

Transcript of James Naismith, Ph.D.

Date: June 13, 2026
Case: Merck Sharp & Dohme LLC -v- Halozyme Inc. (PTAB)

Planet Depos
Phone: 888.433.3767
Email: transcripts@planetdepos.com
www.planetdepos.com

Halozyme EX2304
Merck v. Halozyme
PGR2025-00046

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MERCK SHARP & DOHME LLC,
Petitioner,

v.

HALOZYME, INC.,
Patent Owner.

Case Nos.: PGR2025-00042 Patent Nos.: 12,037,618
PGR2025-00046 12,091,692
PGR2025-00052 12,264,345

VIDEO DEPOSITION OF JAMES NAISMITH, Ph.D.

Saturday, June 13, 2026
12:41 p.m. (BST)

The Randolph Hotel
Beaumont Street
Oxford, OX1 2LN
United Kingdom

Job No.: 638140
Court Reporter:
Chanelle Malliff, CLR, ACR, QRR2*

A P P E A R A N C E S

FOR THE PETITIONER:

SIDLEY AUSTIN LLP
1501 K Street NW
Washington, DC 20005
(202) 736-8914
By: Jeffrey P. Kushan (In person)
jkushan@sidley.com

Dr. Amy L. Mahan (Via Zoom)
amahan@sidley.com

Chelsea Himes (Via Zoom)
chimes@sidley.com

FOR THE PATENT OWNER: (all via Zoom)

QUINN EMANUEL URQUHART & SULLIVAN LLP
111 Huntington Avenue, Suite 520
Boston, MA 02199
(617) 712-7100
By: Lauren Martin
laurenmartin@quinnemanuel.com

Elliot Choi
elliotchoi@quinnemanuel.com

Zach Summers
zachsummers@quinnemanuel.com

A P P E A R A N C E S

(continued)

FOR THE PATENT OWNER: (all via Zoom)

STERNE, KESSLER, GOLDSTEIN & FOX PLLC
1101 K Street NW, 10th Floor
Washington DC 20005
(202) 772-8508
By: Eldora L. Ellison
eellison@sternekessler.com

Tray Powers
tpowers@sternekessler.com

Also Present:

(In person) Wendy Viner,
Videographer, Planet Depos

(Via Zoom) Josh Mack,
Executive Director, Patent Litigation
Counsel at Halozyme, Inc.

(Via Zoom) Aubrey Haddach, Halozyme

C O N T E N T S

Deponent Page

DR. JAMES NAISMITH (sworn) 6

Examination by Ms. Martin 6

****

E X H I B I T I N D E X
(Previously marked)

No. Description Page

Exhibit 1133 Naismith Declaration 10
PGR2025-00004, US Patent No. 12,018,298

Exhibit 1133 Naismith Declaration 11
PGR2025-00046, US Patent No. 12,091,692

Exhibit 1001 US Patent No. 12,018,298, ...12
Date of Patent: June 25, 2024

Exhibit 1001 US Patent No. 12,091,692, ...13
Date of Patent: Sep. 17, 2024

Exhibit 1026 Common disclosure 59

Saturday, June 13, 2026

P R O C E E D I N G S

(On the record at 12:41 p.m.)

VIDEOGRAPHER: Here begins media 1 in the videotaped deposition Dr. James Naismith, in the matter of Merck Sharp & Dohme LLC v Halozyme, Inc. in the United States Patent and Trademark Office, case numbers PGR2025-0042, PGR2025-0046 and PGR2025-0052. 12:41:07 12:41:09 12:41:11 12:41:16 12:41:19

Today's date is June 13, 2026 and the time is 12:41 p.m. This video deposition is taking place at The Randolph Hotel, Beaumont Street, Oxford, UK. 12:41:37 12:41:41 12:41:46

The videographer today is Wendy Viner on behalf of Planet Depos. 12:41:51 12:41:54

Could I ask counsel to please identify themselves and state whom they represent, beginning with the attorney in the room, followed by our Zoom participants. 12:41:56 12:41:57 12:41:59 12:42:03

MR. KUSHAN: Jeff Kushan from Sidley Austin, representing Merck Sharp & Dohme LLC. 12:42:09 12:42:11

MS. MARTIN: Lauren Martin from Quinn Emanuel, representing Halozyme. 12:42:21 12:42:22

MR. KUSHAN: Can we also -- you can probably 12:42:29

get all the names of the rest of the people attending from the Zoom. 12:42:31 12:42:33

VIDEOGRAPHER: Of course. No worries. 12:42:35

Our court reporter today is Chanelle Malliff on behalf of Planet Depos. 12:42:36 12:42:38

Will the court reporter please swear in the witness and we can proceed. 12:42:40 12:42:42

DR. JAMES NAISMITH 12:42:45

having duly sworn to tell the truth, 12:42:55

was examined and testified as follows: 12:42:55

EXAMINATION 12:43:01

BY MS. MARTIN: 12:43:01

Q. Good afternoon, Dr. Naismith. 12:43:03

A. Good afternoon. I realize it's very early in the morning for you, so thank you for being flexible. 12:43:05 12:43:06

Q. No worries. Thank you for making yourself available on a Saturday. We really appreciate that. 12:43:09 12:43:11

All right, so under the Patent Trial and Appeal Board standing order in this matter I'm obligated to give you the following instruction, which I'm going to read: 12:43:17 12:43:20 12:43:23 12:43:26

"You must ask me, the deposing counsel, 12:43:29

rather than your own counsel for any clarifications, definitions or explanations of any words, questions or documents presented during the cross-examination." 12:43:31 12:43:34 12:43:38

Do you understand that instruction? 12:43:44

A. Yes, I do. 12:43:45

Q. Okay, great. Who is present with you in the room right now? 12:43:46 12:43:49

A. So opposite me is the videographer. Opposite and to the right is the court reporter. And to my right, right of my eye line, is Mr. Kushan. 12:43:50 12:43:53 12:43:57

Q. Is there anything open on your computer besides Zoom? 12:44:05 12:44:06

A. It isn't my computer that is being used here. My computer is in my bag, not here. 12:44:07 12:44:09

Q. Okay. So you were provided a computer by the -- by somebody at Planet Depos? 12:44:13 12:44:16

A. I'm looking to check. It's their computer but yeah, they say yes it's their computer. 12:44:22 12:44:24

Q. Oh okay, got it. Got it. So did you bring any materials with you besides the exhibits that we've talked about? 12:44:26 12:44:36 12:44:38

A. No. 12:44:44

Q. Have you marked anything on any of those exhibits? 12:44:45 12:44:46

A. No. They were provided to me this morning, brought in by Mr. Kushan, so I haven't touched them. 12:44:47 12:44:50

Q. Okay. What did you do to prepare for the deposition today? 12:44:55 12:44:57

A. I reread my declarations in the three matters. I looked back through the patents, the disclosure -- the common disclosure. I looked again at the declarations, particularly from Hecht, Simpson and Petsko. And I looked again through my deposition -- um, and scanned through my own deposition and my previous declarations for I think matter 4 but I would say "the '600 patent". So if that's the wrong thing, my apologies. 12:45:00 12:45:04 12:45:11 12:45:15 12:45:20 12:45:25 12:45:28 12:45:31 12:45:36

Q. Who did - did you meet with anyone to prepare for this deposition? 12:45:42 12:45:45

A. Yes, I did. 12:45:46

Q. Who did you meet with? 12:45:47

A. I met with Mr. Kushan and, I forget his second name but Leif and Amy from Sidley Austin. 12:45:48 12:45:53

Q. For how long did you meet with them? 12:46:00

A. Mr. Kushan and I spent about five hours yesterday evening in Oxford with Amy -- and I forget -- Mahan I think online, and I can't remember Leif's second name but they were online for most but not all of that time. 12:46:03 12:46:06 12:46:10 12:46:14 12:46:17

Q. And was that the only meeting that you had with counsel to prepare for this deposition? 12:46:19 12:46:20

A. No, we'd had -- when I was told there would be -- there would be a deposition in this matter, we had a couple of Zoom meetings online to discuss what timing arrangements and also what the scope would be, so where I should focus my attention. 12:46:23 12:46:26 12:46:29 12:46:36 12:46:40

MR. KUSHAN: I'm gonna counsel the witness to not reveal any attorney-client privileged communications. 12:46:46 12:46:47 12:46:51

BY MS. MARTIN: 12:46:55

Q. Dr. Naismith, are you aware that the board has issued final written decisions in some of the PGRs? 12:46:55 12:46:57 12:47:02

A. Yes, I'm aware that there is a final judgment, yes. 12:47:02 12:47:06

Q. Have you read any of the final written 12:47:10

decisions? 12:47:12

A. I read the last page, I think. I haven't 12:47:13

read through the document, no. 12:47:16

Q. Did you consider the contents of the final 12:47:24

written decisions in preparing your declarations in 12:47:26

the 42, 46 and 52 matters? 12:47:30

A. No, I did not. 12:47:34

Q. Did you consider the contents of the final 12:47:37

written decisions in preparing for your deposition 12:47:40

today? 12:47:42

A. No, I did not. 12:47:43

Q. Can you please find the matter 4 declaration, 12:47:59

which was in the box labeled Exhibit 1 for the '298 12:48:05

patent. 12:48:12

(Previously marked Exhibit 1133 identified.) 12:48:13

A. Of course. If you give me just a second. 12:48:13

VC TECHNICIAN: Would you like me to pull 12:48:22

that up on the screen, Ms. Martin? 12:48:23

MS. MARTIN: Yeah, that would be great. 12:48:26

A. So I have, just to check we're on the same 12:48:27

one, PGR2025-00004, US Patent ends in '298; is that 12:48:29

correct? 12:48:36

BY MS. MARTIN: 12:48:39

Q. Yes, that's correct. Okay, so please keep 12:48:39

that handy. And then also please find the 12:48:41

declaration for matter 46, which is for the '692 12:48:52

patent. And that should be one of the ones that you 12:48:57

brought with you. 12:49:00

(Reporter clarification.) 12:49:24

MS. MARTIN: So the first document, the 12:49:26

declaration from matter 4, is Exhibit 1133. 12:49:27

So all of the Naismith declarations are 12:49:31

Exhibit 1133 and their respective matters. 12:49:33

So then the second document is the 12:49:41

declaration from matter 46, so that's also 12:49:44

Exhibit 1133 in the matter 46 case. 12:49:48

COURT REPORTER: Is the technician 12:50:05

electronically marking them or are they already 12:50:06

marked? 12:50:09

MR. KUSHAN: They're already marked. 12:50:10

COURT REPORTER: They're already marked. 12:50:11

Okay. 12:50:11

MS. MARTIN: They're already marked. 12:50:12

(Previously marked Exhibit 1133 identified.) 12:50:13

THE WITNESS: So I see I need to just correct myself, which was when I looked at this case -- I don't know the case number but it was the '600 patent and this is the '298. But I now understand the declarations are essentially the same. 12:50:14 12:50:15 12:50:17 12:50:19 12:50:22

BY MS. MARTIN: 12:50:23

Q. Yeah, yeah, I think the '600 was for -- I think was matter 3. 12:50:24 12:50:25

A. Yeah, it was just so that I didn't -- okay. 12:50:26

Q. Understood. Okay, so do you have your matter 46 declaration? 12:50:31 12:50:37

A. Yes. 12:50:38

Q. Okay. And then for ease of reference here, if you could also pull out the '298 patent, which was Exhibit 2 in the box, and that's Exhibit 1001 from matter 4. 12:50:40 12:50:46 12:50:51 12:50:56

(Previously marked Exhibit 1001 identified.) 12:51:11

A. So there are three copies. Will I give one to Mr. Kushan? 12:51:17 12:51:19

Q. Sure. Thank you. 12:51:20

A. So this is what is in the box and it ends in '298; is that correct? 12:51:23 12:51:26

Q. Yes. Yes, perfect. And then if you want to also get the '692 patent, which you should have in the materials that Mr. Kushan provided. And that's Exhibit 1001 from matter 46. So do you have all of those? 12:51:29 12:51:36 12:51:41 12:51:43 12:52:08

(Previously marked Exhibit 1001 identified.) 12:52:08

A. I have four things in front of me. 12:52:09

Q. Perfect. Okay, so can you please turn in the matter 46 declaration to paragraph 90? 12:52:11 12:52:22

VC TECHNICIAN: Ms. Martin, do you have a page number, by any chance? 12:52:38 12:52:40

THE WITNESS: It begins on page 57 in my copy in front of me, "Defined Terms ..." headed. 12:52:56 12:53:00

BY MS. MARTIN: 12:53:18

Q. Dr. Naismith, do you have paragraph 90? 12:53:18

A. Yes, I do. 12:53:22

Q. All right. The terms "PH20" and "modified PH20 polypeptide" are defined in the common disclosure, correct? 12:53:23 12:53:30 12:53:34

A. That's ... I said that's right. The common disclosure defines these two terms. 12:53:35 12:53:38

Q. And if you then continue on, I think under 12:53:43

paragraph 90 on page 58 in your declaration, you excerpted the paragraphs in the common disclosure that include those definitions, is that right? 12:53:47 12:53:52 12:53:57

A. That's correct, I've highlighted two long paragraphs where those are talked about and defined. 12:54:01 12:54:03

Q. And then if you go to paragraph 91, which is on page 59. You said: 12:54:09 12:54:12

"Dr. Simpson testified at her deposition that the first sentence in each paragraph above (highlighted in yellow) is the definition of each term." 12:54:18 12:54:21 12:54:22 12:54:25

Is that right? 12:54:27

A. That's what Dr. Simpson stated, I think in her deposition, and I've excerpted the relevant portion from the deposition. 12:54:27 12:54:30 12:54:33

Q. Okay. Can you then go back to page 58 that has the portions from the common disclosure? 12:54:42 12:54:45

A. Yes, I have. 12:54:48

Q. So do you agree with Dr. Simpson that the first sentence in each paragraph is the definition of each of the terms? 12:54:49 12:54:51 12:54:57

A. It's not a complete definition. I think you 12:55:00

have to read the whole paragraph to get the complete definition, but the first definition, the first sentence, captures essential features of it. That it is: 12:55:02 12:55:04 12:55:08 12:55:12

"... PH20 ..." 12:55:14

When it's used in the patent: 12:55:14

"... refers to a type of hyaluronidase that occurs in sperm and is neutral-active." 12:55:15 12:55:19 12:55:21

But there are important other parts of the definition spelt out in the paragraph. 12:55:22 12:55:24

Q. Okay, so are you saying that the complete paragraph for each of those terms is the definition? 12:55:30 12:55:33

A. So I said that you read -- the first sentence is key but you have to read -- you read through the full paragraph and it helps you clarify the definition of what it is being used in the common disclosure. 12:55:36 12:55:39 12:55:42 12:55:44 12:55:47

Q. So then can you turn to paragraph 100, which is on pages 65 to 66? 12:55:51 12:55:54

A. I'm on paragraph 100. 12:56:09

Q. Okay. And then below paragraph 100, on 12:56:13

page 66, you've excerpted again that paragraph from the specification that has the definition for modified PH20 polypeptide? 12:56:17 12:56:21 12:56:25

A. I've excerpted part of that paragraph, that's correct. 12:56:28 12:56:31

Q. And you've highlighted the second sentence in that paragraph, that starts: 12:56:43 12:56:46

"A modified PH20 polypeptide can have up to [100](sic) amino acid replacements ..." 12:56:48 12:56:52 12:56:55

Is that right? 12:56:56

A. In my declaration that has a yellow highlighter for that sentence. 12:56:58 12:57:01

Q. All right, so let's turn back to paragraph 100. Perfect. Do you see the second sentence in paragraph 100? 12:57:10 12:57:11 12:57:19

A. It begins: 12:57:22

"After defining the phrase ..." 12:57:22

Q. Yes. So you say: 12:57:25

"After defining the phrase 'modified PH20 polypeptide,' the common disclosure explains that modified PH20 proteins 12:57:30 12:57:34 12:57:37

'can have up to 150 amino acid replacements, so long as the resulting modified PH20 polypeptide exhibits hyaluronidase activity' (below)." Correct? 12:57:38 12:57:43 12:57:45 12:57:48 12:57:51

A. Yeah, those are the words that are written in my declaration, yes. 12:57:51 12:57:56

Q. So when you wrote the declaration, you stated that the sentence that starts -- the sentence that says: 12:58:00 12:58:04 12:58:10

"A modified PH20 polypeptide can have up to [100] (sic) amino acid replacements ..." 12:58:10 12:58:14

That sentence appears after the phrase "modified PH20 polypeptide" is defined; correct? 12:58:16 12:58:21

A. When you say "after" in terms of the paragraph that is excerpted the sentence follows -- one follows the other, is that what you mean? When you -- 12:58:26 12:58:28 12:58:32 12:58:35

Q. Well you use -- 12:58:35

A. -- say "after", I want to check. 12:58:35

Q. Sorry. I don't want to talk over you. 12:58:41

A. My apologies. My question was, when you say 12:58:43

"after", so the paragraph I've excerpted begins: 12:58:46

"As used herein, 'modified PH20 12:58:50

polypeptide' ... refers to a PH20 12:58:54

polypeptide that contains at least ..." 12:58:57

Blah, blah, blah, and then it goes on to 12:59:00

further define. But you need to read the entire 12:59:02

paragraph to understand the definition that's being 12:59:05

applied here. 12:59:07

Q. So I'm asking you about the phrase that you 12:59:11

used in your declaration, which is after defining the 12:59:14

phrase "modified PH20 polypeptide"? 12:59:18

A. Yes, so that's right, so the first sentence 12:59:22

begins that definition, which is the first 12:59:25

definition, and then you get this additional sentence 12:59:28

that helps you understand that definition and 12:59:30

clari -- so you're clear in your mind what it says. 12:59:32

Q. So I think we can all agree that the first 12:59:38

sentence: 12:59:40

"As used herein, 'modified PH20 polypeptide' ..." 12:59:42

Is the definition, right? 12:59:44

MR. KUSHAN: Objection, foundation. 12:59:47

THE WITNESS: No, I don't agree with that. 12:59:49

I think you have to, as I've said, read the entire paragraph in this case and it clearly tells you that -- it tells you at the first sentence it begins what it's talking about is a concept of modified polypeptide and then it gives you a clear limitation to that, which says it has "up to 150 amino acid replacements, so long as [it] ... exhibits hyaluronidase activity". And it further begins to tell you what the other amino acid replacements are and can include any one or more of those modifications or at least one replacement. 12:59:50 12:59:54 12:59:58 13:00:02 13:00:05 13:00:09 13:00:12 13:00:15 13:00:17 13:00:23 13:00:26

BY MS. MARTIN: 13:00:27

Q. So in your declaration when you said that that sentence about the 150 replacements comes after the definition, you were wrong, right? 13:00:34 13:00:35 13:00:38

A. No, I don't think I was wrong. I said that that sentence is the beginning of the definition so there is a definition but you have to read the whole paragraph to understand what the full meaning is. That's why I have excerpted the whole paragraph. 13:00:43 13:00:46 13:00:49 13:00:51 13:00:53

Q. So let's keep page 66 handy but then if you can go to paragraph 109, which is on page 74? 13:01:06 13:01:09

A. Yes. 13:01:26

Q. You say in paragraph 109: 13:01:38

"I recognize that the definition of 13:01:40

'modified PH20 polypeptide' in the 13:01:42

common disclosure considered in 13:01:46

isolation does not explicitly state that 13:01:47

each modified PH20 polypeptide is 13:01:51

enzymatically active." 13:01:54

Correct? 13:01:57

A. That's correct, that's what the sentence 13:01:58

says. 13:02:01

Q. So in paragraph 109 you state that the term 13:02:07

"modified PH20 polypeptide" is not defined to require 13:02:10

enzymatic activity; correct? 13:02:15

MR. KUSHAN: Objection, foundation. 13:02:19

THE WITNESS: No, that's not what I state in 13:02:21

that paragraph. I said that it does not, when 13:02:23

considered in isolation does not explicitly state 13:02:25

that each modified PH20 polypeptide is enzymatically 13:02:28

active. And I did not base my opinion solely on 13:02:35

that. Instead, I pointed out that only when 13:02:38

I considered all the language in certain claims, and 13:02:40

then in conjunction with the common disclosure I would have considered that the claims as a whole define a set of modified PH20s that exhibit hyaluronidase activity. 13:02:42 13:02:45 13:02:49 13:02:54

What the point I make in paragraph 109 is that the phrase in isolation does not explicitly state enzymatically active. I didn't base my opinion on a single isolated phrase. 13:02:55 13:02:57 13:03:02 13:03:06

Q. Well, so you say the definition of modified PH20 polypeptide considered in isolation. So when you said the definition of modified PH20 polypeptide in paragraph 109, what language from the common disclosure were you referring to? 13:03:14 13:03:17 13:03:20 13:03:23 13:03:28

A. So the phrase "modified PH20 polypeptide" appears multiple times in the common disclosure. My point was that I didn't use simply that phrase on its own in isolation to form my -- how I have read and understood the patent. I set out the reasons for my -- how I have approached this analysis in the previous paragraphs and I said that it was important that you had to read the entire common disclosure. 13:03:31 13:03:34 13:03:40 13:03:43 13:03:47 13:03:50 13:03:53 13:03:56

Q. That was not my question. My question was, 13:04:01

when you used the word "definition" in paragraph 109, what portion -- what portion of the paragraph that has the definition of modified PH20 were you talking about when you said -- when you used the word "definition" in paragraph 109? 13:04:03 13:04:09 13:04:11 13:04:15 13:04:18

MR. KUSHAN: Objection to form. 13:04:20

THE WITNESS: So what I'm talking about is the phrase in isolation -- a definition in isolation of modified PH20 polypeptide occurs in the common disclosure in different places. But on its own, just that isolated phrase, doesn't, how I understand the requirement for enzyme activity, that I didn't base my opinion simply in that words "modified PH20 polypeptide". 13:04:25 13:04:26 13:04:29 13:04:34 13:04:38 13:04:42 13:04:45 13:04:50

BY MS. MARTIN: 13:04:54

Q. Well, your sentence doesn't say -- that's not what the sentence says. Do you agree with the sentence that you wrote at the start of paragraph 109: 13:04:54 13:04:57 13:05:01 13:05:03

"... that the definition of 'modified PH20 polypeptide' in the common disclosure considered in isolation does not explicitly state that each 13:05:04 13:05:07 13:05:11

modified PH20 polypeptide is enzymatically active"? 13:05:14

A. Yes, I agreed with that, I've just said so. 13:05:18

That I agreed that in isolation that that phrase 13:05:20

where it is used doesn't on its own define -- 13:05:23

doesn't -- sorry, doesn't explicitly state that each 13:05:27

is enzymatically active. 13:05:29

Q. And so you agree that the definition of 13:05:33

modified PH20 polypeptide in the common disclosure 13:05:36

does not explicitly state that the modified PH20 13:05:41

polypeptides are enzymatically active? 13:05:45

MR. KUSHAN: Objection to foundation. 13:05:48

THE WITNESS: No, my point is that in 13:05:50

isolation if you just cap just that isolated phrase, 13:05:53

it doesn't itself explicitly state that. But 13:05:57

I didn't use the isolated phrase to make that 13:06:00

definition. I said that you had -- 13:06:04

BY MS. MARTIN: 13:06:07

Q. So you -- 13:06:07

A. Sorry my -- sorry, not definition, 13:06:09

understanding. So the definition on its own 13:06:11

"modified PH20 polypeptide" in isolation is not how 13:06:12

I understood and read that; that you have to read the 13:06:16

common disclosure to fully understand what is being referred to with the meaning modified PH20 polypeptides, and having done that I conclude that they are directed to active forms of the protein. 13:06:20 13:06:24 13:06:29 13:06:32

Q. Can we turn back to page 66? 13:06:38

A. Yes. 13:06:43

Q. And do you agree that the first sentence: 13:06:55

"As used herein, 'modified PH20 polypeptide' ... refers to a PH20 polypeptide that contains at least one amino acid modification, such as at least one amino acid replacement as described herein, in its sequence of amino acids compared to a reference unmodified PH20 polypeptide." 13:06:58 13:07:02 13:07:04 13:07:07 13:07:10 13:07:12 13:07:15 13:07:18

Do you agree that that statement from the common disclosure defining modified PH20 polypeptide does not include any limitation regarding activity? 13:07:20 13:07:22 13:07:26

MR. KUSHAN: Objection, foundation. 13:07:31

THE WITNESS: So what my understanding is, as I read it and in my opinion, is that that in isolation -- and I didn't rely on that sentence in 13:07:35 13:07:37 13:07:39

isolation -- that sentence in isolation does not, as you say, state that enzymatic activity is required in isolation. But my understanding and my opinion is not based solely on that sentence in isolation. 13:07:44 13:07:48 13:07:53 13:07:56

BY MS. MARTIN: 13:08:06

Q. Can you please turn to paragraph 104? I think it's on the next page, page 68. 13:08:06 13:08:10

A. Yes, I am there. 13:08:14

Q. And in paragraph 104 you state, in the third sentence, you state that: 13:08:19 13:08:33

"PH20 is expressly defined in the common disclosure to ..." 13:08:35 13:08:41

Sorry, it's moving on the screen. Strike that. Let me start it again. Can you scroll back up? 13:08:48 13:08:48

A. That's why I use paper and I'm not very good with the screen. My apologies. 13:08:52 13:08:55

Q. Fine. Okay, let me start again. 13:08:57

"PH20 is expressly defined in the common disclosure to have a form a POSA would understand is folded." 13:08:59 13:09:03 13:09:06

Correct? 13:09:06

A. That's what the sentence says, yes. 13:09:08

Q. So do you agree that PH20 is expressly defined in the common disclosure to have a form a POSA would understand is folded? 13:09:09 13:09:11 13:09:16

A. It is active, which means it is also folded. So it's expressly in the disclosure as an active form of the protein which is enzymatically active and folded. 13:09:18 13:09:20 13:09:25 13:09:28

Q. But you don't use the word "active" here, right, you just use the word "folded"? 13:09:30 13:09:34

A. That's correct, the language is different because I was -- the language relates to the patent I was asked to assess. But PH20 is properly understood as the folded active form on the surface of the sperm cell, neutral-active. 13:09:37 13:09:38 13:09:41 13:09:44 13:09:48

(Reporter clarification.) 13:09:58

Neutral-active. It's neutral-active. 13:09:58

Q. If PH20 is properly understood as folded active form, then why didn't you put the word "active" in that sentence in paragraph 104? 13:10:02 13:10:05 13:10:08

A. In a long report of many things I honestly can't remember all my word choices but I do make it clear in my conclusion and elsewhere that PH20 is the 13:10:13 13:10:16 13:10:20

express -- is an active form found on the surface of the sperm cell. We in fact looked at that at paragraph -- on page 58: 13:10:24 13:10:28 13:10:37

"As used herein, PH20 refers to a type of hyaluronidase ..." 13:10:39 13:10:44

It goes on, sperm cell neutral-active: 13:10:46

"... truncated forms thereof [which] have activity ... includes ... variants ..." 13:10:48 13:10:48 13:10:50

Etc. So that's all in there. And also later on I state the require -- as I read the claims, they're directed to the active form of the protein. 13:10:52 13:10:58 13:11:01

For activity you have to have folding. 13:11:06

Q. So it's your testimony now that for matter 46, which is the '692 patent, that those claims are limited to the active PH20, active modified PH20? 13:11:09 13:11:13 13:11:17

A. So it's my opinion, and as I set out in my declaration and I've quite clearly stated in my declaration, that as I read the claims they are directed to the active mutants or modified PH -- active modified PH20. 13:11:23 13:11:28 13:11:31 13:11:33 13:11:39

Now I do understand, and I set out in 13:11:41

paragraph 110 that claim scope is of course a matter for the board, right. I'm not a lawyer and I don't -- I'm not offering a legal opinion, only a scientific one. And if the board were to enlarge the claim scope, but I think we all agree that within the claims are these folded active forms of the protein then since the bulk of my opinions address written description and enablement, my opinions are that those things are not properly described for that subset. So adding other subsets wouldn't change my opinion as regards enablement and written description. But I understand that my opinions and how I have read the claim scope are not -- it's for the patent board to decide how that should be read or what the legal threshold is. 13:11:42 13:11:46 13:11:51 13:11:53 13:11:58 13:12:02 13:12:06 13:12:13 13:12:14 13:12:16 13:12:20 13:12:24 13:12:27 13:12:30 13:12:33

MS. MARTIN: So we agreed to limit the scope of this deposition to claim construction. And so, Mr. Kushan, if your witness is going to start talking about 112 then I should be able to question him on 112, meaning that I should have more than 2 hours. 13:12:37 13:12:39 13:12:42 13:12:46 13:12:49

MR. KUSHAN: No. No. No. 13:12:52

MS. MARTIN: I feel that if we agreed to 13:12:52

limit it to claim construction, that's what we should be doing. 13:12:53 13:12:56

MR. KUSHAN: He's addressing claim construction. You can ask the questions focused on claim construction. If you -- just continue your deposition. 13:12:57 13:12:58 13:13:00 13:13:04

MS. MARTIN: That's fine. Just make sure that we're all on the same page here. 13:13:06 13:13:07

BY MS. MARTIN: 13:13:21

Q. Okay, can you please turn to paragraph 43. 13:13:21

A. Paragraph 43 is on page 19 and it begins: 13:14:00

"As I explain ..." 13:14:03

Is that correct? 13:14:05

Q. Yes. Okay, so in paragraph 43, in your declaration for the -- in matter 46, you say that you: 13:14:06 13:14:16 13:14:20

"... read the claims as a whole as being directed to modified PH20 polypeptides that (i) contain an amino acid sequence that satisfies the sequence identity claim parameters, (ii) meet the position 313 substitution requirement, and (iii) 13:14:20 13:14:23 13:14:28 13:14:31 13:14:32 13:14:36

have folded to adopt the same tertiary fold found in the native state of the wild-type PH20 protein." Correct? 13:14:38 13:14:41 13:14:44 13:14:46

A. That's what I say, yes. 13:14:47

Q. And that's accurate, right? 13:14:52

A. So it's not the complete analysis in 43, as the first sentence begins I point you to D and E. So in this declaration for this matter I considered -- I separated out my analysis to focus on the early stages in the first paragraphs 43 to 48 on folding things, understanding the folding subset, and then I moved to consider activity in 104 to 108. And I've produced my conclusions at the end of paragraph 108 for how I read the claims as a whole there. So my final conclusion about how a POSA would read it is set there. I just split my analysis for this particular patent into two sections. 13:14:55 13:14:58 13:15:04 13:15:06 13:15:09 13:15:15 13:15:19 13:15:22 13:15:24 13:15:27 13:15:33 13:15:35

Q. So when you included romanettes (i) through (iii) in paragraph 43, you're saying that you instead you intended to include a fourth romanette and you didn't? 13:15:38 13:15:44 13:15:50 13:15:54

MR. KUSHAN: Objection to foundation. 13:15:56

THE WITNESS: So that's not what I'm saying. 13:15:58
I'm saying that I have set out my opinions as to the 13:15:59
full -- my full understanding of the claims in these 13:16:02
series of paragraphs. This is my analysis paragraph 13:16:08
which focuses -- this part focuses on folding. 13:16:12
I deal with activity later on, which I point to in E 13:16:16
which is the activity analysis and I end up in 13:16:22
paragraph 108 where I give you my conclusions and it 13:16:24
says a POSA would conclude. 13:16:28

BY MS. MARTIN: 13:16:30

Q. So when you say in paragraph 43 that you read 13:16:30
the claims as a whole as being directed to modified 13:16:33
PH20 polypeptides that satisfy three features -- 13:16:39

MR. KUSHAN: Objection to foundation. 13:16:45

BY MS. MARTIN: 13:16:49

Q. I haven't -- sorry, let me start again 13:16:49
because I didn't finish my question. When you say in 13:16:51
paragraph 43 that you read the claims as a whole as 13:16:53
being directed to modified PH20 polypeptides that 13:16:57
satisfy the three romanettes that you've listed 13:17:01
there -- 13:17:04

A. Oh I see what you mean by "romanettes". My apologies. 13:17:05 13:17:08

Q. I'm sorry, (i), (ii) and (iii), you are reading the claims as a whole as being directed to modified PH20 polypeptides that have -- that meet the sequence identity claim parameters, have the position 313 substitution, and have folded to adopt the same tertiary fold, right? 13:17:09 13:17:13 13:17:17 13:17:23 13:17:26 13:17:30

A. I understand now. So this is not my complete conclusion on the claims. In this paragraph I set out my analys -- so this paragraph is the beginning of me -- I talk about in the next few paragraphs about my analysis, how I constructed my analysis on folding. I then move in -- as at the beginning it says "in ...D and ...E" and in E I separate out my activity analysis. And my conclusion for what the claims are read, how I have read the claims, are set out in the -- entirely in the conclusion in paragraph 108. 13:17:32 13:17:34 13:17:38 13:17:41 13:17:48 13:17:50 13:17:53 13:17:58 13:18:00 13:18:03 13:18:07

Q. So let's turn to paragraph 108 which starts on page 71. Are you there? 13:18:11 13:18:13

A. Nearly. My apologies, the pages are starting 13:18:28

to come -- 13:18:31

Q. You're fine, sorry. It's just hard to tell when you're not in person. 13:18:32

A. I'm on paragraph 108 now. 13:18:37

Q. Okay, perfect. And so in paragraph 108 you say: 13:18:41

"I believe Dr. Hecht more accurately describes why a POSA would have read the claims as a whole as being directed to modified PH20 polypeptides that are properly folded, and certain of those being enzymatically active." 13:18:44

Right? 13:18:59

A. That's what my sentence says, yes. 13:19:00

Q. So certain claims are directed to PH20 -- modified PH20s that are properly folded and enzymatically active, right? 13:19:03

A. No. 13:19:12

Q. Are you saying now all claims are directed to PH20s that are properly folded and enzymatically active? 13:19:19

A. That's the conclusion I rendered in 13:19:26

paragraph 109, which I said that the claims -- the last sentence of paragraph 109 is that -- can I just read it? That a POSA "... would have concluded that the claims define a set of modified PH20s that exhibit hyaluronidase activity." And that's consistent with the sentence I've written in paragraph 108. 13:19:27 13:19:31 13:19:35 13:19:38 13:19:41 13:19:44 13:19:46

Q. Okay, so let's go to -- I just want to understand because in this declaration you say that "... certain claims (e.g., claim 5) ...", which is what you've written in 109 -- 13:19:49 13:19:55 13:19:58 13:20:05

A. Sorry, we're on to paragraph 109? 13:20:09

Q. Sorry. Sorry, yeah, let me start again. The last sentence in paragraph 109 you say that a POSA: 13:20:11 13:20:14

> "... when a POSA considers all of the language used in certain claims (e.g., claim 5) and does that in conjunction with the common disclosure, she would have concluded that the claims define a set of modified PH20s that exhibit hyaluronidase activity." 13:20:18 13:20:20 13:20:23 13:20:26 13:20:28 13:20:31 13:20:33

Right? 13:20:34

A. Yes, that's what this sentence says, and concluded that the claims, meaning all the claims, define a set of modified PH20s that exhibit hyaluronidase activity. 13:20:35 13:20:38 13:20:41 13:20:45

Q. Okay, so you're now saying that all of the claims require hyaluronidase activity and not just claim 5? 13:20:47 13:20:51 13:20:55

A. I'm not now saying that, that's what the declaration says. 13:20:57 13:21:00

Q. So in paragraph 108, when you've said that the claims -- would understand the "claims as a whole as being directed to modified PH20 polypeptides that are properly folded, and certain of [them] being enzymatically active", you meant to say that all of them would be enzymatically active? 13:21:13 13:21:17 13:21:21 13:21:26 13:21:28 13:21:31

A. Oh, sorry, I see now. Sorry, my apologies. So they're directed to modified PH20 polypeptides and those that are enzymatically active. So that's what it says, is that they're properly folded and are -- certain of -- and the ones within that population are properly folded that are enzymatically active. So it's the certain of the modified PH20 polypeptides 13:21:36 13:21:37 13:21:42 13:21:44 13:21:46 13:21:51 13:21:54

that are folded. There is a subset of those that are enzymatically active. 13:21:58 13:22:00

So if we go back to -- sorry, I see the point. I think it is the little box diagram on page 49. At the top of page 49. 13:22:02 13:22:07 13:22:17

Q. Yes. 13:22:27

A. So we've drawn a big universe of various sub-populations and I've shown "Natively folded modified PH20 polypeptides", and what I'm referring to and those that are stably enzymatically active is the little green highlighted box, "adequate stability", enzymatic stability. That's to where I think the claims are directed in that box which is a subset of the folded ones. Sorry, that's the "certain", if that helps. 13:22:28 13:22:31 13:22:35 13:22:40 13:22:42 13:22:44 13:22:48 13:22:49 13:22:56

Q. Okay, so let's go back to -- actually let's go to paragraph 100. 13:23:05 13:23:10

A. That's page 65? 13:23:26

Q. Yes, I think. Then, sorry, can you go to the next page because I'm looking for the fourth sentence in paragraph 100. So do you see the sentence that starts: 13:23:42 13:23:45 13:23:49 13:23:56

"I agree with Dr. Hecht ..." 13:23:56

A. "... that this passage ... also supports ... certain claims ... as defining modified PH20 polypeptides [as requiring] hyaluronidase activity." 13:23:59 13:24:02 13:24:02

Yes, I see that. 13:24:06

Q. Do you see that sentence? 13:24:08

A. I can read that, yes. 13:24:12

Q. All right. So you stated in your matter 46 declaration that: 13:24:13 13:24:16

"... certain claims (e.g., claim 5) ... [define] modified PH20 polypeptides that exhibit hyaluronidase activity." 13:24:18 13:24:23 13:24:28

Correct? 13:24:28

A. No, that's not what I'm saying. I'm saying that -- 13:24:28 13:24:31

Q. You literally said the words "certain claims". Are you saying that you didn't use the language "certain claims"? 13:24:32 13:24:34 13:24:36

MR. KUSHAN: Objection to foundation. Objection as to form. 13:24:38 13:24:39

THE WITNESS: So what I'm saying is that that particular passage I've highlighted helps understand 13:24:42 13:24:44

particular claim 5, for example claim 5, as defining them to have hyaluronidase activity. I don't, in my opinion, that having read the common disclosure in its entirety, as I conclude in paragraph 109 that the claims are -- all the claims are directed to the active form of the protein. 13:24:48 13:24:52 13:24:57 13:25:01 13:25:04 13:25:10

There are -- different paragraphs dwell on different points but it doesn't -- I've given you what I conclude to be the analysis. 13:25:12 13:25:16 13:25:18

BY MS. MARTIN: 13:25:25

Q. So when you said in your declaration "that this passage ... supports reading certain claims (e.g., claim 5) as defining modified PH20 polypeptides that exhibit hyaluronidase activity", what you meant to say was that it supports reading all of the claims as defining modified PH20 polypeptides that exhibit hyaluronidase activity? 13:25:25 13:25:30 13:25:36 13:25:39 13:25:42 13:25:45 13:25:48

A. No. What I meant was that you read this, and particularly Dr. Hecht cited this, but I have previously stated that the modified PH20 polypeptide as I have read the claims requires activity for a whole host of reasons that I set out in 13:25:52 13:25:55 13:26:01 13:26:06 13:26:10

paragraph 108, and that this phrasing here helps you understand that reading. It's part of the common disclosure. It's part of what forms my opinions for the claims. But that phrase in isolation doesn't help -- doesn't -- isn't what I rest on for the entire patent. 13:26:12 13:26:16 13:26:18 13:26:20 13:26:24 13:26:27

Q. Okay. Can you turn to page 69. 13:26:31

A. Yes, I'm on page 69. 13:26:49

Q. I think you had said before -- actually -- yeah, okay, perfect. You had said before that subsection -- okay -- that subsection E addresses the activity; is that right? 13:26:52 13:26:55 13:26:59 13:27:07

A. That's correct, that this series of paragraphs addresses my activity analysis. 13:27:08 13:27:11

Q. And you say the claims -- in the header for subsection E is that "The Claims Include Enzymatically Active Modified PH20 Polypeptides", right? 13:27:14 13:27:18 13:27:21 13:27:25

A. Yes, that's correct, that's what the header says. 13:27:25 13:27:28

Q. So the claims include enzymatically active modified PH20 polypeptides but they are not limited 13:27:29 13:27:32

to enzymatically active modified PH20 polypeptides, right? 13:27:36 13:27:42

MR. KUSHAN: Objection to foundation. 13:27:42

THE WITNESS: That isn't my conclusion and my conclusion that I spell out when I say the "conclusion" is, that the claims define a set of modified PH20s that exhibit hyaluronidase activity, and I give my reasons for reaching that conclusion at the end. 13:27:44 13:27:45 13:27:47 13:27:50 13:27:54 13:27:57

BY MS. MARTIN: 13:28:01

Q. Sorry, what paragraph are you reading from that says that the claims require hyaluronidase activity? 13:28:01 13:28:03 13:28:06

A. As I read the claims, that is paragraph 109 where I say "and ... she would have concluded", so that is a conclusion of my analysis in paragraph 109. So the paragraphs are the underlying ideas and analysis that go to reach my conclusion, and I spell out my conclusion in 109. 13:28:06 13:28:12 13:28:15 13:28:21 13:28:24 13:28:27

Q. So based on the language that was used in claim 5 a POSA would have concluded that all of the claims define a set of modified PH20 polypeptides 13:28:33 13:28:35 13:28:40

that exhibit hyaluronidase activity? 13:28:44

A. That's not what I said. So in 109 I say that 13:28:46

"the language ... and ... in conjunction with the 13:28:51

common disclosure", you have to read the common 13:28:54

disclosure, you would have concluded or at least my 13:28:57

opinion is the POSA would have concluded that the 13:29:01

claims are directed to modified PH20s that are 13:29:03

enzymatic -- that exhibit hyaluronidase activity. 13:29:07

Q. But you used the language -- you used the 13:29:11

phrase "certain claims" in this paragraph, correct? 13:29:14

A. Yeah, that's correct, that is there but 13:29:18

I also state my conclusion for "the claims". I don't 13:29:21

say this claim or that claim, I say "the claims 13:29:24

define a"-- are directed to "a set of modified PH20s 13:29:27

that exhibit hyaluronidase activity". That is the 13:29:34

conclusion of my opinion or on how I have read the 13:29:36

claim scope. 13:29:41

Q. So why did you refer to "language used in 13:29:42

certain claims" in this sentence? 13:29:45

A. Because I read -- my understanding was I had 13:29:47

to read the patent that I was asked to and I wrote my 13:29:51

declaration on that. I drew attention to claim 5 as 13:29:55

particularly interesting but I didn't use it to inform how I read claim 1. How I read the other claims was to properly read the common disclosure and test that claim independently. 13:29:57 13:30:02 13:30:07 13:30:10

Q. So then why did you call out claim 5 in this sentence? 13:30:14 13:30:17

A. I thought it was an interesting claim to call. I can't remember more than that, that I remember claim 5 specifically calls out specific mutations that are all active, and that position, 313, is one of the ones that I think Dr. Petsko flagged as particularly tolerant, and in that claim 5 these call out the substitutions that are active. So I thought it was worth noting but it isn't -- my conclusion is that the claims define a set of modified PH20s that exhibit hyaluronidase activity. 13:30:17 13:30:19 13:30:21 13:30:24 13:30:28 13:30:33 13:30:37 13:30:41 13:30:44 13:30:46

Q. Okay. Can you -- actually can you turn to paragraph 104 in this declaration and then just keep it handy. (Pause). And then at the same time pull up your matter 4 declaration on the '298 patent? 13:31:11 13:31:13 13:31:16 13:31:28

A. Okay. 13:31:33

Q. It's Exhibit 1 for the tech. 13:31:53

A. Can I just check it is -- this is PGR2025-00004, US Patent '298, my declaration, yes? 13:31:56

Q. Yes. 13:32:03

A. Yes, I've got it. Thank you. 13:32:05

Q. Then can you turn to paragraph 104? 13:32:06

A. I don't know if you can see, I'm in -- drowning in a sea of paper. I'll just move some things is okay? 13:32:08

Q. I can imagine. 13:32:16

A. I've got paragraph 104 in my PGR2025-00004. 13:32:44

Q. Perfect. Okay. So do you have two declarations side-by-side with two paragraph 104s? 13:32:53

A. Yes, I've got four bundles of papers but the 104 is visible to me in both, although I have to turn the page in the PGR2025-00004 because paragraph 104 goes over to 67 and 68. So if you hear me turn the page, it's just because the paragraph splits across the two. 13:32:59

Q. Okay, yeah, that's fine. I just want to make sure that we're -- you've got them both. All right. 13:33:23

So in matter 4, in paragraph 104, you say in the third sentence: 13:33:28

"PH20 is expressly defined in the common disclosure to have a form [that the] POSA would understand ..." Sorry. 13:33:35 13:33:38 13:33:43 13:33:54

A. Yeah, I've got the sentence. 13:33:54

"PH20 is expressly defined in the common disclosure ... would understand is folded and is enzymatically active." 13:33:56 13:33:58 13:34:02

Q. Yes, thank you. So that's what you say in your matter 4 declaration, you say: 13:34:05 13:34:06

"... folded and is enzymatically active". 13:34:07

But in your matter 46 declaration you say that: 13:34:09

"PH20 is expressly defined ... to have a form a POSA would understand is folded." 13:34:17 13:34:26

And you don't say -- you don't include the language "enzymatically active"; correct? 13:34:29 13:34:31

A. That's correct, in the 0046 that, the words after "is folded" aren't -- "and is enzymatically active" are not added here, that's correct. 13:34:34 13:34:39 13:34:44

Q. So why did you not include the phrase "enzymatically active" in the matter 46 declaration? 13:34:48 13:34:50

A. Because, as I said, I split my analysis 13:34:54

because each declaration I have to consider the test separately, the case, and formulate my opinions for the patent in front of me. So I split my analysis here. So I focus mainly on the folding for this patent in 46, and then I dealt with the enzymatic activity in paragraphs 105 to 109. And as I've said, at the end of paragraph 109 I give you my conclusions to how the claims are read, which is they're enzymatically active proteins. 13:34:57 13:35:02 13:35:05 13:35:08 13:35:11 13:35:14 13:35:20 13:35:24 13:35:27

Q. So you agree that PH20 has the same definition in both the '298 patent and the '692 patent, correct, it's the same definition? 13:35:29 13:35:32 13:35:35

A. Yes, I do. 13:35:38

Q. All right. Yet in the matter 46 declaration for the '692 patent you said that "PH20 is expressly defined ... to have a form a POSA would understand is folded". 13:35:40 13:35:47 13:35:51 13:35:55

And in the matter 4 declaration for the '298 patent you said "PH20 is expressly defined ... to have a form a POSA would understand is folded and is enzymatically active." 13:35:57 13:36:00 13:36:07 13:36:12

Correct? 13:36:13

A. That's correct, in those paragraphs I use different words because I was dealing with different patents, and I constructed my report differently because each report I understand has to be independently stand on its own. So my -- the way I conducted my analysis was different here and I wrote my report differently but my conclusion which is given in 109 integrates across that and gives you my analysis. 13:36:14 13:36:16 13:36:18 13:36:22 13:36:24 13:36:29 13:36:31 13:36:34 13:36:38

Q. So you said that you used different language because there are different patents but it's the same -- the patents have the same common disclosure and they have the same definition for PH20, right? 13:36:41 13:36:43 13:36:44 13:36:48

A. That's correct, I've said that the PH20 is the same, but I was talking about my analysis of claim construction here. And so I analyzed my claim construction differently here but I reach the same conclusion and it's because the claims are differently spelt out here, I thought -- my understanding is I have to conduct an independent analysis for each patent and that's what I did. 13:36:51 13:36:53 13:36:56 13:37:03 13:37:06 13:37:07 13:37:10 13:37:12

Q. So is it your testimony that PH20 is defined 13:37:15

in the specification to require folding and activity? 13:37:18

A. So PH20 is defined in the common disclosure as in neutral-active form found in the surface of the cell which is both folded and enzymatically active. 13:37:22 13:37:27 13:37:30

Q. So in your matter 46 declaration when you just said that it's defined to include forms that are active -- I'm sorry, forms that are folded -- 13:37:37 13:37:39 13:37:44

A. Yeah, that's part of it because, as I said, I separated out my analysis of folding up to paragraph 104 and then from heading E, I then moved on to my analysis before rendering my final opinion as to how I read claim construction. So it's just that I split my analysis in folding and activity differently in this report because I considered a different claim language than in the '298 I think it is -- '298. So, that is why there's a difference in words. But my conclusion for 46 is that the claims are directed to enzymatically active modified PH20 polypeptides. 13:37:51 13:37:53 13:37:56 13:38:00 13:38:04 13:38:07 13:38:11 13:38:15 13:38:18 13:38:24 13:38:29 13:38:36

Q. Okay. Can you turn to paragraph 43 in the '298 declaration? 13:38:44 13:38:51

A. That's matter 4, is that correct? 13:38:53

Q. Yes. 13:38:54

(Reporter clarification) 13:39:13

A. Paragraph 43. Is that correct, Ms Martin? 13:39:14

Q. Yes. Yes, thank you. 13:39:15

A. That's page 19 and it splits over on to page 20. 13:39:15 13:39:16

Q. Yes. Perfect. Then if you could turn to paragraph 43 in the matter 46 declaration as well? 13:39:20 13:39:22

A. Yes, I'm on those two. 13:39:58

Q. Perfect. Okay, so in the matter 4 declaration, in paragraph 43 you say that you "... read the claims as a whole as being directed to modify PH20 polypeptides that ..." meet four requirements, right? 13:40:00 13:40:02 13:40:06 13:40:10 13:40:15

A. That's correct. 13:40:16

Q. And the fourth requirement is that they "are enzymatically active", correct? 13:40:18 13:40:20

A. That's what the paragraph says in matter 4, yes. 13:40:23 13:40:25

Q. Okay. And then in matter 46, in paragraph 43, as we discussed, you say that the claims -- you "read the claims as a whole as being 13:40:27 13:40:31 13:40:35

directed to modified PH20 polypeptides that" satisfy three criteria, correct? 13:40:38 13:40:44

MR. KUSHAN: Objection to foundation. 13:40:46

THE WITNESS: So again I'm going to come back and say at the start I set out where I discuss my analysis in this analysis for this patent which is matter 46. I separated out the folding analysis from the activity analysis. I did so because the claim language was different. I had to consider it independently. And my conclusion as to how I've read the claim scope is given in paragraph 109. But the words are different between those two paragraphs because I approached the reading of this patent independently from the matter 4. 13:40:48 13:40:50 13:40:54 13:40:57 13:41:01 13:41:05 13:41:07 13:41:10 13:41:15 13:41:17 13:41:20

BY MS. MARTIN: 13:41:26

Q. In any event, in paragraph 43 in the matter 46 declaration, you say that the claims as a whole are directed to modified PH20 polypeptides that satisfy three of your requirements, correct? 13:41:23 13:41:33 13:41:38 13:41:42

A. The sentence in this paragraph which is beginning my analysis of folding, states that how I have read the claims and is given in the conclusion 13:41:44 13:41:47 13:41:56

of the section in paragraph 109. So that is correct, in this sentence it talks about this because I'm gonna focus on the folding analysis here, and then I separate out my activity analysis in this matter and I give my conclusion at the end of paragraph 109. 13:41:58 13:42:03 13:42:05 13:42:10 13:42:13 13:42:15

Q. But in paragraph 43 in matter 46, you say: 13:42:18

"As I explain in [subsections] ...D and ...E below ..." 13:42:23 13:42:26

So, as you explain in your folding and activity sections, right, that's how you start this paragraph? And then you still conclude, in paragraph 43, that you read the claims as a whole as being directed to modified PH20 polypeptides that satisfy three criteria; correct? 13:42:27 13:42:30 13:42:35 13:42:37 13:42:41 13:42:45

A. No, I didn't say conclude here. The conclusion is given in the end, in paragraph 108 (sic), once I have completed my analysis. But this section deals with the folding and the latter section deals with activity. And my conclusion is given at the end of the section 108 -- 109, sorry. So this is not the conclusion, this is the prefix to beginning 13:42:47 13:42:49 13:42:52 13:42:56 13:43:01 13:43:05 13:43:10

to think about folding. 13:43:12

Q. Okay. Can you turn to paragraph 108 then in 13:43:27

both the matter 4 and the matter 46 declarations. 13:43:43

A. In the 46 that's in page 71 and goes over on 13:44:04

to page 73. 13:44:07

Q. Yes. 13:44:20

A. I'm just turning there in matter 4. That 13:44:21

begins on page 70 and ends on page 73. 13:44:23

Q. So do you see the first sentence in your 13:44:46

matter 4 declaration? 13:44:48

A. Yes. 13:44:51

Q. You say: 13:44:52

"I believe Dr. Hecht more accurately 13:44:53

describes why a POSA would have read the 13:44:55

claims as a whole as being directed to 13:44:57

modified PH20 polypeptides that are 13:45:00

enzymatically active." 13:45:03

Correct? 13:45:05

A. Yes, I can see that's what I've said in 13:45:05

declaration 4. 13:45:08

Q. And then in the matter 46 declaration you 13:45:10

say: 13:45:14

"I believe Dr. Hecht more accurately describes why a POSA would have read the claims as a whole as being directed to modified PH20 polypeptides that are properly folded, and certain of those being enzymatically active." Right? 13:45:16 13:45:18 13:45:20 13:45:23 13:45:27 13:45:28 13:45:30

A. That's right. 13:45:31

Q. So in the matter 4 declaration, you say that the claims as a whole are directed to modified PH20 polypeptides that are enzymatically active. But in matter 46 declaration you say a POSA would have read the claims as a whole as being directed to modified PH20 polypeptides that are properly folded, and certain of those are enzymatically active. Right? 13:45:31 13:45:41 13:45:43 13:45:51 13:45:53 13:45:56 13:45:59

A. So I have said how I -- what the -- how I meant the sentence to read. How it reads to me is that in the matter 46 we're going back to the box and I'm directing you to the specific top left-hand box, that is the green box colored, active proteins that are -- so the properly folded is a bigger universe. And then -- but the claims here are directed to the 13:46:03 13:46:07 13:46:10 13:46:15 13:46:19 13:46:23 13:46:28

enzymatically active portion of that universe in that corner, in this paragraph 108, that's why I used my analysis differently because I consider different claim language, separated out folding from the activity analysis. 13:46:31 13:46:35 13:46:40 13:46:43 13:46:46

Q. I'm still trying to understand. Are you saying that -- so you said that certain of those are enzymatically active, meaning that the claims as a whole are directed to properly folded PH20 polypeptides of which certain of them are enzymatically active, right? 13:46:49 13:46:51 13:46:55 13:46:57 13:47:02 13:47:04

A. No, that's not what I meant. So what I'm saying is that because I separated my analysis in matter 46 to folding and activity, that I read the claims as being directed to folded and active proteins that just folded proteins is a bigger -- has sub-categories within it but I -- so that's what I dealt with in the first sections. And then when I deal with my analysis around activity I am focused down and the claims are directed to enzymatically active which are also folded. 13:47:06 13:47:10 13:47:15 13:47:19 13:47:22 13:47:28 13:47:32 13:47:35 13:47:39 13:47:43

So to have activity you must be folded, but not 13:47:45

all folded proteins have enzymatic activity. 13:47:48

So what I'm doing is saying the claims are 13:47:51

directed to folding and within that subset of folding 13:47:53

only those that are enzymatically active. 13:47:57

Q. But that's not what you say in paragraph 108, 13:47:59

you say "certain of those being enzymatically 13:48:02

active"? 13:48:05

A. Yes, it's directed to certain of those that 13:48:05

are enzymatically active. That's how I read my 13:48:08

sentence. It's directed to those that are modified 13:48:14

and folded as well as having -- and directed to those 13:48:17

that are enzymatically active. 13:48:21

Q. So you're reading out the "certain of those"? 13:48:24

A. No, "certain of those" -- so as I tried to 13:48:26

explain what the language is meant to convey, is if 13:48:30

we go back to the box, page 49, that I've boxed 13:48:33

"Natively folded ... PH20 polypeptides" and within 13:48:47

that there are different types of them, and it's the 13:48:51

certain of those that are enzymatically active, 13:48:53

properly folded and stable that I believe the claims 13:48:55

are directed to. And because -- and that's -- so 13:48:58

that's what that sentence says: the certain of those 13:49:01

boxes that are folded, only those that are enzymatically active is how I have construed the claims. 13:49:05 13:49:07 13:49:10

Q. So if that's how you're construing the claims here why didn't you just use the same language that you used in the matter 4 declaration? 13:49:16 13:49:18 13:49:21

A. My understanding is that I have to approach each patent independently. The claim language was different. I read it differently and did my analysis differently. I reached a conclusion that I rendered in paragraph 109, which was that my conclusion is the claims are directed to enzymatically active hyaluronidase activity. 13:49:23 13:49:26 13:49:29 13:49:31 13:49:34 13:49:39 13:49:43

Q. Can you turn to paragraph 110 in the matter 46 declaration. 13:50:37 13:50:43

A. Yes. 13:50:59

Q. In the second sentence you say: 13:51:00

"I understand the panel conducting this proceeding could conclude that the claims are not ..." 13:51:01 13:51:05 13:51:07

Defined to modified PH -- or, I'm sorry: 13:51:07

"... that the claims are not limited to 13:51:10

modified PH20 polypeptides that have stably folded." Correct? 13:51:12 13:51:14 13:51:16

A. Yes, that's what I said. The panel could conclude that. I'm not a lawyer. 13:51:17 13:51:19

Q. And you didn't say anything about enzymatic activity in that sentence, did you? 13:51:22 13:51:24

A. That sentence doesn't have enzymatic activity in it. And it's not my conclusion, it just meant you know that I obviously have to be respectful of what the board can decide. 13:51:27 13:51:30 13:51:32 13:51:35

Q. Is it possible for a PH20 to have adopted the stable -- to have stably folded and not be enzymatically active? 13:51:40 13:51:44 13:51:48

A. As a scientific point there are variants of PH20 known in the literature that are stably folded but have no enzymatic activity. In fact that's known. 13:51:52 13:51:58 13:52:02 13:52:06

MS. MARTIN: We've been going for over an hour so can we take a quick break? 13:52:10 13:52:12

MR. KUSHAN: Sure. 13:52:16

VIDEOGRAPHER: We are going off the record. 13:52:17

The time is 1:52. 13:52:18

(A short break) 13:52:29

VIDEOGRAPHER: We are back on the record. 14:06:44

The time is 2:06 14:06:45

BY MS. MARTIN: 14:06:50

Q. Welcome back, Dr. Naismith. 14:06:50

A. Hello. 14:06:52

Q. Did you discuss the substance of your deposition with counsel during the break? 14:06:54 14:06:56

A. I did not. 14:06:58

Q. All right, so you have the common disclosure in front of you, right? 14:06:59 14:07:03

A. It's in a folder, yes. 14:07:04

Q. Perfect. And so we've been talking about your declaration in matter 46 and that covers the '692 patent, correct? 14:07:07 14:07:09 14:07:15

A. Yes, I mean I believe so but I obviously want to just turn to my front piece to check. Yes, '692, that's correct. 14:07:18 14:07:20 14:07:25

Q. And the position at issue in that declaration is position 313, correct? 14:07:26 14:07:28

A. The position that's called out in the claims, 14:07:33

claim 1, yes, is 313, that's correct. 14:07:35

Q. Okay. And actually do you have the '692 patent somewhere? 14:07:38 14:07:42

A. I have it here. 14:07:52

Q. Can you turn to the claims in the '692 patent? It should be on page 185. It's the second-to-last page. 14:07:54 14:07:55 14:07:59

A. To make it easier, do you mind if I just remove matter 4 from in front of me and put it to the side. 14:08:00 14:08:02 14:08:06

Q. Mm-hmm, that's fine. 14:08:08

A. Okay, I'm on the '692 patent. 14:08:20

Q. Okay, and you've got the claim 1? 14:08:22

A. Let me find the claims, sorry. 14:08:25

Q. Okay. The second-to-last page. 14:08:28

A. Okay. There's bulldog clips. (Pause). Yes. 14:08:31 14:08:35

VC TECHNICIAN: Would you like me to share this on screen, Ms Martin? 14:08:46 14:08:47

BY MS. MARTIN: 14:08:48

Q. Yeah, if you want to, that's fine. Thank you. Okay, are you there, Dr. Naismith? 14:08:48 14:08:49

A. Yes, I am, I'm on the claims section. 14:08:52

Q. Perfect. And so just confirming the '692 patent, the position at issue is position 313? 14:08:54 14:08:56

A. I'm confirming, yes, that in claim 1 it says the modified position and it spells out 313 with reference to SEQ ID No:3. 14:09:00 14:09:03 14:09:07

Q. Okay, thank you. And just to confirm we're all on the same page here. That you interpret claim 1 of the '692 patent which requires modified PH20 polypeptides with a modification at position 313, you interpret claim 1 to be limited to properly folded and enzymatically active proteins, correct? 14:09:12 14:09:13 14:09:16 14:09:23 14:09:26 14:09:31

A. That's correct, that's how I read the claim. 14:09:36

Q. All right. Now can you turn in the common disclosure, Exhibit 1026, to page 135. 14:09:42 14:09:48

(Previously marked Exhibit 1026 identified.) 14:09:53

A. I'm going to put aside the patent 692, if that's okay? 14:09:56 14:09:59

Q. Yes. 14:10:01

A. What page of the common disclosure, please, sorry? 14:10:08 14:10:11

Q. Page 135. 14:10:11

A. What numbers do you want me to use, the bottom right, which says Petitioner Merck extract page numbers, or the column page numbers in the center? There's two numbers on each page so I just want to be sure I get the right one for you. 14:10:17 14:10:20 14:10:24 14:10:26 14:10:33

Q. Sorry, I had it and then -- one second here. (Pause). Okay, on the Petitioner Merck Ex. 1026, page 148. 14:10:36 14:10:54 14:11:09

A. Okay, I'll get there. 14:11:14

Q. And to orient ourselves, if you look at Merck's page 145, you see that this is Table 5, inactive mutants? 14:11:16 14:11:22 14:11:27

A. Yes, I can see that's what it says. It's Table 5, yeah. 14:11:30 14:11:32

Q. Okay. Now if you turn back to Merck's page 148. Do you see maybe about a little bit of the ways down the page, position 313, the right-hand column? 14:11:37 14:11:41 14:11:49 14:11:56

A. Yes, I do. 14:11:57

Q. And there is one amino acid listed in that column for inactive mutants, and that one variant is cysteine; correct? 14:11:57 14:12:04 14:12:08

A. So the patent has classified that variant 313 as inactive in its classification. 14:12:11 14:12:15

Q. So the patent teaches that modifying position 313 to a cysteine results in an inactive PH20, correct? 14:12:18 14:12:24 14:12:32

A. I disagree, I don't think that's what the patent teaches. The patent teaches that it is at 313 less than 20% activity in the assay they deployed. 14:12:33 14:12:35 14:12:42

Q. I understand. So it's -- so position 313 mutation to cysteine is classified as an inactive mutant but the classification was based on less than 20% activity; is that right? 14:12:54 14:12:57 14:13:02 14:13:05

A. That's correct, that's how the patent classifies inactive mutants. 14:13:07 14:13:10

Q. So under your construction of claim 1 of the '692 patent would the mutation to cysteine at position 313 that is taught in the patent, would that variant satisfy claim 1? 14:13:19 14:13:23 14:13:28 14:13:36

A. It might do because the reasons for why it was under 20% activity were not disclosed or investigated by the -- in the disclosure. So if the mutant was 19% active it would have been classified 14:13:39 14:13:41 14:13:44 14:13:50

as inactive, but I would have classified 19% as an active form of the protein. 14:13:54 14:13:59

Q. I think you said that the reasons why it was under 20% activity were not disclosed. What did you mean by that? 14:14:06 14:14:12 14:14:17

A. What I meant was that in the assay that is in the patent, they imposed their own threshold, so I've got no numbers to know what was actually measured. Was the protein secreted, folded, made? Was it 19% active? Any one of those, and other factors, could have led to a protein being classified as inactive. And what I mean here is that the M313 cysteine which was 19% active would have still ended up in this table as classified inactive but if it was 19% then I would have included that as within the scope because that is an active form of the protein. 14:14:19 14:14:23 14:14:27 14:14:29 14:14:34 14:14:37 14:14:40 14:14:46 14:14:49 14:14:54 14:14:57

Q. So you don't know one way or the other whether the variant with the cysteine at position 313 falls within the scope of claim 1 of the '692 patent? 14:15:06 14:15:08 14:15:13

A. I believe that the patent doesn't give me the information necessary to make that call for the M313, that's correct. 14:15:17 14:15:19 14:15:23

Q. You said M313, but I just want to make sure that we're clear that it's M313 to cysteine, correct? 14:15:25 14:15:29

A. Yes, sorry, to be -- that's just -- my apologies. M313C, the patent doesn't give me the information or disclose the information that would allow me to tell you whether it is active or not, and since 19% activity would be classified as inactive by the patent, 19% activity would be in my terms active and any POSA would see it so that would be within the scope. 14:15:35 14:15:36 14:15:42 14:15:45 14:15:48 14:15:51 14:15:55 14:15:59

Q. And I believe we discussed in your last deposition that your threshold for activity was around -- was 5%, am I remembering that right? 14:16:04 14:16:06 14:16:09

A. So we discussed that and we talked about a POSA tends to think around 5. But Dr. Petsko said, "Sort of, well, maybe 5 up to 10". But Dr. Simpson's paper, design paper, uses 5. And I said that most POSAs would use 5, but my analysis wouldn't change if we said 10 here because it's, you know, anything below 20 would be classified as inactive. So I gave you 19% which I think all of us, Dr. Simpson, Dr. Petsko, myself, any POSA would agree is an active 14:16:13 14:16:20 14:16:24 14:16:30 14:16:34 14:16:37 14:16:41 14:16:45 14:16:52

protein. 14:16:55

Q. Is an active protein. 14:16:56

A. An ac -- is active. Sorry, "an". My 14:16:59

apologies. 14:17:02

Q. That's fine. No, it's just for the 14:17:03

transcript. I'm having the same difficulty. 14:17:04

A. Okay, sorry. M313C if it had 19% activity 14:17:09

would be, by my definition and I believe any POSAs, 14:17:13

an active protein, therefore would be in the scope. 14:17:16

Q. Thank you. 14:17:20

A. Is that hopefully clear? 14:17:21

Q. Yes. Thank you. And before the break you 14:17:23

said that there are variants of PH20 known in the 14:17:28

literature that are stably folded but have no 14:17:34

enzymatic activity, correct? 14:17:37

A. Yes, I said that. 14:17:38

Q. Was that known before the priority date? 14:17:40

A. Let me -- I want to check the Simpson paper, 14:17:46

if it had been investigated. I think it was known 14:17:49

because people had mutated the key glutamate residue 14:17:54

that was identified as a catalytic mechanism in 14:18:00

ArMing. They had made that mutation so it was known 14:18:04

that that could be expressed and purified but had no activity. 14:18:07 14:18:10

Q. How do you know that it was stably folded if it had no activity? 14:18:21 14:18:24

A. It was able to be isolated, it was able to be secreted and analyzed so I assumed therefore it would be folded. And you can do other tests -- I'd have to familiarize myself with the ArMing paper to check all the things that were done in it. 14:18:26 14:18:29 14:18:32 14:18:38 14:18:42

Q. I'm just trying to understand as a general matter. 14:18:43 14:18:45

A. Okay, as a general matter then if the protein can be purified or can behave on a size exclusion column then you would assume that it was properly folded. If you had made a single mutation at the catalytic site, for publications in science, sometimes you will see people do circular dichroism measurements. In other papers people will accept a simple what's called blue native or blue native SDS-page, or you can do gel filtration chromatography, and so those may be acceptable. 14:18:46 14:18:50 14:18:56 14:18:59 14:19:02 14:19:07 14:19:11 14:19:14 14:19:23 14:19:29

For very precise enzymatic studies, sometimes 14:19:32

people like to determine a crystal structure of the mutant. 14:19:35 14:19:38

So you will see a variety of things used in the literature but as a minimum threshold that the protein has to be isolated because unfolded proteins tend to aggregate and don't behave normally on purification. 14:19:39 14:19:42 14:19:45 14:19:49 14:19:54

Q. Would you say that a crystal structure is necessary to know whether or not a protein has been stably folded? 14:20:06 14:20:08 14:20:13

A. No, I didn't say that. I said that for people who are very interested in particular subtleties of enzyme mechanism, they might go on and determine the crystal structure of a properly folded inactive protein, and so you sometimes see that in publications, but it's not a threshold test. 14:20:14 14:20:20 14:20:24 14:20:27 14:20:31 14:20:32

Q. Do you know one way or the other whether changing the methionine at position 313 to a cysteine, would you expect that to result in an unfolded protein? 14:20:37 14:20:40 14:20:44 14:20:49

A. So we know that that position tolerates quite a few changes and there are a number of active 14:20:56 14:20:58

mutants described for that protein, and Dr. Petsko I think highlights it in his box as one of the -- not the most tolerated but one of the more tolerated positions for change. If I made that mutant then I think maybe -- I don't have any reason to suspect it would be unfolded but I don't know. I would be surprised, but surprises happen in science, so. 14:21:01 14:21:07 14:21:10 14:21:14 14:21:17 14:21:20 14:21:27

Q. Would you expect that mutant to be active under your threshold? 14:21:32 14:21:36

MR. KUSHAN: Objection to the foundation. Go ahead. 14:21:37 14:21:39

THE WITNESS: So I didn't consider whether the mutant made here would be active above 5%. What I said was that the patent, it could well be in the patent declaration, the patent's common disclosure, that it could be above 5%. Would I suspect it? That's a good question, you know. Maybe -- I hadn't thought a lot about whether -- I'd have to think about that. Cysteine can be tricky sometimes. You might have to adjust the buffers because cysteine can stick to itself or tubes. You know, it's quite inactive so sometimes you can just slip in a bit of 14:21:41 14:21:44 14:21:48 14:21:53 14:21:58 14:22:02 14:22:04 14:22:09 14:22:12 14:22:16 14:22:20

reductant to keep the solution reduced. That can prevent aggregation. 14:22:22 14:22:27

So this position does tolerate quite a few changes so I can't see an obvious reason why it would inactivate or unfold but these things sometimes are unexpected, as I pointed out previously. 14:22:28 14:22:30 14:22:33 14:22:36

Q. And if it were the case that the cysteine -- the M313C variant had less than 5% activity then you would agree that it would not satisfy claim 1 under your construction? 14:22:58 14:22:59 14:23:04 14:23:08

MR. KUSHAN: Objection to foundation. 14:23:09

THE WITNESS: So what I would say is if you isolated M313C and in a robust well-performed assay the enzyme had less than 5% activity then I would agree that is an inactive protein. And since my reading of the claims are they are directed to the active forms of these mutants, then that -- in that case, where you'd done that experiment, it would be excluded, correct. 14:23:16 14:23:17 14:23:19 14:23:24 14:23:27 14:23:29 14:23:32 14:23:36

BY MS. MARTIN: 14:23:38

Q. Okay. And then can you turn, please, in Exhibit 1026 to, I wrote down page 67 but I'm not 14:23:38 14:23:42

sure if that's -- 14:23:49

A. Well I'll turn to both pages and we can find 14:23:51

out which one. I don't want to waste your time. So 14:23:53

67 is full of text and that is the patent numbering. 14:23:56

So at the top it says where the full length sequence 14:24:09

is compared. In the exhibit -- 14:24:11

Q. Yes, it looks like the exhibit page 67. 14:24:15

A. Okay, perfect. So the exhibit, page 67, has 14:24:17

95%, 96%, 97%, 98% or 99%. Is that -- 14:24:21

Q. Yes. 14:24:27

A. Yes, we're on the same page. Perfect. 14:24:28

Q. Perfect. Then do you see the paragraph that 14:24:30

says: 14:24:32

"As used herein, modified PH20 14:24:33

polypeptide ..." 14:24:37

A. That begins on line 5. 14:24:40

Q. Yes. 14:24:43

A. Yes, that I think is one of the paragraphs 14:24:43

I excerpted in my declaration. 14:24:46

Q. Yes, and so that paragraph you agree provides 14:24:49

the definition for a modified PH20 polypeptide? 14:24:52

A. It is -- that paragraph is one of the places 14:24:58

where you -- in forming my opinion for how to read the claims that I read, yes, and relied on. It was part of the evidence for it in forming my opinion. 14:25:00 14:25:04 14:25:07

Q. So you agreed that modified PH20 polypeptide is a defined term in the common disclosure, correct? 14:25:13 14:25:18

A. So within the common disclosure it is defined, yes. 14:25:22 14:25:26

Q. And the definition appears in the paragraph that we are looking at, starting at line 5, on page 67, correct? 14:25:27 14:25:29 14:25:33

A. So it's one of the places that you can find in the patent where that is defined but, as I said, it's not the -- that isolated phrase or isolated sentence isn't the basis for how I read the claims but here is a definition of it given. 14:25:36 14:25:39 14:25:43 14:25:46 14:25:49

Q. Okay, so what I would like you to do is to read into the record whatever portion of this paragraph, starting at line 5, you believe is the definition for a modified PH20 polypeptide? So please start reading and then stop at what you believe to be the end of the definition for modified PH20 polypeptide? 14:25:52 14:25:55 14:25:59 14:26:02 14:26:07 14:26:11 14:26:14

A. Of course. 14:26:17

MR. KUSHAN: Objection to form. Objection to foundation. 14:26:18 14:26:21

THE WITNESS: So, I'm going to read the paragraph, and I said that it appears elsewhere, but I'm going to read this entire paragraph because this was part of the things that went into my analysis. 14:26:22 14:26:23 14:26:26 14:26:29

"As used herein, 'modified PH20 polypeptide' or 'variant PH20 polypeptide' refers to a PH20 polypeptide that contains at least one amino acid modification, such as at least one amino acid replacement as described herein, in its sequence of amino acids compared to a reference unmodified PH20 polypeptide. A modified PH20 polypeptide can have up to 150 amino acid replacements, so long as the resulting modified PH20 polypeptide exhibits hyaluronidase activity. Typically, a modified PH20 polypeptide contains 1 ..." 14:26:32 14:26:37 14:26:43 14:26:46 14:26:49 14:26:52 14:26:57 14:27:01 14:27:05 14:27:10 14:27:14

And I'm just going to abridge the numbers: 14:27:17

"... or 50 amino acid replacements. It is understood that a modified PH20 polypeptide ... can include one or more other modifications, in ... at 14:27:19 14:27:22 14:27:27

least one amino acid replacement as described herein." 14:27:30 14:27:33

BY MS. MARTIN: 14:27:43

Q. So you read the full paragraph as the definition of "modified PH20 polypeptide"? 14:27:43 14:27:44

MR. KUSHAN: Objection to foundation. 14:27:49

THE WITNESS: No, I read the full paragraph as where the definition is set out and it is one of the things that went into forming my opinion as to how the claims should be read, but I pointed out that I read the disclosure as a whole in forming my opinion as to how the claims were read. 14:27:51 14:27:52 14:27:54 14:27:57 14:28:01 14:28:05

MS. MARTIN: All right, can we go off the record and take a quick break? 14:28:08 14:28:11

VIDEOGRAPHER: We are going off the record. The time is 2:28. 14:28:13 14:28:14

(A short break) 14:28:18

VIDEOGRAPHER: We are back on the record. The time is 2:33. 14:33:29 14:33:30

MS. MARTIN: Perfect. I don't have any further questions. 14:33:33 14:33:35

MR. KUSHAN: And we have no questions. 14:33:38

THE VIDEOGRAPHER: Okay. This concludes the deposition. We are going off the record. The time is 2:33 p.m. 14:33:40 14:33:41 14:33:42

COURT REPORTER: Before we go off the record, can I have the orders obtained on the record? 14:33:43 14:33:43

MR. KUSHAN: If you could send a rough, that would be great. 14:33:54 14:33:55

MS. MARTIN: Yes, please. 14:33:57

MR. KUSHAN: Lauren, do you need to order, timing wise? 14:33:59 14:34:00

MS. MARTIN: Oh yeah. Can we get the expedited or whatever -- (Off the record discussion). 14:34:02 14:34:02

If you could do the one day, that would be great. (Off the record discussion). So if we can get the final on Monday, that would be great. Thanks so much everybody. Do you need anything else from us? 14:34:42 14:34:42 14:35:12 14:35:23 14:35:24

MR. KUSHAN: No. 14:35:31

COURT REPORTER: No, thank you. 14:35:32

VIDEOGRAPHER: Thank you. 14:35:32

(Whereupon, the deposition concluded at 2:35 p.m.)

CERTIFICATE OF DEPONENT

I, JAMES NAISMITH, Ph.D., hereby certify that I have read and examined the entire transcript of my deposition and attest that it is a true and correct transcription of my deposition testimony given on Saturday, June 13, 2026, save and except for the changes and/or corrections, if any, listed on the Errata Sheet attached.

Signed _____

JAMES NAISMAITH, PH.D.

Dated this _____ day of _____, 2026.

ERRATA SHEET

Case Name: Merck Sharp & Dohme LLC v. Halozyme, Inc.

Witness Name: James Naismith, Ph.D.

Page / Line	From	To
____ /_____	_____	_____
____ /_____	_____	_____
____ /_____	_____	_____
____ /_____	_____	_____
____ /_____	_____	_____
____ /_____	_____	_____
____ /_____	_____	_____
____ /_____	_____	_____
____/_____	_____	_____
____/_____	_____	_____
____/_____	_____	_____
____/_____	_____	_____

Subscribed and sworn to before me this _____ day of _____, 2026.

_____

JAMES NAISMITH, PH.D.

CERTIFICATE OF COURT REPORTER

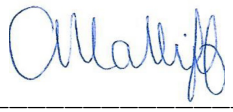
I, CHANELLE MALLIFF, a Certified LiveNote Reporter, Accredited Court Reporter, and Qualified Realtime Reporter, hereby certify that:

JAMES NAISMITH, Ph.D., the witness whose deposition is hereinbefore set forth, was duly sworn by me before the commencement of such deposition and that such deposition was taken before me and is a true record of the testimony given by such witness.

I further certify that the adverse party, the Petitioner MERCK SHARP & DOHME LLC, was represented by counsel at the deposition.

I further certify that the deposition of JAMES NAISMITH, Ph.D., occurred at the offices of The Randolph Hotel Beaumont Street Oxford, OX1 2LN, United Kingdom on Saturday, June 13, 2026, commencing at 12:41 p.m. to 2:35 p.m.

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



CHANELLE MALLIFF

CLR, ACR, QRR2*

June 14, 2026

A
a"-
41:14
able
28:19, 65:5
about
7:21, 9:1, 14:5, 18:9, 19:4, 19:14, 22:4, 22:7, 28:19, 30:16, 32:12, 32:13, 46:15, 50:2, 51:1, 56:6, 57:14, 60:16, 63:14, 67:18, 67:19
above
14:10, 67:13, 67:16
abridge
71:19
ac
64:3
accept
65:18
acceptable
65:21
accredited
76:3
accurate
30:6
accurately
33:7, 51:13, 52:1
acid
16:9, 17:1, 17:12, 19:6, 19:9, 24:11, 24:12, 29:19, 60:20, 71:10, 71:11, 71:15, 71:20, 72:1
acids
24:14, 71:13
acr
1:31, 76:30
across
43:17, 46:8
action
76:23, 76:25
active
20:8, 20:20, 21:7, 23:1, 23:6, 23:10, 24:4, 26:4, 26:5, 26:6, 26:8, 26:13, 26:18, 26:19, 27:1, 27:12, 27:16, 27:20, 27:21, 28:6, 33:12, 33:17, 33:21, 35:14, 35:15, 35:18, 35:21, 36:2, 36:10, 38:6, 39:17, 39:21, 40:1, 42:10, 42:13, 44:8, 44:11, 44:19, 44:21, 45:9, 45:21, 47:4, 47:7, 47:18, 48:17, 51:17, 52:6, 52:11, 52:15, 52:20, 53:1, 53:8, 53:11, 53:15, 53:21, 54:4, 54:7, 54:9, 54:12, 54:19, 55:2, 55:12, 56:14, 59:12, 61:22, 62:2, 62:10, 62:13, 62:16, 63:6, 63:8, 63:22, 64:2, 64:3, 64:9, 66:22, 67:8, 67:13, 68:17
active"
44:16
activity
17:4, 19:8, 20:14, 21:4, 22:12, 24:18, 25:2, 27:8, 27:13, 30:13, 31:7, 31:8, 32:16, 34:5, 34:21, 35:4, 35:6, 37:4, 37:12, 38:2, 38:14, 38:17, 38:21, 39:12, 39:14, 40:7, 40:13, 41:1, 41:8, 41:15, 42:16, 45:6, 47:1, 47:13, 49:8, 50:4, 50:11, 50:20, 53:5, 53:14, 53:19, 53:22, 54:1, 55:13, 56:7, 56:8, 56:17, 61:8, 61:12, 61:20, 62:4, 63:7, 63:8, 63:12, 64:7, 64:15, 65:2, 65:4, 68:8, 68:14, 71:17
actually
36:16, 39:9, 42:17, 58:2, 62:8
added
44:19
adding
28:10
additional
18:14
address
28:7
addresses
39:11, 39:14
addressing
29:3
adequate
36:11
adjust
67:20
adopt
30:1, 32:7
adopted
56:12
adverse
76:12
after
16:18, 16:20, 17:13, 17:15, 17:20, 18:1, 18:10, 19:14, 44:18
afternoon
6:13, 6:14
again
8:9, 8:11, 16:1, 25:14, 25:17, 31:17, 34:13, 49:4
aggregate
66:6
aggregation
68:2
agree
14:19, 18:17, 18:22, 22:17, 23:7, 24:7, 24:16, 26:1, 28:5, 37:1, 45:10, 63:22, 68:9, 68:15, 69:20
agreed
23:2, 23:3, 28:16, 28:22, 70:4
ahead
67:11
all
2:18, 3:4, 6:1, 6:18, 9:5, 11:10, 13:4, 13:17, 16:14, 18:17, 20:22, 26:21, 27:10, 28:5, 29:8,

33:19, 34:15, 35:2, 35:5, 35:14, 37:8, 38:5, 38:16, 40:21, 42:10, 43:20, 45:14, 54:1, 57:11, 59:8, 59:14, 63:21, 65:8, 72:13
allow
63:6
already
11:16, 11:18, 11:19, 11:21
also
3:16, 5:22, 9:11, 11:3, 11:13, 12:14, 13:2, 26:4, 27:10, 37:2, 41:12, 53:21
although
43:14
amahan@sidley
2:12
amino
16:9, 17:1, 17:12, 19:6, 19:9, 24:11, 24:12, 24:14, 29:19, 60:20, 71:10, 71:11, 71:13, 71:15, 71:20, 72:1
amy
2:11, 8:21, 9:2
analys
32:11
analysis
21:19, 30:7, 30:10, 30:17, 31:5, 31:8, 32:13, 32:16, 38:9, 39:14, 40:16, 40:18, 44:22, 45:3, 46:6, 46:9, 46:15, 46:21, 47:9, 47:11, 47:13, 49:6, 49:7, 49:8, 49:21, 50:3, 50:4, 50:18, 53:3, 53:5, 53:13, 53:19, 55:9, 63:18, 71:7
analyzed
46:16, 65:6
any
7:1, 7:2, 7:20, 8:1, 9:14, 9:22, 13:11, 19:10, 24:18, 49:16, 62:10, 63:9, 63:22, 64:8, 67:5, 72:20, 74:8, 76:23, 76:24
anyone
8:16
anything
7:11, 8:1, 56:6, 63:19, 73:16
apologies
8:15, 17:22, 25:16, 32:2, 32:22, 35:16, 63:4, 64:4
appeal
1:3, 6:19
appears
17:13, 21:15, 70:8, 71:5
applied
18:8
appreciate
6:17
approach
55:7
approached
21:19, 49:13
aren't
44:18
arming
64:22, 65:8
around
53:19, 63:13, 63:15
arrangements
9:11
aside
59:17
asked
26:12, 41:21
asking
18:9
assay
61:8, 62:6, 68:13
assess
26:12
assume
65:14
assumed
65:6
attached
74:9
attending
6:1
attention
9:12, 41:22
attest
74:5
attorney
5:16, 76:24
attorney-client
9:14
aubrey
3:23
austin
2:5, 5:18, 8:21
available
6:17
avenue
2:21
aware
9:17, 9:20

B

back
8:8, 14:16, 16:14, 24:5, 25:14, 36:3, 36:16, 49:4, 52:18, 54:16, 57:3, 57:6, 60:15, 72:18
bag
7:14
base
20:20, 21:7, 22:12
based
25:4, 40:20, 61:11
basis
70:14
beaumont
1:25, 5:11, 76:18
because
26:11, 31:18, 34:9, 36:20, 41:20, 43:15, 43:17, 44:22, 45:1, 46:2, 46:4, 46:11, 46:18, 47:8, 47:14, 49:8, 49:13, 50:2, 53:3, 53:13, 54:21, 61:19, 62:16, 63:19, 64:20, 66:5, 67:20, 71:6
been
56:19, 57:14, 61:22, 64:19, 66:9
before
1:3, 39:9, 39:10, 47:11, 64:12, 64:17, 73:4, 75:18, 76:8, 76:9
beginning
5:15, 19:17, 32:11, 32:14, 49:21, 50:22

begins
5:4, 13:12, 16:17, 18:1, 18:13, 19:3, 19:8, 29:11, 30:8, 51:8, 69:16
behalf
5:13, 6:5
behave
65:13, 66:6
being
6:15, 7:13, 15:17, 18:7, 24:1, 29:17, 31:13, 31:20, 32:4, 33:9, 33:12, 35:12, 35:13, 48:12, 48:22, 50:14, 51:15, 52:3, 52:6, 52:13, 53:15, 54:6, 62:11
believe
33:7, 51:13, 52:1, 54:20, 57:17, 62:20, 63:11, 64:8, 70:18, 70:21
below
15:22, 17:4, 50:9, 63:20
besides
7:12, 7:20
between
49:12
big
36:7
bigger
52:21, 53:16
bit
60:16, 67:22
blah
18:5
blood
76:23
blue
65:19
board
1:3, 6:19, 9:17, 28:2, 28:4, 28:14, 56:11
boston
2:22
both
43:14, 43:20, 45:11, 47:4, 51:3, 69:2
bottom
60:2
box
10:13, 12:15, 12:21, 36:4, 36:11, 36:13, 52:18, 52:19, 52:20, 54:16, 67:2
boxed
54:16
boxes
55:1
break
56:20, 57:2, 57:9, 64:12, 72:14, 72:17
bring
7:19
brought
8:4, 11:6
bst
1:22
buffers
67:20
bulk
28:7
bulldog
58:16
bundles
43:13

C

call
42:5, 42:8, 42:13, 62:21
called
57:22, 65:19
calls
42:9
can't
9:3, 26:21, 42:8, 68:4
cap
23:13
captures
15:3
case
1:14, 5:7, 11:14, 12:2, 12:3, 19:2, 45:2, 68:7, 68:18, 75:2
catalytic
64:21, 65:16
cell
26:14, 27:2, 27:6, 47:4
center
60:4
certain
20:22, 33:11, 33:15, 34:10, 34:16, 35:13, 35:20, 35:22, 36:15, 37:3, 37:10, 37:16, 37:18, 38:12, 41:10, 41:19, 52:5, 52:15, 53:7, 53:10, 54:6, 54:8, 54:13, 54:14, 54:19, 54:22
certificate
74:1, 76:1
certified
76:2
certify
74:3, 76:4, 76:12, 76:16, 76:22
chance
13:11
chanelle
1:31, 6:4, 76:2, 76:29
change
28:10, 63:18, 67:4
changes
66:22, 68:4, 74:8
changing
66:18
check
7:17, 10:20, 17:20, 43:1, 57:18, 64:18, 65:8
chelsea
2:14
chimes@sidley
2:15
choi
2:27
choices
26:21
chromatography
65:21
circular
65:17
cited
38:19
claim
28:1, 28:5, 28:13, 28:17, 29:1, 29:3, 29:5, 29:21, 32:6, 34:10, 34:17, 35:7, 37:10, 38:1, 38:13, 40:21, 41:13, 41:17, 41:22, 42:2, 42:4, 42:5, 42:7, 42:9, 42:12, 46:16, 47:12, 47:15, 49:8, 49:11, 53:4, 55:8, 58:1, 58:13, 59:4, 59:8, 59:11, 59:13,

61:15, 61:18, 62:19, 68:9
claims
20:22, 21:2, 27:11, 27:15, 27:19, 28:6, 29:17, 30:15, 31:4, 31:13, 31:19, 32:4, 32:10, 32:17, 33:9, 33:15, 33:19, 34:1, 34:4, 34:10, 34:16, 34:19, 35:2, 35:6, 35:11, 36:13, 37:3, 37:10, 37:17, 37:18, 38:5, 38:12, 38:16, 38:21, 39:4, 39:15, 39:16, 39:21, 40:6, 40:12, 40:14, 40:22, 41:7, 41:10, 41:12, 41:13, 41:19, 42:3, 42:15, 45:8, 46:18, 47:17, 48:12, 48:22, 49:17, 49:22, 50:13, 51:15, 52:3, 52:10, 52:13, 52:22, 53:8, 53:15, 53:20, 54:2, 54:20, 55:3, 55:4, 55:12, 55:20, 55:22, 57:22, 58:5, 58:14, 59:1, 68:16, 70:2, 70:14, 72:10, 72:12
clari
18:16
clarification
11:7, 26:15, 48:2
clarifications
7:1
clarify
15:16
classification
61:2, 61:11
classified
61:1, 61:10, 61:22, 62:1, 62:11, 62:14, 63:7, 63:20
classifies
61:14
clear
18:16, 19:5, 26:22, 63:2, 64:11
clearly
19:2, 27:18
clips
58:16
clr
1:31, 76:30
colored
52:20
column
60:3, 60:18, 60:21, 65:14
com
2:10, 2:12, 2:15, 2:25, 2:28, 2:30, 3:11, 3:13
come
33:1, 49:4
comes
19:14
commencement
76:8
commencing
76:19
common
4:23, 8:9, 13:18, 13:20, 14:2, 14:17, 15:17, 16:21, 20:5, 21:1, 21:12, 21:15, 21:21, 22:9, 22:21, 23:8, 24:1, 24:16, 25:11, 25:18, 26:2, 34:18, 38:3, 39:2, 41:4, 42:3, 44:1, 44:6, 46:12, 47:2, 57:11, 59:14, 59:20, 67:15, 70:5, 70:6
communications
9:15
compared
24:14, 69:6, 71:13
complete
14:22, 15:1, 15:12, 30:7, 32:9
completed
50:18
computer
7:11, 7:13, 7:14, 7:15, 7:17, 7:18
concept
19:4
conclude
24:3, 31:10, 38:4, 38:9, 50:12, 50:16, 55:19, 56:5
concluded
34:3, 34:19, 35:2, 40:15, 40:21, 41:5, 41:6, 73:21
concludes
73:1
conclusion
26:22, 30:16, 32:10, 32:16, 32:18, 33:22, 40:4, 40:5, 40:6, 40:8, 40:16, 40:18, 40:19, 41:12, 41:16, 42:15, 46:7, 46:18, 47:17, 49:10, 49:22, 50:5, 50:17, 50:20, 50:22, 55:10, 55:11, 56:9
conclusions
30:14, 31:9, 45:7
conduct
46:20
conducted
46:6
conducting
55:18
confirm
59:7
confirming
59:2, 59:4
conjunction
21:1, 34:17, 41:3
consider
10:4, 10:8, 30:13, 45:1, 49:9, 53:3, 67:12
considered
20:5, 20:18, 20:22, 21:2, 21:10, 22:21, 30:9, 47:14
considers
34:15
consistent
34:6
constructed
32:13, 46:3
construction
28:17, 29:1, 29:4, 29:5, 46:16, 46:17, 47:12, 61:15, 68:10
construed
55:2

construing
55:4
contain
29:19
contains
18:4, 24:10,
71:10, 71:18
contents
10:4, 10:8
continue
13:22, 29:5
continued
3:2
convey
54:15
copies
12:18
copy
13:12
corner
53:2
correct
10:22, 11:2,
12:1, 12:22,
13:19, 14:4,
16:5, 17:5,
17:14, 20:9,
20:10, 20:14,
25:21, 26:10,
29:13, 30:4,
37:13, 39:13,
39:19, 41:10,
41:11, 44:16,
44:17, 44:19,
45:12, 45:22,
46:1, 46:14,
47:22, 48:3,
48:15, 48:17,
49:2, 49:19,
50:1, 50:15,
51:18, 56:3,
57:16, 57:19,
57:21, 58:1,
59:12, 59:13,
60:22, 61:5,
61:13, 62:22,
63:2, 64:15,
68:19, 70:5,
70:10, 74:5
corrections
74:8
could
5:14, 12:14,
48:7, 55:19,
56:4, 62:10,
65:1, 67:14,
67:16, 73:6,
73:13
counsel
3:22, 5:14,
6:22, 7:1, 9:7,
9:13, 57:9,
76:14
couple
9:10
course
6:3, 10:16,
28:1, 71:1
court
1:30, 6:4, 6:6,
7:9, 11:15,
11:19, 73:4,
73:19, 76:1,
76:3
covers
57:15
criteria
49:2, 50:15
cross-examination
7:3
crystal
66:1, 66:8,
66:14
cysteine
60:22, 61:4,
61:10, 61:16,
62:12, 62:18,
63:2, 66:19,
67:19, 67:20,
68:7

D

date
4:19, 4:22,
5:9, 64:17
dated
74:18
day
73:13, 74:18,
75:19
dc
2:7, 3:8
deal
31:7, 53:19
dealing
46:2
deals
50:19, 50:20
dealt
45:5, 53:18
decide
28:14, 56:11
decisions
9:18, 10:1,
10:5, 10:9
declaration
4:12, 4:15,
10:12, 11:4,
11:9, 11:13,
12:11, 13:9,
14:1, 16:12,
17:7, 17:8,
18:10, 19:13,
27:18, 27:19,
29:15, 30:9,
34:9, 35:9,
37:9, 38:11,
41:22, 42:18,
42:20, 43:2,
44:10, 44:12,
44:21, 45:1,
45:14, 45:18,
47:5, 47:21,
48:8, 48:11,
49:17, 51:10,
51:20, 51:21,
52:9, 52:12,
55:6, 55:15,
57:15, 57:20,
67:15, 69:19
declarations
8:7, 8:10,
8:13, 10:5,
11:10, 12:5,
43:12, 51:3
define
18:6, 21:3,
23:4, 34:4,
34:19, 35:3,
37:10, 40:6,
40:22, 41:14,
42:15
defined
13:13, 13:18,
14:5, 17:14,
20:13, 25:11,
25:18, 26:2,
44:1, 44:6,
44:13, 45:16,
45:19, 46:22,
47:2, 47:6,
55:21, 70:5,
70:7, 70:12
defines
13:21
defining
16:18, 16:20,
18:10, 24:17,
37:3, 38:1,
38:13, 38:16
definition
14:11, 14:20,
14:22, 15:2,
15:11, 15:13,
15:17, 16:2,
18:7, 18:13,
18:14, 18:15,
18:20, 19:15,
19:17, 19:18,
20:3, 21:9,
21:11, 22:1,
22:3, 22:5,
22:8, 22:20,
23:7, 23:16,
23:19, 23:20,
45:11, 45:12,
46:13, 64:8,
69:21, 70:8,
70:15, 70:19,
70:21, 72:5,
72:8
definitions
7:2, 14:3

deployed
61:8
deponent
4:3, 74:1
depos
3:19, 5:13, 6:5, 7:16
deposing
6:22
deposition
1:19, 5:5, 5:10, 8:6, 8:12, 8:13, 8:17, 9:7, 9:9, 10:9, 14:8, 14:14, 14:15, 28:17, 29:6, 57:9, 63:12, 73:2, 73:21, 74:5, 74:6, 76:7, 76:8, 76:9, 76:14, 76:16
described
24:13, 28:9, 67:1, 71:12, 72:1
describes
33:8, 51:14, 52:2
description
4:11, 28:8, 28:12
design
63:17
determine
66:1, 66:14
diagram
36:4
dichroism
65:17
difference
47:16
different
22:10, 26:10, 38:7, 38:8, 46:2, 46:6, 46:10, 46:11, 47:15, 49:9, 49:12, 53:3, 54:18, 55:9
differently
46:3, 46:7, 46:17, 46:19, 47:14, 53:3, 55:9, 55:10
difficulty
64:6
directed
24:4, 27:12, 27:20, 29:18, 31:13, 31:20, 32:4, 33:9, 33:15, 33:19, 35:12, 35:17, 36:13, 38:5, 41:7, 41:14, 47:18, 48:12, 49:1, 49:18, 50:14, 51:15, 52:3, 52:10, 52:13, 52:22, 53:9, 53:15, 53:20, 54:3, 54:8, 54:10, 54:11, 54:21, 55:12, 68:16
directing
52:19
director
3:21
disagree
61:6
disclose
63:5
disclosed
61:20, 62:4
disclosure
4:23, 8:9, 13:19, 13:21, 14:2, 14:17, 15:18, 16:21, 20:5, 21:1, 21:13, 21:15, 21:21, 22:10, 22:21, 23:8, 24:1, 24:17, 25:12, 25:19, 26:2, 26:5, 34:18, 38:3, 39:3, 41:4, 41:5, 42:3, 44:2, 44:7, 46:12, 47:2, 57:11, 59:15, 59:20, 61:21, 67:15, 70:5, 70:6, 72:11
discuss
9:10, 49:5, 57:8
discussed
48:21, 63:11, 63:14
discussion
73:12, 73:14
document
10:3, 11:8, 11:12
documents
7:3
dohme
1:6, 5:6, 5:19, 75:2, 76:13
doing
29:2, 54:2
done
24:3, 65:9, 68:18
down
53:20, 60:17, 68:22
dr
2:11, 4:4, 5:5, 6:8, 6:13, 9:17, 13:15, 14:8, 14:13, 14:19, 33:7, 37:1, 38:19, 42:11, 51:13, 52:1, 57:6, 58:22, 63:15, 63:16, 63:21, 63:22, 67:1
drawn
36:7
drew
41:22
drowning
43:7
duly
6:9, 76:7
during
7:3, 57:9
dwell
38:7

E

e
32:15, 34:10, 34:16, 37:10, 38:13
each
14:9, 14:11, 14:20, 14:21, 15:13, 20:7, 20:19, 22:22, 23:5, 45:1, 46:4, 46:21, 55:8, 60:4
early
6:14, 30:10
ease
12:13
easier
58:8
eellison@sternek-essler
3:11
eldora
3:10
electronically
11:16
elliot
2:27
elliotchoi@quinn-emanuel
2:28
ellison
3:10
else
73:16
elsewhere
26:22, 71:5

emanuel
2:20, 5:21
employed
76:24
enablement
28:8, 28:11
end
30:14, 31:8, 40:9, 45:7, 50:5, 50:17, 50:21, 70:21
ended
62:13
ends
10:21, 12:21, 51:8
enlarge
28:4
entire
18:6, 19:1, 21:21, 39:6, 71:6, 74:4
entirely
32:18
entirety
38:4
enzymatic
20:14, 25:2, 36:12, 41:8, 45:5, 54:1, 56:6, 56:8, 56:17, 64:15, 65:22
enzymatically
20:8, 20:19, 21:7, 23:1, 23:6, 23:10, 26:6, 33:12, 33:17, 33:20, 35:14, 35:15, 35:18, 35:21, 36:2, 36:10, 39:17, 39:21, 40:1, 44:8, 44:11, 44:16, 44:18, 44:21, 45:9, 45:21, 47:4, 47:18, 48:17, 51:17, 52:6, 52:11, 52:15, 53:1, 53:8, 53:11, 53:20, 54:4, 54:6, 54:9, 54:12, 54:19, 55:2, 55:12, 56:14, 59:12
enzyme
22:12, 66:13, 68:14
errata
74:9, 75:1
essential
15:3
essentially
12:5
etc
27:10
evening
9:2
event
49:16
everybody
73:16
evidence
70:3
ex
60:7
examination
4:5, 6:11
examined
6:10, 74:4
example
38:1
except
74:7
excerpted
14:2, 14:14, 16:1, 16:4, 17:16, 18:1, 19:20, 69:19
excluded
68:19
exclusion
65:13
executive
3:21
exhibit
4:12, 4:15, 4:18, 4:21, 4:23, 10:13, 10:15, 11:9, 11:11, 11:14, 11:22, 12:15, 12:17, 13:4, 13:6, 21:3, 34:5, 34:20, 35:3, 37:11, 38:14, 38:17, 40:7, 41:1, 41:8, 41:15, 42:16, 42:22, 59:15, 59:16, 68:22, 69:6, 69:7, 69:8
exhibits
7:20, 8:2, 17:3, 19:7, 71:16
expect
66:19, 67:8
expedited
73:12
experiment
68:18
explain
29:12, 50:8, 50:10, 54:15
explains
16:22
explanations
7:2
explicitly
20:6, 20:18, 21:6, 22:22, 23:5, 23:9, 23:14
express
27:1
expressed
65:1
expressly
25:11, 25:18, 26:1, 26:5, 44:1, 44:6, 44:13, 45:15, 45:19
extract
60:2
eye
7:10

F

fact
27:2, 56:17
factors
62:10
falls
62:19
familiarize
65:8
features
15:3, 31:14
feel
28:22
few
32:12, 66:22, 68:3
filtration
65:20
final
9:18, 9:20, 9:22, 10:4, 10:8, 30:16, 47:11, 73:15
financially
76:26
find
10:12, 11:3, 58:14, 69:2, 70:11
fine
25:17, 29:7, 33:2, 43:19, 58:11, 58:21, 64:5
finish
31:18
first
11:8, 14:9, 14:20, 15:2, 15:14, 18:12, 18:13, 18:17,

19:3, 24:7, 30:8, 30:11, 51:9, 53:18
five 9:1
flagged 42:12
flexible 6:15
floor 3:7
focus 9:12, 30:10, 45:4, 50:3
focused 29:4, 53:19
focuses 31:6
fold 30:2, 32:8
folded 25:20, 26:3, 26:4, 26:7, 26:9, 26:13, 26:17, 28:6, 30:1, 32:7, 33:11, 33:16, 33:20, 35:13, 35:19, 35:21, 36:1, 36:8, 36:14, 44:8, 44:11, 44:14, 44:18, 45:17, 45:20, 47:4, 47:7, 52:5, 52:14, 52:21, 53:9, 53:15, 53:16, 53:21, 53:22, 54:1, 54:11, 54:17, 54:20, 55:1, 56:2, 56:13, 56:16, 59:11, 62:9, 64:14, 65:3, 65:7, 65:15, 66:10, 66:14
folder 57:13
folding 27:13, 30:11, 30:12, 31:6, 32:14, 45:4, 47:1, 47:9, 47:13, 49:7, 49:21, 50:3, 50:10, 50:19, 51:1, 53:4, 53:14, 54:3
followed 5:16
following 6:20
follows 6:10, 17:16, 17:17
forget 8:20, 9:3
form 21:17, 22:6, 25:19, 26:2, 26:5, 26:13, 26:18, 27:1, 27:12, 37:20, 38:6, 44:2, 44:14, 45:16, 45:20, 47:3, 62:2, 62:16, 71:2
forming 70:1, 70:3, 72:9, 72:11
forms 24:4, 27:7, 28:6, 39:3, 47:6, 47:7, 68:17
formulate 45:2
forth 76:7
found 27:1, 30:2, 47:3
foundation 18:21, 20:15, 23:11, 24:19, 31:1, 31:15, 37:19, 40:3, 49:3, 67:10, 68:11, 71:3, 72:6
four 13:7, 43:13, 48:13
fourth 30:21, 36:20, 48:16
fox 3:6
front 13:7, 13:13, 45:3, 57:12, 57:18, 58:9
full 15:16, 19:19, 31:4, 69:4, 69:5, 72:4, 72:7
fully 24:1
further 18:6, 19:8, 72:21, 76:12, 76:16, 76:22

G

gave 63:20
gel 65:20
general 65:10, 65:12
give 6:20, 10:16, 12:18, 31:9, 40:8, 45:7, 50:5, 62:20, 63:4
given 38:8, 46:8, 49:11, 49:22, 50:17, 50:20, 70:15, 74:6, 76:10
gives 19:5, 46:8
glutamate 64:20
go 14:6, 14:16, 19:22, 34:8, 36:3, 36:16, 36:17, 36:19, 40:18, 54:16, 66:13, 67:10, 72:13, 73:4
goes 18:5, 27:6, 43:16, 51:4
going 6:21, 28:18, 49:4, 52:18, 56:19, 56:22, 59:17, 71:4, 71:6, 71:19, 72:15, 73:2
goldstein 3:6
gonna 9:13, 50:3
good 6:13, 6:14, 25:15, 67:17
great 7:6, 10:19, 73:7, 73:14, 73:15
green 36:11, 52:20

H

haddach 3:23
halozyme 1:11, 3:22, 3:23, 5:6, 5:21, 75:2
handy 11:3, 19:21, 42:19
happen 67:7
hard 33:2

headed
13:13
header
39:15, 39:19
heading
47:10
hear
43:16
hecht
8:10, 33:7, 37:1, 38:19, 51:13, 52:1
hello
57:7
help
39:5
helps
15:16, 18:15, 36:15, 37:22, 39:1
here
5:4, 7:13, 7:14, 12:13, 18:8, 26:8, 29:8, 39:1, 44:19, 45:4, 46:6, 46:16, 46:17, 46:19, 50:3, 50:16, 52:22, 55:5, 58:4, 59:8, 60:6, 62:12, 63:19, 67:13, 70:15
hereby
74:3, 76:4
herein
18:2, 18:19, 24:8, 24:13, 27:4, 69:14, 71:8, 71:12, 72:2
hereinbefore
76:7
highlighted
14:4, 14:10, 16:6, 36:11, 37:22
highlighter
16:13
highlights
67:2
himes
2:14
honestly
26:20
hopefully
64:11
host
38:22
hotel
1:24, 5:11, 76:18
hour
56:20
hours
9:1, 28:20
huntington
2:21
hyaluronidase
15:7, 17:4, 19:8, 21:4, 27:5, 34:5, 34:21, 35:4, 35:6, 37:4, 37:11, 38:2, 38:14, 38:17, 40:7, 40:12, 41:1, 41:8, 41:15, 42:16, 55:13, 71:17

I

id
59:6
ideas
40:17
identified
10:15, 11:22, 12:17, 13:6, 59:16, 64:21
identify
5:14
identity
29:20, 32:6
ii
29:21, 32:3
iii
29:22, 30:20, 32:3
imagine
43:9
important
15:10, 21:20
imposed
62:7
inactivate
68:5
inactive
60:12, 60:21, 61:2, 61:4, 61:10, 61:14, 62:1, 62:11, 62:14, 63:7, 63:20, 66:15, 67:22, 68:15
inc
1:11, 3:22, 5:6, 75:2
include
14:3, 19:10, 24:18, 30:21, 39:16, 39:21, 44:15, 44:20, 47:6, 71:22
included
30:19, 62:15
includes
27:8
independent
46:20
independently
42:4, 46:5, 49:10, 49:14, 55:8
inform
42:2
information
62:21, 63:5
instead
20:21, 30:20
instruction
6:20, 7:4
integrates
46:8
intended
30:21
interested
66:12, 76:25
interesting
42:1, 42:7
interpret
59:8, 59:11
investigated
61:21, 64:19
isolated
21:8, 22:11, 23:13, 23:15, 65:5, 66:5, 68:13, 70:13
isolation
20:6, 20:18, 21:6, 21:10, 21:17, 22:8, 22:22, 23:3, 23:13, 23:21, 24:22, 25:1, 25:3, 25:4, 39:4
issue
57:20, 59:3
issued
9:18
itself
23:14, 67:21

J

james
1:19, 4:4, 5:5, 6:8, 74:3, 74:14, 75:3, 75:22, 76:6, 76:17
jeff
5:18
jeffrey
2:9
jkushan@sidley
2:10
job
1:29
josh
3:20
judgment
9:21

june
1:21, 4:19, 5:1, 5:9, 74:7, 76:19, 76:31

K

keep
11:2, 19:21, 42:18, 68:1
kessler
3:6
key
15:15, 64:20
kingdom
1:27, 76:19
know
12:3, 43:6, 56:10, 62:8, 62:17, 63:19, 65:3, 66:9, 66:17, 66:21, 67:6, 67:17, 67:21
known
56:16, 56:18, 64:13, 64:17, 64:19, 64:22
kushan
2:9, 5:18, 5:22, 7:10, 8:4, 8:20, 9:1, 9:13, 11:18, 12:19, 13:3, 18:21, 20:15, 22:6, 23:11, 24:19, 28:18, 28:21, 29:3, 31:1, 31:15, 37:19, 40:3, 49:3, 56:21, 67:10, 68:11, 71:2, 72:6, 72:22, 73:6, 73:9, 73:18

L

labeled
10:13
language
20:22, 21:12, 26:10, 26:11, 34:16, 37:18, 40:20, 41:3, 41:9, 41:18, 44:16, 46:10, 47:15, 49:9, 53:4, 54:15, 55:5, 55:8
last
10:2, 34:2, 34:14, 63:11
later
27:10, 31:7
latter
50:19
lauren
2:24, 5:20, 73:9
laurenmartin@quinnemanuel
2:25
lawyer
28:2, 56:5
least
18:4, 19:11, 24:10, 24:12, 41:5, 71:10, 71:11, 72:1
led
62:11
left-hand
52:19
legal
28:3, 28:15
leif
8:21
leif's
9:4
length
69:5
less
61:8, 61:11, 68:8, 68:14
let's
16:14, 19:21, 32:20, 34:8, 36:16
limit
28:16, 29:1
limitation
19:5, 24:18
limited
27:16, 39:22, 55:22, 59:11
line
7:10, 69:16, 70:9, 70:18, 75:5
listed
31:21, 60:20, 74:8
literally
37:16
literature
56:16, 64:14, 66:4
litigation
3:21
little
36:4, 36:11, 60:16
livenote
76:2
llc
1:6, 5:6, 5:19, 75:2, 76:13
llp
2:5, 2:20
long
8:22, 14:4, 17:2, 19:7, 26:20, 71:15
look
60:10
looked
8:8, 8:9, 8:11, 12:2, 27:2
looking
7:17, 36:20, 70:9
looks
69:7
lot
67:18

M

ma
2:22
mack
3:20
made
62:9, 64:22, 65:15, 67:4, 67:13
mahan
2:11, 9:3
mainly
45:4
make
21:5, 23:15, 26:21, 29:7, 43:19, 58:8, 62:21, 63:1
making
6:16
malliff
1:31, 6:4, 76:2, 76:29
many
26:20
marked
4:10, 8:1, 10:15, 11:17, 11:18, 11:19, 11:21, 11:22, 12:17, 13:6, 59:16
marking
11:16
marriage
76:23
martin
2:24, 4:5, 5:20, 6:12, 9:16, 10:18, 10:19, 11:1, 11:8, 11:21, 12:6, 13:10, 13:14, 19:12, 22:15, 23:17, 25:5, 28:16, 28:22, 29:7,

29:9, 31:11, 31:16, 38:10, 40:10, 48:3, 49:15, 56:19, 57:5, 58:19, 58:20, 68:20, 72:3, 72:13, 72:20, 73:8, 73:11
materials
7:20, 13:3
matter
5:6, 6:19, 8:14, 9:9, 10:12, 11:4, 11:9, 11:13, 11:14, 12:8, 12:10, 12:16, 13:4, 13:9, 27:14, 28:1, 29:15, 30:9, 37:8, 42:20, 43:21, 44:10, 44:12, 44:21, 45:14, 45:18, 47:5, 47:22, 48:8, 48:10, 48:18, 48:20, 49:7, 49:14, 49:16, 50:5, 50:7, 51:3, 51:7, 51:10, 51:21, 52:9, 52:12, 52:18, 53:14, 55:6, 55:14, 57:15, 58:9, 65:11, 65:12, 76:26
matters
8:8, 10:6, 11:11
maybe
60:16, 63:16, 67:5, 67:17
mc
63:4, 64:7, 68:8, 68:13
mean
17:17, 32:1, 57:17, 62:5, 62:12
meaning
19:19, 24:2, 28:20, 35:2, 53:8
means
26:4
meant
35:14, 38:15, 38:18, 52:17, 53:12, 54:15, 56:9, 62:6
measured
62:8
measurements
65:18
mechanism
64:21, 66:13
media
5:4
meet
8:16, 8:19, 8:22, 29:21, 32:5, 48:13
meeting
9:6
meetings
9:10
merck
1:6, 5:6, 5:19, 60:2, 60:7, 75:2, 76:13
merck's
60:11, 60:15
met
8:20
methionine
66:18
might
61:19, 66:13, 67:20
mind
18:16, 58:8
minimum
66:4
mm-hmm
58:11
modification
24:11, 59:10, 71:11
modifications
19:11, 71:22
modified
13:17, 16:3, 16:8, 16:20, 16:22, 17:3, 17:11, 17:13, 18:2, 18:11, 18:19, 19:4, 20:4, 20:7, 20:13, 20:19, 21:3, 21:9, 21:11, 21:14, 22:3, 22:9, 22:13, 22:20, 23:1, 23:8, 23:9, 23:21, 24:2, 24:8, 24:17, 27:16, 27:20, 27:21, 29:18, 31:13, 31:20, 32:5, 33:10, 33:16, 34:4, 34:20, 35:3, 35:12, 35:17, 35:22, 36:9, 37:3, 37:11, 38:13, 38:16, 38:20, 39:17, 39:22, 40:1, 40:7, 40:22, 41:7, 41:14, 42:16, 47:18, 49:1, 49:18, 50:14, 51:16, 52:4, 52:10, 52:13, 54:10, 55:21, 56:1, 59:5, 59:9, 69:14, 69:21, 70:4, 70:19, 70:21, 71:8, 71:14, 71:16, 71:17, 71:21, 72:5
modify
48:13
modifying
61:3
monday
73:15
more
19:10, 28:20, 33:7, 42:8, 51:13, 52:1, 67:3, 71:22
morning
6:15, 8:3
most
9:5, 63:17, 67:3
move
32:14, 43:7
moved
30:13, 47:10
moving
25:13
much
73:16
multiple
21:15
must
6:22, 53:22
mutant
61:11, 61:22, 66:2, 67:4, 67:8, 67:13
mutants
27:20, 60:12, 60:21, 61:14, 67:1, 68:17
mutated
64:20
mutation
61:10, 61:16, 64:22, 65:15
mutations
42:10
myself
12:2, 63:22, 65:8

N

naismaith
74:14

naismith
1:19, 4:4, 4:12, 4:15, 5:5, 6:8, 6:13, 9:17, 11:10, 13:15, 57:6, 58:22, 74:3, 75:3, 75:22, 76:6, 76:17
name
8:21, 9:4, 75:2, 75:3
names
6:1
native
30:2, 65:19
natively
36:8, 54:17
nearly
32:22
necessary
62:21, 66:9
need
12:1, 18:6, 73:9, 73:16
neutral-active
15:9, 26:14, 26:16, 27:6, 47:3
next
25:7, 32:12, 36:20
no:3
59:6
normally
66:6
nos
1:14
noting
42:14
number
12:3, 13:11, 66:22
numbering
69:4
numbers
5:8, 60:1, 60:3, 60:4, 62:8, 71:19
nw
2:6, 3:7

O

objection
18:21, 20:15, 22:6, 23:11, 24:19, 31:1, 31:15, 37:19, 37:20, 40:3, 49:3, 67:10, 68:11, 71:2, 72:6
obligated
6:20
obtained
73:5
obvious
68:4
obviously
56:10, 57:17
occurred
76:17
occurs
15:8, 22:9
offering
28:3
office
1:1, 5:7
offices
76:17
oh
7:19, 32:1, 35:16, 73:11
okay
7:6, 7:15, 7:19, 8:5, 11:2, 11:20, 12:9, 12:10, 12:13, 13:8, 14:16, 15:12, 15:22, 25:17, 29:10, 29:14, 33:5, 34:8, 35:5, 36:16, 39:7, 39:10, 39:11, 42:17, 42:21, 43:8, 43:11, 43:19, 47:20, 48:10, 48:20, 51:2, 58:2, 58:12, 58:13, 58:15, 58:16, 58:22, 59:7, 59:18, 60:7, 60:9, 60:15, 64:7, 65:12, 68:21, 69:8, 70:16, 73:1
once
50:18
one
10:21, 11:5, 12:18, 17:17, 19:10, 19:11, 24:10, 24:12, 28:4, 42:11, 60:5, 60:6, 60:20, 60:21, 62:10, 62:17, 66:17, 67:2, 67:3, 69:3, 69:18, 69:22, 70:11, 71:10, 71:11, 71:22, 72:1, 72:8, 73:13
ones
11:5, 35:20, 36:14, 42:11
online
9:3, 9:4, 9:10
only
9:6, 20:21, 28:3, 54:4, 55:1
open
7:11
opinion
20:20, 21:7, 22:13, 24:21, 25:3, 27:17, 28:3, 28:11, 38:3, 41:6, 41:16, 47:11, 70:1, 70:3, 72:9, 72:12
opinions
28:7, 28:8, 28:12, 31:3, 39:3, 45:2
opposite
7:8
order
6:19, 73:9
orders
73:5
orient
60:10
other
15:10, 17:17, 19:9, 28:10, 42:2, 62:10, 62:17, 65:7, 65:18, 66:17, 71:22
otherwise
76:26
ourselves
60:10
out
12:14, 15:11, 20:21, 21:18, 27:17, 27:22, 30:10, 31:3, 32:11, 32:15, 32:18, 38:22, 40:5, 40:19, 42:5, 42:9, 42:13, 46:19, 47:9, 49:5, 49:7, 50:4, 53:4, 54:13, 57:22, 59:5, 68:6, 69:3, 72:8, 72:10
outcome
76:26
over
17:21, 43:16, 48:5, 51:4, 56:19
own
7:1, 8:12,

21:17, 22:10, 23:4, 23:20, 46:5, 62:7
owner 1:12, 2:18, 3:4
ox1 1:26, 76:18
oxford 1:26, 5:11, 9:2, 76:18

P

page 4:3, 4:11, 10:2, 13:11, 13:12, 14:1, 14:7, 14:16, 16:1, 19:21, 19:22, 24:5, 25:7, 27:3, 29:8, 29:11, 32:21, 36:4, 36:5, 36:18, 36:20, 39:7, 39:8, 43:15, 43:17, 48:5, 48:6, 51:4, 51:5, 51:8, 54:16, 58:6, 58:7, 58:15, 59:8, 59:15, 59:20, 59:22, 60:3, 60:4, 60:8, 60:11, 60:16, 60:17, 68:22, 69:7, 69:8, 69:11, 70:10, 75:5
pages 15:20, 32:22, 69:2
panel 55:18, 56:4
paper 25:15, 43:7, 63:17, 64:18, 65:8
papers 43:13, 65:18
paragraphs 14:2, 14:5, 21:20, 30:11, 31:5, 32:12, 38:7, 39:14, 40:17, 45:6, 46:1, 49:12, 69:18
parameters 29:21, 32:6
part 16:4, 31:6, 39:2, 39:3, 47:8, 70:3, 71:7
participants 5:17
particular 30:18, 37:22, 38:1, 66:12
particularly 8:10, 38:19, 42:1, 42:12
parties 76:23, 76:24
parts 15:10
party 76:12
passage 37:2, 37:22, 38:12
patent 1:1, 1:3, 1:12, 1:14, 2:18, 3:4, 3:21, 4:13, 4:16, 4:18, 4:19, 4:21, 4:22, 5:7, 6:18, 8:14, 10:14, 10:21, 11:5, 12:4, 12:14, 13:2, 15:6, 21:18, 26:11, 27:15, 28:14, 30:18, 39:6, 41:21, 42:20, 43:2, 45:3, 45:5, 45:11, 45:12, 45:15, 45:19, 46:21, 49:6, 49:13, 55:8, 57:16, 58:3, 58:6, 58:12, 59:3, 59:9, 59:17, 61:1, 61:3, 61:7, 61:13, 61:16, 61:17, 62:7, 62:19, 62:20, 63:4, 63:8, 67:14, 67:15, 69:4, 70:12
patent's 67:15
patents 8:8, 46:3, 46:11, 46:12
pause 42:19, 58:16, 60:7
people 6:1, 64:20, 65:17, 65:18, 66:1, 66:12
perfect 13:1, 13:8, 16:15, 33:5, 39:10, 43:11, 48:7, 48:10, 57:14, 59:2, 69:8, 69:11, 69:12, 72:20
person 2:9, 3:18, 33:3
petitioner 1:7, 2:3, 60:2, 60:7, 76:13
petsko 8:11, 42:11, 63:15, 63:22, 67:1
pgr 1:14, 1:15, 1:16, 4:13, 4:16, 5:8, 10:21, 43:2, 43:10, 43:15
pgrs 9:19
phrase 16:18, 16:20, 17:13, 18:9, 18:11, 21:6, 21:8, 21:14, 21:16, 22:8, 22:11, 23:3, 23:13, 23:15, 39:4, 41:10, 44:20, 70:13
phrasing 39:1
phs 21:3, 33:16, 33:20, 34:4, 34:20, 35:3, 40:7, 41:7, 41:14, 42:16
piece 57:18
place 5:10
places 22:10, 69:22, 70:11
planet 3:19, 5:13, 6:5, 7:16
please 5:14, 6:6, 10:12, 11:2, 11:3, 13:8, 25:6, 29:10, 59:20, 68:21, 70:20, 73:8
pllc 3:6
point 21:5, 21:16, 23:12, 30:8, 31:7, 36:3, 56:15
pointed 20:21, 68:6,

72:10
points
38:8
polypeptide
13:18, 16:3, 16:8, 16:21, 17:3, 17:11, 17:14, 18:3, 18:4, 18:11, 18:19, 19:5, 20:4, 20:7, 20:13, 20:19, 21:10, 21:11, 21:14, 22:9, 22:14, 22:21, 23:1, 23:8, 23:21, 24:9, 24:10, 24:15, 24:17, 38:20, 69:15, 69:21, 70:4, 70:19, 70:22, 71:8, 71:9, 71:10, 71:14, 71:16, 71:18, 71:21, 72:5
polypeptides
23:10, 24:3, 29:18, 31:14, 31:20, 32:5, 33:10, 35:12, 35:17, 35:22, 36:9, 37:4, 37:11, 38:14, 38:17, 39:17, 39:22, 40:1, 40:22, 47:19, 48:13, 49:1, 49:18, 50:14, 51:16, 52:4, 52:11, 52:14, 53:10, 54:17, 56:1, 59:10
population
35:20
portion
14:15, 22:2, 53:1, 70:17
portions
14:17
posa
25:19, 26:3, 30:16, 31:10, 33:8, 34:3, 34:14, 34:15, 40:21, 41:6, 44:3, 44:14, 45:16, 45:20, 51:14, 52:2, 52:12, 63:9, 63:15, 63:22
posas
63:18, 64:8
position
29:21, 32:6, 42:10, 57:20, 57:21, 57:22, 59:3, 59:5, 59:10, 60:17, 61:3, 61:9, 61:17, 62:18, 66:18, 66:21, 68:3
positions
67:4
possible
56:12
powers
3:12
precise
65:22
prefix
50:22
prepare
8:5, 8:16, 9:7
preparing
10:5, 10:9
present
3:16, 7:6
presented
7:3
prevent
68:2
previous
8:13, 21:20
previously
4:10, 10:15, 11:22, 12:17, 13:6, 38:20, 59:16, 68:6
priority
64:17
privileged
9:14
probably
5:22
proceed
6:7
proceeding
55:19
produced
30:14
properly
26:12, 26:17, 28:9, 33:11, 33:16, 33:20, 35:13, 35:19, 35:21, 42:3, 52:5, 52:14, 52:21, 53:9, 54:20, 59:11, 65:14, 66:14
protein
24:4, 26:6, 27:12, 28:6, 30:3, 38:6, 62:2, 62:9, 62:11, 62:16, 64:1, 64:2, 64:9, 65:12, 66:5, 66:9, 66:15, 66:20, 67:1, 68:15
proteins
16:22, 45:9, 52:20, 53:16, 54:1, 59:12, 66:5
provided
7:15, 8:3, 13:3
provides
69:20
publications
65:16, 66:16
pull
10:17, 12:14, 42:19
purification
66:7
purified
65:1, 65:13
put
26:18, 58:9, 59:17

Q

qrr2
1:31, 76:30
qualified
76:3
question
17:22, 21:22, 28:19, 31:18, 67:17
questions
7:2, 29:4, 72:21, 72:22
quick
56:20, 72:14
quinn
2:20, 5:21
quite
27:18, 66:21, 67:21, 68:3

R

randolph
1:24, 5:11, 76:18
rather
7:1
reach
40:18, 46:17
reached
55:10
reaching
40:8
read
6:21, 9:22, 10:2, 10:3, 15:1, 15:14, 15:15, 18:6, 19:1, 19:18, 21:17, 21:21,

23:22, 24:21, 27:11, 27:19, 28:13, 28:14, 29:17, 30:15, 30:17, 31:12, 31:19, 32:17, 33:8, 34:3, 37:7, 38:3, 38:18, 38:21, 40:14, 41:4, 41:16, 41:20, 41:21, 42:2, 42:3, 45:8, 47:12, 48:12, 48:22, 49:10, 49:22, 50:13, 51:14, 52:2, 52:12, 52:17, 53:14, 54:9, 55:9, 59:13, 70:1, 70:2, 70:14, 70:17, 71:4, 71:6, 72:4, 72:7, 72:10, 72:11, 72:12, 74:4
reading
32:4, 38:12, 38:15, 39:2, 40:11, 49:13, 54:13, 68:16, 70:20
reads
52:17
realize
6:14
really
6:17
realtime
76:4
reason
67:5, 68:4
reasons
21:18, 38:22, 40:8, 61:19, 62:3
recognize
20:3
record
5:3, 56:22, 57:3, 70:17, 72:14, 72:15, 72:18, 73:2, 73:4, 73:5, 73:12, 73:14, 76:10
reduced
68:1
reductant
68:1
refer
41:18
reference
12:13, 24:14, 59:6, 71:13
referred
24:2
referring
21:13, 36:9
refers
15:7, 18:3, 24:9, 27:4, 71:9
regarding
24:18
regards
28:11
related
76:22
relates
26:11
relevant
14:14
relied
70:2
rely
24:22
remember
9:4, 26:21, 42:8, 42:9
remembering
63:13
remove
58:9
rendered
33:22, 55:10
rendering
47:11
replacement
19:11, 24:12, 71:12, 72:1
replacements
16:10, 17:2, 17:12, 19:7, 19:9, 19:14, 71:15, 71:20
report
26:20, 46:3, 46:4, 46:7, 47:14
reporter
1:30, 6:4, 6:6, 7:9, 11:7, 11:15, 11:19, 26:15, 48:2, 73:4, 73:19, 76:1, 76:3, 76:4
represent
5:15
represented
76:13
representing
5:19, 5:21
require
20:13, 27:11, 35:6, 40:12, 47:1
required
25:2
requirement
22:12, 29:22, 48:16
requirements
48:14, 49:19
requires
38:21, 59:9
requiring
37:4
reread
8:7
residue
64:20
respectful
56:10
respective
11:11
rest
6:1, 39:5
result
66:19
resulting
17:2, 71:16
results
61:4
reveal
9:14
right
6:18, 7:7, 7:9, 7:10, 13:17, 13:20, 14:3, 14:12, 16:11, 16:14, 18:12, 18:20, 19:15, 26:9, 28:2, 30:6, 32:8, 33:13, 33:17, 34:22, 37:8, 39:12, 39:18, 40:2, 43:20, 45:14, 46:13, 48:14, 50:11, 52:7, 52:8, 52:15, 53:11, 57:11, 57:12, 59:14, 60:2, 60:5, 61:12, 63:13, 72:13
right-hand
60:17
robust
68:13
romanette
30:21
romanettes
30:19, 31:21, 32:1
room
5:16, 7:7
rough
73:6

S

said
13:20, 14:7,

15:14, 19:1, 19:13, 19:16, 20:17, 21:11, 21:20, 22:4, 23:2, 23:16, 34:1, 35:10, 37:16, 38:11, 39:9, 39:10, 41:2, 44:22, 45:6, 45:15, 45:19, 46:10, 46:14, 47:6, 47:8, 51:19, 52:16, 53:7, 56:4, 62:3, 63:1, 63:15, 63:17, 63:19, 64:13, 64:16, 66:11, 67:14, 70:12, 71:5
same
10:20, 12:5, 29:8, 30:1, 32:7, 42:19, 45:10, 45:12, 46:12, 46:13, 46:15, 46:17, 55:5, 59:8, 64:6, 69:11
satisfies
29:20
satisfy
31:14, 31:21, 49:1, 49:19, 50:15, 61:18, 68:9
saturday
1:21, 5:1, 6:17, 74:7, 76:19
save
74:7
say
7:18, 8:14, 16:19, 17:15, 17:20, 17:22, 20:2, 21:9, 22:16, 25:2, 29:15, 30:5, 31:12, 31:18, 33:6, 34:9, 34:14, 35:14, 38:15, 39:15, 40:5, 40:15, 41:2, 41:13, 43:21, 44:9, 44:10, 44:12, 44:15, 48:11, 48:21, 49:5, 49:17, 50:7, 50:16, 51:12, 51:22, 52:9, 52:12, 54:5, 54:6, 55:17, 56:6, 66:8, 66:11, 68:12
saying
15:12, 30:20, 31:2, 31:3, 33:19, 35:5, 35:8, 37:14, 37:17, 37:21, 53:7, 53:13, 54:2
says
17:10, 18:16, 19:6, 20:11, 22:17, 25:22, 31:10, 32:15, 33:14, 35:1, 35:9, 35:19, 39:20, 40:12, 48:18, 54:22, 59:4, 60:2, 60:13, 69:5, 69:13
scanned
8:12
science
65:16, 67:7
scientific
28:4, 56:15
scope
9:11, 28:1, 28:5, 28:13, 28:16, 41:17, 49:11, 62:15, 62:19, 63:10, 64:9
screen
10:18, 25:13, 25:16, 58:19
scroll
25:14
sds-page
65:20
sea
43:7
second
8:21, 9:4, 10:16, 11:12, 16:6, 16:15, 55:17, 60:6
second-to-last
58:7, 58:15
secreted
62:9, 65:6
section
50:1, 50:19, 50:21, 59:1
sections
30:18, 50:11, 53:18
see
12:1, 16:15, 32:1, 35:16, 36:3, 36:21, 37:5, 37:6, 43:6, 51:9, 51:19, 60:11, 60:13, 60:16, 63:9, 65:17, 66:3, 66:15, 68:4, 69:12
send
73:6
sentence
14:9, 14:20, 15:3, 15:14, 16:6, 16:13, 16:16, 17:9, 17:13, 17:16, 18:12, 18:14, 18:18, 19:3, 19:14, 19:17, 20:10, 22:16, 22:17, 22:18, 24:7, 24:22, 25:1, 25:4, 25:10, 25:22, 26:19, 30:8, 33:14, 34:2, 34:6, 34:14, 35:1, 36:20, 36:21, 37:6, 41:19, 42:6, 43:22, 44:5, 49:20, 50:2, 51:9, 52:17, 54:10, 54:22, 55:17, 56:7, 56:8, 70:14
sep
4:22
separate
32:15, 50:4
separated
30:10, 47:9, 49:7, 53:4, 53:13
separately
45:2
seq
59:6
sequence
24:13, 29:19, 29:20, 32:6, 69:5, 71:12
series
31:5, 39:13
set
21:3, 21:18, 27:17, 27:22, 30:17, 31:3, 32:10, 32:17, 34:4, 34:20, 35:3, 38:22, 40:6, 40:22, 41:14, 42:15, 49:5, 72:8, 76:7
share
58:18

sharp
1:6, 5:6, 5:19, 75:2, 76:13
sheet
74:9, 75:1
short
57:2, 72:17
should
9:12, 11:5, 13:2, 28:14, 28:19, 28:20, 29:1, 58:6, 72:10
shown
36:8
sic
16:9, 17:12, 50:18
side
58:10
side-by-side
43:12
sidley
2:5, 5:18, 8:21
signature-p1kal
76:27
signed
74:13
simple
65:19
simply
21:16, 22:13
simpson
8:10, 14:8, 14:13, 14:19, 63:21, 64:18
simpson's
63:16
since
28:7, 63:7, 68:15
single
21:8, 65:15
site
65:16
size
65:13
slip
67:22
solely
20:20, 25:4
solution
68:1
some
9:18, 43:7
somebody
7:16
sometimes
65:17, 65:22, 66:15, 67:19, 67:22, 68:5
somewhere
58:3
sorry
17:21, 23:5, 23:19, 25:13, 31:17, 32:3, 33:2, 34:12, 34:13, 35:16, 36:3, 36:14, 36:19, 40:11, 44:4, 47:7, 50:21, 55:21, 58:14, 59:21, 60:6, 63:3, 64:3, 64:7
sort
63:16
specific
42:9, 52:19
specifically
42:9
specification
16:2, 47:1
spell
40:5, 40:18
spells
59:5
spelt
15:11, 46:19
spent
9:1
sperm
15:8, 26:14, 27:2, 27:6
split
30:17, 44:22, 45:3, 47:13
splits
43:17, 48:5
stability
36:12
stable
54:20, 56:13
stably
36:10, 56:2, 56:13, 56:16, 64:14, 65:3, 66:10
stages
30:11
stand
46:5
standing
6:19
start
22:18, 25:14, 25:17, 28:18, 31:17, 34:13, 49:5, 50:11, 70:20
starting
32:22, 70:9, 70:18
starts
16:7, 17:9, 32:20, 36:22
state
5:15, 20:6, 20:12, 20:16, 20:18, 21:7, 22:22, 23:5, 23:9, 23:14, 25:2, 25:9, 25:10, 27:11, 30:2, 41:12
stated
14:13, 17:8, 27:18, 37:8, 38:20
statement
24:16
states
1:1, 5:7, 49:21
sterne
3:6
stick
67:21
still
50:12, 53:6, 62:13
stop
70:20
street
1:25, 2:6, 3:7, 5:11, 76:18
strike
25:13
structure
66:1, 66:8, 66:14
studies
65:22
sub-categories
53:17
sub-populations
36:8
subscribed
75:18
subsection
39:11, 39:16
subsections
50:8
subset
28:10, 30:12, 36:1, 36:14, 54:3
subsets
28:10
substance
57:8
substitution
29:22, 32:7
substitutions
42:13
subtleties
66:13
suite
2:21
sullivan
2:20
summers
2:29
supports
37:2, 38:12,

38:15
sure
12:20, 29:7, 43:20, 56:21, 60:5, 63:1, 69:1
surface
26:13, 27:1, 47:3
surprised
67:7
surprises
67:7
suspect
67:5, 67:16
swear
6:6
sworn
4:4, 6:9, 75:18, 76:7

T

table
60:11, 60:14, 62:14
take
56:20, 72:14
taken
76:9
taking
5:10
talk
17:21, 32:12
talked
7:21, 14:5, 63:14
talking
19:4, 22:3, 22:7, 28:18, 46:15, 57:14
talks
50:2
taught
61:17
teaches
61:3, 61:7
tech
42:22
technician
10:17, 11:15, 13:10, 58:18
tell
6:9, 19:9, 33:2, 63:6
tells
19:2, 19:3
tend
66:6
tends
63:15
term
14:11, 20:12, 70:5
terms
13:13, 13:17, 13:21, 14:21, 15:13, 17:15, 63:8
tertiary
30:1, 32:8
test
42:4, 45:1, 66:16
testified
6:10, 14:8
testimony
27:14, 46:22, 74:6, 76:10
tests
65:7
text
69:4
th
3:7
thank
6:15, 6:16, 12:20, 43:4, 44:9, 48:4, 58:21, 59:7, 64:10, 64:12, 73:19, 73:20
thanks
73:15
themselves
5:15
therefore
64:9, 65:6
thereof
27:7
thing
8:15
things
13:7, 26:20, 28:9, 30:12, 43:8, 65:9, 66:3, 68:5, 71:7, 72:9
think
8:13, 9:3, 10:2, 12:7, 12:8, 13:22, 14:13, 14:22, 18:17, 19:1, 19:16, 25:7, 28:5, 36:4, 36:13, 36:19, 39:9, 42:11, 47:15, 51:1, 61:6, 62:3, 63:15, 63:21, 64:19, 67:2, 67:5, 67:18, 69:18
third
25:9, 43:22
thought
42:7, 42:14, 46:19, 67:18
three
8:7, 12:18, 31:14, 31:21, 49:2, 49:19, 50:15
threshold
28:15, 62:7, 63:12, 66:4, 66:16, 67:9
through
8:8, 8:11, 8:12, 10:3, 15:15, 30:19
time
5:9, 9:5, 42:19, 57:1, 57:4, 69:3, 72:16, 72:19, 73:2
times
21:15
timing
9:11, 73:10
today
5:12, 6:4, 8:6, 10:10
today's
5:9
told
9:8
tolerant
42:12
tolerate
68:3
tolerated
67:3
tolerates
66:21
top
36:5, 52:19, 69:5
touched
8:4
tpowers@sterneke-ssler
3:13
trademark
1:1, 5:7
transcript
64:6, 74:4
transcription
74:6
tray
3:12
trial
1:3, 6:18
tricky
67:19
tried
54:14
true
74:5, 76:9
truncated
27:7
truth
6:9
trying
53:6, 65:10

tubes
67:21
turn
13:8, 15:19, 16:14, 24:5, 25:6, 29:10, 32:20, 39:7, 42:17, 43:5, 43:14, 43:16, 47:20, 48:7, 51:2, 55:14, 57:18, 58:5, 59:14, 60:15, 68:21, 69:2
turning
51:7
two
13:21, 14:4, 30:18, 43:11, 43:12, 43:18, 48:9, 49:12, 60:4
type
15:7, 27:4
types
54:18
typically
71:17

U

uk
5:11
um
8:12
under
6:18, 13:22, 61:15, 61:20, 62:4, 67:9, 68:9
underlying
40:17
understand
7:4, 12:4, 18:7, 18:15, 19:19, 22:11, 24:1, 25:19, 26:3, 27:22, 28:12, 32:9, 34:9, 35:11, 37:22, 39:2, 44:3, 44:7, 44:14, 45:16, 45:20, 46:4, 53:6, 55:18, 61:9, 65:10
understanding
23:20, 24:20, 25:3, 30:12, 31:4, 41:20, 46:20, 55:7
understood
12:10, 21:18, 23:22, 26:13, 26:17, 71:21
unexpected
68:6
unfold
68:5
unfolded
66:5, 66:20, 67:6
united
1:1, 1:27, 5:7, 76:18
universe
36:7, 52:21, 53:1
unmodified
24:15, 71:13
urquhart
2:20
use
17:19, 21:16, 23:15, 25:15, 26:8, 26:9, 37:17, 42:1, 46:1, 55:5, 60:1, 63:18
uses
63:17

V

variant
60:21, 61:1, 61:18, 62:18, 68:8, 71:9
variants
27:9, 56:15, 64:13
variety
66:3
various
36:7
vc
10:17, 13:10, 58:18
via
2:11, 2:14, 2:18, 3:4, 3:20, 3:23
video
1:19, 5:10
videographer
3:19, 5:4, 5:12, 6:3, 7:8, 56:22, 57:3, 72:15, 72:18, 73:1, 73:20
videotaped
5:5
viner
3:18, 5:12
visible
43:14

W

want
13:1, 17:20, 17:21, 34:8, 43:19, 57:17, 58:21, 60:1, 60:5, 63:1, 64:18, 69:3
washington
2:7, 3:8
waste
69:3
way
46:5, 62:17, 66:17, 76:25
ways
60:17
we're
10:20, 29:8, 34:12, 43:20, 52:18, 59:7, 63:2, 69:11
we've
7:21, 36:7, 56:19, 57:14
welcome
57:6
well-performed
68:13
wendy
3:18, 5:12
went
71:7, 72:9
whatever
70:17, 73:12
whereupon
73:21
whether
62:18, 63:6, 66:9, 66:17, 67:12, 67:18
whole
15:1, 19:18, 19:20, 21:2, 29:17, 30:15, 31:13, 31:19, 32:4, 33:9, 35:11, 38:22, 48:12, 48:22, 49:17, 50:13, 51:15, 52:3, 52:10, 52:13, 53:9, 72:11
wild-type
30:3
wise
73:10
within
28:5, 35:20, 53:17, 54:3, 54:17, 62:15, 62:19, 63:9, 70:6
witness
6:7, 9:13, 12:1, 13:12, 18:22, 20:16, 22:7, 23:12, 24:20, 28:18,

31:2, 37:21, 40:4, 49:4, 67:12, 68:12, 71:4, 72:7, 75:3, 76:6, 76:10
word 22:1, 22:4, 26:8, 26:9, 26:18, 26:21
words 7:2, 17:6, 22:13, 37:16, 44:17, 46:2, 47:17, 49:12
worries 6:3, 6:16
worth 42:14
wouldn't 28:10, 63:18
written 9:18, 9:22, 10:5, 10:9, 17:6, 28:7, 28:11, 34:6, 34:11
wrong 8:15, 19:15, 19:16
wrote 17:8, 22:18, 41:21, 46:7, 68:22

Y

yeah 7:18, 10:19, 12:7, 12:9, 17:6, 34:13, 39:10, 41:11, 43:19, 44:5, 47:8, 58:21, 60:14, 73:11
yellow 14:10, 16:12
yesterday 9:2
yourself 6:16

Z

zach 2:29
zachsummers@quinnemanuel 2:30
zoom 2:11, 2:14, 2:18, 3:4, 3:20, 3:23, 5:16, 6:2, 7:12, 9:10

.

.10 4:12
.11 4:15
.12 4:18
.13 4:21
.59 4:23
.6 4:4, 4:5

0

00004 4:13, 10:21, 43:2, 43:10, 43:15
00042 1:14
00046 1:15, 4:16
00052 1:16
0042 5:8
0046 5:8, 44:17
0052 5:8
02199 2:22
06 57:4

1

1 57:1
10 3:7, 63:16, 63:19
100 15:19, 15:21, 15:22, 16:9, 16:15, 16:16, 17:11, 36:17, 36:21
1001 4:18, 4:21, 12:15, 12:17, 13:4, 13:6
1026 4:23, 59:15, 59:16, 60:7, 68:22
104 25:6, 25:9, 26:19, 30:13, 42:18, 43:5, 43:10, 43:12, 43:14, 43:15, 43:21, 47:10
105 45:6
108 30:13, 30:15, 31:9, 32:19, 32:20, 33:4, 33:5, 34:7, 35:10, 39:1, 50:17, 50:21, 51:2, 53:2, 54:5
109 19:22, 20:2, 20:12, 21:5, 21:12, 22:1, 22:5, 22:19, 34:1, 34:2, 34:11, 34:12, 34:14, 38:4, 40:14, 40:16, 40:19, 41:2, 45:6, 45:7, 46:8, 49:11, 50:1, 50:6, 50:21, 55:11
110 28:1, 55:14
1101 3:7
111 2:21
112 28:19, 28:20
1133 4:12, 4:15, 10:15, 11:9, 11:11, 11:14, 11:22
12 1:22, 5:3, 5:10, 76:19
12,018,298 4:14, 4:18
12,037,618 1:14
12,091,692 1:15, 4:17, 4:21
12,264,345 1:16
13 1:21, 5:1, 5:9, 74:7, 76:19
135 59:15, 59:22
14 76:31
145 60:11
148 60:8, 60:16
150 17:1, 19:6, 19:14, 71:15
1501 2:6
17 4:22

185
58:6
19
29:11, 48:5, 61:22, 62:1, 62:9, 62:13, 62:14, 63:7, 63:8, 63:21, 64:7

2

2
57:4, 72:16, 72:19, 73:3, 73:21, 76:20
20005
2:7, 3:8
202
2:8, 3:9
2024
4:19, 4:22
2025
1:14, 1:15, 1:16, 4:13, 4:16, 5:8, 10:21, 43:2, 43:10, 43:15
2026
1:21, 5:1, 5:9, 74:7, 74:18, 75:19, 76:19, 76:31
25
4:19
28
72:16
298
10:13, 10:21, 12:4, 12:14, 12:22, 42:20, 43:2, 45:11, 45:18, 47:15, 47:16, 47:21
21n
1:26, 76:18

3

313
29:22, 32:7, 42:11, 57:21, 58:1, 59:3, 59:5, 59:10, 60:17, 61:1, 61:4, 61:7, 61:9, 61:17, 62:12, 62:18, 62:21, 63:1, 63:2, 63:4, 64:7, 66:18, 68:8, 68:13
33
72:19, 73:3
35
73:21, 76:20

4

41
1:22, 5:3, 5:10, 76:19
42
10:6
43
29:10, 29:11, 29:14, 30:7, 30:11, 30:20, 31:12, 31:19, 47:20, 48:3, 48:8, 48:11, 48:21, 49:16, 50:7, 50:13
46
10:6, 11:4, 11:13, 11:14, 12:11, 13:4, 13:9, 27:15, 29:15, 37:9, 44:12, 44:21, 45:5, 45:14, 47:5, 47:17, 48:8, 48:20, 49:7, 49:17, 50:7, 51:3, 51:4, 51:21, 52:12, 52:18, 53:14, 55:15, 57:15
48
30:11
49
36:4, 36:5, 54:16

5

5
34:10, 34:17, 37:10, 38:13
50
71:20
52
10:6, 57:1
520
2:21
57
13:12
58
14:1, 14:16, 27:3
59
14:7

6

600
8:14, 12:3, 12:7
617
2:23
638140
1:29
65
15:20, 36:18
66
15:20, 16:1, 19:21, 24:5
67
43:16, 68:22, 69:4, 69:7, 69:8, 70:10
68
25:7, 43:16
69
39:7, 39:8
692
11:4, 13:2, 27:15, 45:11, 45:15, 57:16, 57:18, 58:2, 58:5, 58:12, 59:2, 59:9, 59:17, 61:16, 62:19

7

70
51:8
71
32:21, 51:4
7100
2:23
712
2:23
73
51:5, 51:8
736
2:8
74
19:22
772
3:9

8

8508
3:9
8914
2:8

9

90
13:9, 13:15, 14:1
91
14:6
95
69:9
96
69:9
97
69:9
98
69:9
99
69:9