
24 but outside of my colleagues, only counsel at Reichman
25 Jorgensen.

1 Q. Okay. And go ahead and tell me the names of
2 the individuals at Exponent that you spoke with about
3 the case.

4 A. Sure. Their names are Han Byul Park.

5 REPORTER: Can you please spell them as you
6 say them?

7 WITNESS: Yes.

8 A. Han, H-A-N, Byul, B-Y-U-L, Park, P-A-R-K. And
9 Mike Kratochvil, K-R-A-T-O-C-H-V-I-L.

10 BY MR. MILLS:

11 Q. Okay. So other than Han and Mike at Exponent,
12 setting aside counsel at Reichman Jorgensen, you haven't
13 spoken with anyone else about this case; correct?

14 A. Yes, that's correct.

15 Q. Who is Han at Exponent?

16 A. These are colleagues of mine. They are also
17 technical consultants.

18 Q. Okay. Is Han a subordinate to you at
19 Exponent?

20 A. Yes.

21 Q. Is Mike a subordinate to you at Exponent?

22 A. Yes.

23 Q. What is Han's job title at Exponent?

24 A. Senior scientist.

25 Q. And what is Mike's job title at Exponent?

1 A. Senior scientist.

2 Q. Did Han assist you in preparing your
3 declaration for this case?

4 A. She did, yes. Provided support at my
5 direction.

6 Q. Did Mike assist you in preparing your
7 declaration for this case?

8 A. Yes. He also provided support at my
9 direction.

10 Q. At any point in your involvement in this case,
11 have you spoken with anyone at a company called Bruker?

12 A. No.

13 REPORTER: Okay. Jad, you said Bruker?

14 MR. MILLS: Yes.

15 REPORTER: B-R-U-K-E-R?

16 MR. MILLS: Dr. Vargas, is that how you would
17 spell it?

18 WITNESS: Yes.

19 REPORTER: Thank you.

20 WITNESS: Yes.

21 BY MR. MILLS:

22 Q. And how are you familiar with Bruker?

23 A. They make certain analytical equipment,
24 including NMRs and I have used a Bruker NMR in my
25 research.

1 Q. Do you have any understanding as to whether
2 Bruker is involved in these proceedings in any form?

3 A. I don't have any specific information about
4 Bruker's involvement.

5 Q. Do you have any materials there with you in
6 the conference room?

7 A. Yes. I have a clean unmarked copy of my
8 declaration as well as the exhibits in binders.

9 Q. Okay. So is it correct that you have binders
10 containing clean unmarked copies of your declaration and
11 all of the exhibits that are cited in you declaration?

12 A. Yes.

13 Q. Other than the exhibits cited in your
14 declaration, is there any other materials that you have
15 an access to currently during the deposition?

16 A. Only a pen.

17 Q. Please take a look at paragraph 12 of your
18 declaration.

19 A. I'm at paragraph 12.

20 Q. Paragraph 12 is under a title that says
21 "Materials Review." Do you see that?

22 A. Yes.

23 Q. And then in paragraph 12, there's a table with
24 a list of exhibits that begin at 1001 and end at 1032;
25 is that correct?

1 A. Yes.

2 Q. Is this a -- in paragraph 12 of your
3 declaration, a comprehensive list of all materials that
4 you reviewed in preparing your declaration?

5 A. Yes.

6 Q. And this list also corresponds with the
7 materials and the binders in front of you; is that
8 correct?

9 A. That's correct.

10 Q. How did you prepare for your deposition today?

11 A. I reviewed my declaration and the exhibits, as
12 well as the patent at issue.

13 Q. Other than reviewing your declaration, the
14 exhibits, and the patent at issue, did you do anything
15 else to prepare for your deposition today?

16 A. That was the nature of my preparation.

17 Q. So other than reviewing the documents, there's
18 nothing else that you did to prepare; is that correct?

19 A. That's correct, yes.

20 MR. COLSHER: I just would caution the witness
21 you can, you know, reveal who you spoke to, but not the
22 subject of those communications.

23 WITNESS: Thank you, Patrick.

24 A. I did speak to counsel in preparation of this
25 as well.

1 BY MR. MILLS:

2 Q. Other than speaking with counsel, did you
3 speak with anyone else in preparation for your
4 deposition?

5 A. I also spoke to Mike and Han as part of the
6 preparation.

7 Q. Other than Mike and Han and counsel at
8 Reichman Jorgensen, did you speak with anyone else as
9 part of your preparation for the deposition?

10 A. No.

11 Q. Oh, were Mike or Han present when you were
12 speaking with counsel at Reichman Jorgensen?

13 A. They were not.

14 Q. Okay. And is the answer the same with regard
15 to during your preparation of the declaration?

16 A. Could you rephrase the question?

17 Q. When you were preparing your declaration, were
18 Han or Mike ever present when you were discussing the
19 case with any counsel at Reichman Jorgensen?

20 A. I don't believe so.

21 Q. And you mentioned speaking with counsel at
22 Reichman Jorgensen to prepare for your deposition.
23 How -- did you meet with them once or more than once?

24 A. It was more than once.

25 Q. How many times did you meet with counsel to

1 prepare for your deposition?

2 A. About three.

3 Q. When was the most recent time?

4 A. I spoke to them yesterday.

5 Q. Was that meeting virtual or in-person?

6 A. It was virtual.

7 Q. How long was that meeting?

8 A. A little over an hour.

9 Q. Prior to that, when was the most recent time
10 that you met with counsel to prepare for your
11 deposition?

12 A. Last week.

13 Q. What form did that meeting take place?

14 A. It was also virtual.

15 Q. How long did that meeting take place?

16 A. I don't recall specifically, but it was
17 probably maybe two hours.

18 Q. Before that, what was the most recent occasion
19 on which you met with counsel to prepare for your
20 deposition?

21 A. I think it must have been the week before
22 that. Maybe two. I don't recall specifically.

23 Q. In what form did that meeting take place?

24 A. Also virtual.

25 Q. How long was that?

1 A. Perhaps a little more than an hour. I'm not
2 exactly sure.

3 Q. Before that, were there any other meetings
4 with counsel to prepare for your deposition?

5 A. Not to prepare for my deposition.

6 Q. At any of the three meetings to prepare for
7 your deposition, was there anyone present other than
8 counsel for Reichman Jorgensen?

9 A. No.

10 Q. You mentioned the possibility that there were
11 meetings with counsel other than to prepare for your
12 deposition; is that correct?

13 A. Yes.

14 Q. How many of those meetings occurred? And I'm
15 asking specifically about after you signed your
16 declaration.

17 A. So to make sure I understand, this is after I
18 signed my declaration, but other than the three meetings
19 where we spoke to or we spoke?

20 Q. Yeah.

21 A. I don't believe we spoke or met other than
22 in-between -- in that timeframe.

23 Q. Taking a look again at the list of materials
24 reviewed in paragraph 12 of your declaration. I'd like
25 you to identify for me any of these references. There

1 are references that you can testify that you reviewed
2 them before you were approached to work on this case?

3 A. Specifically, and at this time, I can tell you
4 that I have had previously -- prior to this case,
5 reviewed Exhibit 1025. That's a textbook by Berg,
6 Exhibit 1032 textbook by Harris, "Quantitative Chemical
7 Analysis."

8 REPORTER: What -- so what was the exhibit
9 number, 1032?

10 WITNESS: Yes.

11 REPORTER: Thank you. Excuse me. Go ahead.

12 A. And -- but again, I don't have -- yeah,
13 perfect recall, but those two I can tell you were
14 textbooks that I had reviewed during my education.

15 BY MR. MILLS:

16 Q. Okay. So as you sit here today, reviewing
17 your list of materials reviewed in paragraph 12, do you
18 recall having reviewed prior to this case, Exhibit 1025
19 and Exhibit 1032, but you do not recall having reviewed
20 any of the other exhibits; correct?

21 A. Those specifically, correct.

22 Q. Please turn to paragraphs 21 through 23 of
23 your declaration.

24 A. (Complies) I can see paragraph 21.

25 Q. So in paragraphs 21 through 23 of your

1 declaration, do you see where you say several times, "I
2 have been informed and understand?"

3 A. Yes.

4 Q. And this section is titled "Claim
5 Construction," correct?

6 A. Yes.

7 Q. So when you say in your Claim Construction
8 section paragraphs 21 through 23 of your declaration, "I
9 have been informed and understand," how did you become
10 informed of those things?

11 A. I was instructed by counsel.

12 Q. In what form were you instructed by counsel?

13 A. Verbally. And then the legal standards were
14 provided as well in writing.

15 Q. And in what form did the writing take place,
16 in which you were provided the legal standards?

17 A. This specific language about these legal
18 standards was provided by counsel.

19 Q. So other than the specific language in
20 paragraphs 21 through 23, was there other information
21 provided to you by counsel regarding claim construction?

22 A. I think we discussed to this generally. I
23 don't specifically recall any other content that was
24 provided aside from this.

25 Q. Is it fair to say that paragraphs 21 through

1 23 present that the sum total of information you had
2 about standards for claim construction?

3 A. Yes.

4 Q. Please take a look at paragraph 22 of your
5 declaration.

6 A. Yes.

7 Q. Okay. So here you say that claim terms are
8 generally given their plain and ordinary meaning. Do
9 you see that?

10 A. Yes.

11 Q. So I want to see if we have the same
12 understanding of what that means. I'm going to try and
13 come up with a -- what I think is an easy example. I
14 just want to see if we're on the same page.

15 So -- and it might help if you look at
16 paragraph 74 of your declarations because I think you
17 have the claim terms there.

18 A. Excuse me, page 74 or paragraph 74?

19 Q. Paragraph 74. Thank you for asking. Page 41.

20 A. Paragraph 74, got it.

21 Q. Okay. And you see that the claims recite
22 assaying with the instrument to detect proteins in the
23 biological sample and concentrations across a dynamic
24 range comprising at least six orders of magnitude?

25 A. Yes, I see that language.

1 Q. Okay. So as an example of plain and ordinary
2 meaning, do you agree there where it says at least six
3 orders of magnitude that would be satisfied by something
4 that just did five orders of magnitude; correct?

5 MR. COLSHER: Objection to form.

6 A. Six orders of magnitude is a discreet value,
7 so less than six is less than six. So the -- again, the
8 context I think in which things are being described is
9 important.

10 BY MR. MILLS:

11 Q. Specifically it says, "At least six orders of
12 magnitude." Do you see that?

13 A. Yes.

14 Q. So you would agree that where the claim
15 language says at least six orders of magnitude, it's not
16 satisfied by something that does five orders of
17 magnitude; correct?

18 A. Correct. I would interpret at least six to be
19 six or more.

20 Q. So you might want to keep paragraph 74 handy
21 in case we come back to it, but I want to ask you again
22 about paragraph 23. In paragraph 23 of your
23 declaration, you say that it can be appropriate to rely
24 on textbooks, encyclopedias, and dictionaries to
25 understand the claim terms. Do you see that?

1 A. Yes.

2 Q. Did you rely on any textbooks, encyclopedias,
3 or dictionaries to construe the claims in this case?

4 A. I relied on a textbook for a definition of
5 dynamic range, for example.

6 Q. Can you point me to where in your declaration
7 you relied on a textbook for the definition of dynamic
8 range?

9 A. Yes, paragraph 44.

10 Q. Okay. And go ahead and tell me which exhibit
11 number you're relying on in paragraph 44.

12 A. That's Exhibit 1032, "Quantitative Chemical
13 Analysis."

14 Q. And for what proposition did you rely upon
15 Exhibit 1032 in paragraph 44 of your declaration?

16 A. The definition of dynamic range.

17 Q. And specifically?

18 A. Specifically the dynamic range of a given
19 method is the concentration range over which the
20 technique has a measurable response to the presence of
21 an analyte.

22 Q. Is there anything more that you relied upon
23 for other than what you just said?

24 A. No. Although the -- again, I'll just note
25 that it's not necessarily a linear response.

1 Q. Okay. So the reason I asked is you stopped
2 after the comma and the sentence went on. So is that
3 after the comma where you say although not necessarily a
4 linear response, is that something you're adding to
5 Exhibit 1032 or is that something that you're getting
6 from Exhibit 1032?

7 A. From Exhibit 1032.

8 Q. Okay. So that's also part of what you're
9 saying is the definition?

10 A. Yes.

11 Q. Other than paragraph 44 of your declaration,
12 it's relying on some Exhibit 1032. Is there any other
13 place where you rely upon your textbook, encyclopedia,
14 or a dictionary to construe the claims in this case?

15 A. Uhhh. Huh? I believe that is the primary
16 one.

17 Q. And then looking back at paragraph 22 of your
18 declaration, you also say there that it's correct and
19 appropriate to review the specification the prosecution
20 history of the patents. Do you agree with that?

21 A. Yes, that's my understanding.

22 Q. Okay. Did you read the entirety of the
23 specification of the challenged patent?

24 A. I did.

25 Q. Did you read the entirety of the prosecution

1 history of the challenged patent?

2 A. I believe I only read excerpts of the
3 prosecution history.

4 Q. Is it correct that the entirety of the
5 excerpts of the prosecution history that you reviewed
6 are included in Exhibit 1002 in this case?

7 A. Yes.

8 Q. We've been using the phrase the challenged
9 patent. I just want to make sure we're on the same
10 page. It's U.S. Patent Number 11435360; correct?

11 A. Correct.

12 Q. All right. Let's go back to paragraph 74 of
13 your declaration. Let me know when you're there.

14 A. No, I'm there.

15 Q. So -- and I want you to keep a finger on
16 paragraph 74. And I want you to flip between that and
17 paragraph 47. Do you have both of those there?

18 A. Yes.

19 Q. Okay. In paragraph 47, do you state that "The
20 invention is directed to a method of assaying a
21 biological sample to distinguish its biological states
22 using a plurality of particles having surfaces with
23 different physicochemical properties." Correct?

24 A. Correct.

25 Q. Okay. So I now want you to look at

1 paragraph 74. Here there's the claim language; correct?

2 A. Yes.

3 Q. Okay. So starting with claim element 1A that
4 you agree that claim 1 requires assaying a biological
5 sample by contacting the biological sample, the
6 plurality of particles comprising different particle
7 types to form coronas around the plurality of particles?

8 MR. COLSHER: Objection to form.

9 A. The claim language reads slightly differently.
10 But your summary is generally in line with my
11 understanding of it.

12 BY MR. MILLS:

13 Q. What difference that you think you're noting?

14 A. Well, the claim itself says to bind the
15 plurality of particles and form coronas around the
16 plurality particles.

17 Q. Okay. And is that different than what I said?

18 A. Your words were slightly different than the
19 wording in the claim.

20 Q. Okay.

21 A. I just wanted to note that.

22 Q. Okay. And was there any material difference
23 that you noticed or you were just -- you're just trying
24 to be very particular about --

25 A. I just want to make sure that I'm following

1 along correctly, yes.

2 Q. Great. Okay. And in claim element 1A, do you
3 see where it recites "The coronas corresponding to the
4 different particle types"?

5 A. Yes.

6 Q. Okay. So I think this is pretty basic. I
7 just want to make sure we're on the same page. So you
8 agree that claim requires and it has -- there's two
9 requirements from what it calls the coronas. Do you see
10 those?

11 A. Yes.

12 Q. Okay. So in claim step A it says, "The
13 coronas the first requirement is they differ based on
14 particle type." Do you see that one?

15 A. Yes.

16 Q. Okay. And you agree that that is one of the
17 requirements of what the claim calls the coronas;
18 correct?

19 A. Correct.

20 Q. And the second requirement of what the claim
21 calls "The coronas is that they comprise overlapping and
22 distinct proteins." Do you see that?

23 A. Yes.

24 Q. Okay. You agree that those are both two
25 requirements for what the claim calls "the coronas,"

1 correct?

2 A. Yes.

3 Q. So now I want to look at step B here. And do
4 you see in step B where it says "At least a subset of
5 the plurality of particles comprising the coronas." Do
6 you see that?

7 A. Yes.

8 Q. Do you notice that in claim element 1B, just
9 like in claim element 1A, it says "The coronas?"

10 A. Yes, I see that language.

11 Q. So I think this is an easy question. I just
12 want to make sure we're on the same page. And so when
13 it says in claim element 1B, the coronas, do you agree
14 that that element in 1B is referring back to the same
15 set of coronas that is discussed in claim element 1A?

16 A. Not necessarily, because B also says that it's
17 at least a subset of the plurality of particles from A.
18 So if it's at least a subset and that subset is fewer
19 than all of the coronas, then that would still satisfy
20 it based on the language.

21 Q. Is it correct then when you were performing
22 your analysis for this case, do you believe that the
23 coronas in element 1B did not have to satisfy the
24 requirements of the coronas in step 1A?

25 MR. COLSHER: Objection to form.

1 A. I think they have to satisfy 1A, but it could
2 still be a subset of the total number of the plurality
3 of particles that were contacted in part A.

4 BY MR. MILLS:

5 Q. Right. And so let's try and make this a
6 little bit more understandable, I think. So I'm not
7 going to hold you to a number, but just if we're making
8 up an experiment that fits in here. Give me a number of
9 particles, a hypothetical number of particles, for the
10 plurality of particles.

11 A. Hypothetically, let's say three.

12 Q. Okay. I mean, maybe a slightly larger number.
13 I mean, what's a realistic number for an experiment like
14 this, you think?

15 A. I think a realistic number for an experiment
16 like this could be anything two or above.

17 Q. And when you say that, you're saying not just
18 particle types, you're saying actual particle types that
19 you are bringing to the sample, is that what you're
20 saying?

21 A. This would be particle types.

22 Q. Okay. All right. I think there was a
23 disconnect a moment ago. So you're saying there, there
24 needs to be at least two particle types; is that
25 correct?

1 A. The plurality of particles, operationally, how
2 you do this is that it would be types.

3 Q. Okay. But in reality and in the claim for
4 each particle type, there is more than one actual
5 particle put in there. More than one copy of that
6 particle type; is that fair?

7 A. Correct.

8 Q. Okay. Okay. I think we're understanding each
9 other now.

10 So I'm just going to -- for ease, you said
11 three types. Let's just call them A, B, and C, okay?
12 And I'm just trying to make sure we understand this
13 conceptually. So let's make up a number of the actual
14 particles of type A that we're putting in here.

15 A. As if we could count them individually?

16 Q. Right.

17 A. I see.

18 Q. Let's make it a round number so it's easy to
19 talk about --

20 A. Sure. Yeah. This is -- I think this
21 hypothetical is de-coupled from the way that you can
22 actually measure and use nanoparticles, but I think for
23 the purpose of the hypothetical, we can call it, let's
24 say ten.

25 Q. Okay. And is that like -- is that your best

1 estimate for the number of a particular particle type
2 that would be used in an assay like this or do you have
3 a better estimate?

4 MR. COLSHER: Objection to form.

5 A. Do you mean types or discreet numbers of a
6 given type of particle?

7 BY MR. MILLS:

8 Q. The latter.

9 A. I think those numbers are higher than ten.

10 Q. Okay. So is a million a bad number?

11 A. It depends on the method and the experiment,
12 but that's probably closer than ten.

13 Q. Okay. Okay. Would you be comfortable if our
14 hypothetical just says of each of particle types A, B,
15 and C, there is 1 million on each of those particle
16 types?

17 A. Sure.

18 Q. Okay. And again, I'm not asking you if that's
19 the reality of a particular assay. We're just -- we're
20 trying to understand this concept. Okay.

21 So when the claim says at least a subset, I
22 have -- in our example, we have three particle types.
23 We have a million of each particle type. So the claim
24 is telling me I don't have to get all million of
25 particle type A. Or let me actually start with an

1 easier question. It's telling me I don't have to get
2 all 3 million particles in that step; is that fair?

3 A. Yes.

4 Q. Okay. And is it also telling me that if I
5 only get 999,999 particle type A, I'm still okay. I got
6 at least a subset of -- let me withdraw the question and
7 ask a better question.

8 So if I -- of each of these three subsets, I
9 get -- instead of all 1 million of the particles, I get
10 999,999 of each particle type, I'm still within that
11 claim element B of separating at least a subset; is that
12 correct?

13 A. Yes, that's correct.

14 Q. Okay. And then I think the hypothetical you
15 raised earlier was there's three particle types and I
16 get 999,999 of type A and of type B, but I don't get any
17 of type C. And is that what you were telling me
18 earlier? I'm still practicing the claims because I have
19 at least a subset of the particles comprising the
20 coronas; is that right?

21 A. That scenario would also satisfy at least a
22 subset.

23 Q. Okay. All right. Thank you. Okay. I want
24 to go back to your specification. So just take a look
25 at paragraph 130 of your declaration and try and keep 74

1 handy because we might need it again just because it has
2 the claim language. Let me know when you have
3 paragraph 130.

4 A. Paragraph 130 or 134?

5 Q. 130.

6 A. Great. I'm here.

7 Q. Okay. So starting on the fourth line from the
8 top of paragraph 130 of your declaration, you say that
9 using a biological sample consisting of human blood
10 plasma is consistent with the 360 patent description of
11 biological samples; correct?

12 A. Yes.

13 Q. The first citation you provide a support of
14 what you're saying is a consistency is to column 20,
15 lines 32 through 45 of the challenge patent; correct?

16 A. Yes.

17 Q. Maybe keep that paragraph handy and flip to
18 paragraph 133.

19 A. (Complies) Seen paragraph 133.

20 Q. So once again you say that it is consistent
21 with the 360 patent for a biological sample to be human
22 blood plasma; correct?

23 A. Yes.

24 Q. And one of the citations you provide here to
25 support this consistency is very close to the one you

1 used earlier, do you see that, that column 20 citation?

2 A. Yes.

3 Q. So in paragraph 130, the lines in column 20
4 were 32 through 45. In paragraph 133, you cite lines 33
5 through 45. Do you see that?

6 A. Yes.

7 Q. Okay. And I'm going to show you one more
8 place before I ask you about that. So now let's look at
9 paragraph 49 of your declaration.

10 A. (Complies).

11 Q. And one of the first terms -- well, so here
12 you say that the 360 patent describes certain terms used
13 in the patent. Do you see that?

14 A. Yes.

15 Q. One of the terms that you address in
16 paragraph 49 and I think it's actually the very first
17 term is a biological sample. Do you see that?

18 A. Yes.

19 Q. Here, once again, you cite column 20 of the
20 challenged patent, but now you're citing lines 34
21 through 40 instead of 32 through 45. Do you see that?

22 A. Yes, I see that.

23 Q. Okay. So I have a couple of questions about
24 your reliance on this portion, on this specification.
25 So you're repeatedly citing this portion of the

1 specification to say that the biological sample is
2 consistent with what the specification says there.

3 So my first question is, why is it that you're
4 pointing to the patent specification to tell you that
5 that is consistent with what you're identifying as the
6 biological sample?

7 A. I -- when comparing the prior art to the
8 patent and claim one says assay in a biological sample,
9 my intention is to note that human blood plasma is a one
10 biological sample that the patent contemplates.

11 Q. So is it correct that you were looking to the
12 patent specification to inform you as to the scope of
13 the claim term biological sample?

14 A. That's one place I looked, yes.

15 Q. And you probably noticed that sometimes you
16 cite all of lines 32 through 45 in column 20, and
17 sometimes you started at line 33 or 34. So is there a
18 reason that you've cut out the first line or two of the
19 passage from those citations or is that, you know,
20 basically a typo?

21 A. I don't have the patent language exactly in
22 front of me, so it could just be that there are multiple
23 places in the specification that refer to biological
24 samples.

25 Q. Well, and I want to make sure you understand

1 my question. So each time you're talking about
2 biological sample and you -- sometimes you -- and you're
3 always pointing to the same column. Sometimes you point
4 to the full paragraph, but sometimes you point just to
5 part it. Maybe it would help if we look at the patent
6 spec, would that be helpful?

7 A. I think that would be helpful. Thank you.

8 Q. Why don't you go ahead and look at the patent
9 spec in column 20.

10 A. (Complies) I'm at the patent specification in
11 column 20.

12 Q. Okay. So first of all, you agree with me that
13 lines 32 through 45 constitute one full paragraph of the
14 specification in column 20; correct?

15 A. Yes.

16 Q. So in the citations in your declaration where
17 you omitted line 32 or 33 from your citation, those are
18 the lines on which the first sentence of the paragraph
19 appears; is that correct?

20 A. Yes.

21 Q. When you wrote your declaration, you would
22 agree that you read the first sentence of that paragraph
23 which you cited; correct?

24 A. Yes.

25 Q. So as you sit here today, is there any reason

1 that you want to omit lines 32 and 33 of column 20 from
2 what you say is consistent with the specifications
3 description of the biological sample?

4 A. There's no specific reason. I'll say that 32
5 and 33 sort of set up the definition and after that
6 there are specific examples. So plus or minus
7 the -- that setup I think is a question of, you know,
8 whether or not to include that when those examples are
9 being listed.

10 Q. Okay. Thank you. So I now I want to ask you
11 about a different portion of specification that I did
12 not find cited in your declaration. So I'm going to
13 point you to it and then if you just cited somewhere in
14 your declaration, I just want you to set me straight.
15 So column 50 in the line that begins in line 26.

16 A. Column 50, 5-0?

17 Q. Yes. Let me know when you're there.

18 A. Yes.

19 Q. So here in column 50, the specification
20 beginning at line 26, the patent states "The terms
21 individual subject and patient are used interchangeably
22 herein irrespective of whether the subject has or is
23 currently undergoing any form of treatment." Do you see
24 that?

25 A. Yes.

1 Q. Did you review this portion of the
2 specification before signing your declaration?

3 A. Yes.

4 Q. And are you aware as you sit here today of any
5 place in your declaration where you cited these lines
6 from the specification?

7 A. I don't specifically recall, though I'd have
8 to confirm.

9 Q. Okay. Thank you. So we haven't been going up
10 quite an hour, but we've been going 50 minutes. I'm
11 about to move to new lines of questioning and I don't
12 want to start it and then take a break and we also maybe
13 won't be able to get realtime. Are you okay if we take
14 a brief break now and then start in maybe another five
15 or ten minutes?

16 A. Yes.

17 Q. Great.

18 (Off the record.)

19 BY MR. MILLS:

20 Q. Welcome back, Dr. Vargas.

21 A. Thank you.

22 Q. During the break, did you communicate with
23 anyone regarding this case?

24 A. No.

25 Q. Let's take a look at paragraph 246 of your

1 declaration. While you're pulling that up, we're -- I'm
2 changing topics a little bit and I'll introduce it by
3 asking this question. In paragraph 246 of your
4 declaration, you're just kind of discussing the
5 Exhibit 1007; correct?

6 A. Yes.

7 Q. Okay. How do you pronounce Exhibit 1007?

8 A. I've been saying Zaccaria.

9 Q. Okay. Me too. But I think there's different
10 ways people can do it, so...

11 A. I think that's right.

12 Q. Okay. So my first question in paragraph 246
13 of your declaration, when you're talking about what you
14 identify as the claimed biological sample, you say, "RBC
15 lysate or hemolysate." Do you see that?

16 A. Yes.

17 REPORTER: And clarification, are you saying
18 lysate?

19 MR. MILLS: Lysate, L-Y-S-A-T-E.

20 REPORTER: Thank you.

21 BY MR. MILLS:

22 Q. So first of all, RBC stands for red blood
23 cells; correct?

24 A. Yes.

25 Q. When you say RBC lysate or hemolysate, are

1 those just two different words that mean the same thing?

2 A. Yes.

3 Q. Okay. Great. I thought that was the case,
4 but I wanted to make sure. Okay. Let's take a look at
5 the next paragraph, it's 247. The second-to-last line
6 of the paragraph, you say that Zaccaria "Individually
7 incubated," it says, "500 micrograms of each of three
8 kinds of nanoparticles for 45 minutes with 200
9 microliters of hemolysate containing one milligram of
10 total protein." Do you see that?

11 A. Yes.

12 Q. Okay. So I just want too make sure when you
13 say that they individually incubated the three different
14 nanoparticles with 200 microliters in hemolysate, is
15 that happening at one container or at three containers?

16 A. From my read of this, it is happening in three
17 separate containers, so...

18 Q. Okay. And so when it says 200 microliters of
19 hemolysate containing one milligram of total protein,
20 that's the amount of hemolysate that's in each of those
21 three containers; correct?

22 A. Yes. That's my understanding.

23 Q. And then individually to each one of those
24 containers, you have either particle type A, particle
25 type B, or particle type C; correct?

1 A. Correct.

2 MR. COLSHER: Objection to form.

3 BY MR. MILLS:

4 Q. In -- you're citing page 1871 of Zaccaria in
5 that paragraph 247; correct?

6 A. Yes.

7 Q. Okay. In paragraph 248, you note that
8 500 micrograms of each kind of nanoparticle was
9 separately incubated in duplicates for 45 minutes with
10 200 microliters of RBC lysates, i.e., one milligram of
11 proteins followed by extensive washing to remove all
12 bound proteins. Do you see that?

13 A. Yes.

14 Q. There you cite page 1872; correct?

15 A. Correct.

16 Q. So where you -- in paragraphs 247 and 248
17 where you give that description, it looks pretty
18 similar. You're citing pages 1871 and 1872. Are those
19 describing different experiments or are they just
20 repeating the description of the same experiment
21 essentially?

22 A. Do you mind if I pull the exhibit just to make
23 sure that I can refresh my memory.

24 Q. Of course. It's Exhibit 1007, correct.

25 A. Thank you. From this, it appears there are

1 two different experiments in the same study?

2 Q. Do you think that there are two different
3 experiments in the same study?

4 A. Yes.

5 Q. And on page 1872, it says they're separately
6 incubated in duplicates --

7 A. Yes.

8 Q. What does it mean that they're separately
9 incubated in duplicates?

10 A. My read of this is that there are a total of
11 six vessels, two per type and each of them incubated
12 with the stated amount of protein.

13 Q. Okay. So we have six vessels, two vessels
14 have particle type A, two vessels have particle type B,
15 and two vessels have particle type C in them; correct?

16 A. Yes. That's my understanding of this
17 experiment.

18 Q. And just to confirm that I'm using A, B, and
19 C, because it's easier, but can you go ahead and tell us
20 what the names of the particle types are that they're
21 using in Zaccaria?

22 A. Yes. There are three different types of iron
23 oxide nanoparticles that are functionalized with surface
24 modification -- distinct surface modifications. So one
25 of them is functionalized with aspartic acid, one with

1 oleic acid, and one with a quaternary amine group.

2 REPORTER: Okay. And hold on. The last one,
3 did you say a quad? Spell it again or say it again.

4 WITNESS: Quaternary amine, that's
5 Q-U-A-T-E-R-N-A-R-Y.

6 REPORTER: Thank you. Go right ahead. Excuse
7 me.

8 BY MR. MILLS:

9 Q. In Zaccaria, they use -- they're talking about
10 Q-treated particles and OS-treated particles. They have
11 another signal particle that they use?

12 A. Yes. Q refers to the quaternary amine
13 functionalized or positive, OS is -- refers to the oleic
14 acid functionalized particles, and PAA corresponds to
15 the aspartic acid.

16 Q. Okay. So six vessels, two of them have Q
17 particles, two of them have OS particles, two of them
18 have PAA particles; correct?

19 A. Correct.

20 Q. So in the Q vessels, we don't have OS
21 particles; correct?

22 A. Correct.

23 Q. And in the Q vessels, we also don't have PAA
24 particles; correct?

25 A. That's right.

1 Q. In the Q vessel, there's just Q particles with
2 respect to particles?

3 A. That's my understanding.

4 Q. Same question. The OS vessel, the only
5 particles in there are OS particles; correct?

6 A. Correct.

7 Q. In the PAA vessel, the only particles in there
8 are PAA particles; correct?

9 A. Correct.

10 Q. Okay. And I also want to be clear, it's not
11 just one Q particle that's in the Q vessel; correct?

12 A. Correct.

13 Q. And I'm not asking you what the number is, but
14 just like in our hypothetical, it could be that there's
15 a million Q particles in Q vessel number 1; correct?

16 A. Correct.

17 Q. Maybe there are a million Q particles in Q
18 vessel number 2; correct?

19 A. Correct.

20 Q. Okay. And when it says two replicates, it
21 means that I have a Q vessel with a plurality of Q
22 particles, maybe a million, and I also have a second Q
23 vessel with perhaps a million particles for that;
24 correct?

25 MR. COLSHER: Objection to form.

1 A. The duplicate means that it's two replicates
2 of the same conditions. Typically you conduct tests in
3 replicates to ensure reproducibility.

4 BY MR. MILLS:

5 Q. Okay.

6 A. So there's no -- there should be no
7 differences between the duplicates.

8 Q. Okay. So with respect to the two Q-treated
9 vessels, they both have what they believe to be
10 approximately the same number of Q particles in each
11 vessel; is that fair?

12 A. Yes.

13 Q. Go ahead and take a look at paragraph 251 of
14 your declaration.

15 A. (Complies) I can see paragraph 251.

16 Q. Okay. In paragraph 251 of your declaration,
17 you have a cite to page 1872. Do you see that?

18 A. Yes.

19 Q. That's one of the pages we looked at in
20 Zaccaria just a moment ago; correct?

21 A. Yes.

22 Q. Okay. In your declaration, paragraph 251, you
23 used the phrase, "Their respective eluted corona." Do
24 you see that?

25 A. Yes.

1 Q. Okay. And that's a phrase that comes from
2 Zaccaria on page 1872; correct?

3 A. Yes.

4 Q. Okay. So I just want to make sure that I'm
5 understanding correctly what's happening in Zaccaria.
6 So I have the six containers. Is there a different word
7 than container that we could use? Something like a vial
8 or just...

9 A. I think container is generally accurate.

10 Q. Okay. So there's six containers. Each one of
11 them has a plurality of particles of exactly one
12 particle type in the container; correct, so far?

13 A. Correct.

14 Q. And each container also has RBC lysate;
15 correct?

16 REPORTER: Sorry, has what lysate?

17 MR. MILLS: RBC.

18 REPORTER: RBC.

19 BY MR. MILLS:

20 Q. Let me ask the question again. Each container
21 also has RBC lysate in it; correct?

22 A. Correct.

23 Q. When it refers to the eluted corona in the
24 container, what does that mean?

25 A. That is describing the corona that's been

1 isolated from the particles after they've been formed.

2 Q. Okay. So in Zaccaria, they mix the particles
3 and the lysate together called a particular particle
4 type in a single vial?

5 A. Yes.

6 Q. And they allowed coronas of an individual
7 particle type to form around those particles in that
8 particular vial; is that correct?

9 A. Yes.

10 Q. Okay. And then I think you said that then
11 they -- they're going to separate that subset of
12 particles of an individual particle type from the rest
13 of the lysate; is that right?

14 A. Yes.

15 Q. In Zaccaria, how do they do that?

16 A. In Zaccaria, they use a magnet to isolate the
17 particles after the corona had been formed around them,
18 and then they wash it to make sure that the rest of the
19 solution is off and then they desorb or elute the corona
20 off of the particles using 40 microliters of urea in a
21 2 percent CHAPS solution.

22 REPORTER: Please spell CHAPS.

23 WITNESS: Sure. It's an acronym, C-H-A-P-S.

24 REPORTER: Okay. Thank you. Excuse me.

25 BY MR. MILLS:

1 Q. Okay. So I want to walk through that kind of
2 step-by-step to make sure I understand it. So each tube
3 I have one -- I have multiple copies of one particular
4 particle type; correct?

5 A. Yes.

6 Q. So if I'm in a Q container, I have plurality
7 of particles comprising the Q corona; is that correct?

8 A. After you've added the lysate and allowed the
9 coronas to form, yes.

10 Q. Okay. And then I used the magnet to just kind
11 of pull the particles over to the side of the container
12 and hold them there while I dump out the rest of the
13 fluid; is that right?

14 A. Effectively, yes.

15 MR. COLSHER: Objection to form.

16 BY MR. MILLS:

17 Q. Okay. And once I've dumped out the fluid,
18 then I'm going to put a wash buffer in and mix it up to
19 try and get anything else that is a loose protein to
20 come off the particles; is that right?

21 A. Could be a loose protein, could be other
22 lysate debris.

23 Q. Okay. And I do that in multiple -- there's
24 multiple washing steps; is that correct?

25 A. Yes.

1 Q. Okay. So in each of those washing steps, I'm
2 using the magnet to hold the particles in place while I
3 pour off the wash buffer to make sure that I've
4 separated the Q corona, which is still there on those
5 particles from the lysate which we have put out. Am I
6 correct so far?

7 A. Yes.

8 Q. Okay. Now what if I've lost a handful or
9 maybe even a lot of Q particles, maybe I didn't -- my
10 magnet wasn't strong enough. So I had a million
11 particles when I started and I poured out the
12 supernatant and then 600,000 of the particles went out.
13 But I still have 400,000 of the Q particles there in my
14 vial after I washed it. Do you understand the scenario?

15 A. Yes, I understand the scenario.

16 Q. Okay. So when I have 400,000 of the original
17 600 -- or of the original 1 million Q particles that are
18 still in that container, I now have a subset of
19 particles of just the Q particle type that compromise
20 the Q particle type corona that I've separated from the
21 lysate; is that correct?

22 MR. COLSHER: Objection to form.

23 A. In the scenario, yes.

24 BY MR. MILLS:

25 Q. Okay. And when I perform that step on the

1 first vial, then I move on to the second vial; right?

2 I'm going to do that to the second vial of the Q

3 particles as well; correct?

4 A. Likely, yes.

5 Q. Okay. And when I do that, once I finish the

6 washing step, I now have a subset of Q particles

7 comprising of Q corona that have been separated from the

8 RBC lysate; correct?

9 A. Yes.

10 Q. Now I move on to the OS particles. I complete

11 my washing step. Now I have a subset of OS particles

12 comprised of the OS corona that have been separated from

13 the lysate; is that correct?

14 A. Correct.

15 Q. So I do that twice; correct?

16 A. Yes.

17 Q. Okay. And then in Zaccaria, I have the third

18 particle type, the PAA particle type, that's the same as

19 with the first two?

20 A. Yes.

21 Q. Okay. So therefore, each PAA container -- in

22 each one of those, I have a subset -- at least a subset

23 of part -- PAA particles comprising of PAA corona had

24 been separated from the RBC lysate; correct?

25 A. Correct.

1 Q. And then you were talking about desorption and
2 you also used the word elution. So in Zaccaria, is
3 there a difference between desorption and elution?

4 A. My understanding is in this context, those
5 terms are used interchangeably to describe the removal
6 of the proteins from the particle.

7 Q. Okay. So once we've used the urea and the
8 CHAPS to denature or desorb the individual particle type
9 comprising the individual corona from the particles, now
10 we have at least a subset of the proteins that came from
11 that individual particle type; is that correct?

12 A. Correct.

13 Q. Let's take a look at under the materials and
14 methods section in Zaccaria. There's a section that
15 says, "RBC preparation and lysis." Do you see that?

16 A. Yes.

17 Q. Go ahead and read that section to yourself. I
18 just want to make sure that you're familiar with what it
19 says for the questions I'm about to ask you.

20 A. (Complies).

21 MR. COLSHER: And this is off topic, but Judy
22 was there a new realtime link?

23 REPORTER: Hold on. I can send you one. Let
24 me just -- Patrick, did you ever get feed on your end or
25 no?

1 MR. COLSHER: Yeah. Mine was working
2 until --

3 REPORTER: I just did everything I can do on
4 my end, you know, in a short amount of time. So go
5 ahead.

6 BY MR. MILLS:

7 Q. Okay. Dr. Vargas, you've had a chance to
8 review the section of Zaccaria and their methods. It
9 says "RBC preparation lysis," correct?

10 A. Correct.

11 Q. Okay. So Zaccaria discloses that blood
12 samples were collected from five consenting donors;
13 correct?

14 A. Correct.

15 Q. Zaccaria does not disclose whether or not the
16 donors were fasting at the time that the sample was
17 taken; correct?

18 A. I don't believe they disclose any other
19 details about the state of the healthy patient.

20 Q. That includes --

21 A. Or the subject.

22 Q. That includes whether or not the donors were
23 fasting; correct?

24 A. Correct.

25 Q. Zaccaria does disclose centrifuging the

1 samples at 1,000 times the force of gravity for ten
2 minutes; correct?

3 A. Correct.

4 Q. Zaccaria discloses use of Ficoll gradient,
5 F-I-C-O-L-L.

6 REPORTER: I'm sorry. Jad, when you put your
7 head down like that, I can't hear you very well. So
8 Zaccaria discloses using what?

9 MR. MILLS: Ficoll, F-I-C-O-L-L.

10 BY MR. MILLS:

11 Q. Ficoll gradient separation to remove
12 leucocytes; correct?

13 A. Correct.

14 Q. What is Ficoll gradient separation?

15 A. This is likely a density -- a method of
16 density separation in order to separate different types
17 of blood cells.

18 Q. It's not a particular method that you've used
19 before; is that correct?

20 MR. COLSHER: Objection to form.

21 A. I've used gradient separation before. I don't
22 recall specifically if it was Ficoll gradient.

23 BY MR. MILLS:

24 Q. Zaccaria discloses washing the erythrocytes
25 three times. Both with PBS and PMSF; correct?

1 A. Correct.

2 Q. Zaccaria does not describe storing the cells
3 overnight in a solution of PBS, glucose and EDTA-free
4 protease inhibitor cocktail tablets; correct?

5 MR. COLSHER: Objection to form.

6 A. No, or correct.

7 BY MR. MILLS:

8 Q. Okay. Thank you. That is something we have
9 to be careful with to make sure -- so you were saying my
10 statement was correct because it does not disclose that
11 in Zaccaria?

12 A. Yes.

13 MR. COLSHER: Same objection.

14 BY MR. MILLS:

15 Q. And Zaccaria lysis was performed by hypotonic
16 shock; correct?

17 A. Correct.

18 Q. And the solution used in Zaccaria was a
19 phosphate buffer with Ethylenediaminetetraacetic acid.

20 REPORTER: Okay. Hold on. Ethylene and what
21 was the second one?

22 MR. MILLS: Diaminetetraacetic acid.

23 REPORTER: Okay.

24 BY MR. MILLS:

25 Q. And EMSF; correct?

1 A. Correct.

2 Q. And this was frozen for 30 minutes, and the
3 freezing time was repeated twice in Zaccaria; correct?

4 A. Yes.

5 Q. Okay. I'm going to change text a little bit.
6 Let's take a look at paragraph 119 of your declaration.

7 A. I can see paragraph 119.

8 Q. So if you see at paragraph 119, you reference
9 what you call protein PIK3R4?

10 REPORTER: PIK what?

11 MR. MILLS: 3R4.

12 A. Yes.

13 BY MR. MILLS:

14 Q. And you also reference what you call
15 protein SBF1?

16 A. Yes.

17 Q. In your declaration, you also provide a
18 molecular weight for each of those two codes; correct?

19 A. Yes.

20 Q. Okay. And at the end of that identification,
21 you provide a cite to a range of pages beginning on 25,
22 and then ending on page 31 of Exhibit 1007. Do you see
23 that?

24 A. Yes.

25 Q. In your declaration, you don't provide us with

1 an individual page number where SBF1 shows up; correct?

2 A. That's correct.

3 Q. And the same is true for PIK3R4; correct?

4 A. Sorry, could you repeat that? I couldn't hear
5 you.

6 Q. The same is true for PIK3R4, you don't give us
7 the specific page number on which that entry is found;
8 correct?

9 A. Yes, correct.

10 Q. So we're going to play archeologist with the
11 record here just a little bit. I don't think this will
12 be -- hopefully, it's not difficult for you. I just
13 want to make sure that we're looking at the same thing
14 that you were looking at, okay? So you have the
15 document in front of you; correct, Zaccaria
16 Exhibit 1007?

17 A. Yes.

18 Q. Okay. Can you go ahead and find in there and
19 tell us the page number on which the entry for SBF1 that
20 you relied in on in your declaration shows up?

21 A. Yes. For the sake of time, is it okay if I
22 open Acrobat, a PDF version in order to find it
23 electronically rather than searching?

24 Q. Let me ask a couple threshold questions first.
25 So first of all, it sounds like off the top of your head

1 sitting here right now, you don't recall what page
2 number it's on; is that fair?

3 A. Correct.

4 Q. And then I also -- I suspect, but I want to
5 confirm. The reason you're asking to open the
6 electronic version is because the print is so small on
7 those pages, it's difficult to actually see what shows
8 up on that; is that fair?

9 A. It is, yes.

10 Q. Okay. So basically what you're asking for is
11 you want to do an electronic search to try and find out
12 what page it shows up on?

13 A. Yes.

14 Q. Okay. If we have to get to that, maybe we'll
15 do that. But if you can just try on a first pass, let's
16 see if you can do it by looking at the pages.

17 A. Understood.

18 Q. While you're looking at it, if you can just
19 tell us kind of as you look at a particular page, just
20 let us know, "I'm looking at this page number," and then
21 when you get to another page number, just tell us, you
22 know, what you're looking at as you're doing it.

23 A. Sure. I'm looking at supplemental
24 data -- supplemental data 2, sheet 1, all 909 proteins
25 that begins -- the cover page is on page 24 of 120 of

1 the exhibit.

2 MR. COLSHER: And just for the record, I'm
3 going to put in there. The witness had asked for an
4 electronic copy and we're currently looking at paper
5 versions.

6 BY MR. MILLS:

7 Q. Okay. So right now you're on page 24; is that
8 correct?

9 A. Yes. And I'm trying to read page 25 on the
10 print version.

11 Q. Okay. So go ahead and let you us know when
12 you're finished with page 25.

13 A. I think -- I'm not sure I could tell you
14 whether or not it's the correct letters.

15 Q. Okay. So to make it easier for you, what I'm
16 going to ask -- I have a colleague here. I'm going to
17 ask him to share on the screen, and that way we can zoom
18 in and we'll all be looking at the same thing. So I'm
19 going to ask my colleague to bring up page 25 of
20 Exhibit 1007, share it on the screen and let's zoom in
21 until it's legible.

22 A. I can see the screen.

23 Q. Okay. So we're at 300 percent. Is
24 that -- well, now hold on. Let's get the zoom stable.
25 Okay. So the 300 percent zoom, is that working for you,

1 Dr. Vargas?

2 A. It is.

3 Q. Okay. And just pause for a moment. I want to
4 show you the page numbers so that we all know we're
5 looking at the same thing. So can you -- because it's
6 zooming, we have to hopefully not make you dizzy,
7 but -- okay. So can you see now we're on page 25?

8 A. Yes.

9 Q. Of Exhibit 1007, okay. So let's go back over
10 to the -- where the -- there's a -- well, and I guess go
11 ahead and read to us the first couple of headings that
12 we're looking at.

13 A. Sure. The first few headings, I would have to
14 verify what the first column is. I suspect it's a code
15 for this protein, or this gene or perhaps one is a code
16 for the protein and the other is for the gene.

17 Q. I'll pause you there. I'm -- at this point,
18 I'm just looking for exactly what it says at the top of
19 the --

20 A. Oh, I see.

21 Q. So the first column says what?

22 A. The column -- the first column says AC.

23 Q. Okay. And do you know what AC stands for?

24 A. I don't offhand.

25 Q. Okay.

1 A. I would have to look at it.

2 Q. The next column says ID; is that correct?

3 A. Yes.

4 Q. Okay. And the next column says MW?

5 A. Yes.

6 Q. Do you know what MW stands for?

7 A. MW stands for molecular weight.

8 Q. Okay. The next column says what?

9 A. PI.

10 Q. Okay. What is that?

11 A. That's the isoelectric point.

12 Q. Okay. And then what does the next column say?

13 A. That column says descriptions.

14 Q. Okay. So do any of the columns that we've
15 talked about so far, will those provide you with the
16 information you need to be able to find where SBF1 was
17 that you relied on your declaration?

18 A. Yes.

19 Q. Okay. So -- and is this zoom, this
20 300 percent zoom, is that comfortable zoom? Do you want
21 to zoom in more or less, or is this the right --

22 A. I can read this at this zoom, so I'm okay.

23 Q. Okay. So go ahead and read down and let us
24 know when you're ready and we'll scroll down to
25 get -- so that you can see the rest of the page.

1 A. I am ready to scroll down. And again, ready
2 to scroll down. And as I sit here, I don't see it on
3 this page.

4 Q. Okay. So now we're ready to move to page 26?

5 A. Yes.

6 Q. We're on page 26 now.

7 A. I don't see it or I guess I'm yet ready to
8 keep scrolling. And I am done with this section. I'm
9 also done with this section.

10 Q. Okay. You're ready to move on to page 27?

11 A. Yes.

12 Q. Okay. Do you have page 27 now?

13 A. I'm done looking at this section. Also done
14 with this section.

15 Q. Okay. You're ready to move to page 28?

16 A. Yes.

17 Q. Okay. We have page 28 up.

18 A. I see Myotubularin-related protein 5, SBF1 at
19 about a third of the way down.

20 Q. Okay. Let's -- just so that we can try and be
21 precise. 23 entries from the top, is that what you're
22 pointing to?

23 A. Yes.

24 Q. Okay. Let's zoom out on that one a little bit
25 more just to make it easier for Dr. Vargas to see it.

1 Okay. And do you remember that first column that said
2 AC. Do you recall that?

3 A. Yes.

4 Q. So for the column header AC, what's the value
5 for the entry that you're pointing to on page 28?

6 A. That value is 095248.

7 Q. There's a molecular weight that is reported
8 for that entry. Do you see that molecular weight?

9 A. Yes.

10 Q. Is that the same molecular weight that you've
11 provided in your declaration in paragraph 119?

12 A. Apologies. Could you please remind me which
13 paragraph in my declaration we were initially looking at
14 prior to this?

15 Q. Paragraph 119.

16 A. 119, thank you.

17 Q. Let me ask the question --

18 A. Yes.

19 Q. -- just to make sure the record is clear. So
20 this entry 23 lines from the top on page 28 of
21 Exhibit 1007 provides the same molecular weight for AC
22 entry number 095248, that you attributed to SBF1,
23 paragraph 119 in your declaration; correct?

24 A. Correct. Yes, it is.

25 Q. Seeing this entry, can you confirm that this

1 is the entry that you were pointing to in your
2 declaration?

3 A. Yes.

4 Q. Do you want to read the rest of the supplement
5 to see if you were pointing to another one or is this
6 the one?

7 A. I can't recall specifically as I sit here,
8 whether or not it was also detected in one of the other
9 conditions, but this is the protein that I refer to in
10 my declaration.

11 Q. And when you say "one of the other
12 conditions," what do you mean by that?

13 A. The -- this table is organized by -- perhaps
14 I'm mixing up my supplemental tables.

15 Q. Maybe it would help you -- I don't want to
16 make you dizzy, but let's go back to page 25 and look at
17 the headings. Let's keep it pretty zoomed in.

18 MR. MILLS: So I think what Dr. Vargas is
19 asking for is she wants to know whether each of the
20 different particles are showing up in the chart. So if
21 you could just scroll from left to right so she can see
22 the headings there.

23 A. Thank you.

24 BY MR. MILLS:

25 Q. Does that answer the question for you?

1 A. Yes, it does.

2 Q. Okay. So there are six columns of results
3 corresponding to the six containers that we were talking
4 about earlier; is that correct?

5 A. Yes.

6 Q. Okay. So there's two for the Q-treated
7 particle; correct?

8 A. Yes. I think it's further over -- oh, yes.
9 We are there, yes.

10 Q. Okay. And then after, like two for the
11 Q-treated particles, then there's two replicates for the
12 OS-treated particles; correct?

13 A. Yes.

14 Q. And after that, there's two replicates for the
15 PAA-treated particles; correct?

16 A. Correct.

17 Q. Those are the three particles types that you
18 were discussing earlier in the six containers; correct?

19 A. Correct.

20 Q. Okay. Let's go back to page 28, zoom in on
21 the SBF1 entry.

22 A. Thank you.

23 Q. Okay. Now we're at 600 zoom. Trying to make
24 it easy.

25 MR. MILLS: And Garrett, can you just

1 highlight it in yellow, that entry, so it's easy to find
2 out?

3 REPORTER: I'm sorry. Let's see. Jad, who
4 are you just referring to? Derrick, is that what you
5 said?

6 MR. MILLS: I said Garrett.

7 REPORTER: Oh, Garrett. Okay. Gotcha.

8 MR. MILLS: Garrett, go ahead and scroll to
9 the right.

10 MR. POTTER: (Complies).

11 MR. MILLS: I want to be able -- okay, great.
12 I want to be able to -- Dr. Vargas to be able to see
13 that there's continuity in the highlighting from the
14 entry that she's pointing to across the results.

15 A. Thank you, yes. I can see that.

16 BY MR. MILLS:

17 Q. So on -- from what you're looking at now, we
18 have that entry for AC number 095248 is highlighted in
19 yellow across the six -- the results from the six
20 different containers; is that correct?

21 A. Yes, correct.

22 Q. Okay. Great. So you pointed out that this is
23 a little bit difficult to do just because of size of the
24 print. And so what I'm going to try and do now is help
25 everyone out. I think this will be helpful.

1 MR. MILLS: If we can, Garrett, I'd like to be
2 able to keep this up, but also to have them on the
3 screen. What is it? Premarked as Exhibit 2009.

4 BY MR. MILLS:

5 Q. Right now on the screen, there's a single page
6 document that's been premarked as Exhibit 2009. Do you
7 see that?

8 A. Yes.

9 Q. Okay. So I'll explain what this is, and then
10 we're going to walk through it. This is intended to be
11 an accurate summary of the entry on page 28 of
12 Exhibit 1007 that you relied on for the SBF1?

13 A. Okay. Sure.

14 MR. COLSHER: Can -- excuse me, Counsel. I
15 haven't been provided with a copy. Can you please
16 provide (inaudible) a review as well? Thank you.

17 MR. MILLS: Yeah. We can drop the PDF in the
18 chat, but which --

19 MR. COLSHER: That would be helpful. I
20 understand, it's hard for me. I -- there's a whole
21 bunch of stuff. I just -- it's easier if I can look at
22 it to the side for me personally.

23 MR. MILLS: Sure.

24 MR. COLSHER: Just like to have a copy. Thank
25 you.

1 MR. MILLS: Go ahead and confirm for us when
2 you have the copy, when you see it in the chat, Counsel.

3 MR. COLSHER: Okay. It's in the chat. Thank
4 you.

5 MR. MILLS: Okay.

6 BY MR. MILLS:

7 Q. So Dr. Vargas, we may need to go back and
8 forth between the two documents a little bit, but all
9 we're trying to do is zoom in on -- and show kind of the
10 context of where it came from on the top. So you see
11 there's two little thumbnails at the very top. Do you
12 see that?

13 A. Yes.

14 Q. And the first -- well, let's start with the
15 second one. The second thumbnail says page 28 of 120 of
16 premarked Exhibit 1007. Do you see that labeling?

17 A. Yes.

18 Q. Okay. And then there's a blue box in that
19 thumbnail, and although it's difficult maybe to see
20 what's in the thumbnail, below that thumbnail there's a
21 blue box around the entry that we were looking at just a
22 moment ago with AC number 095248; correct?

23 A. Yes.

24 Q. Okay. So I just want you and -- well, let's
25 position these documents so you can see both things

1 simultaneously, but I want you to confirm that the
2 information in the blue box is an accurate
3 representation of the corresponding information on
4 page 28 of Exhibit 1007?

5 A. As I sit here, it looks correct.

6 Q. Okay. Then on the left-hand side of
7 Exhibit 2009, there's another thumbnail. It says
8 page 25 of 120 of Exhibit 1007, and there's a red box
9 corresponding to the column headings that we looked at
10 earlier.

11 So in Exhibit 1007, we're going to go back up
12 to page 25 so you can look at that. And I want you to
13 confirm the same thing. The column headings are
14 accurately represented on Exhibit 2009.

15 A. Yes, they appear correct.

16 Q. Okay. Great. And then we've added some
17 coloring to the thumbnail on the right-hand side, it's
18 maybe some tanned purple and green. And each one of
19 those colors corresponds to one of the particle types;
20 is that correct?

21 A. Yes, I can see that.

22 Q. So the tan -- I'm not good with my colors. I
23 probably should do kindergarten again, but I'm going
24 to -- I'll call it tan. Will that work for you if I
25 call it tan?

1 A. Yes.

2 Q. Okay. So the tan coloring corresponds to the
3 two replicates of the Q-treated particles types;
4 correct?

5 A. Correct.

6 Q. And the purple coloring corresponds to the two
7 replicates for the OS-treated particle type containers;
8 correct?

9 A. Correct.

10 Q. And the green coloring in Exhibit 2009
11 corresponds to the two replicates for the PAA-treated
12 particle types; correct?

13 A. Correct.

14 Q. Okay. So now we're going to do it
15 step-by-step, but I'm going to go -- in Exhibit 1007,
16 we're going to go back to page 28, zoom in so that it's
17 easy for you to see. But I want to you to confirm that
18 the data that Zaccaria reports for this entry for AC
19 number 095248 is accurately represented on Exhibit 2009,
20 okay? So first, I'm going to ask you about the
21 Q-treated particle.

22 A. Uh-huh.

23 Q. So is Exhibit 2009 accurate with respect to
24 the results reported by Zaccaria for AC number 095248
25 with respect to the Q-treated particle replicates?

1 A. Yes, it appears correct.

2 Q. Same question with respect to the OS-treated
3 particle replicates.

4 A. Yes.

5 Q. Same question with respect to the PAA-treated
6 particle replicates.

7 A. Yes.

8 Q. Okay. And then there's one more thing here on
9 Exhibit 2009. There's a legend about the replicates of
10 particles that came from page 17 of Exhibit 1007. So I
11 want you to confirm that we got that correct as well.
12 So we're going to go to that page of Exhibit 2007 and
13 zoom in to make sure that we have -- that that is also
14 an accurate summary of what appears on Exhibit 1007.

15 A. Yes. It appears correct between the two
16 documents.

17 Q. Thank you. Okay. So having compared
18 everything one to one, there's no questions or concerns
19 about the accuracy of 2009, as summarizing or presenting
20 the data for SBF1 that's done in Exhibit 1007; correct?

21 MR. COLSHER: Objection to form.

22 A. It appears correct to me.

23 BY MR. MILLS:

24 Q. Okay. Thank you. So we can take that
25 Exhibit 2009 down. Let's go ahead and put Exhibit 2010

1 into the chat then you can put it up on the screen.

2 While we're doing that, I'll just -- I'm
3 trying to save you some time and a little bit of angst
4 here. So rather than make you search for PIK3R4, we'll
5 cut to the chase a little bit. We've done the same
6 thing with that one. I just want to make sure we've
7 done that correct.

8 A. Thank you.

9 MR. COLSHER: And Jad, if you're waiting for
10 me, I have it. I'm not sure if that's --

11 MR. MILLS: Great. Thank you.

12 BY MR. MILLS:

13 Q. So I'll give you just a moment to look at
14 Exhibit 2010. And while you're doing it, I'll ask
15 Garrett to pull up page 29 of Exhibit 1007.

16 MR. POTTER: (Complies).

17 BY MR. MILLS:

18 Q. Okay. Dr. Vargas, have you had a chance to
19 look at Exhibit 2010? If you're trying to talk to us,
20 you're muted. We're not hearing you.

21 A. Apologies. Yes. I've had a chance to review
22 Exhibit 2010.

23 Q. Okay. So some portions of Exhibit 2010 are
24 identical to what was in 2009. So if you look at the
25 thumbnail in the top left corner with the red column

1 headings, page 25, that's identical; correct?

2 A. Correct.

3 Q. And then on the bottom left-hand corner, the
4 portion from page 17 of Exhibit 1007, that's also the
5 same; right?

6 A. Yes.

7 Q. And otherwise, it's the same idea as
8 Exhibit 2009, but now we're looking at PIK3R4 entry
9 rather than the SBF1; correct?

10 A. Yes.

11 Q. Okay. So we're going to do the same thing
12 that we did last time. So it should be easy this time.
13 I want to start by looking at Exhibit 1007. Let's first
14 make sure that you're able to see that that's on
15 page 29. So you agree we're looking at page 29 of
16 Exhibit 1007?

17 A. Yes.

18 Q. Okay. So now we're going back to -- before we
19 head back to page 29, so let's scroll through just this
20 one page. We won't make you do the other ones again.
21 But we'll just scroll down and have you look for the
22 PIK3R4.

23 A. I don't see it yet.

24 Q. Okay. Let's scroll down.

25 A. Thank you. I can see that it's highlighted.

1 Q. Okay. And let's scroll down the rest a little
2 bit just to see if there's any -- if it shows up any
3 other times on the page or is that the one?

4 A. I don't see -- I don't see it elsewhere.

5 Q. Okay. Let's make sure we've gone all the way
6 to the bottom, okay?

7 A. I don't see it elsewhere on the page.

8 Q. Okay. And then zoom out on Exhibit 1007, just
9 so that you can see kind of the whole page. And I just
10 want you to confirm it's a little bit -- you know, it's
11 maybe two-thirds of the way down the page; is that
12 right?

13 A. Yeah, I think so.

14 Q. Okay. So when you're looking at the thumbnail
15 in the upper right-hand corner of Exhibit 2010, there's
16 a blue box that seems to correspond to that entry for
17 PIK3R4; correct?

18 A. Yes, it looks about right.

19 Q. Okay. And then we're going to zoom in on
20 Exhibit 1007 and confirm that the content is accurate.
21 So we're going to zoom in now at 300 percent and you're
22 comparing that to the blue box content on Exhibit 2010.
23 And the question to you is whether the blue box content
24 in Exhibit 2010 accurately represents the corresponding
25 information on Exhibit 1007 on 29?

1 A. Yes, it appears correct.

2 Q. I want to make sure this is the -- I guess we
3 should compare that molecular weight that's reported
4 there to the molecular weight which you had in
5 paragraph 119 of your declaration.

6 A. Yes, it's consistent with what I cited in my
7 declaration.

8 Q. So you agree this is the entry that you were
9 citing in your declaration; correct?

10 A. Yes.

11 Q. There isn't a different entry that we should
12 be looking at, this is the right one?

13 A. I would have to confirm that in a format
14 that's a little bit easier. But yes. This is -- this
15 appears to be the same entry.

16 Q. And sitting here right now, you don't recall
17 there being any different entries; is that correct?

18 A. No, that's correct.

19 Q. Okay. So we've confirmed the information in
20 the blue box is correct. You already agree that the
21 information in the red box is correct; right?

22 A. Yes.

23 Q. Okay. And we have the same tan, purple and
24 green color coding which accurately tells us the
25 replicates of the particle treatment that we're looking

1 at; correct?

2 A. Correct.

3 Q. Okay. So now in Exhibit 1007, Garrett is
4 going to slowly scroll over because I want you to be
5 able to confirm that what is reproduced on Exhibit 2010
6 accurately reflects what is appearing in Exhibit 1007?

7 A. Yes, the two appear accurate.

8 Q. Okay. So you agree that the data in exhibit
9 2010 accurately reproduces the data for the PIK3R4
10 AC number in Exhibit 1007 for each of the Q, OS, PAA
11 particle types; correct?

12 A. Yes.

13 Q. Okay. Thank you. All right. We can take
14 that down now. I know we strained your eyes a little
15 bit. We've been going a little bit -- a little while.
16 Do you want another -- should we take another break?

17 MR. COLSHER: Yeah, let's take a few.

18 MR. MILLS: Great. We'll go off the record.

19 WITNESS: Thank you.

20 (Off the record.)

21 BY MR. MILLS:

22 Q. So I do have one more question about
23 Exhibit 2010, but I think we went through it. If you
24 need us to put it up again, we can put it back up. This
25 is just the same question I asked about Exhibit 2009.

1 You said you have no questions or concerns with the
2 accuracy of it in summarizing the entry from
3 Exhibit 1007. So it's the same question about
4 Exhibit 2010.

5 MR. COLSHER: Objection to form.

6 BY MR. MILLS:

7 Q. You have no questions or concerns with the
8 accuracy of Exhibit 2010 summarizing the data for PIK3R4
9 found in Exhibit 1007; correct?

10 MR. COLSHER: Objection to form.

11 A. Yes. I have not looked at it independently as
12 I sit here but it appears accurate between the two.

13 BY MR. MILLS:

14 Q. And you say you haven't looked at it
15 independently, where you went through it and compared
16 it; is that correct?

17 A. Yes. I mean, I have not separately sort of
18 reviewed the documents side-by-side, but yes.

19 Q. Okay. So was there anything else you wanted
20 to look at to confirm the accuracy or are you satisfied
21 with the accuracy of this Exhibit 2010?

22 A. It appears accurate, yes.

23 Q. Okay. Go ahead and take a look at
24 paragraph 122 of your declaration.

25 A. I can see paragraph 122.

1 Q. Okay. Paragraph 122 of your declaration. You
2 discuss a different reference. It's called Bryk;
3 correct?

4 A. Yes.

5 Q. How do you pronounce Bryk?

6 A. I had been calling it Bryk, but I don't know
7 that that's correct.

8 Q. It might be Bryk.

9 A. I'm okay with Bryk.

10 Q. Okay. And in any case, it's Exhibit 1009; is
11 that correct?

12 A. Yes.

13 Q. Okay. And you, in your declaration, you look
14 to Bryk to provide concentrations, which you call high
15 and low abundant proteins; correct?

16 A. Yeah. I viewed it as representative of a
17 source that provides protein concentrations in units
18 that are comparable.

19 Q. You looked to Bryk because Zaccaria does not
20 itself disclose concentrations of the samples that it
21 tested; correct?

22 A. That's correct. It reports identification and
23 relative abundance as across conditions, but it does not
24 report the concentrations or the expected concentrations
25 of those individual proteins in the biological sample.

1 Q. In paragraph 122 of your declaration, you
2 identified values that you said were the lowest non-zero
3 detected concentrations in Bryk for PIK3R4 and SBF1;
4 correct?

5 A. Correct.

6 Q. And in your declaration, you again cite a
7 range of pages rather than the particular page. And the
8 range of pages you cited is 16 through 61 of
9 Exhibit 1009; is that correct?

10 A. Yes.

11 Q. And this is the same problem as before where
12 there's a lot of pages, tiny print, and we don't have
13 the specific page; right?

14 A. Yes.

15 MR. COLSHER: Objection to form.

16 BY MR. MILLS:

17 Q. So we're going to take a look at Exhibit 1009.
18 You can go ahead and pull that up. You have that;
19 correct?

20 A. I have 1009.

21 Q. Okay. And we're going to do the same or
22 similar exercises before. We're going to play
23 archeologists with the record. And we're going to start
24 by making sure we identify what it was you were looking
25 at in your declaration.

1 So paragraph 122 of your declaration, you
2 state that the lowest non-zero detected concentration
3 for SBF1 is 6.62 times 10 to negative 6 picomoles per
4 milligram; correct?

5 A. Correct.

6 Q. So like the range of six -- pages 16 to 61 of
7 Exhibit 1009 for that concentration; correct?

8 A. Correct.

9 Q. And you agree that that -- the value doesn't
10 show up on every page from 16 to 61, but there's a
11 particular page where you have that value; is that fair?

12 A. Yes.

13 Q. Okay. So go ahead and take a look at
14 Exhibit 1009 and tell me whether you would be able to
15 identify that page by looking at the copy of Bryk that
16 you have with.

17 MR. COLSHER: And again, for the record, we're
18 looking at hard copy and electronic copies. These have
19 been produced in the context of this proceeding.

20 You can respond to the question, Dr. Vargas.

21 A. On the printout that I have of this exhibit, I
22 can't read the text, so...

23 BY MR. MILLS:

24 Q. Okay. And that's the printout that -- and
25 that's not a printout from us. It's the printout that

1 your counsel provided to you; right? That you looked at
2 but you can't --

3 A. Yes.

4 Q. The text is just too small to make it out;
5 right?

6 A. Correct. At least on the hard copy.

7 Q. I just want to make sure you're not saying we
8 did something wrong, it's -- that's just the way it
9 came; right?

10 A. That's right.

11 Q. Okay. So would you like us to put up the
12 electronic copy so that we can all see the same thing
13 we're looking at the same time?

14 A. That would be great. Thank you.

15 MR. MILLS: So let's go ahead and do that,
16 Garrett.

17 MR. POTTER: (Complies).

18 BY MR. MILLS:

19 Q. And let's go to the beginning of whatever the
20 first page of that data table would be.

21 A. (Complies).

22 Q. Okay. So yeah. Let's go maybe to the prior.
23 Okay. So page 16 has data on it, but on page 15,
24 there's a header; is that correct, Dr. Vargas?

25 A. Yes.

1 Q. So this is table S3.

2 A. Yes.

3 Q. Okay. So you cited, I guess about 40 pages of
4 table S3, and on one of those pages we're going to find
5 the golden nugget we're looking for; is that right?

6 A. Yes.

7 Q. Okay. Do you want to go through those
8 40 pages yourself looking at them, or do you want us to
9 see if we can find it for you?

10 A. If we can electronically search, that would be
11 my preference.

12 Q. Okay. So how is it that you want to do that?

13 A. If you have identified the line item and can
14 pull it up offhand, that would -- that's great.
15 Otherwise we can search for SBF1, assuming this copy of
16 the exhibit is OCR.

17 Q. So I think I've identified it. So we'll go to
18 what I think is the right entry and we'll ask you to
19 confirm that for us.

20 A. Great.

21 Q. So I think on page 51 is the first place I
22 want to look. And I'm looking maybe 15 entries from the
23 bottom of the page 51 of 63 of Exhibit 1009. Let us
24 know if you're able to find it.

25 A. I see it about a third of the way down in this

1 view of the page, yes.

2 Q. Okay. Is there a number that you can tell us
3 to try and let us know which line you're looking at?

4 A. Yes. This is -- the text is just larger than
5 my last eye exam. I believe the number is 095248 there.

6 Q. Okay. Is that the same AC number we were
7 looking at before?

8 A. I believe it is, yes.

9 Q. This is -- is it 15 entries from the bottom?

10 A. Yes.

11 Q. Would you like us to go ahead and highlight
12 the data from that entry in yellow so we can follow it
13 across the page?

14 A. Please.

15 Q. I suppose what we should do is we should go
16 either to the top of this page or we should go to
17 probably page 16 of the document to see what the column
18 header is saying. Under the column ID show up on
19 page 16.

20 A. Yes.

21 MR. MILLS: Okay. So we're -- again, we're
22 all about trying to make life easier here. So we're
23 going to keep this document up, but we're also going to
24 put a moment pre-marked as Exhibit 2011. We'll begin by
25 dropping the PDF there in the chat so Counsel can take a

1 look at it. While that's happening, I'll just -- I'll
2 tell you, it's intended to be the same thing as the
3 others where we're just -- we're trying to zoom in on
4 the information so that we can see it and confirm that
5 we're all talking about the same thing.

6 MR. MILLS: So Counselor, go ahead.

7 MR. COLSHER: I'm just saying I have it, but
8 just for the record, when I look at 300 percent, you
9 know, it varies by screen.

10 MR. MILLS: Sorry, say that again?

11 MR. COLSHER: The zoom at 300 percent on a
12 Zoom screen is not going to be the same as zoom on
13 300 percent on otherwise screen.

14 MR. MILLS: So you're saying that the
15 thumbnails in Exhibit 2011 are smaller than the -- you
16 can't make out the text in the thumbnail, is that what
17 you're saying, Counsel?

18 MR. COLSHER: I was just saying that the
19 version of Bryk that sits on the screen has represented
20 this exhibit being at 300 percent zoom magnification,
21 but it appears smaller than what it would otherwise on a
22 computer display. It's not an important point. Just
23 want the record to be clear.

24 MR. MILLS: Okay.

25 MR. COLSHER: I know we're remote and it's

1 tricky.

2 BY MR. MILLS:

3 Q. Okay. Dr. Vargas, have you had a chance just
4 to take a look at a high level on Exhibit 2011?

5 A. Yes.

6 Q. Okay. You see that there's an upper left hand
7 thumbnail that says page 16 of 63?

8 A. Yes.

9 Q. And that has a green highlighting on the
10 column?

11 A. Yes, I see that.

12 Q. Okay. So on Exhibit 1009, I want us to go to
13 the corresponding portion of the green highlighting.
14 And I just want you to confirm that what is zoomed in
15 the big green box appears to be an accurate
16 representation of what's around the green box in the
17 thumbnail?

18 A. Yes.

19 Q. Okay. So the green box is an accurate
20 representation; correct?

21 A. Yes.

22 Q. Okay. So now we're going to talk about the
23 blue box. So the blue box is zoomed in on page 51 of
24 63. So we found our yellow highlighting on that page or
25 the entry that you identified; correct?

1 A. Correct.

2 Q. Okay. Now we're going to scroll over looking
3 for data. And you had said 6.62 times 10 to the
4 negative 6. So are we looking at the column with the
5 entry of 6.62 times 10 to the negative 6 for SBF1?

6 A. Yes.

7 Q. Okay. And we had added some -- did we add the
8 coloring or is this coloring -- okay. So we've
9 added -- okay. So it's the blue highlighting in Bryk, I
10 believe is original here. But in our Exhibit 2011
11 that -- I guess it's not corrected. So that's the same
12 coloring that we have in Exhibit 2011; correct?

13 A. Correct.

14 Q. Okay. And there's a value of 6.62 times 10 to
15 the negative 6 for donor three. That's the value that
16 you pointed to in your declaration; correct?

17 A. Correct.

18 Q. And then Bryk also reports values for donors
19 one, two, and four for that same entry; correct?

20 A. Yes, correct.

21 Q. In Exhibit 2011, we've accurately represented
22 the corresponding data in Exhibit 1009 for all four
23 donors; is that fair?

24 A. Yes, that's correct.

25 Q. Okay. All right. So you know we're going to

1 do the same thing for PIK3R4, and per Exhibit 2011 gives
2 the -- a little bit because we've giving you a page
3 number there of 44. But I will ask you, do you want to
4 turn to your hard copy page or do you want us to use the
5 electronic version of the exhibit?

6 A. I prefer the electronic, please.

7 Q. Okay. And while he's turning there, I should
8 ask, this entry for -- that we looked at in
9 Exhibit 1009, page 51. That's the entry in Bryk that
10 you relied on in your declaration; is that correct?

11 A. Yes.

12 Q. Okay. So now we're looking at page 44 of
13 Exhibit 1009. And I guess we should look at your
14 declaration. So in your declaration, the value was 3.17
15 times 10 to the negative 4; correct?

16 A. Yes, correct.

17 Q. Okay. So that's the value we'll be looking
18 for per PIK3R4. But first, I will ask you whether we
19 have found the entry that you relied on in your
20 declaration for PIK3R4?

21 A. I believe this is it.

22 Q. Okay. Before we zoom in, let's see if we can
23 count, I believe that looks 20 entries from the bottom
24 on page 44. Maybe let's go ahead and highlight that
25 entry because it's easier to count.

1 A. Did you say 19?

2 Q. I had said 20, but I suppose it depends on
3 whether you count pin one PIPs.

4 A. I was counting from the third column.

5 Q. Yeah.

6 A. I see.

7 Q. Okay. Yeah. So is it 20 entries from the
8 bottom?

9 A. I'm still counting 19, but I agree that the
10 highlighted row is -- oh, it's -- maybe I missed one.
11 Apologize. I am now counting 20 lines from the bottom.

12 Q. Perfect. All right. And we'll go ahead and
13 scroll over to the right. I want to see if we can find
14 that entry with the 3.17 times 10 to the negative 4 that
15 you relied on in your declaration.

16 A. Uh-huh.

17 Q. Okay. So are you seeing that value?

18 A. Yes, I am.

19 Q. That's the value that you identified in your
20 declaration; correct?

21 A. Yes, correct.

22 Q. This confirms to you we're now -- we're
23 looking at the entry Bryk that you relied on in your
24 declaration for PIK3R4; correct?

25 A. Yes.

1 Q. That entry is accurately presented in enlarged
2 form, in legible form in Exhibit 2011; correct?

3 A. Yes, it appears so.

4 Q. So that 3.17 times 10 to the negative 4, that
5 was the value reported for donor one; correct?

6 A. Yes.

7 Q. For donors two through four, the value was
8 reported -- it was at all null set. There was nothing
9 detected for any of those donors; correct?

10 A. Correct.

11 Q. Okay. And just as before, you have no
12 questions or concerns with the accuracy of Exhibit 2011.
13 It summarized the data for SBF1 and PIK3R4 found in
14 Exhibit 1009; correct?

15 A. Correct, not at this time.

16 Q. Okay. Thank you. We can close those out
17 because I think we've -- I think we're going to try and
18 look at some larger text.

19 A. Great.

20 Q. Hopefully it should be a little bit easier to
21 use.

22 I want to talk about the sample preparation
23 method real quick. So please take a look at page 2753
24 of Exhibit 1009. There's a heading that says,
25 "Materials and Methods." Let me know if you see that.

1 A. Yes, I can see it.

2 Q. Underneath materials and methods, there's a
3 subheading that says "Erythrocytes." Do you see that?

4 A. Yes.

5 Q. And erythrocytes we talked about is red blood
6 cells; is that correct?

7 A. Yes.

8 Q. Okay. Go ahead and read to yourself the
9 description on your materials and methods for
10 erythrocytes, and I'm going to ask you some questions.

11 A. (Complies) I have reviewed the paragraph.

12 Q. There's also -- down below erythrocyte,
13 there's another subheading under materials and methods
14 that says, "Lysis of the cells and membrane
15 preparations." Do you see that?

16 A. Yes.

17 Q. Go ahead and read that section to yourself as
18 well, I just want to make sure you have all that
19 information.

20 A. (Complies) Yes, I reviewed it.

21 Q. In Bryk, the samples that were analyzed were
22 prepared by centrifuging at 150 times the force of
23 gravity for five minutes; correct?

24 A. Correct.

25 Q. The leucocytes were removed by applying a

1 leukocyte depletion filter; correct?

2 A. Yes.

3 Q. Bryk discloses the donors were fasting at the
4 time of -- the samples were taken; correct?

5 A. That's correct.

6 Q. Have you ever used a leukocyte depletion
7 filter?

8 A. I have not.

9 Q. In Bryk, the erythrocytes were washed four
10 times then using only PBS; correct?

11 A. Yes.

12 Q. In Bryk, the cells were stored overnight in a
13 solution of PBS, glucose, and EDTA-free protease
14 inhibitor cocktail tablets; correct?

15 A. Correct.

16 Q. And Bryk, lysis was performed by solution of
17 Tris, HCL SDS, FDTT; correct?

18 A. Correct.

19 Q. Bryk does not describe freezing for 30 minutes
20 or repeating the freezing fine cycle twice; correct?

21 MR. COLSHER: Objection to form.

22 A. That's correct.

23 BY MR. MILLS:

24 Q. Thank you. You can put that document aside.
25 I'd like to ask you some questions about the Hu

1 reference, that's Exhibit 1008.

2 REPORTER: Give what, that's Exhibit 1008?

3 Thank you.

4 BY MR. MILLS:

5 Q. Do you have that document in front you,
6 Dr. Vargas?

7 A. Yes, I do.

8 Q. Okay. And you reviewed the Hu reference
9 before signing your declaration; correct?

10 A. Yes.

11 Q. I basically want to get -- I want to make sure
12 I understand the mechanics of Hu, similar to how we
13 discussed the mechanics of Zaccaria. Let's have you
14 take a look at paragraph 134 through 136 of your
15 declaration.

16 A. (Complies) I can see paragraphs 134 and
17 through 136.

18 Q. Go ahead and read those to yourself just to
19 refresh your recollection or make sure that you're fully
20 familiar with what you said there.

21 A. I've reviewed the paragraphs.

22 Q. Okay. So do you remember before when we were
23 talking about Zaccaria, we talked about particle
24 types A, B, and C. We kind of used a generic term. Do
25 you recall that?

1 A. Yes.

2 Q. And there A, B, C meant Q, OS, and PAA; right?

3 A. Yes.

4 MR. COLSHER: Objection to form.

5 BY MR. MILLS:

6 Q. And Hu -- we still have particle types A, B,
7 and C, but they're different A, B, and Cs than in
8 Zaccaria; correct?

9 A. That's correct.

10 Q. Okay. So now lets' figure out what
11 terminology we're going to use for particle type A, B,
12 and C. So having -- we just looked at your declaration,
13 can you -- what's the best way to refer to those
14 particle types?

15 A. These particle types differed by size. So we
16 could refer to them as 30, 200 and 400 nanometer
17 particles.

18 BY MR. MILLS:

19 Q. Okay. And in Zaccaria, there were six
20 containers that were being operated on. What's the
21 number of containers being operated on?

22 MR. COLSHER: Objection to form.

23 A. It depends on the experiment, but we can say
24 at least three of the particles were individually
25 contacted based on particle type.

1 BY MR. MILLS:

2 Q. Okay. So in any experiment that we're dealing
3 with, whenever there's a container, that container has
4 only one particle type in it; is that correct?

5 A. Yes, only one particle type.

6 Q. Okay. And in Hu, we're talking about human
7 plasma; is that right?

8 A. Yes.

9 Q. Okay. So we have three containers. Is it
10 more specific about what the container is in Hu or is
11 the best word to use for this one vial?

12 A. I think container works well.

13 Q. Okay. So we have three containers, in each
14 container we have only one particle type; correct?

15 A. Yes.

16 Q. Just as before, we have a plurality of
17 particles of the given particle type in the container;
18 correct?

19 A. Yes.

20 Q. So without holding you to the specific number,
21 it wouldn't be odd to talk about if we hypothesize a
22 number. Maybe there is a million particles of type 30
23 in one of the containers; correct?

24 A. Sure.

25 Q. And you might have a comparison -- you might

1 have a comparable number, but I'll put -- there's a lot
2 of individual particles for the 200 and the 400 in each
3 of them as well; correct?

4 A. Correct.

5 Q. So just like when we were talking about
6 Zaccaria, at some point they're going to separate the
7 individual particle type for some subset of them from
8 the biological sample that you identified; correct?

9 MR. COLSHER: Objection to form.

10 A. After it's been contacted, yes.

11 BY MR. MILLS:

12 Q. Okay. So in Hu, how did they do that
13 mechanically? Specifically, what's the process they go
14 through to achieve that separation?

15 A. After contacting the particles with the
16 plasma, they -- again, these are iron oxide. They used
17 a magnet to hold the particles while they washed the
18 supernatant off.

19 Q. Okay. So it's the same or a similar procedure
20 as in Zaccaria, they have a magnet holding the particles
21 against the surface of the container. They pour out the
22 sample and wash a couple of times to try and make sure
23 they got rid of all of the loose stuff. Is there --

24 MR. COLSHER: Objection to form.

25 A. Generally, yes.

1 BY MR. MILLS:

2 Q. Is there any particular in which you disagree
3 with the description?

4 A. I guess there's multiple ways to remove a
5 fluid from a sample. So whether they removed it with a
6 pipette or dumped, if you will, I think there are
7 variations on the individual steps that would achieve
8 the same thing, removing the solution from the bound
9 particles.

10 Q. Okay. And we're not sure exactly whether they
11 were dumping the water, the liquid out or whether they
12 were pipetting it out, is that your point?

13 REPORTER: I'm sorry, they were -- did you say
14 pipetting it out?

15 MR. MILLS: Pipette.

16 REPORTER: A high pet, is that what you said?

17 MR. MILLS: Right. Pipetting.

18 REPORTER: Pipetting. Can you spell that,
19 please?

20 MR. MILLS: P-I-P-E-T-T-E.

21 BY MR. MILLS:

22 Q. In the first step, I'm combining a single
23 particle type in a container with -- in this case some
24 blood plasma; correct?

25 A. Yes.

1 Q. And I'm forming, for instance, 30 nanometer
2 particle type corona around perhaps a million 30
3 nanometer particles in that particular container;
4 correct?

5 A. Yes.

6 Q. Okay. And then I'm going to decant or
7 otherwise remove plasma sample from the container, and
8 I'm going to keep at least a subset of those 30
9 nanometer particles in my container; is that correct?

10 A. Yes.

11 Q. Okay. The same as with Zaccaria. If I lost
12 400,000 of the particles because they flew out or if I
13 lost 600,000, I still have at least a subset of the 30
14 nanometer particles comprising of the coronas in that
15 container; correct?

16 A. Yes. In that scenario, you would still have
17 at least a subset.

18 Q. And when I perform that step, I don't
19 have -- in that container, I don't have any 200
20 nanometer particles; correct?

21 A. Correct. Only one particle type per container
22 in this study.

23 Q. And so I also -- when I do that separating
24 step in that container, I don't have any 200-nanometer
25 particle type corona in that container; correct?

1 A. Correct.

2 Q. Okay. And the same is true with respect to
3 the 400 nanometer corona. I don't have any of those
4 either; correct?

5 A. Yes. In that scenario that's correct.

6 Q. And then the same is true with respect to the
7 two other vials. Each vial has a subset of one particle
8 type, a subset of the particles of one particle type
9 comprising one particle type corona; correct?

10 A. At least that, yes.

11 Q. But when you say at least that, it doesn't
12 have any -- if it's a 200-nanometer vial, it doesn't
13 have 30 nanometer coronas; correct?

14 A. No.

15 Q. And we may have the no correct problem there.
16 So let's --

17 A. Oh.

18 Q. Yeah. So let me ask the question again. If
19 it's the 200-nanometer particle vial, we don't have any
20 30-nanometer particle coronas in that vial; correct?

21 A. Correct.

22 Q. We don't have any 400-nanometer coronas in
23 that vial; correct?

24 A. Correct.

25 Q. If it's a 400-nanometer particle vial, we

1 don't have any 30-nanometer of particle coronas in that
2 vial; correct?

3 A. Correct.

4 Q. We also don't have any 200-nanometer corona in
5 the 400-nanometer particle vial; correct?

6 A. Correct.

7 Q. Just to make sure I haven't screwed it up. In
8 the 30-nanometer particle vial, we don't have any
9 200-nanometer coronas; correct?

10 A. Correct.

11 Q. In the 30-nanometer particle vial, we also
12 don't have any 400-nanometer particle coronas; correct?

13 A. Correct.

14 Q. Okay. Okay. So in each vial, we have at
15 least a subset of particles from our contracting phase,
16 but in each vial that subset has just one of the three
17 potential particle type coronas; correct?

18 A. Correct.

19 Q. Okay. Okay. In paragraph 152, you discussed
20 an SDS in Hu procedure. Go ahead and take a look at
21 paragraph 152.

22 A. (Complies). Yes, I can see paragraph 152.

23 Q. Okay. And we'll get to that in just a moment.
24 But with Zaccaria, we talked about after we've separated
25 at least a subset of particles comprising of the

1 coronas, that then you elute or desorb the proteins from
2 the particles. Do you remember that from Zaccaria?

3 A. Yes.

4 Q. That same thing is happening here?

5 A. Yes.

6 Q. Okay. So how does that happen in here?

7 A. The -- in Hu, the nanoparticle protein
8 complexes as they put it, or the protein coronas on the
9 particles are desorbed or eluted using urea and ammonium
10 bicarb solution.

11 Q. Okay. So I want to make sure I understand how
12 this is working. So we still have three different
13 vials; is that correct?

14 A. Yes.

15 Q. Okay. And to each vial, each with its own
16 particle type, after we've washed it, now we are adding,
17 I think you said urea?

18 A. Yes.

19 Q. To desorb or elute the proteins off of that in
20 particle type into the solution; is that correct?

21 A. Correct.

22 Q. Okay. So that's the step that happens
23 immediately after the washing, before we go on the
24 SDS-PAGE; is that correct?

25 MR. COLSHER: Objection to the form.

1 A. That's correct.

2 BY MR. MILLS:

3 Q. So I just want to make sure, we load the
4 SDS-PAGE, are we loading it with particles or are we
5 just loading it with the proteins that have already come
6 off the particles?

7 MR. COLSHER: Objection to form.

8 A. My understanding is it's just the proteins.

9 BY MR. MILLS:

10 Q. Have you ever done SDS-PAGE?

11 A. Yes, I have.

12 Q. And when you did SDS-PAGE, you were loading
13 proteins rather than the particles; is that fair?

14 A. It depends on the experiment, but generally,
15 yes.

16 Q. Okay. And then did they digest the proteins?

17 A. At any point in the study, yes.

18 Q. Okay. At what point did they digest them?

19 A. I believe they digest them prior to LCMS
20 analysis.

21 Q. Okay. Take a look at page 855 of Hu. And
22 there's a reference to shotgun proteomics.

23 REPORTER: Shotgun what?

24 MR. MILLS: Proteomics.

25 REPORTER: Please spell it.

1 MR. MILLS: P-R-O-T-E-O-M-I-C-S.

2 REPORTER: Oh, what's in -- okay.

3 MR. COLSHER: And did you say 855? Sorry.

4 Sorry.

5 MR. MILLS: This is what I was
6 looking -- well, maybe 355.

7 A. Can you point me to the specific paragraph?

8 BY MR. MILLS:

9 Q. Yes. About 24 lines down from the top and
10 it's right before the reference number, 41.

11 A. Got it.

12 Q. Okay. So my question is going to be about
13 reference 41. So go ahead and look at the end of Hu
14 where it tells us what reference 41 is. Just read that
15 link to yourself.

16 A. (Complies) Yes, I can see the reference in Hu.

17 Q. Okay. I want you to compare that to the table
18 in paragraph 12 of your declaration.

19 A. I don't believe it's in my exhibit list.

20 Q. So -- and you've anticipated my question, of
21 course. So I just want to make sure what Hu calls
22 reference 41 is not one of the references that you
23 considered in providing your opinions in your
24 declaration; correct?

25 A. That's correct.

1 Q. Thank you. All right. We can set that aside
2 for now. I'm going to ask you some questions about
3 Exhibit 1006. I guess I should ask, it's about 12:30.,
4 before we move on to a new exhibit, are you ready for
5 lunch? I don't want to --

6 A. I'm okay right now.

7 Q. Okay. About how long are you good to continue
8 going?

9 A. At least another half hour.

10 Q. Okay. You want to go a half hour before we
11 take a break?

12 A. That works for me as long as the -- that works
13 for you and --

14 MR. MILLS: Okay. Counsel, is that okay with
15 you?

16 MR. COLSHER: It's fine with me. I would just
17 lay it out to the court reporter if she needs a break
18 before that timeline.

19 REPORTER: That's fine. The -- yeah, that's
20 fine. And Mr. Mills, do you have an idea roughly how
21 long you're going today?

22 MR. MILLS: I don't know yet. I don't know.

23 BY MR. MILLS:

24 Q. Okay. Do you have Exhibit 1006?

25 A. Yes.

1 Q. Okay. And -- sorry I said 1005, but I mean
2 1000 -- I said 1006, I mean 1005. So I'm trying to ask
3 you about the Cai reference.

4 REPORTER: About the what? Hold on. About
5 the what?

6 MR. MILLS: Cai reference, C-A-I.

7 REPORTER: Is it an acronym?

8 MR. MILLS: No.

9 BY MR. MILLS:

10 Q. Okay. Let's have you go ahead and take a look
11 at paragraph 223 of your declaration.

12 A. (Complies) I can see paragraph 223.

13 Q. Okay. In paragraph 223 of your declaration,
14 you provided an annotated version of figure 1 from Cai;
15 correct?

16 A. Correct.

17 Q. Do you have an understanding of the process
18 that Cai is depicting in figure 1?

19 A. Yes.

20 Q. Okay. So I want to make sure. We've
21 discussed this in Zaccaria discussed it in Hu. I want
22 to see if the process is that we've outlined that we've
23 been discussing and we're going to explore that in Cai.
24 So in figure 1 of Cai, they are -- they're showing an
25 Eppendorf tube; is that correct?

1 A. It looks like a schematic of an Eppendorf
2 tube, yes.

3 Q. And in the Eppendorf tube, although there's
4 just one of them, you would agree that in figure 1 of
5 Cai, it's telling us the process for an experiment
6 that's going to be using two other Eppendorf tubes;
7 correct?

8 A. At least --

9 MR. COLSHER: Objection to form.

10 BY MR. MILLS:

11 Q. Okay.

12 A. At least two and it says yes, a scheme of the
13 carbon nanoparticle pull-down experiment.

14 Q. Okay. So here in figure 1 we're going to have
15 an Eppendorf tube that has lysate from HeLa cells in it.
16 It also has CB particles in it; correct?

17 A. In one tube of the experiment, yes.

18 Q. And in a second tube of the experiment, we're
19 going to have lysate from HeLa cells and we're going to
20 have CNTs having a diameter of 20-40 nanometers; is that
21 correct?

22 A. Yes.

23 Q. Okay.

24 A. At least to those two. There could be other
25 sizes of the carbon nanotubes as well.

1 Q. So when you say "at least those two," you mean
2 there's at least those two vials, those two --

3 A. Yes.

4 Q. Okay. So we've correctly described the
5 particles that are showing up in the two tubes that we
6 know exist in figure 1; is that correct?

7 MR. COLSHER: Objection to form.

8 A. Yes.

9 BY MR. MILLS:

10 Q. And just to be clear, in the CNT or carbon
11 nanotube, Eppendorf tube, we don't have any carbon black
12 particles; correct?

13 A. Correct.

14 Q. And the same is true for the carbon black
15 Eppendorf tube, we don't have any carbon nanotubes in
16 the carbon black Eppendorf tube; correct?

17 A. Correct.

18 Q. So similar to Zaccaria and Hu, I want to make
19 sure we understand the mechanics of the process. So
20 the -- in one vial, the CNTs are exposed to a lysate of
21 HeLa cells and in separate vial -- I said vial, but
22 Eppendorf tube, the carbon black is exposed to a lysate
23 from HeLa cells; correct?

24 MR. COLSHER: Objection to form.

25 A. Yes.

1 BY MR. MILLS:

2 Q. Okay. So after exposure of each of the
3 separate carbon materials, the two separate Eppendorf
4 tubes, two lysate of HeLa cells, there's going to be a
5 centrifugation step, do you agree?

6 MR. COLSHER: Objection to form.

7 A. Yes.

8 BY MR. MILLS:

9 Q. And what's the force that's applied during
10 that centrifugation step?

11 A. According to this figure 1, it says 800G.

12 Q. How does that correspond to the force of
13 gravity?

14 A. I believe that's 800 times the force of
15 gravity.

16 Q. What's the effect of the centrifugation?

17 A. You separate based on density in
18 centrifugation?

19 Q. Okay. So similar to Zaccaria and Hu, we were
20 discussing that, you're going to decant or perhaps
21 maybe --

22 REPORTER: Hold on. Similar to -- similar to
23 what?

24 MR. MILLS: Zaccaria --

25 BY MR. MILLS:

1 Q. -- and Hu you were going to decant the lysate
2 from the Eppendorf tube; correct?

3 MR. COLSHER: Objection to form.

4 A. I'm not sure if they're decanting or if
5 they're, you know, pipetting it out, but yes, you're
6 separating the solid at the bottom from the liquidated
7 solution.

8 BY MR. MILLS:

9 Q. Can you -- because they're also a washing
10 step?

11 A. Yes.

12 Q. Can you describe that?

13 A. I think washing buffers are applied to the
14 solid particles with coronas at the bottom, and then
15 removed again cyclically.

16 Q. Okay. So after the decanting and the washing,
17 you've removed what you've identified as the biological
18 sample from the Eppendorf tube; correct?

19 MR. COLSHER: Objection to form.

20 A. The rest of the solution, yes.

21 BY MR. MILLS:

22 Q. Okay. And so what you're left with is, in one
23 vial you have the CNTs and whatever proteins bound to
24 the CNTs and in the other vial you have CBs, and
25 whatever proteins bound to the CBs; correct?

1 A. Correct.

2 REPORTER: And clarification. Are you saying
3 CNT or CMT?

4 MR. MILLS: N, carbon nanotube, CNT.

5 BY MR. MILLS:

6 Q. So, CNTs together, and a separate Eppendorf
7 tube has CBs; correct?

8 A. That's correct.

9 Q. I want to ask you briefly about panel C and D
10 in figure 1. So in panel D, there's little kind of
11 discreet dots and in panel C there's what looked like
12 tendrils perhaps. Can you explain what we're seeing in
13 panel C and D?

14 A. Yes. Those are transmission electron
15 micrographs or TEM images of the nanoparticles used in
16 this study. Panel C is a TEM image of the multi-walled
17 carbon nanotubes, which, as you mentioned, appear to be
18 sort of tendril-like. And in panel D, the carbon black
19 particles are smaller and look more punctate, if you
20 will.

21 Q. And in Cai, it describes the carbon nanotubes
22 in figure 1 as forming an agglomerate matrix.

23 REPORTER: A what matrix?

24 MR. MILLS: Agglomerate.

25 BY MR. MILLS:

1 Q. Do you know what I mean when I say that,
2 Dr. Vargas?

3 A. Yes. That they tend to stick together.

4 Q. Okay. So yeah -- so can you explain what that
5 is, the agglomerate matrix of carbon nanotubes?

6 A. I think agglomeration I would generally read
7 as sticking together. So the tubes may aggregate, is
8 another, maybe way, to describe what's happening.

9 Q. In that agglomeration, does that have an
10 impact in Cai on the amount of protein that sticks with
11 the carbon nanotubes?

12 MR. COLSHER: Objection to form.

13 A. The different carbon nanotubes absorb
14 different amounts of proteins, though I think it would
15 be oversimplifying to attribute it to a single property.

16 BY MR. MILLS:

17 Q. In figure 1A after the washing step, it says,
18 "Remove unbound proteins and supernate." Do you see
19 that?

20 A. Yes.

21 Q. So that's that decanting or pipetting step
22 that you were describing; correct?

23 A. Yes.

24 Q. I don't know whether the copy of the Exhibit
25 that you have has coloring. Can you tell me whether it

1 does?

2 A. It appears to, I see black and blue.

3 Q. Okay. And do you know what the blue dots are?

4 A. They don't specifically say in the legend, but
5 based on the description of the schematic, it appears as
6 though they're using blue dots to describe the bound
7 proteins versus unbound, which you can see in the first
8 two vials or Eppendorf tubes. There's also some sort of
9 gray or black dots.

10 Q. I think I'm going to try and put it up on the
11 screen so we can see that other version. And what we
12 might do is -- I think in your declaration, so in
13 paragraph 223. So let's put up paragraph 223 of the
14 declaration in color so that we can zoom in on it.
15 Okay. Let's zoom on it even more if we can.

16 A. Yes, I can see it.

17 Q. Okay. Do you see there's four depictions of
18 the Eppendorf tubes. Do you see that?

19 A. Yes.

20 Q. That isn't telling us that there's four
21 Eppendorf tubes, it's telling us that there's four
22 states of an individual Eppendorf tube. Do you agree?

23 A. Yes. That's how I interpret the schematic.

24 Q. In the first depiction of the Eppendorf tube,
25 there's a line shortly below the top of the Eppendorf

1 tube that indicates fluid level in the tube. Do you
2 agree?

3 A. Yes.

4 Q. And under that line, so within the fluid,
5 there are some dark-colored circles that are floating in
6 the liquid. Do you agree?

7 A. Yes.

8 Q. There are also some squiggly lines that are
9 dark colored that are touching the circles. Do you see
10 that?

11 A. Yes.

12 Q. Then perhaps there's some squiggly lines that
13 are that same color that are at the bottom of the tube
14 that aren't touching a blue circle or a gray circle;
15 correct?

16 A. Yes.

17 Q. In the second depiction, all of the blue
18 particles are down at the pellet; correct?

19 A. Correct.

20 Q. The gray particles -- the gray circles are
21 floating in the supernate?

22 A. Uh-huh.

23 Q. And there's a black or a dark material that's
24 surrounding the blue particles in the pellet. Do you
25 agree?

1 A. Yes.

2 Q. After the washing step, in the third depiction
3 of the vial it says, "Remove unbound proteins and
4 supernate." Do you agree?

5 A. Yes.

6 Q. And in this third depiction of the vial, we no
7 longer have that same fluid line showing up. Do you
8 agree with me?

9 A. Yes.

10 Q. So in that third depiction of the vial, the
11 supernate has been removed. Do you agree?

12 A. Yes.

13 Q. And with that supernate, we have removed the
14 gray dots. Do you agree?

15 A. Yes.

16 Q. Those gray dots represent the unbound proteins
17 that were floating in the supernate rather than being
18 bound to the particle; correct?

19 A. Yes, that's one interpretation of them.

20 Q. Okay. Do you have any different
21 interpretation?

22 A. No, not at this time. I only mean that like
23 it's a schematic and without a legend, so.

24 Q. That's the way you understand it?

25 A. Yes, yes.

1 Q. Okay. Great. And then the black material or
2 the dark material that's sounding the -- well, let me
3 back up and ask a different question first.

4 The blue particles that are in the pellet, you
5 agree that those represent -- I said -- I -- let me try
6 that again because I screwed that question up.

7 The blue dots -- here's a new question. The
8 blue dots in the pellet in the second and third
9 depictions of the Eppendorf tube in figure 1A, those
10 represent the particles that moved into the pellet by
11 centrifugation; correct?

12 A. Yeah. I think that's where -- I mean, there's
13 maybe some ambiguity in there. I think the two things
14 that are in the third vial are the particles and the
15 bound proteins. So whether the black is the protein or
16 the particle, I think is -- could be interpreted in
17 either scenario.

18 Q. Okay. So looking just at depictions 2 and 3
19 of the Eppendorf tube, it's unclear whether the blue dot
20 is the particle or the protein, but one of -- the blue
21 dot is either one of those and then the black is the
22 other one.

23 Do you agree?

24 A. Yes.

25 Q. Okay. In the fourth depiction of the

1 Eppendorf tube, the blue dots have been removed outside
2 of the Eppendorf tube.

3 Do you agree?

4 A. Yes.

5 Q. And within the Eppendorf tube, in some amount
6 of liquid, there are squiggly lines floating in the
7 liquid.

8 Do you agree?

9 A. Yes.

10 Q. The caption under there says, "Elute bound
11 proteins and sample buffer."

12 REPORTER: Hold on. Says what?

13 MR. MILLS: Elute.

14 REPORTER: Spell it.

15 MR. MILLS: E-L-U-T-E.

16 REPORTER: Elute bound what?

17 MR. MILLS: Proteins.

18 REPORTER: Okay.

19 BY MR. MILLS:

20 Q. So I'm going to ask the question again. The
21 fourth depiction of the Eppendorf tube, Cai, underneath
22 the tube it says, "Elute bound proteins and sample
23 buffer." Do you see that?

24 A. Yes.

25 Q. So you've agreed the squiggly lines in the

1 fourth depiction of the Eppendorf tube are intended to
2 depict the proteins that were formerly bound to a
3 particle, but now have been eluted into the sample
4 buffer?

5 A. Yes.

6 MR. COLSHER: Objection, form.

7 BY MR. MILLS:

8 Q. That's how you've identified those squiggly
9 lines, you put a green box around it; correct?

10 A. Correct.

11 Q. You've identified those squiggly lines as
12 subset of proteins. Do you agree?

13 A. Yes.

14 Q. And so those proteins have now been separated
15 from the blue dots. Do you agree?

16 A. Yes.

17 Q. And the blue dots are shown outside the
18 Eppendorf tube?

19 A. Yes.

20 Q. Do you agree now that Figure 1A of Cai is
21 using the blue dots to depict the particles of whichever
22 particular particle type were put into that particular
23 tube; correct?

24 A. Yes.

25 MR. COLSHER: Objection to form.

1 A. Yes. I think it could very-well represent
2 that.

3 BY MR. MILLS:

4 Q. Do you have alternative interpretation that
5 you want to put forward?

6 A. No, not at this time.

7 Q. And certainly the way that you have mapped it,
8 you've identified the gray squiggly lines as the subset
9 of proteins that were eluted from the particle type;
10 correct?

11 A. Yes.

12 Q. Okay. And so under that interpretation, the
13 one you used for your mapping, if we're looking at the
14 second and third depictions of the Eppendorf tube,
15 the -- what looks like a black pellet is really just
16 concentrated gray squiggly lines; is that correct?

17 A. I would say that those are intended to
18 represent the protein-bound particles, so the corona's
19 particles plus coronas.

20 Q. Okay. So when we're looking at the fourth
21 depiction of the Eppendorf tube, we now have the
22 proteins that were formerly bound to the particle type
23 that was in that particular Eppendorf tube; correct?

24 A. Correct.

25 Q. And we've separated those proteins from the

1 particles that were formerly -- that they were formerly
2 connected to; correct?

3 A. Yes.

4 Q. That's what you've identified as the
5 separation of proteins in purple; correct?

6 A. Yes.

7 Q. Okay. And just for completeness, I want to
8 make sure, on the left-hand side you also have a red box
9 around the phrase CNT or CB. Do you see that?

10 A. Yes.

11 Q. You put that red box around there to indicate
12 that in the two tubes, one of the tubes has a CNT
13 particle type and then the other tube, you have a CB
14 particle type; correct?

15 A. Correct.

16 Q. And you also have -- I was going to call it
17 orange, but I may get corrected and told that it's a box
18 that's around the entire Eppendorf tube. That's that
19 further depiction on the left. Do you see that?

20 A. Yes.

21 Q. What do you want to call that color?

22 A. I like orange.

23 Q. Okay. Great. We're speaking the same
24 language. Okay.

25 So that orange is just indicating that the

1 fluid that's in that first depicted Eppendorf tube is a
2 lysate that came from HeLa cells; correct?

3 A. Yes, correct.

4 Q. Okay. And what does it mean that it's a
5 lysate?

6 A. It means that the cells have been lysed and
7 their interior contents have been isolated.

8 Q. Okay. So the lysate is the contents of the
9 interior of the cells; is that fair?

10 A. Yes.

11 Q. Okay. And what does it mean that it is lysate
12 of HeLa cells?

13 A. HeLa cells are human cervical cancer cell
14 line, and those cells were lysed and analyzed.

15 Q. Do you know what an immortalized cell line is?

16 A. My understanding of an immortalized cell line
17 is that it can be continuously cultured.

18 Q. Do you know whether or not HeLa cells are an
19 immortalized cell line?

20 A. It's my understanding that HeLa cells are
21 immortalized, yes.

22 Q. Going back to Figure 1A, so in the first
23 depiction of the Eppendorf tube we have the liquid line
24 at the top representing that there's lysate of HeLa cell
25 in that Eppendorf tube; correct?

1 A. Correct.

2 Q. In the second depiction of the tube, the
3 lysate is still in the tube; correct?

4 A. Correct.

5 Q. In the third depiction of the tube, the lysate
6 is not in the tube; correct?

7 A. That's correct.

8 Q. In the fourth depiction of the tube, the
9 lysate also is not in the tube even though there's new
10 fluid in there; correct?

11 A. Yes, that's correct.

12 Q. The new fluid is a sample buffer rather than a
13 lysate; correct?

14 A. Yes.

15 MR. COLSHER: Objection to form.

16 BY MR. MILLS:

17 Q. So in each point in these depictions of the
18 tube, we're looking at either CB or CNT being separated
19 from lysate of HeLa cells; is that correct?

20 A. Yes.

21 Q. Okay. And we talked back with Zaccaria and
22 with Hu about difference between particle type and the
23 number of actual particles in there. Do you remember
24 that?

25 A. Yes.

1 Q. And we used a million as an example, you know,
2 we're not saying that it is exactly a million, but the
3 same concept applies in Cai as well, you agree?

4 MR. COLSHER: Objection to form.

5 A. That there is more than one particle in a
6 given particle type -- in a given vessel, yes.

7 Q. Okay. So if we're about the CB Eppendorf, if
8 we start with a million CB particles, that we've exposed
9 to lysate of HeLa cells, and then we decant the
10 supernate and we wash it, the claim requires that we
11 have to have at least some of those particles that were
12 separated from the lysate; correct?

13 MR. COLSHER: Objection to form.

14 A. I think that depends on the context of the
15 rest of the experiment, in that at least a subset of a
16 plurality of particles could mean what you're saying,
17 but I think it could also mean other things depending on
18 what the rest of the experiment design is.

19 Q. So I guess what I'm asking is, if I have a
20 million CB particles in the lysate and the first
21 depiction of the tube, and when I centrifuge it I get
22 400,000 of the particles in the pellet, 600,000 are
23 still floating in the supernate and I decant that
24 supernate with 600,000 of the million particles. At
25 that point in that tube I have a subset of particles

1 compromising the CB corona in that vial; correct?

2 A. Yes, that's correct.

3 Q. Okay. And it doesn't matter that I didn't get
4 all of the CB particles. I have the subset -- I have a
5 subset of CB particles comprising the CB corona;
6 correct?

7 A. Correct.

8 Q. And the same is true for the CNT vial; right?

9 A. Yes.

10 Q. Okay. Great. Thank you.

11 Let's go head and talk about Cai figure 3?

12 REPORTER: Cai figure what?

13 MR. MILLS: 3.

14 MR. COLSHER: And I don't know if this is a
15 quick one, but we're coming up on that half hour we
16 spoke about at 12:00.

17 MR. MILLS: So thank you for bringing that up.
18 That's a good point. Let's go ahead and take a break.
19 And it is 1:00 p.m. Is now a good time for a lunch
20 break?

21 WITNESS: Yes.

22 MR. MILLS: Okay. How long would you like for
23 lunch, Dr. Vargas?

24 WITNESS: Is 30 minutes too long?

25 MR. MILLS: It's not too long. We can do

1 longer than that if you like.

2 WITNESS: I think 30 minutes is sufficient.

3 MR. MILLS: Great. Can we come back at 1:30?
4 Does that work for you, Judy?

5 REPORTER: Yes, thank you. Oh, before we --

6 MR. MILLS: Let's go off the record.

7 REPORTER: Yep. Okay. We're off.

8 (Off the record.)

9 BY MR. MILLS:

10 Q. Welcome back, Dr. Vargas.

11 A. Thank you.

12 Q. Did you have a good lunch?

13 A. I did.

14 Q. Did you have any communications with anyone
15 regarding this case during the break?

16 A. No.

17 Q. Okay. I'm going to ask Garrett to put up on
18 the screen your annotated version of Cai figure 1A, and
19 at the same time Cai figure 3. We can, I think, zoom in
20 on figure 3. I just want to have both of those up there
21 for these.

22 Okay. So -- and then -- I'll leave this up
23 there, but before, I have one question, returning to
24 something we were talking about before. We were talking
25 about the lysate of HeLa cells. Do you remember that?

1 A. Yes.

2 Q. Right. So I have a very specific question.

3 On page 585 of Cai, right-hand column, in the first full
4 paragraph under results there's a subheading that says
5 "Protein Corona of Carbon Nano Particles." Do you see
6 that subheading?

7 A. Yes.

8 Q. There's a paragraph underneath it. And the
9 very last sentence says, "The efficient interaction of
10 proteins with CNTs is not restricted to proteins from
11 cultured human carcinoma cells." Do you see that?

12 A. Yes.

13 Q. And it goes on to say, "Protein extracts,
14 zebrafish, mouse, Drosophila and algae also demonstrated
15 a substantial affinity to CNTs." Do you see that?

16 A. Yes.

17 Q. Okay. And then my question's going to be,
18 what those -- what that is referring to there. But to
19 try and make that easy for you, and if you look on the
20 prior page, 584 under methods, there's a protein lysate
21 preparation. And in the first paragraph it's discussing
22 HeLa cells. Do you see that?

23 A. Yes.

24 Q. In the second paragraph it's discussing
25 zebrafish embryos. Do you see that?

1 A. Yes.

2 Q. And in the third paragraph, it's discussing a
3 name that's kind of long and I'm not going to try to
4 pronounce it. Do you see that?

5 A. I see it.

6 Q. Okay. So my question is, looking back at that
7 sentence on 585 where it's talking about proteins from
8 cultured human carcinoma cells, it's talking about
9 zebrafish, mouse, Drosophila and algae.

10 REPORTER: First of all, hold on. Okay.
11 Where are -- are you reading off of the exhibit?

12 MR. MILLS: I'm reading out of page 585 of
13 Cai, Exhibit 1005.

14 REPORTER: Is that on the screen -- go ahead.
15 Thank you. Excuse me.

16 BY MR. MILLS:

17 Q. I'm going to restart my question, Dr. Vargas.
18 I'm just trying to understand if you know what it means
19 in Cai when it's referring to cultured human carcinoma
20 cells.

21 A. My understanding of that sentence is they're
22 referring to the HeLa cells.

23 Q. Okay. Is it correct that HeLa cells are
24 cultured human carcinoma cells?

25 A. I would have to confirm the type of cancer,

1 but, yes, they are cultured cancer cells. I suspect
2 given in the context of this, that that is the specific
3 cancer type that HeLa cells are from.

4 Q. Okay. And you previously worked with HeLa
5 cells; is that correct?

6 A. Yes.

7 Q. When you worked with HeLa cells, how did you
8 obtain your HeLa cells?

9 A. We purchased them.

10 Q. From where did you purchase them?

11 A. I don't recall specifically, but a commercial
12 vendor. It could have been ATCC or ATTC. It's been a
13 long time, but they're commercially available.

14 Q. Okay. So it was a commercial product that you
15 were using?

16 A. Yes.

17 Q. Okay. Great. Thank you for clearing that up.
18 I thought that was the case, but I just wanted to make
19 sure I was on the same page with you.

20 Okay. So now I'm going to ask you, we spent a
21 good amount of time talking about figure 1A and
22 understanding what's going on in there. And now we're
23 looking at figure 3. One of the things I noticed is
24 that figure 3A, the very end of the -- there's -- well,
25 let me start with this.

1 There's arrows kind of providing pathways. Do
2 you agree, going from the top to the bottom?

3 A. Yes.

4 Q. And the last step or two of the pathway has
5 the acronym MS in both those two portions of the
6 pathway. Do you agree?

7 A. Yes.

8 Q. MS there stands for what?

9 A. Mass spectrometry.

10 Q. Yes. Okay. So other than those last two
11 steps where MS is showing up, is there any other mass
12 spec step happening in figure 3A?

13 A. No, not depicted.

14 Q. Okay. Figure 1A, there's no depiction of mass
15 spec happening in that particular experiment; is that
16 correct?

17 A. That's correct. I think figure 1A is
18 demonstrating the process of isolating proteins prior to
19 a given analysis of them. And mass spec would be one
20 type of analysis that one could do.

21 Q. But in figure 1A, where they're using carbon
22 black or CNT in a particular Eppendorf tube, in figure
23 1A there's no discussion of mass spec; is that correct?

24 MR. COLSHER: Objection to form.

25 A. That's correct. This figure 1A is merely

1 depicting isolation of the proteins prior to any
2 specific analysis.

3 BY MR. MILLS:

4 Q. Okay, thank you. And the same is true -- I
5 guess what -- we're going to need to move a little bit,
6 but figure 2. So the Cai reference. Let's go to figure
7 2. So per the figure 2 experiment, they're not doing
8 mass spec there; correct?

9 REPORTER: I'm sorry. They're not doing what
10 there?

11 MR. MILLS: Mass spec. M-A-S-S --

12 REPORTER: Mass spec.

13 MR. MILLS: -- space, S-P-E-C.

14 MR. COLSHER: Objection to form.

15 A. This figure is depicting gel electrophoresis.

16 REPORTER: Is depicting what? Gel what?

17 WITNESS: Electrophoresis.

18 REPORTER: Electrophoresis. Okay.

19 BY MR. MILLS:

20 Q. You agree that figure 2 performs gel
21 electrophoresis, but does not disclose performing mass
22 spec; correct?

23 MR. COLSHER: Objection to form.

24 A. There's no reference to mass spec in figure 2,
25 yes.

1 BY MR. MILLS:

2 Q. That's true with respect to the caption in
3 figure 2 as well; correct?

4 A. Correct.

5 Q. Let's move up a little bit more in the
6 document in figure 1. So in the past, we've mostly
7 focused on panel A of figure 1, which you mentioned has
8 a scheme for pelleting and decanting the supernate, but
9 figure 1 also has the electrophoresis gel; correct?

10 A. Yes. Figure 1A is depicting the schematic of
11 protein corona formation. And then figure 1B is a
12 representative analysis of the coronas using --

13 REPORTER: Hold on. Please,
14 start -- repeating your answer -- repeat your again,
15 please.

16 WITNESS: Sure. Figure 1A is a schematic
17 demonstrating or depicting protein corona formation and
18 isolation. And Figure 1B is depicting one type of
19 analysis that was conducted on those protein coronas.

20 REPORTER: Thank you.

21 A. In this case, specifically gel
22 electrophoresis.

23 MR. MILLS: Judy, are you good?

24 REPORTER: I'm good. Yep, thank you.

25 BY MR. MILLS:

1 Q. So Dr. Vargas, do you agree that in -- well,
2 let me withdraw the question and start over.

3 Figure 1 also has the TEM images that we
4 talked about earlier today; correct?

5 A. Yes.

6 Q. So in Figure 1, testing that's disclosed
7 includes gel electrophoresis and TEM, but does not
8 include mass spec; correct?

9 MR. COLSHER: Objection to form.

10 A. Correct. Mass spec is not depicted in this
11 figure.

12 Q. Okay. And it's not mentioned in the caption
13 of the figure; correct?

14 A. That's correct.

15 Q. In figure 1, they are staining the proteins
16 with Coomassie blue; correct?

17 A. Yes.

18 Q. All right. Let's move down back to figure 3.
19 And then if you have the hard copy of Cai, I'll have you
20 take a look at pages 586 through 587 of Cai. Do you
21 have that?

22 A. Yes.

23 Q. So in here there's a description of a SILAC
24 experiment, S-I-L-A-C. Do you see that?

25 A. Yes.

1 Q. And figure 1 doesn't have any discussion of
2 SILAC encoding; correct?

3 A. No. Figure 1 is simply an overview of the
4 protein corona isolation steps.

5 Q. Well --

6 A. Excuse me, figure 1A is.

7 Q. Okay. So my question was about figure 1.
8 Figure 1, there's an experiment performed there, but
9 there's no disclosure of SILAC encoding in that
10 experiment that's in figure 1; correct?

11 MR. COLSHER: Objection to form.

12 A. That's correct.

13 BY MR. MILLS:

14 Q. In figure 3, that is the depiction of the
15 SILAC encoding experiment; correct?

16 MR. COLSHER: Objection to form.

17 A. In figure 3, it includes both the SILAC
18 encoding and the, what they refer to as CNT pull down,
19 which relies on the general work flow that's depicted in
20 scheme 1A -- or excuse me, figure 1A.

21 BY MR. MILLS:

22 Q. Are you saying that figure 3 specifically
23 identifies figure 1 in it?

24 MR. COLSHER: Objection to form.

25 A. Figure 3 specifically states that a pull-down

1 experiment was conducted and figure 1 provides a
2 schematic overview of what those pull-down
3 experiments -- how the pull-down experiments are
4 conducted.

5 BY MR. MILLS:

6 Q. Okay. So your answer's a little bit ambiguous
7 and so I want to make sure the record's clear, because
8 first you were talking about what figure 3 says and then
9 you started talking about something that figure 3
10 doesn't say, that it -- it seems like you're making an
11 inference. So I just want to make sure we're clear;
12 right?

13 So what figure 3 says is as a SILAC encoding
14 experiment in which there is a CNT pull down and CB pull
15 down. Fair so far?

16 A. Yes.

17 MR. COLSHER: Objection to form.

18 BY MR. MILLS:

19 Q. Okay.

20 REPORTER: Hold on. Clarification, a CNT pull
21 down and a C, what pull down?

22 MR. MILLS: CB, just --

23 REPORTER: CB pull down.

24 BY MR. MILLS:

25 Q. And to be fair, Dr. Vargas, what you're saying

1 is, even though figure 3 doesn't mention figure 1, you
2 are inferring that when it says, "Pull down" that that
3 refers to the same process that's described in figure
4 1A; is that fair?

5 A. Yes.

6 MR. COLSHER: Objection to form.

7 BY MR. MILLS:

8 Q. Okay. So in the SILAC experiment,
9 mechanically, it's your opinion that things are working
10 the same that we discussed before when we were talking
11 about figure 1A; is that correct?

12 A. Could you be more specific?

13 Q. Sure. So remember we were talking about
14 there's two Eppendorf tubes, one for CNTs and one for
15 CBs. Do you recall that?

16 A. Yes.

17 Q. So for the SILAC experiment in Cai, we -- with
18 respect to pull down, we have two Eppendorf tubes; is
19 that correct?

20 A. Yes.

21 Q. Everything that we said before about figure 1,
22 about, like, one population of particle type in each
23 tube and not the other population of particle type in
24 that tube, that's still correct in figure 3?

25 A. Yes.

1 Q. Okay. And the discussion about when you
2 separate the subset of particles from the lysate, that
3 subset of particles has the corona from that particle
4 type, that's still the same in figure 3; correct?

5 A. Yes.

6 Q. Okay. And the same thing about the particles
7 are being pulled out of the vial leaving the proteins
8 that were eluted from that particular particle type in
9 the vial or the protein, that's also still true, to
10 paraphrase; is that what you're saying?

11 MR. COLSHER: Objection, form.

12 A. That general concept, yes. I don't know
13 specifically if the particles were removed from the vial
14 or the proteins were removed and placed in a fresh one,
15 but generally speaking, the two were separated from one
16 another.

17 BY MR. MILLS:

18 Q. Okay. So the reason that I'm asking about
19 this is, there's a p[oint in time where there's a mix in
20 the workflow in figure 3. Do you see that?

21 A. Yes.

22 Q. When we have that mix, by that time, we no
23 longer are -- we're not mixing together the particles,
24 we're just mixing together proteins that have already
25 been desorbed or eluted from the particles; is that

1 correct?

2 A. Correct.

3 Q. Okay. Great. That's what I wanted to make
4 sure I understood.

5 And then we talked about the SDS-PAGE earlier,
6 and what you said before is still correct, that when we
7 take that mixture of proteins that are -- these proteins
8 are free of the particles already when we load them onto
9 the SDS-PAGE gel; is that correct?

10 MR. COLSHER: Objection to form.

11 A. Yes, I believe so.

12 BY MR. MILLS:

13 Q. Okay.

14 REPORTER: And clarification. You said
15 SDS-PAGE gel, is that what you said?

16 MR. MILLS: Yes.

17 REPORTER: Okay, go ahead. Excuse me.

18 BY MR. MILLS:

19 Q. Okay. So now my question is about what you
20 identify as the biological sample, okay?

21 A. Yes.

22 Q. Do you have that in mind what you've
23 identified as the biological sample?

24 A. Yes.

25 Q. Okay. So that line that says, "Mix." Do you

1 see that in --

2 A. Yes.

3 Q. Is the mix the biological sample as you
4 interpret it?

5 MR. COLSHER: Objection to form.

6 A. The mix is the three different lysates. I
7 would identify the lysate as the biological sample.

8 BY MR. MILLS:

9 Q. Okay. So the three different lysates are the
10 biological sample, but the mix is not biological sample.
11 Is that what you said?

12 A. The mix contains the biological sample or
13 the -- excuse me.

14 The mix derived from the biological sample,
15 but the biological sample itself is the HeLa cell
16 lysate.

17 Q. Okay. So just to make sure I'm understanding
18 correctly, so you mentioned there's three petri dishes;
19 right?

20 A. Yes.

21 Q. Okay. So in each petri dish, we have a
22 population of HeLa cells; is that correct?

23 A. Yes.

24 Q. And those three populations of HeLa cells are
25 independently cultured in that petri dish; is that

1 correct?

2 A. Yes.

3 Q. The culturing conditions as between the light,
4 medium, and heavy are different with respect to the
5 SILAC labeling; is that correct?

6 A. Correct.

7 REPORTER: To the SILAC what?

8 MR. MILLS: SILAC labeling.

9 REPORTER: Labeling, is that what you said?

10 MR. MILLS: Yeah.

11 REPORTER: Thank you. Go ahead.

12 BY MR. MILLS:

13 Q. Okay. So with respect to the heavy population
14 of HeLa cells, there we're putting it in the mix
15 proteins that had bound to the CB, but which have now
16 been eluted from the CB mixture. Do we have that
17 correct?

18 MR. COLSHER: Objection to form.

19 A. Yes.

20 BY MR. MILLS:

21 Q. The same is true with respect to the medium
22 population of the HeLa cells that the proteins that
23 bound to CNTs are added into the mix, but without the
24 CNTs; is that correct?

25 A. Yes.

1 Q. Okay. And then you're saying that that mix
2 also contains proteins from a -- the third population of
3 HeLa cells that is the light population of HeLa cells;
4 is that correct?

5 A. Yes.

6 MR. COLSHER: Objection to form.

7 BY MR. MILLS:

8 Q. Okay. The light population of HeLa cells
9 never has particles in it; correct?

10 A. Correct.

11 Q. Okay. So when we're talking about the mix, we
12 have proteins from three populations of HeLa cells, but
13 we don't have any particles in the mix; is that correct?

14 A. That's correct.

15 Q. And that particle-free mixture of proteins
16 from three populations of HeLa cells, that's what we're
17 loading onto the SDS-PAGE gel; is that correct?

18 A. Yes.

19 Q. Okay. And then that is what we're
20 subsequently analyzing using mass spec in Cai; is that
21 correct?

22 A. Yes.

23 REPORTER: Using what? Did you say, aspec and
24 cotton?

25 MS. MILLS: Mass spec in Cai.

1 REPORTER: Mass spec in Cai, M-A-S-S, S-P-E-C,
2 and C-A-I. Okay, go ahead.

3 MR. MILLS: Yes. Okay. That's all right. I
4 got to find my place, so if you have any other spellings
5 you want to check with this us?

6 REPORTER: Coomassie blue.

7 MR. MILLS: Can you help her, Dr. Vargas, with
8 that one? I don't know if I can do that one.

9 WITNESS: Sure.

10 BY MR. MILLS:

11 Q. The petri dish and culture, you said that the
12 cells are cultured in a petri dish. So is that -- I've
13 seen the term invitro. So this is invitro culturing of
14 the immortalized cell line; is that correct?

15 A. Yes. I think generally speaking, all cell
16 culture is done invitro, that can be on many cell types.
17 In this case, HeLa cells are the type of cells being
18 cultured.

19 Q. Okay. Great. Thank you. Okay.

20 I want to ask you about the mass spec results
21 from the proteins in the mix. I think I'm going to
22 go -- we'll leave that. We can just make figure 3 big.
23 I don't know if we need figure 1 right now. If you need
24 it, of course, we can bring it back up. I'm just trying
25 to make things large enough that you can see it easily.

1 So I think I can help with this if I find the right
2 paragraph in that page.

3 So go -- take a look at paragraphs 225 through
4 229 of your declaration.

5 A. (Complies) Did you say 225 through 229?

6 Q. Yes. My first question is, paragraphs 225
7 through 229 of your declaration are where you address
8 step C of the independent claim; correct?

9 A. Correct.

10 Q. And looking at paragraph 229. Here you have a
11 discussion of -- where you're citing page 587. Do you
12 see your citation of page 587 of Cai, paragraph --

13 A. Yes.

14 Q. Okay. And then further down in the paragraph
15 you say your very last sentence, you say "A POSA would
16 have understood that the" --

17 REPORTER: Hold on. Can't hear you. Okay.
18 Jad, I just -- I can't hear you when you talk down that
19 way.

20 You say opposed, was that the first word?

21 MR. MILLS: POSA, P-O-S-A.

22 BY MR. MILLS:

23 Q. In your declaration, you say that "A POSA
24 would've understood that the emPAI values of detected
25 proteins disclosed by Cai that span from 0.02 to 2254683

1 are relative concentration ranges that are at least six
2 orders of magnitude." Do you see that?

3 A. Yes.

4 Q. Okay. And for that proposition you cite
5 Exhibit 1005 at pages 12 to 17 identified with
6 parentheticals as table S2?

7 A. Yes.

8 Q. Okay. We have the same issue here that we did
9 for the other references, right, where it's not that
10 those numbers show up on all of those pages, but they
11 show up somewhere in that page range. Do you agree?

12 A. Yes.

13 MR. COLSHER: Objection to form.

14 BY MR. MILLS:

15 Q. Okay. So we're going to do the same thing
16 that we did before. And if it's okay with you, we'll
17 try and do it the easy way. And so the first thing
18 we'll do is, we will add to the chat, Exhibit 2007. And
19 then we'll put that up on the screen. We'll take down
20 3A for now.

21 MR. MILLS: Counsel, you should have Exhibit
22 2007 in the chat now.

23 MR. COLSHER: I do.

24 BY MR. MILLS:

25 Q. So we're going to pull up corresponding page

1 in Exhibit 1005. In the meantime, if you can just take
2 a moment to familiarize yourself with Exhibit 2007. I
3 will represent to you that this is intended to summarize
4 what we suspect is where you got this values from in
5 your declaration. But we want you to confirm that.

6 So on the top left-hand side of Exhibit 2007,
7 there's a thumbnail that says, "Page 12, Exhibit 2005."
8 Do you see that?

9 A. Yes.

10 Q. And on the left-hand side of the screen we put
11 up Exhibit 1005 and we've gone to page 12. Do you see
12 that?

13 A. Yes.

14 Q. We're going to go ahead and zoom in Exhibit
15 1005 so that we can see the area of the exhibit that is
16 highlighted in red in Exhibit 2007.

17 And Garrett is going to slowly scroll from the
18 left to the right, which you have a chance to look at
19 the headings on Exhibit 2007 and satisfy yourself that
20 those headings are accurate representations of what
21 appears on that page in Exhibit 1005.

22 A. Yes, those appear correct.

23 Q. Okay. Great.

24 Now, we're going to go to page 13 of Exhibit
25 1005. We're going to go about three quarters of the way

1 down the page. We're going to zoom in a lot and we're
2 going to highlight an entry there and then we're going
3 to ask you to let us know whether that -- or we'll ask
4 you first just to let us know whether you see the entry
5 that's highlighted.

6 A. I can see the highlight, yes.

7 Q. Great. There we have an ascension number
8 IPI00014898; is that correct?

9 A. Yes.

10 Q. And there's a name that says, "Plectin-1." Do
11 you see that?

12 A. Yes.

13 REPORTER: Please, spell Plectin, P-L?

14 MR. MILLS: P-L-E-C-T-I-N-1.

15 REPORTER: Thank you.

16 BY MR. MILLS:

17 Q. Okay. And then we're going to scroll over and
18 look for the emPAI. And actually we'll have you look
19 at -- just compare all the values there and compare them
20 to the blue box in Exhibit 2007.

21 A. They look to be the same values as what's
22 listed in Exhibit 2007.

23 Q. Do you agree that Exhibit 2007 is an accurate
24 representation of the data for --

25 A. Yes.

1 Q. Yeah. Sorry, let me finish.

2 A. Sorry about that.

3 Q. I want to make sure that I have the right
4 name. So let's go over to where the name was so I can
5 make sure it's -- the print's so small. Yeah. Okay.

6 So you agree that the information in the blue
7 box in Exhibit 2007 is an accurate representation of the
8 data provided by Cai on page 13 of Exhibit 1005, and you
9 relied upon in your declaration for Plectin-1?

10 A. Yes.

11 REPORTER: Hold one. Clarification. What you
12 said, the words that you just said after Exhibit 1005 at
13 the very end.

14 MR. MILLS: Can you read me the first part?

15 (Requested testimony was read.)

16 MR. MILLS: That you relied upon in your
17 declaration for Plectin-1.

18 REPORTER: For Plectin. Okay.

19 A. Yes.

20 BY MR. MILLS:

21 Q. And in particular you're relying on the emPAI
22 value of 0.02; correct?

23 A. Correct.

24 Q. Let's put Exhibit 2008 into the chat and up on
25 the screen.

1 MR. MILLS: Counsel, you have Exhibit 2008
2 now?

3 MR. COLSHER: Yes.

4 BY MR. MILLS:

5 Q. So Exhibit 2008 is intend to be a summary of
6 the information in Cai that you relied upon for the KRT8
7 in your declaration. Do you see that?

8 A. Yes.

9 Q. And here we've taken a thumbnail of page 12 of
10 Exhibit 1005. Do you see that?

11 A. Yes.

12 Q. We're going to zoom in on the screen on page
13 12 of Exhibit 2005, and find the entry for KRT8.

14 REPORTER: KR what?

15 MR. MILLS: KRT8.

16 BY MR. MILLS:

17 Q. We'll highlight that and make it easy for you
18 to see.

19 A. I can see the highlights. Thank you.

20 Q. That's the entry that you relied upon in your
21 declaration; is that correct?

22 A. Yes, I believe so.

23 Q. Let's scroll across so that you can confirm
24 that all of the data in Exhibit 2008 matches exactly
25 what appears on page 12 of Exhibit 1005.

1 A. Thank you. It appears correct.

2 Q. Do you agree, with respect to Exhibit 2008,
3 you do not have any concerns as to accuracy or
4 correctness of Exhibit 2008 as a representation of the
5 information that you're relying on in your declaration
6 for KRT8; correct?

7 A. Based on my review here, no I don't have any
8 reason to think it's inaccurate.

9 Q. The same question for Exhibit 2007.

10 A. Yes, same answer.

11 Q. Back in paragraph 229. We can take this
12 material down for now.

13 Back in paragraph 229 of your declaration,
14 where you cite page 587 of Cai. The first sentence of
15 paragraph 229. Do you see that?

16 A. Yes.

17 Q. And you have two quotations in that sentence
18 that are separated by you interposing the words "and
19 that." Do you see that?

20 A. Yes.

21 Q. Okay. So I'd like you to take a look at page
22 587 of Cai.

23 A. I can see page 587.

24 Q. I want you to find on page 587 of Cai, the two
25 sentences that you're quoting in paragraph 229 of your

1 declaration in the first sentence.

2 A. It is the first sentence of the last paragraph
3 in the left-hand column, "Your MS analysis confirmed
4 that the number of proteins enriched by MWCNT binding is
5 much higher than that enriched by CB."

6 Q. Okay. That's the first sentence of the
7 paragraph on page 587 of Cai; correct?

8 A. Yes.

9 Q. And then your second quote is not -- does not
10 immediately follow that first quote, but there's a
11 sentence in-between; is that fair?

12 A. Yes.

13 Q. Okay. If you could go ahead -- I want you to
14 just read the content of that page, starting with this
15 first sentence that you quoted and continuing on until
16 the second sentence that you quoted. I just want to
17 have everything together in context. If you can read
18 that out loud, please?

19 A. Out loud?

20 Q. Yes.

21 A. "Our MS analysis confirmed that the number of
22 proteins enriched by W --

23 REPORTER: Hey, hold on. Just read slow.

24 WITNESS: Sorry.

25 REPORTER: You said, "Our MS analysis

1 confirmed" what?

2 THE WITNESS: -- "that the number of
3 proteins" --

4 REPORTER: Okay.

5 THE WITNESS: -- "enriched by MWCNT binding is
6 much higher than that enriched by CB." That's Charlie
7 Bravo, the abbreviation, "(Figure 3, DNE) an examination
8 of the SILAC ratio of each quantified protein and its
9 empirical peptide abundance index (emPAI) a
10 semi-quantitative indication that the overall abundance
11 of a protein in the mixture reveals no strong
12 correlation between the MWCNT and CB binding
13 efficiencies of a protein and its abundance in the
14 lysate (Figure 3, F). The relative abundance of the
15 MWCNT binding proteins spread over eight orders of
16 magnitude."

17 BY MR. MILLS:

18 Q. Thank you. So there's one part of your
19 reading I'm going to quibble with, but I don't mean it
20 as a criticism, I just want to make sure that we get it
21 correct. But that second sentence, on the page it says,
22 "An examination of the SILAC ratio of each quantified
23 protein and its empirical peptide abundance index
24 (emPAI), a semi-quantitative indication of the overall
25 abundance of protein in the mixture." Do you see that?

1 A. Yes.

2 Q. Did I read that correctly?

3 A. Yes.

4 Q. And I believe when you were trying to read it,
5 I believe you said abundance of a protein in the
6 mixture, but if you -- if that -- if I misheard or if
7 you misspoke regardless, it doesn't say, "Abundance of a
8 protein in the mixture." It says, "Abundance of the
9 protein in the mixture." Correct?

10 A. Correct.

11 Q. Okay. You agree that emPAI is a
12 semi-quantitative indication of overall abundance of
13 protein in the mixture; correct?

14 MR. COLSHER: Objection to form.

15 A. Yes.

16 BY MR. MILLER:

17 Q. And when it says, "In the mixture," let's put
18 up figure 3A. Can you tell us what that refers to in
19 figure 3A?

20 MR. COLSHER: Objection, form.

21 A. The -- in figure 3, the mixture that the text
22 likely refers to would be the mixture of proteins in the
23 step labeled mix, from the light, medium, and heavy.
24 Though, I think the broader context also states that the
25 relative abundance, specifically of the MWCNT bound

1 proteins is also referenced in that paragraph, so.

2 BY MR. MILLS:

3 Q. Okay. So it sounds like there's two things to
4 talk about here. I want to take them one at a time.
5 Will you -- I will get to the MWCNT binding proteins in
6 just a moment.

7 But I want to focus first on where it says,
8 "emPAI is a semi-quantitative indication of overall
9 abundance of protein in the mixture." Do you see that
10 sentence in Cai on page 587?

11 A. Yes.

12 Q. And when it says, "In the mixture" in that
13 sentence, it is referring to what in figure 3A is called
14 Mix, M-I-X; correct?

15 MR. COLSHER: Objection to form.

16 A. They don't specifically refer to that portion
17 of that schematic, but I think it's fair to assume that
18 that's the sample they're referring to or the mixture
19 they're referring to.

20 BY MR. MILLS:

21 Q. That's how you understand it; correct?

22 A. Yes.

23 Q. Okay. And now you wanted to talk about the
24 relative abundance of the MWCNT binding proteins;
25 correct?

1 A. Yes.

2 Q. Okay. So when it says, "Abundance of MWCNT
3 binding proteins," those -- that's limiting the mixture
4 to the proteins that bound MWCNTs; correct?

5 A. Correct. That's my understanding of that
6 sentence.

7 Q. Okay. Great. Thank you. And -- thank you.
8 Please turn to paragraphs 199 to 206 of your
9 declaration. We can take down figure 3 for now.

10 Have you been able to find those paragraphs?

11 A. Yes.

12 Q. Okay. You agree that paragraphs 199 through
13 206 of your declaration is where you discuss claim
14 element 1A1 claims; correct?

15 A. Correct.

16 REPORTER: Clarification. 1A1?

17 MR. MILLS: Yes.

18 REPORTER: Thank you.

19 BY MR. MILLS:

20 Q. In your discussion of claim element 1A1, you
21 cite Cai figure 1A; correct?

22 A. Yes.

23 Q. That's in paragraph 202?

24 A. Yes.

25 Q. Okay. I didn't see in the section discussion

1 element 1A1. It didn't say -- I didn't find any
2 discussion of Cai figure 3. Do you agree with me?

3 A. Correct. I didn't specifically mention figure
4 3. Though my intention in highlighting figure 1 is to
5 speak to the general schematic workflow of protein
6 corona formation steps.

7 Q. So if I were limited to what you wrote in
8 paragraphs 199 through 206, I would be looking at figure
9 1A, I wouldn't be looking at figure 3, based on what you
10 cited; is that fair?

11 A. Sure, yeah. I think so. The figure is a
12 general schematic of how the experiment is done. And
13 that's the only one. Figure 1A is that. And that's the
14 only figure I referred to in this specific section.

15 Q. So yeah. I guess my question's a little
16 different. My question is, if I'm trying to understand
17 what I'm supposed to look at for elements 1A1 in your
18 declaration, I can see in that section a citation of
19 figure 1, but I can't find a citation there to figure 3;
20 is that fair?

21 MR. COLSHER: Objection to form.

22 A. I don't believe I referenced figure 3 in this
23 particular section, and my use of figure 1 was to
24 illustrate and be representative of the experimental
25 steps taken in the study.

1 BY MR. MILLS:

2 Q. Okay. So now I'm going to ask you about
3 paragraphs 216 through 222.

4 My question is, these paragraphs are where you
5 discuss claim element (1)(a)(3); correct?

6 A. Yes.

7 Q. And in this section you cite the Coomassie
8 blue staining results in Cai figure 1; correct?

9 A. Yes.

10 Q. In this section for claim element (1)(a)(3), I
11 also did not find any discussion of Cai figure 3, do you
12 agree?

13 MR. COLSHER: Objection to form.

14 A. Yes. I didn't specifically refer to figure 3.
15 My intention with referring to figure 1B in this section
16 is to illustrate the concept or one way of demonstrating
17 that they are both overlapping and distinct proteins.

18 BY MR. MILLS:

19 Q. Regardless of your intention. If -- I'm
20 trying to understand your discussion of claim element
21 (1)(a)(3) in your declaration from what's written on the
22 page, what's written on the page tells me to look at Cai
23 figure 1, it does not tell me to look at Cai figure 3;
24 is that fair?

25 MR. COLSHER: Objection to form. Misstates

1 testimony.

2 A. These specific paragraphs refer to figure 1
3 and not figure 3, but again, I used that to be
4 illustrative of the general concept and to provide an
5 example of how the study showed both overlapping and
6 distinct proteins isolated.

7 BY MR. MILLS:

8 Q. And I just want to make sure that I haven't
9 missed something. So in the paragraphs where you
10 discuss claim element (1)(a)(3), there's no citation to
11 figure 3 of Cai that I missed; is that fair?

12 MR. COLSHER: Objection to form.

13 A. I don't think I specifically referred to
14 figure 3. But again, I was using figure 1 as
15 illustrative of this concept, not that it was the only
16 experiment where overlapping and distinct proteins were
17 assessed.

18 BY MR. MILLS:

19 Q. Figure 1 was the figure that you did point to
20 for that element in your declaration; correct?

21 MR. COLSHER: Objection to form.

22 A. I did speak to it, yes. I relied on it and
23 discussed it in these paragraphs, but it is, I think
24 illustrative of the concept. It is not the only place
25 where you could look to find instances of both

1 overlapping and distinct proteins.

2 BY MR. MILLS:

3 Q. So you keep wanting to say that you could have
4 pointed -- or maybe somebody could point to something
5 else. My question is really just about what you did
6 point to. So what you did point to was figure 1, not
7 figure 3 for that claim element; correct?

8 MR. COLSHER: Object to form. Misstates
9 testimony. Asked and answered.

10 A. In this section I pointed to figure 1.

11 BY MR. MILLS:

12 Q. Thank you. Let's take a look at paragraphs
13 223 through 224.

14 This is where you discuss claim element 1B;
15 correct?

16 A. Yes.

17 REPORTER: You said B, B as in boy?

18 MR. MILLS: B as in boy.

19 REPORTER: Go ahead.

20 BY MR. MILLS:

21 Q. In this section where you discuss claim
22 element 1B, you cite Cai figure 1; correct?

23 A. Yes. Cai figure 1 has -- was a nice schematic
24 overview of the general workflow and I used it to
25 illustrate just that.

1 Q. Again, I'm asking about specifically what
2 shows up on the page in this section where you're
3 discussing claim element 1B. I did not find any
4 discussion of Cai figure 3 in that section; is that
5 correct?

6 A. No. This section specifically refers to
7 figure 1. Again, as an illustrative concept to
8 demonstrate the separation of the coronas and the
9 particles.

10 Q. You agree that the section of your declaration
11 discussing claim element 1B discusses Cai figure 1, it
12 does not discuss Cai figure 3; correct?

13 A. It doesn't specifically reference figure 3.
14 Though, again, figure 1 is intended to be a generalized
15 schematic of the workflow used in the study.

16 Q. So you said it doesn't specifically reference
17 figure 3, is there like an indirect -- like is there
18 some code in there that I'm supposed to know when you
19 said figure 1, you really meant figure 3 or is -- are
20 you just saying, "No. It doesn't reference figure 3,
21 but you think, you know, maybe you could have." Is that
22 what you're saying?

23 MR. COLSHER: Objection to form.

24 A. I'm saying that I only specifically referenced
25 figure 1. And it is just one illustration of the

1 concepts related to claim 1B.

2 BY MR. MILLS:

3 Q. You keep saying there isn't a specific
4 reference to figure 3. Is there a reference to --

5 Well, we could go back to where you referenced
6 40 pages of the -- you know?

7 Like, was I supposed to be looking through
8 and -- like, is there something like that where there's
9 a range that you want to point me to or are you just
10 saying you pointed to figure 1 and you didn't point to
11 figure 3?

12 MR. COLSHER: Objection to form. Misstates
13 testimony. Asked and answered.

14 A. I'm saying that I relied upon figure 1 in this
15 section to be illustrative of the concepts used in this
16 study, not that it was the only experiment that relied
17 on this particular workflow.

18 BY MR. MILLS:

19 Q. So I understand that you don't say out loud
20 that there's no other experiments that perform the
21 workflow. My question is, what you did point to is
22 figure 1 and you did not point to figure 3 for that
23 claim; is that correct?

24 MR. COLSHER: Objection to form.

25 A. I only specifically referenced figure 1 to

1 address this particular claim.

2 BY MR. MILLS:

3 Q. Okay. You're adding the word specifically in
4 there, but for this claim element you only cited figure
5 1; is that fair?

6 A. In these paragraphs, yes. I am using figure 1
7 to illustrate the concept.

8 Q. In these paragraphs you did not cite figure 3;
9 correct?

10 A. Correct.

11 Q. Okay. I would like to ask you some questions
12 about toxicity.

13 So are you familiar with CNT toxicity?

14 A. I am not a toxicologist, but generally
15 speaking, I am familiar.

16 MR. COLSHER: Objection to form. Outside the
17 scope.

18 BY MR. MILLS:

19 Q. So I'm going to ask you to take a look at page
20 583 of Cai, Exhibit 1005. So I'm going to direct you to
21 the right-hand column, first paragraph. Maybe two
22 thirds of the way down. So I guess it's the second to
23 the last sentence in the paragraph. It says, "Many
24 invitro studies have indicated that various forms of
25 CNTs can penetrate the plasma membrane of mammalian

1 cells and induce cytotoxicity." Do you see that?

2 A. Yes.

3 REPORTER: Of what cells?

4 MR. MILLS: Mammalian.

5 REPORTER: Oh, mammalian? Okay. And
6 of -- hold on. Of --

7 MR. MILLS: Mammalian cells --

8 REPORTER: Of mammalian cells and induced
9 toxicity?

10 MR. MILLS: Cytotoxicity.

11 REPORTER: Fido toxicity.

12 MR. MILLS: Cyto, C-Y --

13 BY MR. MILLS:

14 Q. And then the next sentence says, "In addition,
15 invitro studies have revealed the involvement of CNT
16 exposure in inflammation epithelioid,
17 E-P-I-T-H-E-L-I-O-I-D, epithelioid granulomas,
18 G-R-A-N-U-L-O-M-A-S." So the full word is epithelioid
19 granulomas. "Fibrosis, and biochemical, and
20 toxicological changes in the lungs." Do you see that
21 sentence?

22 A. Yes.

23 Q. And Cai sites reference 6 for this
24 proposition; correct?

25 A. Yes.

1 Q. Prior to signing your declaration, had you
2 reviewed reference exhibit of Cai?

3 A. I don't believe so.

4 Q. One of the things that Cai teaches us that CNT
5 exposure causes is inflammation. Do you agree?

6 A. Yes.

7 Q. Is it your opinion that Cai is teaching us
8 that inflammation from CNT exposure is a desirable
9 invivo trait?

10 MR. COLSHER: Objection to form.

11 A. Cai's discussion of toxicity in this is for
12 awareness and further study. There's no mention of
13 desirability.

14 BY MR. MILLS:

15 Q. Do you think Cai's ambivalent as to whether
16 inflammation invivo is desirable?

17 MR. COLSHER: Objection to form.

18 A. In general, minimizing toxicity when talking
19 about biological systems tends to be a research aim.

20 BY MR. MILLS:

21 Q. Do you agree that the inflammation caused by
22 CNT is not a desirable trait or nature; correct?

23 MR. COLSHER: Form. Asked and answered.

24 REPORTER: Hold on. Can't hear you.

25 MR. COLSHER: Objection to form. Asked and

1 answered. Sorry.

2 A. Again, I can only speak in generality about
3 toxicity. But generally speaking, minimizing toxicity
4 tends to be a research aim when evaluating nano
5 particles.

6 BY MR. MILLS:

7 Q. Do you know what a epithelioid granuloma is?

8 A. Not specifically.

9 Q. Based on Cai's disclosure, do you think that
10 Cai is telling us with epithelial, granulomas are a
11 positive trait of safety?

12 A. I suspect this is a result of toxicity based
13 on the context, but I don't know specifically.

14 Q. Do you know what fibrosis is?

15 A. It's a term I have heard. I don't know that I
16 could provide you a precise definition.

17 Q. So you agree based on the context in Cai that
18 it's telling us that CNT-induced fibrosis is not a
19 desirable result of CNT exposure; correct?

20 A. Again, in this context, this appears to be,
21 again, another adverse affect related to toxicity
22 concerns.

23 Q. Thank you. I have a very discreet question
24 about Exhibit 1014. But I'm going to point you to
25 what's in your declaration first to make it easy.

1 So it looks like -- I think this is paragraph
2 55 of your declaration. Let's put that up on the
3 screen. I said 55, but I meant 58.

4 REPORTER: Can't hear you. Did you say you
5 meant -- you said 55, but meant 58; correct?

6 MR. MILLS: Yes, that's what I said.

7 BY MR. MILLS:

8 Q. Which is why it's good to put them on the
9 screen so we all know we're looking at the same. Okay.

10 So let's go down a little bit more. There's a
11 block quote in your declaration in paragraph 58. Do you
12 see that?

13 A. Yes.

14 Q. In that block quote you're quoting Exhibit
15 1014 with regard to something called MRM?

16 A. Yes.

17 Q. And in that block quote, Exhibit 1014 has
18 citations to references 39, 36, and 40. Do you see
19 that?

20 A. Yes.

21 Q. So now, I'd like Garrett to bring up Exhibit
22 1014 and we're just going to look at the references
23 list. I think this will be an easy question. So let's
24 zoom in because it is a little bit small.

25 So I'll ask first with respect to reference

1 39. And if it is helpful for you, take a look at
2 paragraph 12 of your declaration.

3 My question is, did you review reference 39
4 from Exhibit 1014 prior to signing your declaration?

5 A. No, I don't believe so.

6 Q. Now, I have the same question for reference
7 36?

8 A. No.

9 Q. And the same question for reference 40?

10 A. No.

11 MR. MILLS: Let's go off the record. Take a
12 five-minute break.

13 (Off the record.)

14 BY MR. MILLS:

15 Q. Dr. Vargas, during this break or any of the
16 other breaks, have you communicated with anyone about
17 this case?

18 A. No.

19 Q. Thank you, Dr. Vargas.

20 MR. MILLS: I have no further questions at
21 this time.

22 E X A M I N A T I O N

23 BY MR. COLSHER

24 Q. All right. Thank you, Dr. Vargas. I'm just
25 going to ask you a couple of questions, okay?

1 A. Okay.

2 Q. And specifically while counsel for the patent
3 owner was talking and it was near the end, and we were
4 talking about the Cai reference, and in particular he
5 asked you some questions about limitation 1A3, this is
6 what we've been referring to it.

7 And to orient that is he highlighted
8 paragraphs 216 through 222 of your declaration. Okay.
9 And so I think we skipped over this, but I just want to
10 point out, do you see paragraph 221 and it's on page 116
11 of Exhibit 1003, which is your declaration.

12 A. Yes.

13 Q. And in what figure are you discussing in
14 paragraph 221?

15 MR. MILLS: Objection to scope.

16 REPORTER: I'm sorry, please repeat that,
17 Dr. Vargas.

18 MR. MILLS: Objection to scope.

19 REPORTER: Okay. And Dr. Vargas, please
20 repeat. I'm sorry. Please repeat your --

21 BY MR. COLSHER:

22 Q. Yes. Let me get a clean question. We'll get
23 a clean exchange and go from there. In paragraph 221 of
24 the declaration, which is one of the paragraphs that
25 counsel was asking you broadly, what figure were you

1 discussing?

2 MR. MILLS: Objection, form, scope.

3 A. In paragraph 221, I'm referring to figure 2.

4 BY MR. COLSHER:

5 Q. Okay. And do you recall being asked some
6 specific questions about paragraph 222 of your report?

7 A. Yes.

8 Q. Okay. So let's go to, it's the third full
9 sentence, which is the first sentence -- first full
10 sentence on paragraph 11 -- sorry -- page 117 of
11 paragraph 222. And it begins, "Cai further discloses
12 that," and you're quoting from MS analysis -- you're
13 quoting from Cai. And it begins, "MS analysis."

14 And then the end of that sentence, there's two
15 quotes, and that is on 587. Do you see that?

16 MR. MILLS: Objection to form and scope.

17 A. Yes, I can see that.

18 BY MR. COLSHER:

19 Q. Okay. Let's go to paragraph -- let's go to
20 page 587, which you talked to extensively with counsel
21 about. And this is in Exhibit 1005, okay?

22 A. I see --

23 Q. And I want to direct you -- okay.

24 A. Sorry, I can see page 587.

25 Q. Okay. And in the first full paragraph on page

1 587 of Exhibit 1005. It's a sentence that begins, "Our
2 MS analysis." And this is something that I believe you
3 talked with counsel about.

4 "Our MS analysis confirmed that the number of
5 proteins enriched by MWCNT-binding is much higher than
6 that enriched CB (figure 3DNE)." Do you see that?

7 A. Yes.

8 MR. MILLS: Objection to form. Objection to
9 scope.

10 BY MR. COLSHER:

11 Q. Thank you. And this paragraph here on page
12 557 is the same paragraph that you're referencing in
13 paragraph 222 of your report; is that correct?

14 MR. COLSHER: Objection to form and scope.

15 A. Yes it is.

16 MR. COLSHER: Thank you. No further
17 questions.

18 MR. MILLS: I have no further questions.

19 (The deposition of Jessica Vargas, Ph.D. was
20 concluded at 2:48 p.m.)

21 (Signature was reserved.)
22
23
24
25

1 STATE OF WASHINGTON)

2) SS.

3 COUNTY OF KING)

4

5 I, the undersigned, declare under penalty of
6 perjury that I have read the foregoing transcript, and
7 I was desirous of making; that the foregoing is a
8 true and correct transcript of my testimony contained
9 therein.

10

11 EXECUTED this _____ day of _____ 2025 at
12 _____, _____.

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JESSICA VARGAS

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Judith A. Robinson, Notary Public
in and for the State of Washington
residing at Seattle.
My Commission expires November 4,
2028.
CCR License #2171

Reference No.: 13068194

Case: Preomics GMBH vs Brigham and Women's Hospital

DECLARATION UNDER PENALTY OF PERJURY

I declare under penalty of perjury that I have read the entire transcript of my Deposition taken in the captioned matter or the same has been read to me, and the same is true and accurate, save and except for changes and/or corrections, if any, as indicated by me on the DEPOSITION ERRATA SHEET hereof, with the understanding that I offer these changes as if still under oath.

Jessica Vargas PH.D.

NOTARIZATION OF CHANGES

(If Required)

Subscribed and sworn to on the _____ day of

_____, 20____ before me,

(Notary Sign)_____

(Print Name) _____ Notary Public,

in and for the State of _____

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