

Deposition of
Brian W. Anthony
April 18, 2026
Volume II

Samsung Electronics Co.
VS.
Omni Medsci, Inc.



www.aptusCR.com | 866.999.8310

Omni MedSci Ex. 2046

Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01252

1 UNITED STATES PATENT AND TRADEMARK OFFICE 2 3 BEFORE THE PATENT TRIAL AND APPEAL BOARD 4 5 SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC., FOSSIL GROUP, INC., FOSSIL STORES 6 I, INC., FOSSIL PARTNERS, L.P., OURA HEALTH OY, AND ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD., 7 8 Petitioners, 9 v. 10 OMNI MEDSCI, 11 Patent Owner. 12 Inter Partes Review No. IPR2025-01250 Inter Partes Review No. IPR2025-01251 13 Inter Partes Review No. IPR2025-01252 Inter Partes Review No. IPR2025-01253 14 Inter Partes Review No. IPR2025-01254 15 16 DEPOSITION OF BRIAN W. ANTHONY, PH.D. 17 VOLUME II 18 HELD VIA VIDEOCONFERENCE 19 Saturday, April 18, 2026 20 9:03 a.m. EDT 21 22 Pages: 266 - 397 23 Reported Stenographically by: 24 Cassidy Western, RPR, CRR, CA CSR NO. 14722 25 Job No.: 10188950	Page 266 1 A P P E A R A N C E S (CONTINUED) 2 3 FOR THE PATENT OWNER: 4 NIXON PEABODY LLP 5 By: ANGELO J. CHRISTOPHER, Esq. 6 300 South Grand Avenue, Suite 4100 7 Los Angeles, California 90071 8 (213) 629-6190 9 achristopher@nixonpeabody.com 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 Page 268
1 DEPOSITION OF BRIAN W. ANTHONY, PH.D., 2 VOLUME II, HELD VIA VIDEOCONFERENCE, TAKEN ON BEHALF OF 3 THE PATENT OWNER, COMMENCING AT 9:03 A.M. AND CONCLUDING 4 AT 12:37 P.M., SATURDAY, APRIL 18, 2026, BEFORE CASSIDY 5 WESTERN, CALIFORNIA CERTIFIED SHORTHAND REPORTER 6 NO. 14722 7 8 9 * * * 10 11 A P P E A R A N C E S 12 (ALL PARTIES APPEARING REMOTELY) 13 14 FOR THE PETITIONER SAMSUNG ELECTRONICS CO., 15 LTD., SAMSUNG ELECTRONICS AMERICA, INC.: 16 SHEPPARD MULLIN RICHTER & HAMPTON LLP 17 By: HYUN-JOONG KIM, Esq. 18 1540 El Camino Real, Suite 120 19 Menlo Park, California 94025 20 (650) 815-2600 21 hykim@sheppardmullin.com 22 23 24 25	Page 267 1 I N D E X 2 3 W I T N E S S: 4 BRIAN W. ANTHONY, PH.D. PAGE 5 EXAMINATION BY MR. CHRISTOPHER 270 6 7 8 9 PREVIOUSLY MARKED EXHIBITS: 10 NUMBER PAGE 11 Exhibit 1003 in 271 IPR2025-01254 12 13 Exhibit 1003 in 301 IPR2025-01252 14 15 Exhibit 1030 in 344 IPR2025-01250 16 17 Exhibit 1028 in 371 each of the proceedings 18 19 20 21 22 23 24 25 Page 269

Page 270 1 HELD VIA VIDEOCONFERENCE 2 SATURDAY, APRIL 18, 2026 3 9:03 A.M. - 12:37 P.M. 4 * * * 5 THE STENOGRAPHER: We are on the record 6 at 9:03 a.m. This is Volume II of the deposition 7 of Brian Anthony. My name is Cassidy Western. I 8 am a California Certified Shorthand Reporter, and 9 my license number is 14722. 10 You may proceed, Counsel. 11 EXAMINATION BY COUNSEL FOR PATENT OWNER 12 BY MR. CHRISTOPHER: 13 Q Good morning, Dr. Anthony. 14 A Good morning. 15 Q You understand you're still under oath? 16 A Yes. 17 Q Okay. And any reason why you cannot 18 give complete, accurate, and truthful testimony 19 today? 20 A No. 21 Q Okay. And I think I know the answer 22 based on your background. But for the record, 23 where are you physically located today? 24 A In my office at MIT, Cambridge, 25 Massachusetts.	Page 272 1 that in front of you? 2 A You mean my declaration? 3 Q Yes. 4 A Yes. 5 Q Okay. And we were discussing before we 6 ended yesterday some of the limitations in 7 Claim 1. I'd like to direct your attention now to 8 paragraph 135 in your declaration for the 9 '475 patent. 10 A Okay. 135. 11 Q Yeah. And at the top of paragraph 135, 12 you wrote: 13 '475 patent element [1.d] is 14 substantially identical to the corresponding 15 limitation in the '533 patent on which I 16 previously opined. 17 Do you see that? 18 A Yes. 19 Q And then in the next sentence, you 20 wrote: 21 Aside from differing turns of phrases, 22 the main differences between the two limitations 23 are (i) the '533 patent's additional use of 24 semiconductor sources that are light emitting 25 diodes; and (ii) the '533 patent's use of optical
Page 271 1 Q Okay. And did you discuss your 2 testimony with anyone, including counsel, between 3 the end of yesterday's deposition and this 4 morning? 5 A No. 6 Q Okay. Did you review any documents in 7 connection with these proceedings between the end 8 of yesterday's deposition and this morning? 9 A No. 10 Q Okay. Sounds like you might have had a 11 nice Friday night, then. 12 So before we stopped yesterday, we were 13 discussing your declaration for the '475 patent. 14 If you still have a copy of that, that would be 15 great. But if not, I'm going to put -- 16 A I have the downloads from yesterday. 17 Q Perfect. But for our court reporter, 18 I'll just put this in the -- 19 A Fair enough. 20 Q -- Zoom chat so it's there. 21 (Exhibit 1003 in IPR2025-01254 was 22 previously marked.) 23 BY MR. CHRISTOPHER: 24 Q So we were discussing Exhibit 1003 in 25 IPR2025-01254 for the '475 patent. Do you have	Page 273 1 beam as opposed to the '475's use of optical 2 light. 3 Do you see that? 4 A Yes. 5 Q My question is: Would a person of skill 6 in the art understand that there's a difference 7 between the term "optical beam" and the term 8 "optical light"? 9 A Well, as I explain in my following part 10 of that paragraph 135, I didn't need to opine on 11 the complete overlap between "beam" and "light," 12 but certainly as I described, Lisogurski meets the 13 limitation. 14 Certainly as I described here, a person 15 of ordinary skill in the art would have understood 16 the patent's use of "optical beam" describes the 17 general propagation, radiation pattern or 18 directional shape of light, as does the '475's use 19 of "optical light." 20 So the difference of terms don't change 21 my analysis and my opinions of the '533 patent 22 apply equally to the '475 patent. 23 Q You don't have any opinions on the 24 difference between optical beam and -- whether 25 there's a difference in scope between "optical

Page 274

1 beam" and "optical light." Your opinion is that
2 the prior art meets both terms. Is that correct?
3 A That is correct.
4 Q Would a person of skill in the art
5 understand that the term "optical beam" is
6 narrower than the term "optical light"?
7 MR. KIM: Objection; form.
8 THE WITNESS: Again, as a -- in the
9 previous answer, I didn't need to opine about the
10 potential differences. But certainly in the
11 overlapping region, a POSITA would understand that
12 the terms -- the different use of terms, it
13 doesn't change my analysis. It's light that is
14 interacting with -- in either beam shape or not
15 beam shape. But it still -- the art meets the
16 limitation.
17 BY MR. CHRISTOPHER:
18 Q Okay. You haven't formed any opinions
19 as to whether the term "optical beam" is narrower
20 than the term "optical light" as used in the
21 claims of the '475 and '533 patents. Is that
22 correct?
23 MR. KIM: Objection; form.
24 THE WITNESS: Again, as I say here, I
25 didn't need to opine about the differences between

Page 275

1 the terms "optical beam" and "optical light." But
2 certainly in the overlapping region, the art
3 certainly meets the limitation, as I describe.
4 Optical beam, optical light, still light
5 interacting with the -- the tissue to analyze
6 properties therein.
7 BY MR. CHRISTOPHER:
8 Q Okay. I'd like to direct your attention
9 now to paragraph 196 of your declaration for the
10 '475 patent. This would be page 106 of the PDF.
11 Let me know when you get there.
12 A 196? Yes.
13 Q 196. Okay. In paragraph 196 under the
14 subheading Element [1.n], you address element 1.n
15 in Claim 1 of the '475 patent. Correct?
16 A Yes. Okay, yes. Yep.
17 Q Okay. And then in paragraph 197 and
18 198, you go on to provide your opinions that
19 Lisogurski meets the requirements of element
20 [1.n]. Correct?
21 A Right. As I describe in 197 and then
22 198, Lisogurski discloses a system to detect a
23 signal indicative of system errors such as a
24 physiologically impossible value or a probe-off
25 signal. A POSITA, a person of ordinary skill,

Page 276

1 would have understood or found it obvious that
2 Lisogurski's sensor within the system detects a
3 physiologically impossible value or probe-off
4 signal.
5 Lisogurski discloses the functionality,
6 again, may be combined in a single component. As
7 I discussed in prior, in IX.A.2, the detection of
8 the physiologically impossible value or probe-off
9 signal in Lisogurski's sensor would be consistent
10 with the growing trends towards integrating
11 digital features.
12 I go on: Lisogurski contemplates the
13 error condition not worn by the user when a
14 probe-off signal is detected. So Lisogurski's
15 sensor would determine if the apparatus is being
16 worn by the user or not. So yes.
17 Q Okay. Yesterday, just to reorientate
18 you, you recall we discussed you had authored a
19 prior declaration concerning the '484 patent. Do
20 you recall that?
21 A Yes.
22 Q And you had also previously authored in
23 2019 a declaration concerning the '533 patent.
24 Correct?
25 A Yes.

Page 277

1 Q And you don't cite either of your prior
2 declarations for the '484 or the '533 patent in
3 paragraphs 197 and 198 of your declaration for the
4 '475 patent. Correct?
5 A Well, for example, I mean, I cite back
6 to my earlier discussions in this declaration on
7 the '475 to Section IX.A.3.A and IX.A.3.G, and
8 others that -- where I do -- I am inciting -- or
9 I'm citing my prior both in the '484 and the '533.
10 Q So it's a -- that's --
11 A I don't -- I don't -- I'm not reciting
12 it here, but it's certainly incorporated as part
13 of the discussion what I include here in
14 paragraphs 196 and 197.
15 Q So that's a fair point. Let's look at
16 paragraph 197. In paragraph 97, we'll take this
17 in pieces --
18 A 97 or 197.
19 Q 197. Sorry. 197.
20 A Uh-huh.
21 Q So looking at paragraph 197 of your
22 declaration for the '475 patent. And at the
23 beginning, it reads "Lisogurski discloses and
24 renders obvious wherein the apparatus," in bold.
25 Do you see that?

Page 278 1 A Yes. 2 Q And then you refer to your discussion in 3 Section IX.A.3.A for element [1.pre]. Correct? 4 A Yes. 5 Q And then the next text in bold from the 6 claim reads: 7 Is at least in part configured to 8 determine based at least in part on the output 9 signal. 10 And you cite back to your discussion in 11 Section IX.A.3.G for element [1.f.] Correct? 12 A Yes. 13 Q And the next bold text we see, "that the 14 apparatus," you cite back to Section IX.A.3.A for 15 element 1.pre. Correct? 16 A Yes. 17 Q And then finally, at the end of 18 paragraph 197 in your declaration for the 19 '475 patent in bold, it says "is being worn by the 20 user." And you cite to two portions of 21 Lisogurski. 22 Do you see that? 23 A Yes. 24 Q And for that final portion of 25 element [1.n], "is being worn by the user," you	Page 280 1 Let me start over. 2 In paragraph 236, you address 3 element [8.d] from independent Claim 8 of the 4 '475 patent. Correct? 5 A Correct. 6 Q Okay. And then in paragraph 237, you 7 write: 8 For the same reason I discuss above 9 regarding claim elements [1.f] and [1.l], the 10 majority of this limitation is met by Lisogurski. 11 Do you see that? 12 A Yes. 13 Q And then in paragraph 238, you write: 14 Regarding a processor, a person of 15 ordinary skill in the art would have understood, 16 or at least found it obvious, that using a 17 processor for Lisogurski's front-end processing 18 circuitry is a well-known concept. 19 Do you see that? 20 A Yes. 21 Q Okay. So the term "processor" in 22 element [8.d] is a portion of element [8.d] that 23 you had not addressed previously above for Claim 1 24 of the '475 patent. Correct? 25 A Well, in 1, I describe, for example, in
Page 279 1 don't cite back to a prior section of your 2 declaration for the '475 patent. Correct? 3 A What's cited there at the end of that 4 sentence, I refer back to Lisogurski 15:66 through 5 16:4, and 36:66 through 37:2, which is -- let me 6 go there. 7 Q Well, I'm just asking, you cite 8 Lisogurski here. Correct? Just yes or no? 9 A Yes, I do. 10 Q Okay. And you don't cite either of your 11 prior declarations for the '484 or the '533 for 12 that last portion of element [1.d] -- or sorry, 13 [1.n]. Correct? 14 A I cite Lisogurski here. But, you know, 15 respectfully, I'm citing Lisogurski every place 16 because even in the prior '484 and '533, I was 17 citing Lisogurski. So it's Lisogurski throughout. 18 But I am citing there 15:66 through 16:4 and 36:66 19 through 37:2. 20 Q Understood. Let's look now at 21 paragraph 236, which concerns element [8.d]. This 22 would be on page 124 of the PDF. 23 A 236? 24 Q Paragraph 236. That's right. And in 25 paragraph 236, you address element -- excuse me.	Page 281 1 paragraph 147, how Lisogurski meets the limitation 2 of processing. And then as I described in 238, 3 having the processing, a person of ordinary skill 4 would have understood that using a processor for 5 Lisogurski's front-end processing is well-known. 6 Lisogurski discloses that front-end processing 7 circuitry performs various analog and digital 8 processing of the output signal. A POSITA would 9 have understood or found it obvious that those are 10 common functions of a processor. To this end, 11 Lisogurski explicitly discloses all the concepts 12 of physiological optical monitoring system which 13 includes front-end processing circuitry can be 14 realized in a processor circuit or in processor 15 circuitry. And that's at Lisogurski 16:14 through 16 16. 17 Implementing a processor at the front 18 end was well-known in the art. For example, in 19 U.S. Patent 8,852,103, which is Exhibit 1054, 20 further discloses a medical imaging system 21 preprocessing circuitry that performs one or more 22 functions on signals such as determining one or 23 more characteristics of a received signal. 24 So I discuss processing in -- in one, 25 and then processor explicitly. But Lisogurski, as

Page 282

1 I describe here, meets that limitation as well.
2 **Q Going back to paragraph 238 o your for**
3 **the '475 patent, you don't cite either of your**
4 **prior declarations for the '484 or '533 patents in**
5 **paragraph 238 of your declaration. Correct?**
6 A I'm citing Lisogurski and pointing out
7 how Lisogurski meets those limitations. And even
8 in the prior '484 and '533, those were also citing
9 Lisogurski. But, you know, in that paragraph, I'm
10 citing back to Lisogurski.
11 **Q Sorry. I don't think I got a clear**
12 **answer.**
13 **You don't directly cite your**
14 **declarations for the '484 or '533 patents, the**
15 **prior ones, in paragraph 238. Correct?**
16 MR. KIM: Objection; form.
17 THE WITNESS: As I answered, in that
18 paragraph, I'm describing Lisogurski meeting
19 limitations. I'm not specifically citing the
20 prior declarations, but those prior declarations
21 also were citing Lisogurski. But in that
22 paragraph 238, I'm citing back to Lisogurski. For
23 example, 12:42-50 for the output signal as single
24 digital processing. And that Lisogurski at
25 16:14-16, the functionality can be realized in the

Page 283

1 processor circuitry.
2 So Lisogurski clearly teaches the -- the
3 limitation there.
4 BY MR. CHRISTOPHER:
5 **Q Let's look at paragraph -- let's scroll**
6 **up. Paragraph 198 for your declaration of the**
7 **'475 patent. It's at page 107 of the PDF.**
8 A Okay. Got it.
9 **Q Got it. Okay.**
10 **In paragraph 198 in the first sentence,**
11 **you wrote:**
12 **Lisogurski discloses that its system**
13 **detects a signal indicative of a system error such**
14 **as a physiologically impossible value or a**
15 **probe-off signal.**
16 **And you cite Lisogurski, which is**
17 **Exhibit 1025, at Column 36, Line 66 through**
18 **Column 37, Line 2. Do you see that?**
19 A Yes.
20 **Q And I believe we discussed this passage**
21 **from Lisogurski yesterday, but if you could turn**
22 **for me to Column 36, line 66 of Lisogurski, which**
23 **is Exhibit 1025 in each of the five proceedings.**
24 A Yep.
25 **Q I need to catch up with you now.**

Page 284

1 **Column 36, Line 66, Lisogurski discloses:**
2 **In some embodiments, the system may**
3 **detect a signal indicative of a system error such**
4 **as a physiologically impossible value, a probe-off**
5 **signal, any other suitable signal or any**
6 **combination thereof.**
7 **Do you see that?**
8 A Yes.
9 **Q And in the very first portion of that**
10 **sentence, it states:**
11 **The system may detect a signal**
12 **indicative of a system error.**
13 **Do you see that?**
14 A Yes.
15 **Q Lisogurski doesn't specify which**
16 **component within the system detects a signal**
17 **indicative of a system error as described here in**
18 **Column 36 starting at Line 66. Correct?**
19 MR. KIM: Objection; form.
20 THE WITNESS: Well, Lisogurski
21 explicitly discloses that all the functionality
22 can be realized in a single processor. And so
23 Lisogurski -- a POSITA reading Lisogurski would
24 have understood that all the functionality can be
25 realized in a single processor. That's what

Page 285

1 Lisogurski discloses.
2 BY MR. CHRISTOPHER:
3 **Q But just focusing specifically for**
4 **now -- we'll get to that. But focusing**
5 **specifically on Column 36, Line 66 through**
6 **Column 37, Line 2, in that sentence, Lisogurski,**
7 **you would agree, doesn't specify which component**
8 **in the system detects a signal indicative of a**
9 **system error. Correct?**
10 MR. KIM: Objection; form.
11 THE WITNESS: But -- so that word --
12 that sentence uses "system." The system may
13 detect. And furthermore, Lisogurski then says
14 that the system can be realized in a -- person of
15 ordinary -- let's see. Explicitly discloses all
16 of the components of the system can be realized in
17 a processor.
18 So certainly a POSITA reading that
19 sentence and the -- the Lisogurski in its entirety
20 would have understood that the signal, that
21 detection, would happen in a processor.
22 BY MR. CHRISTOPHER:
23 **Q Well, let's look at Figure 1.**
24 A Figure 1 of?
25 **Q Lisogurski. Let me know when you're**

Page 286 1 there. It's page 3 of the PDF. 2 A Okay. 3 Q Okay. And this is a -- we talked about 4 this yesterday. This is showing a -- an example 5 system 100 in Figure 1 of Lisogurski. Correct? 6 A Yes. 7 Q And a moment ago, you said that 8 Lisogurski discloses that all the components of a 9 system can be realized in a processor. Do you 10 recall that? 11 A As I was quoting from paragraph 238, 12 Lisogurski discloses all the components of the 13 physiological monitoring system, which includes 14 its front-end processing circuitry can be realized 15 in the processing -- in the processor circuit. 16 Q Okay. Looking at the example system in 17 Figure 100, would a person of skill in the art 18 understand that all of the components shown in 19 Figure 1 can be realized in a processor? 20 MR. KIM: Objection; form. 21 THE WITNESS: So, for example, as 22 described in Column 16 of Lisogurski at Line-- 23 starting at 12: 24 In other embodiments, the functionality 25 of one or more of the components may be performed	Page 288 1 explicitly components can be split apart, put 2 together in various ways. A POSITA would 3 understand there are various ways to realize the 4 functionality. That they can be divided over 5 multiple components. For example, some or all of 6 the functionality can be performed in front-end 7 processing circuitry and back-end processing 8 circuitry or both. In other embodiments, the 9 functionality of one or more components may be 10 performed in a different order. 11 So Lisogurski is not just saying it all 12 has to be done in one thing. It's saying that it 13 can be split over multiple things. And certainly, 14 a POSITA would understand how to incorporate 15 processing into a processor. 16 BY MR. CHRISTOPHER: 17 Q That doesn't answer my question. A few 18 moments ago, you said, and I'll quote: 19 Lisogurski explicitly discloses all of 20 the components of a system can be realized in a 21 processor. 22 Do you recall saying that? 23 A And that is what Lisogurski states. 24 Yes. 25 Q Okay. Now, if we look at Figure 1,
Page 287 1 in a different order or may not be required. In 2 an embodiment all the components of the 3 physiological monitoring system can be realized in 4 the processor circuitry. 5 BY MR. CHRISTOPHER: 6 Q Okay. You just quoted Lisogurski, but 7 that doesn't answer my question, which is: Can 8 all of the components of the exemplary system 100 9 shown in Figure 1 be realized in a processor? 10 MR. KIM: Objection; form. 11 THE WITNESS: Well, a POSITA reading 12 Lisogurski would understand the functionality of 13 all the processing. The -- the -- the LEDs would 14 be a front end to that processing circuitry. So a 15 POSITA would understand that the LEDs, that they 16 are connected to the processing circuitry, but 17 that all the functionality, the processing 18 functionality, can be determined by -- with a 19 processor. 20 BY MR. CHRISTOPHER: 21 Q So, in fact, it's not correct that all 22 of the components of the system 100 can be 23 realized in a processor. Correct? 24 MR. KIM: Objection; form. 25 THE WITNESS: Lisogurski describes quite	Page 289 1 let's take the light source, 130, for example. 2 Could you realize a light source, 130, in a 3 processor? Would a person of skill in the art 4 understand that? 5 MR. KIM: Objection; form. 6 THE WITNESS: My analysis of Lisogurski 7 is Lisogurski in its entirety, not just a single 8 sentence. And Lisogurski explicitly explains how 9 the functionality in that paragraph at the top of 10 Column 16, that the functionality of the front-end 11 processing circuitry and back end processing 12 circuitry can be combined into a single processor. 13 In some of the embodiments, the functionality of 14 some of the components may be divided over 15 multiple. 16 For example, some or all of the 17 functionality of the control circuitry may be 18 performed in the front-end processing circuitry 19 and back end processing circuitry or both. In 20 other embodiments one or more of the 21 functionalities may be performed in a different 22 order or not at all or might not be required. 23 In an embodiment, all the components of 24 the physiological monitoring system can be 25 realized in processing circuitry.

Page 290 1 So it's describing, broadly, the 2 components, the functionality can be distributed 3 over -- in different ways. That some of the 4 functionality can be excluded. Some can be 5 included. So broadly, it's describing that 6 there's a lot of flexibility in how these 7 components are broken up, whether all of the 8 functionality is included or not. And so it's 9 quite -- quite clear a POSITA reading this would 10 understand that the Figure 1 is representative of 11 one possible configuration and that they can be 12 arranged in -- by drawing different boxes around 13 the different functionalities. 14 BY MR. CHRISTOPHER: 15 Q I don't think that answers the question. 16 You just read Lisogurski for a minute. 17 I'm asking you specifically about the 18 example in Figure 1, which includes, for example, 19 a light source 130 within the sensor 102. Would a 20 person of skill in the art understand that you 21 could realize all of the components shown in 22 system 100, including the light source 130, in a 23 processor? 24 MR. KIM: Objection; form. 25 THE WITNESS: It may require a custom	Page 292 1 the exemplary system shown in Figure 1, which 2 component would a person of ordinary skill in the 3 art understand performs that detection of a signal 4 indicative of a system error described in 5 Lisogurski? 6 MR. KIM: Objection; form. 7 THE WITNESS: Well, as I describe, going 8 back as well to paragraph 91 and 92 where I talk 9 about the motivation to modify Lisogurski and -- 10 and having the front-end processing circuitry, I 11 think a POSITA looking at the Figure 1 by itself 12 and also as I describe in the motivations to 13 modify, that processing would occur in the 14 front-end processing circuitry as part of the -- 15 you know, the blue box that I label in -- in 16 Figure 45 for -- or page 45 of my other 17 modification of the sub-Figure 1. 18 BY MR. CHRISTOPHER: 19 Q Well, if you look at paragraph 198 of 20 your declaration for the '475 patent -- 21 A Uh-huh. 22 Q -- in the second sentence -- you have it 23 in front of you? 24 A 198? 25 Q 198.
Page 291 1 processor, but certainly a processor that would 2 include both an analog front-end and a digital 3 front end. It would be a -- an expensive -- 4 relatively more expensive solution, but a POSITA 5 could certainly make a single monolithic set of 6 electronics that would incorporate everything. 7 But a POSITA in the design tradeoff 8 space would likely instead have the LEDs separate 9 from that. But could a POSITA, certainly through 10 the teachings of Lisogurski, envision that, have 11 all the functionality in a custom processor that 12 has mixed a analog and digital functionality? 13 Absolutely. 14 But a POSITA reading this would broadly 15 understand in their design tradeoff space, they 16 have the flexibility to do it in the way that 17 makes sense, given cost, complexity, performance 18 targets. 19 BY MR. CHRISTOPHER: 20 Q Okay. A few moments ago, we were 21 talking about the signal indicative of a system 22 error described in Lisogurski at Column 36, 23 starting at Line 66. You recall that? 24 A Column 36, Line 66. Yes. 25 Q Okay. And sticking with Figure 1, in	Page 293 1 A Yeah. 2 Q In paragraph 198 in the second sentence, 3 you wrote: 4 A person of ordinary skill would have 5 understood, or at least found it obvious, that it 6 is Lisogurski's sensor within the system that 7 detects is physiologically impossible value or 8 probe-off signal. 9 Do you see that? 10 A Yes. 11 Q And so the opinion you gave in your 12 declaration is that it's the sensor within 13 Lisogurski's system that detects a signal 14 indicative of a system error. Correct? 15 MR. KIM: Objection; form. 16 THE WITNESS: As I describe, for 17 example, in paragraph 117, Lisogurski -- a person 18 of ordinary skill would have understood that 19 together a light source, detector, front end 20 processing circuitry, all of which are contained 21 within Lisogurski's sensor as modified would 22 comprise a biosensor. 23 And so, you know, certainly that 24 functionality of the detection off -- or the off 25 is part of the biosensor.

Page 294

1 BY MR. CHRISTOPHER:
2 **Q So when you refer to it's Lisogurski's**
3 **sensor within the system in paragraph 198, it's**
4 **your testimony you were referring to the modified**
5 **version of Lisogurski in which the processing**
6 **circuitry is relocated into the sensor. Is that**
7 **correct?**
8 A Well, I'm broadly describing how a
9 POSITA would understand from Lisogurski that
10 functionality can be put into different
11 arrangements. And I'm also describing the
12 motivation to modify that a biosensor would
13 include processing. And you asked where the
14 probe-off signal would occur it would be, for
15 example, in the sensor functionality that would
16 include the biosensor functionality that has that
17 processing. For example, as I describe in the
18 modification in 117.
19 **Q You would agree that for the sensor to**
20 **be able to detect a signal indicative of a system**
21 **error, it would require that processing circuitry**
22 **you just described. Correct?**
23 MR. KIM: Objection; form.
24 BY MR. CHRISTOPHER:
25 **Q Are you still reviewing your**

Page 295

1 **declaration?**
2 A Yes.
3 Right. Again, as I point out back in
4 the paragraph 100 on page 55:
5 In sum, a person of ordinary skill would
6 have understood that the close integration of the
7 front-end processing circuitry and detector in a
8 sensor is highly advantageous for multiple
9 reasons: It enhances the signal integrity,
10 reduces noise, signal degradation.
11 And so Lisogurski teaches that the
12 front-end process -- a POSITA reading Lisogurski
13 would understand the integration of that and the
14 motivation to put that front-end processing
15 together as -- with the biosensor, and that's
16 where the -- the detection of the -- the off
17 signal would be determined.
18 **Q Okay. Now let's go back to Figure 1 of**
19 **Lisogurski. It's page 3 of the PDF. Let me know**
20 **when you get there.**
21 A Yep.
22 **Q Okay. And I want to be clear. I'm --**
23 **I'm not asking you about any modifications to**
24 **Figure 1. I'm asking about Figure 1, the example**
25 **system as it exists here on the page.**

Page 296

1 A person of skill in the art would
2 understand that the sensor 102 by itself would not
3 be able to detect a signal indicative of a system
4 error. Correct?
5 MR. KIM: Objection; form.
6 THE WITNESS: I was not opining on
7 Figure 1 in isolation by itself. I'm opining on
8 what Lisogurski teaches and what a person of skill
9 in the art would understand in Lisogurski in its
10 entirety including Figure 1. A POSITA --
11 Lisogurski explicitly explains how functionality
12 can be realized in different configurations. And
13 Lisogurski certainly discloses that detection
14 signal being calculated in the -- in the
15 biosensor, which is the combination, as Lisogurski
16 discloses, of the light source, light detector and
17 front-end processing.
18 MR. CHRISTOPHER: I'm going to move to
19 strike as nonresponsive.
20 BY MR. CHRISTOPHER:
21 **Q Let's try it again. I'm asking about**
22 **Figure 1, there's no modifications to the system.**
23 **It's exactly how it's described in Lisogurski**
24 **shown in Figure 1.**
25 **Would a person of skill in the art**

Page 297

1 **understand that the sensor 102 be able to detect a**
2 **signal indicative of a system error, yes or no?**
3 MR. KIM: Objection to form and also to
4 the motion to strike.
5 THE WITNESS: Yes, because they would
6 look at that figure in its entirety and the
7 understanding of what Lisogurski teaches. And a
8 POSITA looking at that figure would understand
9 that they could alternatively put the box that is
10 the front-end processing circuitry to include the
11 detector. And so yes.
12 BY MR. CHRISTOPHER:
13 **Q So absent modifying Figure 1 to put the**
14 **front-end processing circuitry into sensor 102,**
15 **you would agree that sensor 102 could not detect a**
16 **signal indicative of a system error. Correct?**
17 MR. KIM: Objection to form.
18 THE WITNESS: That's not what I said.
19 I said that a POSITA looking at Figure 1
20 through the context of the entire patent, they
21 would look at that and understand they had the
22 design flexibility to group that -- put the box in
23 a slightly different way than the way it's drawn
24 because Lisogurski didn't draw all the possible
25 combinations of the boxes, but they described all

Page 298 1 the combinations of the boxes. 2 And so a POSITA reading that would 3 understand that even though in Figure 1 it's shown 4 as a box that's separate, in the teachings of 5 Lisogurski, it's possible to have a box that's 6 combined, and indeed it would be natural to do so. 7 MR. CHRISTOPHER: I'll move to strike as 8 nonresponsive. 9 BY MR. CHRISTOPHER: 10 Q I'm going to ask it one more time and 11 give you one more opportunity to answer because 12 you're not answering my question. 13 Could the sensor 102 that is shown in 14 Figure 1 detect a signal indicative of a system 15 error absent some sort of modification as you've 16 described to Lisogurski, yes or no? 17 MR. KIM: Objection to form and move to 18 strike. And also, to be clear, he's answering the 19 question. 20 MR. CHRISTOPHER: Counsel, he's not 21 answering the question. 22 MR. KIM: Well, he's explaining why he 23 cannot answer the question the way that it is 24 asked. 25 MR. CHRISTOPHER: No, he's not.	Page 300 1 figure -- I'm not modifying Lisogurski. I'm not 2 modifying the figure. Because implicitly what 3 Lisogurski is describing is this is the 4 functionality, and the functionality can be 5 grouped in different ways. 6 And so a POSITA would look at this 7 figure and understand, yes, I have that front-end 8 processing circuitry as a POSITA designing my 9 device, that functionality can be incorporated as 10 part of the biosensor. And yes, I can detect the 11 signal in the case of probe-off in that thing that 12 is the sensor. 13 BY MR. CHRISTOPHER: 14 Q Okay. Let me see if I understand this. 15 In order for the sensor 102 to detect 16 the signal indicative of a system error, there has 17 to be processing circuitry inside the sensor 102. 18 Is that correct? 19 MR. KIM: Objection to form. 20 THE WITNESS: As I described in the -- 21 what Lisogurski teaches and in the motivations to 22 modify, a POSITA reading Lisogurski would 23 understand that that probe-off signal could be 24 part and done inside of the processing 25 functionality of the modified biosensor.
Page 299 1 MR. KIM: He's explaining. 2 MR. CHRISTOPHER: No, he's not. No, 3 he's not. 4 MR. KIM: Yes, he is. 5 MR. CHRISTOPHER: He's -- he's being 6 evasive this entire deposition. 7 MR. KIM: No. 8 MR. CHRISTOPHER: He doesn't want to 9 answer the question. 10 MR. KIM: I -- I disagree. 11 MR. CHRISTOPHER: Okay. The Board will 12 read this and I think it will be quite clear that 13 he's being evasive. 14 So let me -- let me -- for a clean 15 record, I'll re-ask question and give the witness 16 one more opportunity to answer because he's not 17 answering. 18 BY MR. CHRISTOPHER: 19 Q Could the sensor 102 shown in Figure 1 20 of Lisogurski detect a signal indicative of a 21 system error, absent one of the modifications 22 you've proposed, for example, putting the 23 front-end processing circuitry within the sensor? 24 MR. KIM: Objection to form. 25 THE WITNESS: Yes. Because the	Page 301 1 BY MR. CHRISTOPHER: 2 Q Okay. Let me just ask it -- a simple 3 question. You would agree that in order to detect 4 a signal indicative of a system error, that 5 detection requires processing circuitry. Correct? 6 MR. KIM: Objection to form. 7 THE WITNESS: I would agree that that is 8 what Lisogurski teaches and what a POSITA would 9 understand of how to do that into the integrated 10 biosensor as I've explained in the -- using the 11 front-end processing circuit together with the 12 sensor as part of the biosensor. Yes. 13 BY MR. CHRISTOPHER: 14 Q Okay. Let's go -- do you still -- do 15 you still have, from yesterday, a copy of your 16 declaration for the '455 patent? 17 A The '455? 18 Q Yeah, for the '455. 19 (Exhibit 1003 in IPR2025-01252 was 20 previously marked.) 21 Q This is -- by the way, for the record 22 this is Exhibit 1003 in IPR 2025-01252. 23 Let me know when you have that available 24 to you. 25 A Okay. '455.

Page 302 1 Q And when you have that open, can you 2 turn to paragraph 43 of your declaration, please? 3 A 43? 4 Q 43, please. 5 A Yep. 6 Q It's on page 25 of the PDF. 7 A Yep. 8 Q Okay. Paragraph 43, in the first 9 sentence, you wrote: 10 While the 353 -- let me restart. I got 11 my numbers backwards. 12 In the first sentence of paragraph 43, 13 you wrote: While the -- I did it again. Third 14 time's a charm. 15 In paragraph 43, you wrote: 16 While the '455 patent 17 claims additional -- claims include additional 18 limitations. 19 Do you see that? 20 A Yes. 21 Q Okay. And you would agree that the 22 claims of the '455 patent include additional 23 limitations that were not addressed during the 24 prior IPRs for the '533 and '484 patents. 25 Correct?	Page 304 1 patent. This is at the bottom of PDF page 62, 2 please. 3 A Okay. 4 Q Hold on. I'm sorry. I have completely 5 the wrong number down here. 6 Let's go to paragraph -- no, I don't. 7 It's a footnote. That's what the problem is. 8 Okay. Do you see in paragraph 109, it 9 bridges on between two pages, internal pages 59 to 10 60, there's a footnote 2? 11 A Yes. 12 Q Okay. And then in footnote 2, this is 13 at the bottom of internal page number 60, footer 14 page number 63, you write: 15 I have added certain emphasis to the 16 '455 patent's claim limitations throughout my 17 declaration. 18 Do you see that? 19 A Yes. 20 Q And so you've created this color coding 21 system where, according to footnote 2, green 22 emphasis indicates '455 patent claim limitations 23 that are identical to those addressed in the prior 24 '533 patent and '484 patent IPRs. 25 Do you see that?
Page 303 1 MR. KIM: Objection; form. 2 THE WITNESS: I'm sorry. So can you 3 re-ask the question? 4 BY MR. CHRISTOPHER: 5 Q Yeah. Do you see where you -- you say 6 the term "additional limitations" in paragraph 43? 7 A Right. In paragraph 43, while the 8 '455 patent claims include additional limitations. 9 Q Right. 10 A They at most recite a common location to 11 place a wearable device, a generic driver and 12 associated driver circuitry for light sources, a 13 generic measurement or comparison technique using 14 multiple wavelengths, common configurations and 15 characteristics for light sources and detectors 16 and common analytical methods for data processing. 17 So yes. 18 Q Right. And when you said "additional 19 limitations" in paragraph 43 of your declaration, 20 you were referring to additional limitations 21 relative to the claims that were addressed in the 22 prior '533 and '484 patent IPRs. Correct? 23 A Yes, that is correct. 24 Q Okay. And if you could turn now to 25 paragraph 109 of your declaration for the '455	Page 305 1 A Yes. 2 Q Black emphasis indicates 5 -- excuse 3 me -- '455 patent claim limitations that are 4 different from but are substantially identical to 5 those addressed in the prior '533 patent and '484 6 patent IPRs. 7 Do you see that? 8 A Yes. 9 Q And so throughout your analysis, if we 10 see black emphasis text, that indicates a claim 11 limitation or a portion of a claim limitation that 12 differs from the limitations that were addressed 13 in the prior '533 and '484 patent IPRs. Correct? 14 A But are -- 15 MR. KIM: Objection; form. 16 THE WITNESS: But are substantially 17 identical to those addressed in the '533 and the 18 '484. 19 BY MR. CHRISTOPHER: 20 Q Different, though. Correct? 21 A Correct, but are substantially identical 22 to those addressed. 23 Q And then blue emphasis indicates 24 limitations similar to 5 -- excuse me -- '455 25 patent claim limitations as you discussed earlier.

Page 306 1 Correct? 2 A Earlier in this declaration -- 3 Q Right. 4 A -- in the '455 declaration. 5 Q Appreciate that. 6 And then at the very end of footnote 2, 7 you've got red text: 8 All other emphasis -- emphases, showed 9 new limitations in the '455 patent not addressed 10 in the prior '533 patent and '484 patent IPRs. 11 Do you see that? 12 A Yes. 13 Q Okay. And so if we see, for example, 14 text in red in your analysis, that would be a new 15 limitation that was not previously addressed in 16 the prior '533 and '484 patent IPRs. Correct? 17 A Correct. 18 Q Okay. 19 A And I believe that -- that I use other 20 colors other than red to -- to separate the 21 different things that are not addressed. 22 Q Okay. 23 A So green and blue and black are as they 24 say. And then there's red and other colors that 25 are not green, black, and blue.	Page 308 1 Q Okay. And in element [1.b], it recites 2 the phrase, "a light source comprising a driver." 3 Do you see that? 4 A In [1.b], yeah. Including a light 5 source comprising a driver and a plurality of 6 semiconductor sources, yes. 7 Q And a person of skill in the art reading 8 element [1.b] would understand that the light 9 source includes a driver. Correct? 10 A Comprising a driver and a plurality of 11 semiconductor sources, yes. 12 Q If you could turn to paragraph 155 of 13 your declaration for the '455 patent. 14 A Sorry. 155? 15 Q Correct. 155. 16 In paragraph 155, the portion of element 17 [1.f] that reads "detectors that are spatial lie 18 separated from one another" is in black text. 19 Correct? 20 A Yes. 21 Q And so this would be -- as we talked 22 about a moment ago, this would be an example of a 23 claim limitation that is different, but in your 24 view, substantially similar to a prior limitation 25 for the '533 and '484 prior IPRs. Correct?
Page 307 1 Q Got it. That's actually where I was 2 going to go next. I think you captured it. 3 If there's claim -- claim limitations 4 that are emphasized in a color other than green, 5 black, or blue, that would be a new limitation 6 compared to the '533 and '484 patent IPRs. 7 Correct? 8 A Correct. 9 Q Okay. 10 A Yeah. It wasn't appropriate to make all 11 other a rainbow. 12 Q If you could turn to paragraph 119. 13 A Of the '455? 14 Q Of the '455, correct. This is page 66 15 of the PDF. 16 Let me know when you're there. 17 A Yes. 18 Q And if you're red/green colorblind, this 19 could be difficult for you. But in Element [1.b], 20 do you see the text "a driver" in red? 21 A Yes. 22 Q Okay. So that would be an example of a 23 new limitation in element [1.b] relative to the 24 prior '533 and '484 patent IPRs. Correct? 25 A That is correct.	Page 309 1 A Correct. Substantially identical to 2 those addressed in the prior '533 and '484. 3 Q Okay. And if you could turn to 4 paragraph 197 of your declaration for the '455 5 patent. This bridges PDF page 114 onto page 115. 6 Let me know when you're there. 7 A Yes. 8 Q Okay. Now we have three different 9 colors here. The phrase in element -- strike 10 that. Let me back up. 11 In paragraph 197, you address element 12 [1.n] in Claim 1 of the '455 patent. Correct? 13 A Yes. 14 Q And within element [1.n], the phrase 15 comprises three optical wavelengths is in red 16 text. Do you see that? 17 A Yes. 18 Q And so the requirement of three optical 19 wavelengths is a new additional limitation 20 relative to the prior '484 and '533 IPRs. 21 Correct? 22 A Correct. 23 Q And then at the end of the element [1.n] 24 in paragraph 197, the phrase: 25 Wherein the optical wavelengths comprise

Page 310 1 near infrared or invisible wavelengths is in 2 purple text. 3 Do you see that? 4 A Yes. 5 Q And so the phrase "wherein the optical 6 wavelengths comprise near infrared or invisible 7 wavelengths in element [1.n]," that's a new claim 8 limitation relative to the prior '484 and '533 9 IPRs. Correct? 10 A Correct. 11 Q We'll do a few more of these, and then 12 we'll take a short break. 13 If you can go to paragraph 248, please, 14 of your declaration for the '455 patent. 15 A Okay. 16 Q And in paragraph 248, you address 17 element [8.m]. Correct? 18 A Yes. 19 Q And you'll note that the word "six" is 20 in red text here in paragraph 248. Correct? 21 A Yes. 22 Q And so the requirement of six 23 light-emitting diodes is a new limitation relative 24 to the prior '484 and '533 IPRs. Correct? 25 A Correct.	Page 312 1 of the one or more physiological parameters using 2 the output signal corresponding to the other two 3 optical wavelengths. 4 That phrase is annotated in purple text 5 here in paragraph 253. Correct? 6 A Yes. 7 Q Okay. And so once again, that 8 limitation "corresponding to at least one of the 9 optical wavelengths is used to improve measurement 10 of the one or more physiological parameters using 11 the output signal corresponding to the other two 12 optical signals" is a new additional limitation in 13 Claim 11 that was not previously addressed in the 14 prior '484 and '533 decisions. Correct? 15 A Correct. 16 Q Okay. If you can turn to paragraph 270. 17 Let me know when you're there. This is page 149 18 of the PDF. 19 A Yes. 20 Q Okay. In paragraph 270, you address 21 dependent Claim 2 of the '455 patent. Correct? 22 A Yes. 23 Q The phrase "plurality of semiconductor 24 sources" is annotated in purple. Do you see that? 25 A Yes.
Page 311 1 Q Okay. Let's go to paragraph -- a few 2 down. Paragraph 253 of your declaration for the 3 '455 patent. 4 Are you there? 5 A Yes. 6 Q Perfect. Okay. In paragraph 253, you 7 addressed dependent Claim 11 of the '455 patent. 8 Correct? 9 A Yes. 10 Q And the text comprises wavelengths 11 between 600 nanometers and 1,000 nanometers to 12 measure a level of oxyhemoglobin and 13 deoxyhemoglobin is in red. Do you see that? 14 A Yes. 15 Q And so the phrase "comprises between 600 16 nanometers and 1,000 nanometers to measure 17 oxyhemoglobin and deoxyhemoglobin" is a new 18 additional limitation relative to the prior '484 19 and '533 patent IPRs. Correct? 20 A Yes. 21 Q Okay. And then the last portion of 22 Claim 11 as quoted here in paragraph 253 of your 23 declaration, the phrase: 24 Corresponding to at least one of the 25 optical wavelengths is used to improve measurement	Page 313 1 Q And the phrase plurality is based -- let 2 me start over. 3 The phrase "plurality of spatially 4 separated detectors are located on one more or 5 arcs" is annotated in yellow and gold. Correct? 6 A Yes. 7 Q And so the phrases "plurality of 8 semiconductor sources" and "plurality of spatially 9 separated detectors are located on one or more 10 arcs" are new additional limitations in Claim 2 11 relative to the '484 and '533 decisions. Correct? 12 A Yes. 13 Q Okay. If you can turn to paragraph 350 14 of your declaration for the '455 patent. 15 I'm sorry. Which paragraph? 16 Q 350. This is on PDF page 170. 17 A Okay. 18 Q Okay. Are you there? 19 A Yes. 20 Q Perfect. 21 In paragraph 350, you address dependent 22 Claim 17 of the '455 patent. Correct? 23 A Yes. 24 Q The phrase, "a reflective surface to 25 receive and redirect at least some of the output

Page 314

1 optical light from the plurality of semiconductor
2 sources" is annotated in pink text.
3 Do you see that?
4 A Yes.
5 Q And so once again, based on the
6 annotations, we know "a reflective surface to
7 receive a redirect at least some of the output
8 optical light from the plurality of semiconductor
9 sources" is a new claim limitation in Claim 17 of
10 the '455 patent relative to the prior '484 and
11 '533 IPR decisions. Correct?
12 A Yes.
13 Q Okay. If you could turn to paragraph --
14 we'll do one more and then we'll take a short
15 break.
16 Paragraph 383 of your declaration. This
17 is PDF page 190.
18 A Yes.
19 Q Okay. In paragraph 383, you address
20 element [5.b] in Claim 5 of the '455 patent.
21 Correct?
22 A Yes.
23 Q And you'll note in paragraph 383, the
24 portion of element [5.b] reading, "configured to
25 apply one or more regression signal processing

Page 315

1 methodologies to at least a part of the output
2 signal" is annotated in red text. Correct?
3 A Correct.
4 Q And once again, the limitation
5 configured to apply one or more regression signal
6 processing methodologies to at least a part of the
7 output signal in element [5.b] in the '455 patent
8 is a new additional limitation relative to the
9 prior '484 and '533 IPR decisions. Correct?
10 A Correct.
11 Q Okay.
12 MR. CHRISTOPHER: Why don't we go off
13 the record and take a short break.
14 (Break held off the record from
15 10:12 a.m. to 10:24 a.m.)
16 BY MR. CHRISTOPHER:
17 Q Dr. Anthony, welcome back. Did you
18 discuss your testimony with anyone during our
19 break?
20 A No.
21 Q Okay. Can you turn for me to
22 paragraph 352 of your declaration for the '455
23 patent. This is PDF page 170.
24 A Okay.
25 Q And in paragraph 352, the text -- let me

Page 316

1 back up.
2 Paragraph 350, you're addressing
3 dependent Claim 17 of the '455 patent. Correct?
4 A Yes.
5 Q And, you know, based on our discussion
6 prior to the break, do you see the text, "a
7 reflective surface to receive and redirect at
8 least some of the output optical light from the
9 plurality of semiconductor sources" is in pink?
10 Do you see that?
11 A Yes.
12 Q Okay. And once again, that additional
13 limitation in Claim 17 of the '455 patent was not
14 addressed in the prior '484 and '533 IPRs.
15 Correct?
16 A Correct.
17 Q Okay. And then in paragraph 352, you
18 rely on LeBoeuf, Exhibit 1026, for the additional
19 limitation recited in Claim 17 of the '455 patent.
20 Correct?
21 A Right. Lisogurski in view of LeBoeuf.
22 Q Sure. Lisogurski in view of LeBoeuf.
23 Correct?
24 A Yes. Yes.
25 Q Okay. Now, in paragraph 353, in the

Page 317

1 first sentence, you wrote:
2 LeBoeuf discloses that earbud housing 16
3 is partially reflective to scatter light within
4 the cavity defined by the earbud housing 16.
5 Do you see that?
6 A Yes.
7 Q Okay. And then in the next sentence,
8 you wrote:
9 An advantage of this configuration is
10 that it allows the light emitted from optical
11 emitters 24 to, quote, be focused on a particular
12 region of the ear or particular physiological
13 activity maybe located, end quote, enabling,
14 quote, interrogation of that region, end quote, to
15 obtain physiological information.
16 Do you see that?
17 A Yes.
18 Q And so the purpose of the reflective
19 surface in LeBoeuf is to focus light from the
20 emitters onto a particular region of the ear.
21 Correct?
22 MR. KIM: Objection; form.
23 BY MR. CHRISTOPHER:
24 Q Are you reading your declaration?
25 A I'm going back to my declaration where I

Page 318 1 first introduce LeBoeuf just to orient myself to 2 LeBoeuf at a high level first. 3 I think it was a -- when I first 4 described LeBoeuf back in the overview of LeBoeuf 5 and motivation to combine LeBoeuf. 6 So, for example, taking the teachings of 7 LeBoeuf around reflective surfaces in paragraph 8 265, LeBoeuf's reflective surfaces, surface 9 teachings, a person of ordinary skill would have 10 been motivated to combine -- to apply LeBoeuf's 11 reflective surface teachings to Lisogurski's 12 system to receive or redirect at least some of the 13 output light to improve performance. LeBoeuf 14 discloses an earbud with earbud housing that's at 15 least partially reflective to scatter light within 16 the cavity. 17 LeBoeuf teaches this configuration 18 offers two advantages. It would help focus the 19 light generated by optical emitters 24 onto a 20 particular region where the particular 21 physiological activity may be located. And two, 22 to reduce unwanted optical signals from regions 23 that may not be relevant to the physiological 24 activity. 25 Such advantages were well understood in	Page 320 1 Q Okay. So then conversely, if all other 2 things being equal in LeBoeuf, if we remove the 3 reflective surface, the light would be more spread 4 out on the ear. Correct? 5 MR. KIM: Objection to form. 6 THE WITNESS: Well, are you talking 7 about a -- so the general teachings of LeBoeuf are 8 how to use reflective surfaces to help -- I mean, 9 a POSITA taking the teachings of LeBoeuf in 10 combination with Lisogurski would know how to 11 apply them. 12 But if you were to take a particular 13 embodiment and remove the reflective surfaces, it 14 would modify its performance in some way, light 15 would go other places if the reflective surfaces 16 were not there. 17 BY MR. CHRISTOPHER: 18 Q Well, let's look at Figure 8A of 19 LeBoeuf. Let me know when you're there. 20 This is page 8 of the PDF. And I can 21 resend it to you if you need it. 22 A I got it. 23 Q All right. In Figure 8, in this 24 particular embodiment that's shown in Figure 8, 25 there is no reflective surface on the earbud
Page 319 1 the art. And I cite a number of other exhibits, 2 1041. By controlling the emitted light, combining 3 it to physiological meaningful regions, the 4 reflective material enhances the efficiency of 5 light delivery and collection. This, in turn, 6 improves the signal-to-noise ratio by increasing 7 the proportion of relative signal relative to 8 background, resulting in more accurate and 9 reliable signals. 10 So a POSITA would have understood the 11 reflective surfaces used a guide and redirect 12 optical signals within wearable physiological 13 monitors well-known and routinely implemented. 14 Yeah. So yes, some of the reflective 15 surface helps to guide and collect light. 16 Q Yeah. I think a small portion of that 17 answer answered the question, which I just -- I 18 just want to confirm. The purpose -- or at least 19 one purpose of the reflective surface in LeBoeuf 20 is to focus light onto a particular region of the 21 ear. Correct? 22 A I -- it's at least one of those -- 23 that's one of the -- amongst the teachings of 24 LeBoeuf, yeah, on not just the ear, but to a 25 region of the body. Uh-huh.	Page 321 1 housing 16. Correct? 2 A You're talking about 8A or 8C? Because 3 in my declaration, I'm pointing to 8C and how 4 that's -- 5 Q I'm asking about Figure 8A of LeBoeuf. 6 A Okay. 7 Q In Figure 8A of LeBoeuf, there is no 8 reflective surface on the earbud housing 16. 9 Correct? 10 Are you reviewing LeBoeuf? 11 A I'm going -- I'm reviewing LeBoeuf where 12 it's describing, again, Figures 8A and 8C. 13 So in -- LeBoeuf describes the 8A as -- 14 let's see -- the earbud housing 16 includes a 15 light blocking region that blocks light from 16 passing through. Let's see. Bottom portion 17 (indiscernible reading). 18 Q Let's do it this way because this is 19 taking too long. Look at Figure 8A. We talked 20 about this yesterday. 21 A Okay. 22 Q You see the earbud housing 16 in 23 Figure 8A? 24 A Yes. 25 Q And do you see how the -- the light 111

Page 322 1 passes through the earbud housing 16? 2 A Yes. 3 Q And doesn't that tell you, without 4 reading LeBoeuf, that there is no reflective 5 surface on the earbud housing 16? 6 MR. KIM: Objection; form. 7 THE WITNESS: Well, I mean, because the 8 figure as described in paragraph 124, yeah, I 9 agree with you there's a line there. But further, 10 the description says: 11 This light blocking region 16A may be 12 painted black and not to be opaque region or 13 material structure that blocks light transmission. 14 The illustrated configuration may help confine 15 inspection light. 16 So there's some transmitting through in 17 the figure, but it also -- I think the 18 description -- so it describes that some of it's 19 not passing through that as well. 20 BY MR. CHRISTOPHER: 21 Q And we talked about this yesterday. 22 Other than the light blocking region 16A, you 23 agree that light can pass through the earbud 24 housing 16. Correct? 25 MR. KIM: Objection; form.	Page 324 1 Q Thank you. 2 Can you turn back to paragraph 354 of 3 your declaration for the '455 patent? 4 A 354, you said? 5 Q 354, please. 6 A Okay. 7 Q Okay. And in paragraph 354, you've 8 annotated Figure 8C of LeBoeuf. Do you see that? 9 A Yes. 10 Q And in particular, you've annotated the 11 earbud housing 16 shown here in Figure 8C in pink. 12 Do you see that? 13 A Yes. 14 Q Would a person of skill in the art 15 understand that the entirety of the earbud housing 16 16 that you've annotated in pink has a reflective 17 surface? 18 A So as I -- in paragraph 353, right, 19 where we talk about the partially reflective, 20 LeBoeuf disclosed the earbud housing 16 is 21 partially reflective to scatter light within the 22 cavity defined by the earbud housing. LeBoeuf -- 23 and I cite LeBoeuf 123, 125, and also 17. 24 For example, if you go to 125, in some 25 embodiments, as illustrated as Figure 8C, the
Page 323 1 THE WITNESS: Well, what's drawn there 2 is there's light passing through the dotted line. 3 Paragraph 124, although it describes there may be 4 some optically opaque materials that are made so 5 that it doesn't pass through. And then 6 furthermore, 8C incorporates 16 with partially 7 reflective to scatter the light. 8 So we see in 8C where it's staying more 9 constrained with the -- the -- the dotted line 10 staying on the inside of 16. 11 BY MR. CHRISTOPHER: 12 Q So you would agree that the light 13 exiting the embodiment in Figure 8C is more 14 constrained than the light that exits the 15 embodiment shown in Figure 8A of LeBoeuf. 16 Correct? 17 A I mean, as -- as drawn with those lines 18 in 8A and 8C, in 8A, the light coming out is also 19 going through. Some of it's going through 16 and 20 out the front. And in 8C, it's coming out the 21 smaller region. 22 Q Coming out the smaller region in 23 Figure 8C relative to Figure 8A. Correct? 24 A In those particular figures the way 25 they're drawn, yes.	Page 325 1 earbud housing 16 may be at least partially 2 reflective to scatter light within the cavity 3 defined by the earbud housing. In such case, the 4 optical energy 111 may exit the earbud through 5 apertures 34a, 34b and the housing 16 and cover 6 18. 7 The advantages of this configuration is 8 that the light 111 can be focused on a particular 9 region of the ear where a particular physiological 10 activity may be located. Also this configuration 11 may reduce unwanted optical signals from regions 12 that may not be relevant to the physiological 13 activity of interest. 14 So it discloses that, you know, at least 15 part of the housing would be covered -- would be 16 at least partially reflective to scatter light 17 within the cavity. 18 Q I don't think that quite answered my 19 question, which was: Looking at your annotation 20 in Figure 354 of your declaration and the earbud 21 housing that you've annotated in pink, is the 22 entirety of the surface partially reflective? 23 MR. KIM: Objection; form. 24 THE WITNESS: Well, I've labeled the 25 earbud housing. Right?

Page 326

1 BY MR. CHRISTOPHER:
2 Q Got it.
3 A And the figure as described that in that
4 earbud housing 16 may be at least partially
5 reflective to scatter light within the cavity
6 defined by the earbud housing. So it's at least
7 partially. A POSITA could choose to make it
8 partial, it could choose to make it full. I've
9 annotated -- I've labeled it so it's clear what it
10 is. But a POSITA in reading Lisogurski, both
11 looking at the figure and reading about it, would
12 understand it's at least partially. And partially
13 could include all of it.
14 Q Okay. Do you see how the earbud housing
15 kind of wraps around in a curve on the right-hand
16 side of Figure 8C? Do you see that?
17 A I'm -- I'm sorry.
18 Q Well, let's -- let's look at the top.
19 So there's two portions of the earbud housing 16.
20 Do you see that?
21 A Do you want to share your screen to
22 point out what you're -- so I'm making sure I'm
23 understanding --
24 Q Are you looking at paragraph 354 of your
25 declaration?

Page 327

1 A I am.
2 Q Okay.
3 A Yeah.
4 Q And there's -- you've annotated the
5 earbud housing --
6 A Yep.
7 Q -- 16 in pink.
8 A Yeah.
9 Q And kind of in the top half of the
10 figure, it looks almost like an upside down J. Do
11 you see that?
12 A Upside down J.
13 Q Sideways.
14 A You mean the earbud housing? Are you
15 talking about the earbud housing.
16 Q Yeah. I'm talking about the earbud
17 housing.
18 A Okay. So the upper -- the -- the upper
19 portion of the earbud housing?
20 Q Yeah, the upper portion. And it kind of
21 curves around. Do you see that?
22 A Yes.
23 Q Okay. And you've annotated the optical
24 emitters in purple. Correct?
25 A Yes.

Page 328

1 Q And we see on both of the optical
2 emitters that Lisogurski has drawn on Figure 8C
3 the light with reference 111. And in the figure,
4 it appears to be exiting the emitter at
5 approximately a 45-degree angle. Do you see that?
6 A Yes.
7 Q Now, you see where you drew the purple
8 lines to the top of each of the emitter in your
9 annotated version of Figure 8C?
10 A Yes.
11 Q Now, I want you to imagine that light
12 exits each of the emitters along the path shown by
13 your purple error -- arrows. Are you with me?
14 A Sure.
15 Q That light would then reach a portion of
16 the earbud housing 16 that is shown by your purple
17 arrows. Correct?
18 A So you're -- you're talking about the --
19 the purple arrow. That's -- that's just labeling.
20 That's -- that's...
21 Q Right. I'm using that as a -- as a
22 visual guide. I want you to imagine that light
23 exits the emitter and travels along a path using
24 your purple arrow. Imagine that's the path. The
25 light propagates out of the emitter. You with me?

Page 329

1 A Okay.
2 Q Okay. That light would then be incident
3 upon a portion of the earbud housing 16 directly
4 across from the emitter. Correct?
5 A Sure, yeah.
6 Q Okay. And if that portion of the earbud
7 16 was reflective, the earbud housing 16 would
8 reflect the light back towards the emitter.
9 Correct?
10 MR. KIM: Objection; form.
11 THE WITNESS: Well, in the hypothetical
12 situation, if that entire -- if the entire pink
13 thing is internal reflective, light's going to
14 come out and it's going to bounce on the inside --
15 you know, the dotted line there is representative
16 of one of the paths. And even if it bounces, it
17 would bounce again and eventually come out the --
18 the hole of 34a. 34a, 34b.
19 BY MR. CHRISTOPHER:
20 Q So if -- you would agree, then, if -- if
21 the earbud housing 16, the entire surface was
22 reflective, there would be internal reflection
23 within the earbud housing 16. Correct?
24 MR. KIM: Objection; form.
25 THE WITNESS: Right. I mean, LeBoeuf

Page 330

1 teaches a general use of -- of, as I describe in
2 paragraph 266, of using reflective coating to get
3 the light where you want it to. If it's using
4 reflection, it's -- it's going to bounce and then
5 go someplace else. And if that full thing were
6 reflective, then yes, it would only come out the
7 aperture of the hole of 34a, 34b.
8 BY MR. CHRISTOPHER:
9 **Q Okay. So your view is if that entire**
10 **earbud housing 16 were reflective, eventually, the**
11 **light would bounce around and exit the earbud**
12 **housing 16 through the aperture. Correct?**
13 MR. KIM: Objection; form.
14 THE WITNESS: In the hypothetical
15 situation that this was all in general most of the
16 light, yeah, would -- would come out the -- the
17 front there.
18 BY MR. CHRISTOPHER:
19 **Q You said most of the light, but not all**
20 **of the light in that example. Correct?**
21 A It's a hypothetical situation, so it
22 depends on how perfectly reflective that surface
23 is -- surface is. But -- but certainly, a POSITA
24 reading LeBoeuf understands the benefit of using
25 reflective materials to put the light where you

Page 331

1 want it to. And it relies on reflection, so even
2 if there's some loss on the reflective coating,
3 it's still a net positive to get the light to
4 where you want it to go.
5 **Q A person of skill in the art would know**
6 **that the emitters 24 in LeBoeuf could be LEDs.**
7 **Correct?**
8 A Correct, as I've opined.
9 **Q Yeah. And wouldn't a person of ordinary**
10 **skill in the art know that an LED could reabsorb**
11 **light that's reflected back at the LED?**
12 MR. KIM: Objection; form.
13 THE WITNESS: So the surface area of
14 that LED relative to the area of the -- that
15 reflect -- that volume of where the light is being
16 emitted is relatively inconsequential. So even if
17 some light fell back on the LED, compared to the
18 amount that it's emitting, you're getting most of
19 that light still out of the LED and out into the
20 hole.
21 So a POSITA would understand, you know,
22 how to design this to use the LEDs in a way and
23 the reflective coating in a way to get the light
24 where they want it to be in a physiologically
25 relative region.

Page 332

1 BY MR. CHRISTOPHER:
2 **Q And I understand your point about the**
3 **volume of light and the size of the LEDs. But it**
4 **sounds like you agree that it is possible in a**
5 **situation where the earbud housing 16 is -- the**
6 **entire surface is reflective that some of that**
7 **light could be reflected back and absorbed into**
8 **the LED. Correct?**
9 MR. KIM: Objection; form.
10 THE WITNESS: A POSITA would not be
11 concerned in -- would understand how to use LED
12 and reflective surfaces to get light to a
13 physiologically relevant region. The light that
14 is bouncing around -- if you just take this
15 hypothetical situation of light bouncing around in
16 there and you draw -- assume perfect angular
17 reflections, it's a -- that's one -- less than --
18 eyeballing it, less than 1 percent of the surface
19 area if you just take the proportions of the
20 figures as drawn.
21 And that's not -- and even if -- and
22 then there's not going to be perfect absorption,
23 it's going to reflect off of -- so the point that
24 you're making, it's inconsequentially tiny for the
25 amount of energy going back perfectly into the

Page 333

1 LED. And that's not at all going to teach away
2 from using a reflective coating in combination
3 with LED to get light where you want it. I mean,
4 LeBoeuf explicitly teaches how to do this.
5 MR. CHRISTOPHER: Yeah, I'm going to
6 move to strike as nonresponsive.
7 BY MR. CHRISTOPHER:
8 **Q I just asked: A person of skill in the**
9 **art would know that if the earbud housing 16 where**
10 **the entire surface was reflective, some of the**
11 **light could be reflected back into the LED.**
12 **Correct?**
13 MR. KIM: Objection form and also to the
14 motion to strike. He's answering the question.
15 MR. CHRISTOPHER: No. He's giving a
16 totally different off topic answer. I'm asking a
17 straightforward question, and he's expounding on
18 and giving new opinions, and it's completely
19 improper.
20 MR. KIM: Again, he's answering the
21 question in a way that's explains what his answer
22 is at it relates to your question.
23 MR. CHRISTOPHER: No. He's giving
24 completely new opinions.
25 MR. KIM: We can go on forever. But

Page 334 1 just move on. 2 BY MR. CHRISTOPHER: 3 Q Let me re-ask my question. I'll try it 4 one more time. 5 A person of skill in the art would know 6 that if the earbud housing 16, the entire surface 7 was reflective, some of the light could be 8 internally reflected back into the emitters 24. 9 Correct? 10 MR. KIM: Same objections. 11 THE WITNESS: A person of skill in the 12 art would understand that the reflective surface 13 used in conjunction in this particular embodiment, 14 if all of it were reflective, that the light is 15 leaving the LED, hitting reflective surfaces, 16 bouncing around, but most of it is going to be 17 coming out the front face. Would some of it fall 18 back onto the LED? Some. But it's a relative 19 amount. It's tiny. 20 And that would not be a issue at all. 21 It doesn't teach away from the benefit of using an 22 LED with reflective surfaces to direct light to a 23 physiologically relevant region. 24 MR. CHRISTOPHER: I'll move to strike 25 the part of the answer that starts with "and that	Page 336 1 Q Which, if any, components of Figure 8C 2 would be implemented in Lisogurski in the proposed 3 combination? 4 MR. KIM: Objection; form. 5 THE WITNESS: Well, I'm not proposing a 6 wholesale copying of a particular embodiment, but 7 the teachings of Lisogurski in terms of using 8 reflective coatings. So if I go back into the 9 motivation to combine and I talk about, you know, 10 how those reflective surfaces would be used to -- 11 to guide light to the target tissue. So it's not 12 presupposing a particular amalgamation of an 13 embodiment. 14 But the teachings clearly demonstrate 15 how to use reflective material -- reflective 16 coatings to deliver light to the target tissue. 17 BY MR. CHRISTOPHER: 18 Q Okay. Are you proposing to modify 19 Lisogurski to include the earbud housing 16 from 20 LeBoeuf? 21 MR. KIM: Objection; form. 22 THE WITNESS: So as I describe in 23 paragraph 265, with respect to LeBoeuf's 24 reflective surface teachings, a person of ordinary 25 skill in the art would have been motivated to
Page 335 1 would not be an issue at all." Because I didn't 2 ask whether it would be an issue. I just asked 3 whether it would occur. 4 MR. KIM: I'll leave an objection again. 5 MR. CHRISTOPHER: We'll move on. 6 BY MR. CHRISTOPHER: 7 Q Okay. Let's go to paragraph -- the next 8 paragraph from where we've been. 9 A The next one is which one? 10 Q 355, please. Right below where we were 11 just looking at, the annotated figure. 12 Are you there? 13 A Yes. 14 Q Perfect. Okay. In paragraph 355, do 15 you see where you wrote: 16 A person of ordinary skill in the art 17 would have been motivated to apply LeBoeuf's 18 teachings to the Lisogurski system to enhance the 19 efficiency with which light is delivered to the 20 target tissue. 21 Do you see that? 22 A Yes. 23 Q Okay. Let's go back to the paragraph 24 above, Figure 8C of LeBoeuf. Do you see it? 25 A Yes.	Page 337 1 apply LeBoeuf's reflective surface teachings to 2 Lisogurski's system to receive or redirect at 3 least some of the output light to improve the 4 performance of Lisogurski's physiological 5 monitoring system. 6 It goes on: 7 LeBoeuf teaches the configuration offers 8 advantages to help focusing light on a particular 9 region, reduces unwanted optical signals. Such 10 advantages of using reflective coatings, 11 reflective surfaces to direct and guide light were 12 well understood in the art as shown by U.S. Patent 13 No. 2 -- 2012-019793, which is Exhibit 1041, which 14 also has a -- in Exhibit 1041, there's a sensor 15 surrounded by reflective material that also is 16 helping to direct light and/or from the sensor 17 module blood flow region within the body part. 18 Thus by controlling the emitted light, confining 19 it to physiological meaningful regions, the 20 reflective material enhances the efficiency of the 21 light drive -- light delivery and collection. 22 This, in turn, improves signal to noise by 23 increasing the portion of relevant signal relative 24 to the background. 25 So Lisogurski, in combination with

Page 338

1 LeBoeuf, Lisogurski would use the teachings of the
2 reflective coating applied to the relevant
3 surfaces of the particular device that a POSITA
4 was trying to -- to realize.
5 BY MR. CHRISTOPHER:
6 **Q Respectfully, it doesn't answer my**
7 **question.**
8 MR. CHRISTOPHER: I'm going to move to
9 strike.
10 BY MR. CHRISTOPHER:
11 **Q I know what your declaration says. I**
12 **can read it. I'm asking you a specific question,**
13 **which is: In your proposed combination of**
14 **Lisogurski and LeBoeuf, are you proposing to**
15 **modify Lisogurski to include the earbud housing 16**
16 **from LeBoeuf shown in Figure 8C?**
17 MR. KIM: Objection to form and the
18 motion to strike.
19 He just answered the question. It may
20 not be the answer you'd like or you wanted to
21 hear, but --
22 MR. CHRISTOPHER: Counsel --
23 MR. KIM: -- he answered the question.
24 MR. CHRISTOPHER: It's ridiculous. He's
25 just reading the declaration. I'm asking a

Page 339

1 specific question. He goes on and reads for
2 minutes at a time. It's ridiculous.
3 MR. KIM: Well, he's answering the
4 question, also trying to orient you to the right
5 paragraph in his declaration. So he's answering
6 the question.
7 MR. CHRISTOPHER: No, he's not. So let
8 me re-ask my question.
9 BY MR. CHRISTOPHER:
10 **Q In your proposed combination of**
11 **Lisogurski and LeBoeuf, are you proposing to**
12 **modify Lisogurski to include the earbud housing 16**
13 **shown in Figure 8C of LeBoeuf, yes or no?**
14 MR. KIM: Same objections.
15 THE WITNESS: As I answered, I'm not
16 proposing the earbud housing. I'm proposing the
17 teachings of the reflective surface. And that
18 particular -- in Lisogurski -- or in LeBoeuf by
19 itself, that reflective coating is on a -- a
20 particular surface. But in the combination, what
21 I'm teaching is the teaching -- I'm opining a
22 POSITA in combination of LeBoeuf would use the
23 reflective coating -- reflective surface to
24 enhance as I described.
25

Page 340

1 BY MR. CHRISTOPHER:
2 **Q Thank you. That answered the question.**
3 **You're not relying -- you're not proposing to**
4 **modify Lisogurski to physically insert the earbud**
5 **housing 16 from LeBoeuf. Correct?**
6 A I think I answered that in the prior
7 one. But I'm proposing the combination, which is
8 using the reflective surface, not arbitrarily
9 stamping of an earbud housing into something. It
10 is the teachings of the both of them.
11 **Q Thank you.**
12 **Let's turn now to your declaration for**
13 **the '533 patent. This --**
14 A '533?
15 **Q Yes, '533.**
16 MR. CHRISTOPHER: Let me read the number
17 for the record. This is Exhibit 1003 in
18 IPR 2025-01250.
19 THE WITNESS: Okay.
20 BY MR. CHRISTOPHER:
21 **Q Now, if you could turn for me to**
22 **paragraph 138.**
23 A 38?
24 **Q Yeah, it's page 75 of the PDF. Let me**
25 **know when you're there, please.**

Page 341

1 A Okay.
2 **Q Okay. In paragraph 138, you address**
3 **dependent Claim 6 of the '533 patent. Correct?**
4 A Yes.
5 **Q Okay. And do you see the text in green:**
6 **Emits light with a bandwidth between 20**
7 **nanometers to 40 nanometers.**
8 **Do you see that?**
9 A Yes.
10 **Q The prior IPR decision for the**
11 **'533 patent did not address that claim language in**
12 **Claim 6. Correct?**
13 A Yeah. In the prior, I address Claim 5,
14 but not Claim 6, which has the 20 nanometer, 40
15 nanometer.
16 **Q Okay. Let's look at paragraph 142 of**
17 **your declaration for the '533 patent.**
18 A Okay. 142?
19 **Q 142, please.**
20 A Uh-huh.
21 **Q Okay. In the first sentence, you write:**
22 **Additionally, Lisogurski discloses, and**
23 **at minimum renders obvious, that at least one of**
24 **its LEDs emits light with a bandwidth between**
25 **20 nanometers to 40 nanometers.**

Page 342

1 Do you see that?

2 A Yes.

3 Q And you cite Lisogurski Exhibit 1025 at

4 Column 10, Lines 48 through 56. Do you see that?

5 A Yes.

6 Q And we'll look at that in a moment. But

7 before we do that, Column 10, Lines 48 through 56

8 of Lisogurski, that's the only citation to

9 Lisogurski here in paragraph 142. Correct?

10 A At the end of that sentence, it's

11 Lisogurski 10:48 through 56 in this paragraph.

12 Yes.

13 Q Okay. Now, let's look at Lisogurski at

14 Column 10, starting at Line 48. That's on page 37

15 of the PDF if it helps you get there any faster.

16 A Okay.

17 Q Okay. Can you read between Lines 48 and

18 56, and let me know when you've reviewed it?

19 A Okay.

20 Q Okay. Lisogurski doesn't explicitly

21 disclose the bandwidth of the LEDs here at

22 Column 10, Lines 48 through 56. Correct?

23 MR. KIM: Objection; form.

24 THE WITNESS: Well, what I'm describing

25 in my -- what Lisogurski discloses is the use of

Page 343

1 LEDs, and a POSITA at the time would understand

2 what the typical bandwidth is of an LED. As I

3 describe further in that paragraph, as

4 corroborating the Tam reference of 20 to 40

5 nanometers.

6 BY MR. CHRISTOPHER:

7 Q Okay. But you agree in the passage that

8 we just read from Lisogurski, it doesn't

9 explicitly disclose a bandwidth. Correct?

10 A It explicitly discloses using LEDs. And

11 as I've described, a POSITA would know what the

12 typical bandwidth is of an LED.

13 Q But no explicit disclosure of the

14 bandwidth itself in Lisogurski. Correct?

15 A As I said, yes. And what a POSITA

16 reading Lisogurski would also understand they're

17 using LEDs that have a typical bandwidth at the

18 time of 20 to 40 nanometers.

19 Q Okay. At Line 56, this is Column 10 of

20 Lisogurski, Exhibit 1025. At Column 56, do you

21 see where it discloses:

22 In one embodiment, the red wavelength

23 may be between about 600 nanometers and about 700

24 nanometers, and the IR wavelength may be between

25 about 800 nanometers and about 1,000 nanometers.

Page 344

1 Do you see that?

2 A Yes.

3 Q Would a person of skill in the art be

4 able to determine the bandwidth of an LED based on

5 the range of wavelengths of light emitted by the

6 LED?

7 A Well, that's -- I don't think a POSITA

8 reading that would interpret that as being the

9 range that's emitted by the LED. A POSITA reading

10 that would understand that an LED could have, for

11 example, a nominal center wavelength of 600 or a

12 nominal center wavelength of 650. And a POSITA

13 reading that would understand an LED has a

14 bandwidth of 60 -- of 20 to 40 nanometers. That a

15 POSITA reading this would understand those are the

16 ranges that would correspond to red or IR, and

17 that would be correspondent to the nominal center

18 wavelength, the center frequency, if you will,

19 center wavelength of the LED with the

20 corresponding 20- to 40-nanometer bandwidth.

21 (Exhibit 1030 in IPR2025-01250 was

22 previously marked.)

23 Q Look at paragraph -- rather than a

24 paragraph, I'm going to show you Exhibit 1030 from

25 IPR 2025-01250. Let me know when you have that

Page 345

1 downloaded and available to you.

2 A This is the Tam. Yep. Okay.

3 Q Yeah, that was my next question, do you

4 recognize that Exhibit 1030 is the Tam reference

5 you opined on in your declaration?

6 A Yes.

7 Q Okay. Did you review Tam in forming

8 your opinions?

9 A Well, yes. I mean, it's cited here in

10 my declaration.

11 Q Of course. And did you review Tam's

12 teachings in their entirety when you formed your

13 opinions?

14 A Yes.

15 Q Okay. Can you turn to Column 13 of Tam

16 starting at Line 45? Let me know when you're

17 there. It's on page 24 of the PDF.

18 A Okay.

19 Q Okay. Starting at Line 45, Tam

20 discloses:

21 It is clear that small optical

22 components alone, such as LEDs having bandwidths

23 from about 7 to 100 nanometers, would not allow

24 accurate measurements or even have the capability

25 of distinction between hemoglobin derivatives.

Page 346

1 Do you see that?

2 A Yes.

3 Q Now, if you could turn back to

4 paragraph 196 of your declaration for the '533

5 patent, let me know when you're there.

6 A I'm sorry. What paragraph?

7 Q 196, please.

8 A 96.

9 Q Yeah, I'll get you a page number in a

10 moment if you bear with me.

11 A Okay.

12 Q Paragraph 196 starts on PDF page 113.

13 I'd like to ask you about a portion of it that's

14 on PDF page 114. Let me know when you're there.

15 A Okay.

16 Q Okay. So do you see the sentence that

17 reads:

18 Indeed, Tam discloses that light sources

19 with high bandwidth, e.g., 100 nanometers, would

20 not allow accurate measurements.

21 Do you see that?

22 A Yes.

23 Q But as we just read from Tam, you would

24 agree Tam states that LEDs having bandwidths from

25 about 7 to 100 nanometers would not allow accurate

Page 347

1 measurements or even have the capability of

2 distinction between hemoglobin derivatives in

3 Column 13, starting at Line 45 of Tam. Correct?

4 A As described what is there, Tam

5 discloses light sources with high bandwidth would

6 not allow accurate measurements or in -- even have

7 the capability of distinction between hemoglobin

8 derivatives while bandwidth filters such as 40

9 nanometer width filter, could improve the accuracy

10 of the measurement device.

11 Q But the range in Tam that's disclosed is

12 not allowing accurate measurements or even having

13 the capability of distinction between hemoglobin

14 derivatives is 7 to 10 nanometers. Correct?

15 MR. KIM: Objection; form.

16 THE WITNESS: Well, I mean, what's

17 described there is LEDs having bandwidths of --

18 but a POSITA would understand that LEDs of 40

19 nanometer bandwidths are available would also

20 understand that the -- the accuracy of the

21 measurement could be changed with the different

22 quality of LEDs.

23 But certainly, a POSITA would be very

24 familiar with, you know, selecting the right LEDs

25 with a narrow bandwidth to increase accuracy.

Page 348

1 As -- as -- as -- you know, as I opined in the

2 dec.

3 BY MR. CHRISTOPHER:

4 Q I don't think that answers the question.

5 Do you see in that sentence we were

6 reading from paragraph 196 from your declaration

7 was e.g. 100 nanometers? Do you see that?

8 A Yes. Yes.

9 Q Okay. The range that's described in the

10 portion of Tam that you cite in the declaration is

11 actually 7 to 10 nanometers. Correct?

12 Excuse me. 7 to 100 nanometers.

13 Correct?

14 A Yes.

15 Q Okay. Now, if you could turn to -- same

16 paragraph.

17 A Sorry?

18 Q Same paragraph, actually.

19 A So 196.

20 Q Yeah, 196. It's actually -- we're not

21 going far. We're in the same sentence.

22 A Okay.

23 Q You see where you wrote:

24 While bandwidth filters such as a

25 40-nanometer bandwidth filter would improve the

Page 349

1 accuracy of the measurement device.

2 Do you see that?

3 A Yes.

4 Q What's a bandwidth filter?

5 A It's a filter that transmits a band

6 of -- of frequencies, or wavelengths in this case.

7 Q Is the bandwidth filter part of an LED?

8 MR. KIM: Objection; form.

9 THE WITNESS: So I'm just re- --

10 rereading my paragraph here. Can you re-ask the

11 question, please?

12 BY MR. CHRISTOPHER:

13 Q I'm just trying to understand. Is the

14 bandwidth filter part of an LED, or is it a

15 separate component?

16 MR. KIM: Objection; form.

17 THE WITNESS: Well, a POSITA would

18 understand you could potentially buy -- you could

19 certainly have a separate optical element be a

20 filter. Or, you know, an optical filter in front

21 of an LED. Could it be possible to buy an

22 integrated LED filter stack? Certainly. But a

23 filter could either -- it would be a separate

24 thing or it could be an integrated package that

25 you could buy.

Page 350 1 BY MR. CHRISTOPHER: 2 Q So a bandwidth filter could be a 3 separate optical component that narrows the 4 bandwidth of light emitted by an LED. Correct? 5 A A POSITA -- it would have design 6 tradeoffs in either selecting a narrow bandwidth 7 LED if they wanted a narrower band of light. Or 8 if they wanted a wider band of LED if using a 9 filter, designing cost tradeoffs. But certainly, 10 what's taught is -- the knowledge of a POSITA 11 would know how to source a narrow band LED with -- 12 or a wider band LED with a application of optical 13 filter. 14 Q So the one option that's available to a 15 person of skill in the art is to use, say, for 16 example, an LED with a bandwidth of 100 nanometers 17 and then use a bandwidth filter, say a 18 40-nanometer bandwidth filter, to narrow the 19 bandwidth. Correct? 20 MR. KIM: Objection to form. 21 THE WITNESS: Well, and to properly 22 expand to make sure that I'm communicating 23 clearly, a POSITA, in considering a design, could 24 choose to use a narrow band LED that has a 20- 25 40-nanometer bandwidth inherently based on the	Page 352 1 Q Okay. A fair point. But all things 2 otherwise being equal, would a person of skill in 3 the art understand that generally a narrower 4 bandwidth LED is more expensive than a wider 5 bandwidth LED? 6 MR. KIM: Objection to form. 7 THE WITNESS: I think my answer -- it's 8 going to depend on other factors about the LED in 9 terms of, you know, the -- the rate with which you 10 want to fire it, the overall power you're trying 11 to get out of it, lifetime expectations. So 12 it's -- but, you know, all that being said, you 13 know, it's not just the cost of an LED. It's 14 the -- it's one component in the system. 15 And so a POSITA could use either a 16 narrow band LED or wider band LED with a filter 17 or -- or both, or a combination. 18 BY MR. CHRISTOPHER: 19 Q Okay. But my -- my question 20 specifically asked you assume all of those things 21 you just described are otherwise equal between two 22 LEDs. Generally speaking, one of skill in the art 23 understands, again, assuming all those things you 24 just described are otherwise equal, a narrower 25 band LED would be more expensive than a wider band
Page 351 1 precision with which it was designed and 2 manufactured, or a wider band LED in using an 3 optical filter, or both in combination. 4 So all those options are -- a POSITA 5 would be familiar with certainly from the -- the 6 teachings. 7 BY MR. CHRISTOPHER: 8 Q So you mentioned a moment ago -- let me 9 find it so I don't put words in your mouth. 10 You mentioned one of the tradeoffs in 11 selecting an LED is cost. Do you recall that? 12 A I -- I'm sure I said that, yeah. 13 Q Okay. And when you refer to cost, one 14 cost tradeoff would be that a narrower band LED is 15 generally more expensive than a wider band LED. 16 Correct? 17 A Well, it's going to depend on the 18 wavelength and the other specifications. Other 19 design -- you know, power and -- and what have 20 you. And then the cost is not just of a -- of a 21 device is not just associated with the LED. It's 22 the complexity of the -- of manufacturing, so 23 there's design tradeoffs in cost of components, 24 and design factors and usability and size and 25 manufacturing all come into play.	Page 353 1 LED. Correct? 2 MR. KIM: Objection; form. 3 THE WITNESS: Generally speaking, LEDs 4 are rather inexpensive. I haven't looked at the 5 price sheet recently of LEDs. Might there be a 6 change in cost? Sure. But it's not going to be 7 anything significant that would teach away from 8 using a narrow band LED. 9 It's going to be -- if you want sort of 10 your light source to have a narrow band, you 11 either get a narrow band source natively or a 12 narrow band source with a filter -- or a slightly 13 wider band source with a filter. A POSITA would 14 make those cost tradeoffs. 15 BY MR. CHRISTOPHER: 16 Q Did you frame that answer from the 17 perspective of 2012? 18 A Yes. That's the date that is the -- I 19 think it was December of -- I have to look at the 20 date, but it's roughly when, yes. 21 Q Can you turn to Tam, Exhibit 1030? This 22 is Column 9, which is page 22 of your PDF. 23 A I'm sorry. You said Tam, Column 9? 24 Q Yeah, Tam Column 9. It's page 22 of 25 your PDF.

Page 354 1 A Okay. 2 Q And I'll direct your attention starting 3 at Line 61, which is toward the bottom of the 4 left-hand column. Let me know when you see 5 Column 61. 6 A Okay. 7 Q Tam teaches here that LEDs are available 8 in tighter bandwidths by selection at a premium 9 price. 10 Correct? 11 A Yes. 12 Q Okay. Now, let's look at paragraph 144 13 of your declaration for the '533 patent. 14 MR. CHRISTOPHER: You know what? We've 15 been going about an hour. Why don't we take a 16 short break, this is a new segment, and then we'll 17 come back. 18 (Break held off the record from 19 11:25 a.m. to .) 20 BY MR. CHRISTOPHER: 21 Q Welcome back, Dr. Anthony. Did you 22 discuss your testimony with anyone during our 23 break? 24 A No. 25 Q Okay. I'm going to direct you now to	Page 356 1 just look at the language of Claim 12, Claim 12 2 requires that the output signal is generated in 3 part by comparing signals at different optical 4 wavelengths. 5 Do you see that? 6 A Yes. 7 Q Okay. One of skill in the art would 8 understand that in order to generate an output 9 signal in part by comparing signals at different 10 optical wavelengths, the comparison between 11 different optical wavelengths would need to occur 12 prior to generating the output signal. Correct? 13 MR. KIM: Objection; form. 14 THE WITNESS: Well, as recited there, if 15 the system Claim 5 were in the output optical beam 16 which comprises a plurality of optical wavelengths 17 then the output signal is generated in part by 18 comparing signals at different optical 19 wavelengths. 20 So signals for different wavelengths are 21 generated -- used to generate output signal. 22 BY MR. CHRISTOPHER: 23 Q The comparison of signals at different 24 optical wavelengths is used to generate the output 25 signal. Correct?
Page 355 1 paragraph 144 of your declaration for the '533 2 patent. 3 A 144? 4 Q 144, correct. 5 A Okay. 6 Q It's on -- it looks like page 77 of your 7 PDF it starts and we're just onto the next page. 8 Are you there? 9 A Yep. 10 Q Okay. And in paragraph 144 you address 11 dependent Claim 12 of the '533 patent. Correct? 12 A Yes. 13 Q Okay. And you've annotated portions of 14 Claim 12 in different colors, including the 15 phrase, "in part by comparing signals at different 16 optical wavelengths," in purple. 17 Do you see that? 18 A Yes. 19 Q And that additional limitation in 20 purple, "in part by comparing signals in different 21 optical wavelengths," was not addressed in the 22 prior decision for the '533 patent. Correct? 23 A Correct. But as I describe, is still 24 met by Lisogurski. 25 Q Okay. Now, if we take a step back and	Page 357 1 A That's what's disclosed there. 2 Q Okay. Let's look at paragraph 150 of 3 your declaration for the '533 patent. 4 A Okay. 5 Q Okay. And in paragraph 150, in the 6 first sentence, you write: 7 Lisogurski additionally discloses that 8 the output signal, (e.g., processed signals), is 9 generated in part by comparing signals in 10 different optical wavelengths, (e.g., comparing 11 the intensities of red and infrared (IR) 12 wavelengths). 13 Do you see that? 14 A Yes. 15 Q And at the end of that sentence, you 16 have three citations to Lisogurski. Correct? 17 A Yes. 18 Q And then, you know, further down in 19 paragraph 150, you have three more citations to 20 Lisogurski. Do you see those? 21 A Lisogurski 4:52-53 and Lisogurski 52:56. 22 Q Right. And those overlap with your 23 first citation in the first sentence, Column 4, 24 Lines 42 to 56. Correct? 25 A Yes.

Page 358 1 Q Okay. Let's turn back. Lisogurski, 2 Exhibit 1025. And I'll direct you to Column 4, 3 Line 42. It's page -- 4 A Column 4? 5 Q Yeah, Column 4, Line 42. This is 6 page 34 of your PDF. 7 Actually, I'll direct you to Line 48 8 within the paragraph that starts at Line 42. At 9 Line 48, Lisogurski discloses: 10 By comparing the intensities of two 11 wavelengths at different points in the pulse 12 cycle, it is possible to estimate the blood oxygen 13 saturation of hemoglobin in arterial blood. 14 Do you see that? 15 A Yes. 16 Q And then at Line 53, the next paragraph, 17 Lisogurski discusses: 18 For example, the system may determine 19 blood oxygen saturation using two wavelengths of 20 light and a ratio of ratios calculation. 21 Do you see that? 22 A Yes. 23 Q And that sentence doesn't mention 24 intensity. Correct? 25 A Well, you don't compare -- it's -- I	Page 360 1 Q Column 14, starting at Line 56, 2 Lisogurski discloses: 3 Back-end processing circuitry 170 may 4 include processor 172 and memory 174. 5 Do you see that? 6 A Yes. 7 Q And then at Line 60, a few lines down, 8 Lisogurski discloses: 9 Process 172 may receive and process 10 physiological signals received from front-end 11 processing circuitry 150. 12 Do you see that? 13 A Yes. 14 Q Now, if we go back to that portion of 15 Lisogurski we discussed in Column 4, starting at 16 Line 42, about comparing the intensities of the 17 wavelengths, one of skill in the art would 18 understand that the back-end processing circuitry 19 170 performs that comparison. Correct? 20 MR. KIM: Objection; form. 21 BY MR. CHRISTOPHER: 22 Q Are you reviewing Lisogurski or your 23 declaration? 24 A My declaration where I talk about 25 Lisogurski.
Page 359 1 mean, it's not mentioning intensity but it's not 2 comparing wavelengths. It's comparing the light 3 received at different wavelengths. So intensity 4 is implied. 5 Q Okay. Let's look at -- let's look at 6 Column 12 of Lisogurski, Line 42. 7 A I'm sorry. Line what? 8 Q Line 42, please. 9 A 42. Okay. 10 Q Let me know when you're there. 11 A Okay. 12 Q So here, starting at Line 42, Lisogurski 13 discloses: 14 Front-end processing circuitry 150 may 15 receive a detection signal from detector 140 and 16 provide one or more process signals to back-end 17 processes circuitry 170. 18 Do you see that? 19 A Yes. 20 Q Let's turn now to Column 14, Line 60. 21 Actually, let's start at 56. Let me know when 22 you're there. 23 A You said 14? 24 Q Correct. 25 A Okay.	Page 361 1 Well, I mean, as I describe in -- first 2 in paragraph 150, Lisogurski discloses the output 3 signal is generated in part by comparing signals 4 at different optical wavelengths, comparing the 5 red and infrared wavelengths. Lisogurski 6 discloses that the physiological monitoring system 7 may process data to determine physiological 8 parameters using techniques well-known in the art. 9 For example, a system may determine 10 blood oxygen saturation using two wavelengths and 11 a ratio of ratios. That's Lisogurski 4:50 through 12 56. 13 Such calculations include comparing the 14 intensities of two wavelengths, red and IR, to 15 estimate blood oxygen saturation because highly 16 oxygenated blood will absorb more light -- or 17 relatively less red and more IR. Corroborated as 18 I go onto 151 with other -- other art. 19 In 152, I go on: 20 Lisogurski thus teaches at a minimum and 21 renders obvious the process signals generated by 22 the front-end processing circuitry, which the 23 Board rely on to meet the claimed output signal, 24 are generated in part by comparing intensities of 25 two different wavelengths, IR and red.

Page 362 1 A person of ordinary skill, in 153, 2 would have understood the described comparison of 3 optical wavelengths, red and IR. Well-known 4 standard technique. The explicit disclosure in 5 Lisogurski, supported by standard industry 6 practices would have made it clear that the art in 7 Claim 12's limitation related to comparing signals 8 at different wavelengths were explicitly taught 9 and at least rendered obvious by the teachings of 10 Lisogurski. 11 Q Did you identify anywhere in that answer 12 which component in Lisogurski forms the comparison 13 between the wavelengths? 14 MR. KIM: Objection; form. 15 BY MR. CHRISTOPHER: 16 Q Do you understand the question? My 17 question is: Which component in Lisogurski would 18 a person of skill in the art understand performs 19 the comparison between -- comparison of 20 intensities of two different wavelengths? 21 A A processor would determine that. And, 22 you know, as we've discussed extensively, you 23 know, Lisogurski teaches processing being able to 24 be put in a number of different places. But 25 certainly the front-end processing as I opined in	Page 364 1 of boxes shown here, and that puts components and 2 functionality in particular places. I also opined 3 the teachings of Lisogurski where the arrangement 4 would be different. 5 And certainly, that processor 6 functionality would acquire the generated data to 7 process the signals at two different wavelengths. 8 Q Okay. So looking at Figure 1, I want 9 you to assume that this question pertains to the 10 exact configuration shown in Figure 1, not 11 rearranging it. 12 In the system shown in Figure 1, in this 13 arrangement, a person of ordinary skill in the art 14 would understand the back-end processing 15 circuitry 170 performs the comparison between 16 different intensities. Correct? 17 MR. KIM: Objection; form. 18 THE WITNESS: I wasn't opining that 19 Lisogurski perfectly anticipates. I was making an 20 obvious argument in what Lisogurski teaches. So 21 Lisogurski -- a POSITA reading Lisogurski would 22 understand what is taught both based on the figure 23 and the text, and how Lisogurski meets the 24 limitation. 25
Page 363 1 the combination -- motivation to combine -- or 2 motivation to modify would calculate the -- would 3 detect the signals and calculate the comparisons. 4 Q You're referring to a modified version 5 of the front-end processing circuitry relative to 6 the examples shown in Figure 1. Correct? 7 A Well, again, I'm -- it's the teachings 8 of Lisogurski, which include sort of the 9 possibility of putting the functionality into 10 different blocks, if you will, as we discussed 11 previously. But certainly, the teachings of 12 Lisogurski. And a processor would generate that 13 comparison by comparing different optical 14 wavelengths. 15 Q Let's go look at Figure 1 again. 16 Lisogurski, please. Let me know when you're 17 there. 18 A Yep. 19 Q Okay. Now, I know you've discussed 20 rearranging the components in Figure 1. But do 21 you agree that one implementation of Lisogurski 22 would be the system as it's shown with these boxes 23 in Figure 1? You agree with that? 24 A I'm agreeing with Lisogurski teaching a 25 number of configurations. There's a configuration	Page 365 1 BY MR. CHRISTOPHER: 2 Q Okay. You don't have an opinion on 3 which component in Figure 1, assuming the system 4 is arranged exactly as shown in Figure 1, performs 5 the comparison between different intensities. Is 6 that right? 7 MR. KIM: Objection; form. 8 THE WITNESS: Well, the functionality 9 exists in processing. So in the Figure 1, it 10 could occur in the processing circuitry of 150, in 11 170. And as I opined in the combination, that 12 process or functionality would be combined in the 13 place where the light is collected and compared in 14 generating the signal in other combinations as I 15 described. 16 BY MR. CHRISTOPHER: 17 Q So it's your testimony that if we're 18 focused on the exact arrangement shown in 19 Figure 1, the comparison between intensities could 20 occur in either the front-end processing circuitry 21 150 or the back-end processing circuitry 170. Is 22 that fair? 23 MR. KIM: Objection; form. 24 THE WITNESS: Or in the combinations 25 that I described as well where that front-end

Page 366

1 processing is up with the 102, the sensor head.
2 BY MR. CHRISTOPHER:
3 **Q I just want to be clear because I don't**
4 **think that clearly answered the question. I'm not**
5 **asking about combinations, and I just want to**
6 **understand.**
7 **Your testimony, focused on the exact**
8 **configuration and arrangement we see in Figure 1,**
9 **is that one of skill in the art would understand**
10 **that the comparison between wavelengths could**
11 **occur in box 150 or box 170. Correct?**
12 MR. KIM: Objection; form.
13 THE WITNESS: A POSITA reading
14 Lisogurski and the teachings of Lisogurski, the
15 different functionality can be accomplished
16 different places would understand that yes, the
17 functionality of processing and comparing those
18 could be done in 105 -- or sorry, 150 or in 170.
19 And in the combination as well, as I taught it.
20 As I opined that a POSITA would construct it.
21 BY MR. CHRISTOPHER:
22 **Q Okay. Can you turn to paragraph 181?**
23 A Of '533?
24 **Q Of '533, please. This would be page 103**
25 **of your PDF.**

Page 367

1 A Okay.
2 **Q Okay. Paragraph 181, you opine on**
3 **dependent Claims 11 and 18 of the '533 patent.**
4 **Correct?**
5 A Yes.
6 **Q And your opinion is Lisogurski in view**
7 **of Carlson renders obvious Claims 11 and 18.**
8 **Correct?**
9 A Lisogurski in view of Carlson. Yes.
10 **Q Okay. And can you turn to**
11 **paragraph 185? It's on -- two pages down.**
12 **Page 105 of your PDF.**
13 A Yes.
14 **Q And in paragraph 185, you opine that:**
15 **Carlson further discloses one or more**
16 **filters, e.g., optical wavelength filter or double**
17 **pass filter, to select a fraction of one or more**
18 **optical wavelengths.**
19 **Do you see that?**
20 A I'm sorry. You were reading 185?
21 **Q 185, please.**
22 A Carlson further discloses one or more
23 filters to select a fraction of one or more
24 optical wavelengths, yes.
25 **Q So your opinion is that Carlson**

Page 368

1 **discloses one more filters. Correct?**
2 **I'm sorry. Are you reviewing a**
3 **different paragraph of your declaration?**
4 A I'm going back -- I'm going back to
5 where I introduce Carlson -- or reveal Carlson in
6 my declaration.
7 **Q Okay. But I'm asking you about**
8 **paragraph 185 and you literally state:**
9 **Carlson further discloses one or more**
10 **filters to select a fraction of one or more**
11 **optical wavelengths.**
12 **Correct?**
13 MR. KIM: Objection; form.
14 THE WITNESS: Right. I'm just making
15 sure -- I'm orienting myself to Carlson to make
16 sure that I'm reading my paragraph there in the
17 context of how I introduced Carlson. So just give
18 me a moment to read Carlson here, or my discussion
19 of Carlson.
20 BY MR. CHRISTOPHER:
21 **Q So to be clear, you need to review your**
22 **overview of Carlson to be able to answer this**
23 **question?**
24 MR. KIM: Objection; form.
25 THE WITNESS: I'm sorry. Maybe I don't

Page 369

1 understand the question. Can you repeat it?
2 BY MR. CHRISTOPHER:
3 **Q I'm just asking you --**
4 A Uh-huh.
5 **Q -- and I'm showing you the paragraph**
6 **where you literally say it.**
7 **You opine that Carlson further discloses**
8 **one or more filters, e.g., optical wavelength**
9 **filter or double pass filter, to select a fraction**
10 **of one or more optical wavelengths as claimed in**
11 **Claims 11 and 18. Correct?**
12 A So this is Carlson in combination with
13 Lisogurski. But, you know, I'm citing Carlson
14 there. I was just going to go back and confirm my
15 cites there. But I can read my paragraph there,
16 and I agree with what I wrote there.
17 **Q Right. So let me get to my next**
18 **question, which is: You are not opining that**
19 **Lisogurski by itself discloses one or more filters**
20 **as claimed in Claims 11 and 18 of the '533 patent.**
21 **Correct?**
22 MR. KIM: Objection; form.
23 THE WITNESS: I am proposing Lisogurski
24 in view of Carlson.
25

Page 370 1 BY MR. CHRISTOPHER: 2 Q Okay. Now, let's go to paragraph 188 of 3 your declaration. 4 In paragraph 188: 5 A person of ordinary skill in the art 6 would have been motivated to apply Carlson's 7 filter teachings to Lisogurski's wireless sensor 8 to advantageously filter out unwanted background 9 noise and ambient light before they reach the 10 detectors in Lisogurski's sensor. 11 Do you see that? 12 A Yes. 13 Q In your proposed combination of 14 Lisogurski and Carlson, Carlson's filter would be 15 applied to Lisogurski's sensor. Correct? 16 A And as I discussed in detail in 17 Section IX.B.2, and so I would go back and confirm 18 what I said there just to orient myself. 19 Q I'm sorry. You're telling me you need 20 to read the other portion of your declaration to 21 finish your answer? 22 A You're asking me to comment on 23 paragraph 188, and I reference a section that's 24 in -- also in my dec, but is part of 188. 25 Q Now, in paragraph 188, according to your	Page 372 1 A Yep. 2 Q All right. Can you turn to paragraph -- 3 well, first of all, do you recognize Exhibit 1028 4 that I'm showing you as the Carlson reference? 5 A Yes. 6 Q Okay. Let's turn to paragraph 56. 7 A I'm sorry. Which one? 8 Q 56, please. 9 I'll scroll there myself. This is page 10 20 of the PDF. 11 A Yes. 12 Q And you see in paragraph 56, 13 approximately halfway down, Carlson discloses: 14 In addition, it is possible to arrange 15 an optical wavelength filter or double pass filter 16 which is e.g. light permeable at the wavelength of 17 approximately 660 nanometers and in the range of 18 approximately 850 nanometers to 910 nanometers. 19 Do you see that? 20 A Yes. 21 Q And when Carlson says that the filter is 22 permeable at those wavelengths, that means that 23 light having those wavelengths can pass through 24 the filter. Correct? 25 A Light permeable at the -- yes, I think
Page 371 1 opinion, the purpose of adding Carlson's filter 2 teachings to Lisogurski would be to prevent 3 ambient light from reaching Lisogurski's 4 detectors. Correct? 5 A Well, Carlson's teachings to 6 Lisogurski's sensor to filter out unwanted 7 background noise or ambient light before they 8 reach the detector. 9 Q Right. And the -- the benefit a person 10 of skill in the art would understand the benefit 11 of filtering out unwanted background noise and 12 ambient light by adding a filter from Carlson 13 would be to increase the signal-to-noise ratio of 14 the detection signal described in Lisogurski. 15 Correct? 16 A Well, to filter out noise and ambient 17 light, so to reduce noise, thereby would be 18 increasing the ratio of signal to noise. 19 Q Okay. Let me show you Exhibit 1028, 20 Carlson. I don't think we've looked at this one 21 yet. 22 (Exhibit 1028 in each of the proceedings 23 was previously marked.) 24 BY MR. CHRISTOPHER: 25 Q Let me know when you have Exhibit 1028.	Page 373 1 that's true. 2 Q Okay. And conversely, the filter would 3 prevent light having wavelengths other than those 4 listed in the sentence from passing through the 5 filter. Correct? 6 A What Carlson is generally teaching there 7 is a -- a band pass filter they're wanting to 8 particular center frequencies and wavelength and a 9 range of -- yes. 10 Q Okay. And so if we were to modify 11 Lisogurski to include, for example, the sensor 12 described in paragraph 56 of Carlson -- strike 13 that. 14 If Lisogurski were modified to include 15 the filter taught by Carlson in paragraph 56, that 16 filter would not filter out light having a 17 wavelength of approximately 660 nanometers and 18 light in the range of approximately 850 to 910 19 nanometers. Correct? 20 MR. KIM: Objection; form. 21 THE WITNESS: I'm sorry. Can you re-ask 22 question? 23 BY MR. CHRISTOPHER: 24 Q Yeah. I'm just wondering if Lisogurski 25 were modified to include Carlson's sensor --

Page 374 1 A Yeah. 2 Q -- that's described in paragraph 56 with 3 those values, the filter would not prevent light 4 with the wavelengths listed in paragraph 56 from 5 reaching the detector. Correct? 6 MR. KIM: Objection; form. 7 THE WITNESS: I'm just -- before I 8 answer the question, I want to clarify something 9 that I said now that I'm rereading this. 10 So this is describing a double pass 11 filter that has sort of a double band, a double 12 pass, so it's nominally in the range of 660 and 13 nominally in the range between 850 and 910. 14 So I think I misstated having 660 being 15 the center. So that's the center of one of the 16 bands and average of 850 is probably the nominal 17 center of the other band. 18 BY MR. CHRISTOPHER: 19 Q Okay. Let me -- let me re-ask my 20 question. 21 A Yeah. 22 Q If Lisogurski were modified to include 23 the filter that is described in paragraph 56 with 24 these wavelength values, that filter would not 25 prevent light with the wavelengths listed in	Page 376 1 opined on in this declaration, Exhibit 1003, is 2 the same level of ordinary skill in the art as you 3 opined in your prior '533 declaration. Correct? 4 A Correct. 5 Q Okay. And your opinion on the level of 6 ordinary skill in the art is the same across each 7 of the five patents in these proceedings, the 8 '533, the '304, the '455, the '970, and the '475 9 patents. Correct? 10 A Without going through and verifying 11 that, I believe that is the case. I don't think I 12 make any differences in any of them, yes. 13 Q Okay. Let's turn back to paragraph -- 14 let's turn to paragraph 56. And I'd like to 15 direct your attention to a portion that's on 16 page 24, 27 of the PDF at the top of the page, 17 paragraph 56, you wrote: 18 In my opinion, on or before the priority 19 date, a person of ordinary skill in the art, at 20 the time the application that matured into the 21 '533 patent was filed would have had a good 22 working knowledge of optical sensing techniques 23 and their applications and some familiarity with 24 optical system design and signal processing 25 techniques.
Page 375 1 paragraph 56 from reaching the detector. Correct? 2 MR. KIM: Objection; form. 3 THE WITNESS: Well, I mean, I'm not 4 proposing -- I'm proposing the teachings of 5 Carlson using filters. I mean, a POSITA would 6 pick the right filters for the wavelengths of 7 light they were interested in. But, you know, if 8 you were to take that filter, that filter does 9 what it does at those wavelengths. 10 BY MR. CHRISTOPHER: 11 Q Okay. Can you turn to paragraph -- 12 we'll use this declaration, so just allow me to 13 change the paragraph numbers around. 14 Let's turn to paragraph 55 of your 15 declaration for the '533 patent. 16 A 55, you said? 17 Q Yes, 55, please. It's page 26 of your 18 PDF. 19 A Yeah. 20 Q Okay. So starting in paragraph 55, you 21 opine on the level of ordinary skill in the art 22 for the '533 patent. Correct? 23 A Yes. 24 Q Okay. And you state in paragraph 57 25 that the level of ordinary skill in the art you've	Page 377 1 Do you see that? 2 A Yes. 3 Q What do you mean by "good working 4 knowledge"? 5 A Well, I mean, familiarity with optical 6 system designs, signal processing techniques, you 7 know, the ability to make the design tradeoffs as 8 I've been opining throughout here in terms of the 9 optical, electrical, sensors, sensing systems. 10 So, you know, it's understanding the -- you know, 11 how to use sensors and optical components to 12 collect light in a -- and process the resulting 13 signals. 14 Q You see at the last clause of that 15 sentence, you refer to "some familiarity"? 16 A Yes. 17 Q How does "some familiarity" compare to 18 "good working knowledge"? 19 A They're comparable. Some familiarity 20 with optical system design -- you know, we don't 21 need somebody to design a telescope that is trying 22 to see the outer reaches of the solar system. 23 Right? But being able to apply the lenses and 24 filters, optical elements that are relevant to 25 the -- the art at hand.

Page 378 1 Q So in your view, the phrases "good 2 working knowledge" and "some familiarity" are 3 comparable. Correct? 4 A They have good working knowledge of 5 optical sensing techniques and their applications 6 and some familiarity of optical system designs and 7 signal processing techniques. 8 So yeah. The knowledge would have been 9 gained -- that type of knowledge would have been 10 gained via an undergraduate education in something 11 like electrical, mechanical, biomedical, optical 12 or related field of study along with relevant 13 experience in studying or developing physiological 14 monitoring. For example, noninvasive optical 15 biosensors in industry or academia. 16 And, again, that description is 17 approximate. Varying combinations of education 18 and practical experience would also be sufficient. 19 So it's a range of familiarity with the various 20 design axes of a physiological monitoring device 21 of a noninvasive optical biosensor. 22 Q Would a person with some familiarity 23 have less familiarity than someone with good 24 working knowledge? 25 MR. KIM: Objection; form.	Page 380 1 So this captures the general control 2 volume of the knowledge that a POSITA in this art 3 would have. 4 Q That doesn't answer the question, which 5 is: By using the different phrases "good working 6 knowledge" and "some familiarity" in this 7 sentence, were you attempting to draw a 8 distinction between those two terms? 9 MR. KIM: Objection; form. 10 THE WITNESS: Not extensively, because 11 as I further describe, this description is 12 approximate; various combinations of education and 13 practical experience would also be sufficient. 14 BY MR. CHRISTOPHER: 15 Q Okay. And you refer in the sentence to 16 "optical sensing techniques." Do you see that? 17 A Yes. 18 Q Can you give me an example of optical 19 sensing techniques? 20 A Well, for example, you know, related to 21 physiological monitoring, noninvasive optical 22 biosensors and using lenses and filters and 23 detectors to measure -- to turn light photons into 24 electrons and process it and make estimates of 25 physiological properties.
Page 379 1 THE WITNESS: Well, I mean, I clarify. 2 I expand. You know, the person that is a POSITA 3 is going to be gaining their knowledge, that good 4 working knowledge and that some familiarity, via 5 an undergraduate education in one of the mentioned 6 electrical, mechanical, biomedical or optical 7 fields or related study along with experience in 8 studying or develop sensors in industry and 9 academia. 10 So it's -- this is the familiarity and 11 working knowledge that would come from that range 12 of study and experience. But various -- you know, 13 more experience, less education, more education, 14 less experience in that broad area. 15 BY MR. CHRISTOPHER: 16 Q Understood. But I'm focused on your 17 terminology in the sentence. Is there a 18 difference between "good working knowledge" and 19 "some familiarity" as you used those phrases in 20 the sentence of your declaration? 21 A I think that captures the approximate -- 22 so what I further say in the last sentence with: 23 This description is approximate; varying 24 levels of education and practical experience would 25 also be sufficient.	Page 381 1 Q Would one optical sensing technique be 2 estimating blood oxygen saturation? 3 A That's a noninvasive optical biosensor. 4 Q Okay. And your definition of optical 5 sensing techniques here in the definition is not 6 limited to something like estimating blood oxygen 7 saturation. Correct? 8 A No -- 9 Q Okay. 10 A -- that's an example. 11 Q Okay. Now, in the next sentence, this 12 is paragraph 56 of your declaration for the '533 13 patent. The next sentence, you opine: 14 That knowledge would have been gained 15 via an undergraduate degree in education, 16 parentheses -- 17 A Right undergraduate education in 18 engineering. 19 Q Excuse me. Let me just skip ahead to 20 what I really want to ask you about. 21 Do you see the second half of the 22 sentence where you wrote: 23 Along with relative -- excuse me. Not 24 enough coffee this morning. 25 Along with relevant experience in

Page 382 1 studying or developing physiological monitoring 2 devices, e.g., noninvasive optical biosensors in 3 industry or academia. 4 Do you see that? 5 A Yes. 6 Q How much experience studying or 7 developing physiological monitoring devices would 8 a person of skill in the art require? 9 A You said how much -- say that again? 10 Q Sure. How long would a person need to 11 spend gaining relevant experience in studying or 12 developing physiological monitoring devices to be 13 considered a person of ordinary skill in the art? 14 A It's not necessarily the length of time. 15 It's what they do during that time. So it's the 16 integral of what they're doing to gain that 17 experience over the time. So it's relative 18 experience in that domain, either studying or 19 developing physiological monitors. So it's not 20 going to -- it's -- it depends on what they're 21 doing during that time studying. 22 But it's, you know, a couple years. 23 Q You said a couple years? 24 A Yeah. But, I mean, again, it's -- I 25 mean, it's -- it depends on what they're doing.	Page 384 1 a mix of developing and studying. 2 Q You said studying would include 3 fabricating and lab work. Is that right? 4 A It certainly could. 5 Q Is that necessary to be a person of 6 skill in the art? 7 A Again, here the description -- 8 MR. KIM: Objection; form. 9 THE WITNESS: The description here is 10 approximate with a range of experiences. You 11 know, broadly, it's somebody that has these 12 various experiences along with knowledge and -- 13 and at the undergraduate level, electrical, 14 mechanical, biomedical or optical. Relevant 15 experience studying or developing physiological 16 monitoring devices. A combination of stuff they 17 would potentially do in school or academic 18 environment, and then something they would do in a 19 commercial environment in industry or academia. 20 BY MR. CHRISTOPHER: 21 Q So you haven't formulated a specific 22 time frame that a person would need to spend 23 gaining experience in studying or developing 24 physiological monitoring devices in order to be 25 qualified as a person of skill in the art.
Page 383 1 It's hard to put an exact number of years 2 experience because it depends -- it's not just the 3 length of time, it's what they're doing during 4 that time. And if they're -- if all they're doing 5 is work in the area of developing physiological 6 monitors during a period of time, it's going to be 7 a shorter duration than if they're only doing that 8 10 percent of the time. It would be longer. 9 So... 10 Q And in the -- in the same phrase we've 11 been looking at, you see where you say "studying 12 or developing physiological monitoring devices"? 13 A Yes. 14 Q Is studying physiological devices -- 15 monitoring devices different than developing 16 physiological monitoring devices? 17 A With relevant experience in studying or 18 developing. So studying, you're studying, which 19 can include also fabricating and lab work. And 20 developing also includes -- it's studying and 21 developing, studying would generally relate to the 22 academic hat versus developing, more of an 23 industry hat. 24 But depending on the curriculum that 25 they're in and the job they're in, you know, it's	Page 385 1 Correct? 2 MR. KIM: Objection; form. 3 THE WITNESS: Well, as I described, it's 4 likely gained via undergraduate education, which 5 typically is four to five years. And then the 6 relevant experience, again, that's a function of 7 what they're doing during their time of gaining 8 experience. If they're spending all their time in 9 a environment where they're developing 10 physiological monitoring devices, it takes some 11 period of time. If they're spending half of their 12 time or a tenth of their time in that area, then 13 they need more time to get that equivalent 14 experience. 15 But, you know, I'm not defining a 16 particular amount of time. 17 BY MR. CHRISTOPHER: 18 Q Okay. You've attached a copy of your CV 19 as Appendix A to each of these declarations. 20 Correct? 21 A Yes. 22 Q Okay. Let's -- we have the '533 23 declaration open. Let's go to your Appendix A, 24 page 119 of the PDF. Let me know when you're 25 there.

Page 386 1 A Sorry, I didn't have it open. I was 2 looking in the paper version, and in the paper 3 version, I didn't print out my -- 4 Q Do you need me to give you a PDF version 5 in the -- 6 A Yeah, that would be faster. 7 Q Okay. And then when you have it open, 8 it starts at 119 of the PDF. 9 A Okay. 10 Q And you see at the top where it says 11 date: November 20th, 2024? 12 A Yes. 13 Q Do you have a more up-to-date version of 14 your CV? 15 A I'm not looking for a job, so I haven't 16 updated it recently. But I think that's probably 17 the most recent version. 18 Q Fair enough. Any major changes that you 19 would add to your CV from December 20, 2024 [sic] 20 through the present date? 21 A Let's see here. More professional 22 service to other committees. Some additional 23 patent disclosures. Probably 20 new papers. 24 Q Okay. But your employment -- 25 A A bunch -- a bunch of new students.	Page 388 1 Correct? 2 A Yes. 3 Q And those are based on research you've 4 performed. Correct? 5 A Or supervised, yes, and performed. 6 Q Has any of the research that you 7 performed or supervised been funded by Samsung? 8 A No. 9 Q What about any of the other Petitioners? 10 A No. 11 Q Okay. Let's look at -- I changed which 12 declaration I'm asking about, so I have to find 13 which paragraph. Let's see. 14 Paragraph 18, please. Your declaration 15 for the '533 patent. 16 A Paragraph 18? 17 Q Correct. 18 A Okay. 19 Q Okay. And you state here you earned a 20 Bachelor of Science in engineering from Carnegie 21 Mellon and a master's in engineering from MIT. Do 22 you see that? 23 A Yes. 24 Q What type of engineering? 25 A The degree was in mechanical
Page 387 1 Q Your employment's the same. Correct? 2 A Yeah. I'm still here at MIT. 3 Q Okay. Can you turn to, is it section or 4 paragraph 9? This is page 120 of the PDF. And 5 you see where it says "Consulting Record"? 6 A 120. Yes. 7 Q Okay. And then at the very bottom of 8 that list, it lists Samsung beginning 2024, ending 9 2025. Do you see that? 10 A Yes. Yes. 11 Q Is that in connection with your 12 declarations for these proceedings? 13 A Yes. 14 Q Okay. Have you done any other 15 consulting for Samsung? 16 A I've been involved in other IPRs in 17 addition this one. 18 Q That was -- that was my next question. 19 I haven't seen it in your CV. Do you have a list 20 of all of the matters in which you've testified 21 either live or by declaration in the last four 22 years? 23 A I don't. 24 Q Okay. On page -- starting on page 124, 25 you list a number of papers that you've written.	Page 389 1 engineering, but my specialty was in 2 electro-mechanical system design, so automation, 3 robotics, sensors, algorithms, measurement 4 systems. 5 Q And that's for both the bachelor and 6 master's degree? 7 A Yes. 8 Q What about your Ph.D.? 9 A Same thing. 10 Q Okay. 11 A As I say there, my research -- you know, 12 and that's research focused on high-performance 13 computation, signal processing, electro-mechanical 14 system design. That's in line with the Ph.D. 15 Q Got it. I was just wondering which type 16 of engineering. 17 Let's look at paragraph -- in paragraph 18 19, you'll see about halfway down, you describe 19 your work on an optical ring. Do you see that? 20 A Yes. 21 Q Did that product measure blood oxygen? 22 A It did not, no. 23 Q And in paragraph 20, the very end of 24 that paragraph, you wrote: 25 Many of the courses, projects, and

Page 390

1 papers my students undertake involve technologies
2 relevant to the patent at issue. For example,
3 sensor devices including non-invasive optical
4 biosensors.
5 Do you see that?
6 A Yes.
7 Q Did any of those biosensors measure
8 blood oxygen saturation?
9 A Yes. I used to teach a class in
10 biomedical electronics. Shoot, that was back in
11 '97 through -- '97, '98, '99 even. But we had
12 students that would design both EKG systems that,
13 you know, we actually ended up that over in the
14 Museum of Science and non-invasive techniques for
15 pulse rate and heart rate and blood oxygenation as
16 the lab activities.
17 Q And then in paragraph 22, you refer to a
18 new facility. Do you see that?
19 A Yeah. MIT.nano, you mean?
20 Q Yeah. When did that open?
21 A We've been open, what, five -- let's
22 see. Let's look back at my CV. Six years.
23 Let's see, 2017. I've been associated
24 with it, though, since 2016. So yeah.
25 Q Okay. Have you ever built a pulse

Page 391

1 oximeter?
2 A Yes.
3 Q Okay. Have you ever designed an
4 algorithm for measuring blood oxygen saturation?
5 A Yes.
6 Q Okay. When was that?
7 A Oh, back in '97, '98, '99, during the
8 biomedical electronics courses. But, you know,
9 that's been a while ago.
10 Q And what was -- what was the algorithm
11 for measuring blood oxygen saturation? Could you
12 describe it?
13 A Very similar to what's described here.
14 You know, measuring the -- the ratio of received
15 light. What we're trying to do now, actually,
16 fast-forward a couple of decades is we're using
17 multiple wavelengths to try to disambiguate
18 between all the commercially available
19 physiological -- not all of them, but like a lot
20 of the pulse-ox sensor have an inherent racial
21 bias. They work well for people of our -- with my
22 skin tone. And to make it less sensitive to
23 variation in melanin, the skin variation are now
24 using three or four wavelengths in trying to that
25 in a compact form factor.

Page 392

1 But -- so that's been over the last six
2 years we've been working on -- on that. Yeah.
3 Q So using three or more -- or I think you
4 said three or more wavelengths is more of a recent
5 trend?
6 A We're trying to -- there was a -- I was
7 co-author on a -- I guess I wasn't the author, but
8 I was co-cited in a New York Times article with
9 faculty here that was -- really came down hard on
10 the racial disparities in the physiological in --
11 pulse-ox. So that has led to some internal
12 funding being made available to try to eliminate
13 that complication.
14 Q Okay.
15 MR. CHRISTOPHER: Why don't we go off
16 the record for about five minutes. Let me check
17 my notes and see if we can wrap up here and get
18 everyone back to their Saturday.
19 (Break held off the record from to
20 .)
21 MR. CHRISTOPHER: Dr. Anthony, I thank
22 you for your time. I have no further questions
23 for you at this time.
24 THE WITNESS: Thank you.
25 MR. KIM: No questions either.

Page 393

1 THE STENOGRAPHER: And Counsel, before
2 we go off the record, if I could please get
3 transcript orders for the record.
4 MR. CHRISTOPHER: I think we made them
5 yesterday, so I don't want to be inconsistent.
6 But I think it was a rough and the final by
7 Wednesday.
8 MR. KIM: That's my recollection too.
9 THE WITNESS: Mine as well, if it
10 matters.
11 (Off the record at 12:37 p.m.)
12
13
14
15
16
17
18
19
20
21
22
23
24
25

Page 394

1 REPORTER'S CERTIFICATE

2 I, CASSIDY WESTERN, RPR, CRR, CA CSR, WA CCR, the

3 officer before whom the foregoing deposition was taken,

4 do hereby certify that the foregoing transcript is a

5 true and correct record of the testimony given; that

6 said testimony was taken by me stenographically and

7 thereafter reduced to typewriting under my direction;

8 that reading and signing was requested; and that I am

9 neither counsel for, related to, nor employed by any of

10 the parties to this case and have no interest, financial

11 or otherwise, in its outcome.

12 IN WITNESS WHEREOF, I have hereunto set

13 my hand this 22nd day of April, 2026.

14

15

16

17

18 

19 _____

20

21 Cassidy Western, RPR, CRR, CA CSR NO. 14722

22

23

24

25

Page 395

1 DECLARATION UNDER PENALTY OF PERJURY

2 Case Name: Samsung Electronics Co.

3 vs. Omni Medsci, Inc.

4 Date of Deposition: 04/18/2026

5 Job No.: 10188950

6

7 I, BRIAN W. ANTHONY, hereby certify

8 under penalty of perjury under the laws of the State of

9 _____ that the foregoing is true and correct.

10 Executed this _____ day of

11 _____, 2026, at _____.

12

13 _____

14 BRIAN W. ANTHONY

15

16 NOTARIZATION (If Required)

17 State of _____

18 County of _____

19 Subscribed and sworn to (or affirmed) before me on

20 this _____ day of _____, 20____,

21 by _____, proved to me on the

22 basis of satisfactory evidence to be the person

23 who appeared before me.

24 Signature: _____ (Seal)

25

Page 396

1 DEPOSITION ERRATA SHEET

Case Name: Samsung Electronics Co.

2 vs. Omni Medsci, Inc.

Name of Witness: Brian W. Anthony

3 Date of Deposition: 04/18/2026

Job No.: 10188950

4 Reason Codes: 1. To clarify the record.

2. To conform to the facts.

3. To correct transcription errors.

5

6 Page _____ Line _____ Reason _____

7 From _____ to _____

8 Page _____ Line _____ Reason _____

9 From _____ to _____

10 Page _____ Line _____ Reason _____

11 From _____ to _____

12 Page _____ Line _____ Reason _____

13 From _____ to _____

14 Page _____ Line _____ Reason _____

15 From _____ to _____

16 Page _____ Line _____ Reason _____

17 From _____ to _____

18 Page _____ Line _____ Reason _____

19 From _____ to _____

20 Page _____ Line _____ Reason _____

21 From _____ to _____

22 Page _____ Line _____ Reason _____

23 From _____ to _____

24 Page _____ Line _____ Reason _____

25 From _____ to _____

Page 397

1 DEPOSITION ERRATA SHEET

2 Page _____ Line _____ Reason _____

3 From _____ to _____

4 Page _____ Line _____ Reason _____

5 From _____ to _____

6 Page _____ Line _____ Reason _____

7 From _____ to _____

8 Page _____ Line _____ Reason _____

9 From _____ to _____

10 Page _____ Line _____ Reason _____

11 From _____ to _____

12 Page _____ Line _____ Reason _____

13 From _____ to _____

14 Page _____ Line _____ Reason _____

15 From _____ to _____

16 Page _____ Line _____ Reason _____

17 From _____ to _____

18 Page _____ Line _____ Reason _____

19 From _____ to _____

20 Page _____ Line _____ Reason _____

21 From _____ to _____

22 _____ Subject to the above changes, I certify that the

transcript is true and correct

23 _____ No changes have been made. I certify that the

transcript is true and correct.

24

25 _____

BRIAN W. ANTHONY

((i) 272:23 1 1 272:7 275:15 280:23,25 285:23,24 286:5,19 287:9 288:25 290:10,18 291:25 292:1,11,17 295:18,24 296:7,10, 22,24 297:13,19 298:3,14 299:19 309:12 332:18 363:6,15,20,23 364:8,10,12 365:3,4, 9,19 366:8 1,000 311:11,16 343:25 1.b 307:19,23 308:1, 4,8 1.d 272:13 279:12 1.f 278:11 280:9 308:17 1.i 280:9 1.n 275:14,20 278:25 279:13 309:12,14,23 310:7 1.pre 278:3,15 10 342:4,7,14,22 343:19 347:14 348:11 383:8 100 286:5,17 287:8, 22 290:22 295:4 345:23 346:19,25 348:7,12 350:16 1003 271:21,24 301:19,22 340:17 376:1	102 290:19 296:2 297:1,14,15 298:13 299:19 300:15,17 366:1 1025 283:17,23 342:3 343:20 358:2 1026 316:18 1028 371:19,22,25 372:3 103 366:24 1030 344:21,24 345:4 353:21 1041 319:2 337:13,14 105 366:18 367:12 1054 281:19 106 275:10 107 283:7 109 303:25 304:8 10:12 315:15 10:24 315:15 10:48 342:11 11 311:7,22 312:13 367:3,7 369:11,20 111 321:25 325:4,8 328:3 113 346:12 114 309:5 346:14 115 309:5 117 293:17 294:18 119 307:12 385:24 386:8 11:25 354:19 12 286:23 355:11,14 356:1 359:6 12's 362:7	120 387:4,6 123 324:23 124 279:22 322:8 323:3 387:24 125 324:23,24 12:37 270:3 393:11 12:42-50 282:23 13 345:15 347:3 130 289:1,2 290:19, 22 135 272:8,10,11 273:10 138 340:22 341:2 14 359:20,23 360:1 140 359:15 142 341:16,18,19 342:9 144 354:12 355:1,3,4, 10 147 281:1 14722 270:9 149 312:17 150 357:2,5,19 359:14 360:11 361:2 365:10,21 366:11,18 151 361:18 152 361:19 153 362:1 155 308:12,14,15,16 15:66 279:4,18 16 281:16 286:22 289:10 317:2,4 321:1,8,14,22 322:1, 5,24 323:6,10,19 324:11,16,20 325:1, 5 326:4,19 327:7	328:16 329:3,7,21, 23 330:10,12 332:5 333:9 334:6 336:19 338:15 339:12 340:5 16:14 281:15 16:14-16 282:25 16:4 279:5,18 16A 322:11,22 17 313:22 314:9 316:3,13,19 324:23 170 313:16 315:23 359:17 360:3,19 364:15 365:11,21 366:11,18 172 360:4,9 174 360:4 18 270:2 325:6 367:3, 7 369:11,20 388:14, 16 181 366:22 367:2 185 367:11,14,20,21 368:8 188 370:2,4,23,24,25 19 389:18 190 314:17 196 275:9,12,13 277:14 346:4,7,12 348:6,19,20 197 275:17,21 277:3, 14,16,18,19,21 278:18 309:4,11,24 198 275:18,22 277:3 283:6,10 292:19,24, 25 293:2 294:3 2 2 283:18 285:6
--	--	--	--

304:10,12,21 306:6 312:21 313:10 337:13	27 376:16	42 357:24 358:3,5,8 359:6,8,9,12 360:16	341:13 356:15
20 341:6,14,25 343:4, 18 344:14 372:10 386:19,23 389:23	270 312:16,20	43 302:2,3,4,8,12,15 303:6,7,19	5.b 314:20,24 315:7
20- 344:20 350:24	3	45 292:16 345:16,19 347:3	52:56 357:21
2012 353:17	3 286:1 295:19	45-degree 328:5	53 358:16
2012-019793 337:13	304 376:8	455 301:16,17,18,25 302:16,22 303:8,25 304:16,22 305:3,24 306:4,9 307:13,14 308:13 309:4,12 310:14 311:3,7 312:21 313:14,22 314:10,20 315:7,22 316:3,13,19 324:3 376:8	533 272:15,23,25 273:21 274:21 276:23 277:2,9 279:11,16 282:4,8, 14 302:24 303:22 304:24 305:5,13,17 306:10,16 307:6,24 308:25 309:2,20 310:8,24 311:19 312:14 313:11 314:11 315:9 316:14 340:13,14,15 341:3, 11,17 346:4 354:13 355:1,11,22 357:3 366:23,24 367:3 369:20 375:15,22 376:3,8,21 381:12 385:22 388:15
2016 390:24	34a 325:5 329:18 330:7	475 271:13,25 272:9, 13 273:22 274:21 275:10,15 277:4,7, 22 278:19 279:2 280:4,24 282:3 283:7 292:20 376:8	55 295:4 375:14,16, 17,20
2017 390:23	34b 325:5 329:18 330:7	475's 273:1,18	56 342:4,7,11,18,22 343:19,20 357:24 359:21 360:1 361:12 372:6,8,12 373:12, 15 374:2,4,23 375:1 376:14,17 381:12
2019 276:23	350 313:13,16,21 316:2	48 342:4,7,14,17,22 358:7,9	57 375:24
2024 386:11,19 387:8	352 315:22,25 316:17	484 276:19 277:2,9 279:11,16 282:4,8, 14 302:24 303:22 304:24 305:5,13,18 306:10,16 307:6,24 308:25 309:2,20 310:8,24 311:18 312:14 313:11 314:10 315:9 316:14	59 304:9
2025 387:9	353 302:10 316:25 324:18	5	6
2025-01250 340:18 344:25	354 324:2,4,5,7 325:20 326:24	4:50 361:11	6 341:3,12,14
2025-01252 301:22	355 335:10,14	4:52-53 357:21	60 304:10,13 344:14 359:20 360:7
2026 270:2	356 283:17,22 284:1, 18 285:5 291:22,24	5	600 311:11,15 343:23 344:11
20th 386:11	36:66 279:5,18	5 305:2,24 314:20	
22 353:22,24 390:17	37 283:18 285:6 342:14		
236 279:21,23,24,25 280:2	37:2 279:5,19		
237 280:6	38 340:23		
238 280:13 281:2 282:2,5,15,22 286:11	383 314:16,19,23		
24 317:11 318:19 331:6 334:8 345:17 376:16	4		
248 310:13,16,20	4 357:23 358:2,4,5 360:15		
25 302:6	40 341:7,14,25 343:4, 18 344:14 347:8,18		
253 311:2,6,22 312:5	40-nanometer 344:20 348:25 350:18,25		
26 375:17			
265 318:8 336:23			
266 330:2			

61 354:3,5		346:20,25 347:6,12	323:12 329:20 332:4
62 304:1	9	acquire 364:6	343:7 346:24
63 304:14		activities 390:16	363:21,23 369:16
650 344:12	9 353:22,23,24 387:4	activity 317:13	agreeing 363:24
66 283:17,22 284:1, 18 285:5 291:23,24 307:14	91 292:8	318:21,24 325:10,13	ahead 381:19
660 372:17 373:17 374:12,14	910 372:18 373:18 374:13	add 386:19	algorithm 391:4,10
	92 292:8	added 304:15	algorithms 389:3
	96 346:8	adding 371:1,12	allowing 347:12
	97 277:16,18 390:11 391:7	addition 372:14 387:17	alternatively 297:9
7	970 376:8	additional 272:23	amalgamation 336:12
7 345:23 346:25 347:14 348:11,12	98 390:11 391:7	302:17,22 303:6,8, 18,20 309:19 311:18	ambient 370:9 371:3, 7,12,16
700 343:23	99 390:11 391:7	312:12 313:10 315:8	amount 331:18
75 340:24	9:03 270:3,6	316:12,18 355:19 386:22	332:25 334:19 385:16
77 355:6	A	additionally 341:22 357:7	analog 281:7 291:2, 12
8	a.m. 270:3,6 315:15 354:19	address 275:14	analysis 273:21
8 280:3 320:20,23,24	ability 377:7	279:25 280:2 309:11	274:13 289:6 305:9 306:14
8,852,103 281:19	absent 297:13 298:15 299:21	310:16 312:20	analytical 303:16
8.d 279:21 280:3,22	Absolutely 291:13	313:21 314:19	analyze 275:5
8.m 310:17	absorb 361:16	341:2,11,13 355:10	and/or 337:16
800 343:25	absorbed 332:7	addressed 280:23	angle 328:5
850 372:18 373:18 374:13,16	absorption 332:22	302:23 303:21	angular 332:16
8A 320:18 321:2,5,7, 12,13,19,23 323:15, 18,23	academia 378:15 379:9 382:3 384:19	304:23 305:5,12,17, 22 306:9,15,21	annotated 312:4,24
8C 321:2,3,12 323:6, 8,13,18,20,23 324:8, 11,25 326:16 328:2, 9 335:24 336:1 338:16 339:13	academic 383:22 384:17	309:2 311:7 312:13 316:14 355:21	313:5 314:2 315:2
	accomplished 366:15	addressing 316:2	324:8,10,16 325:21
	accuracy 347:9,20,25 349:1	advantage 317:9	326:9 327:4,23
	accurate 270:18 319:8 345:24	advantageous 295:8	328:9 335:11 355:13
		advantageously 370:8	annotation 325:19
		advantages 318:18, 25 325:7 337:8,10	annotations 314:6
		agree 285:7 294:19 297:15 301:3,7 302:21 322:9,23	answering 298:12,18, 21 299:17 333:14,20 339:3,5
			answers 290:15

348:4	13 365:18 366:8	389:5	beam 273:1,7,11,16, 24 274:1,5,14,15,19 275:1,4 356:15
Anthony 270:7,13 315:17 354:21 392:21	arrangements 294:11	back 277:5 278:10,14 279:1,4 282:2,10,22 289:11,19 292:8 295:3,18 309:10 315:17 316:1 317:25 318:4 324:2 329:8 331:11,17 332:7,25 333:11 334:8,18 335:23 336:8 346:3 354:17,21 355:25 358:1 360:14 368:4 369:14 370:17 376:13 390:10,22 391:7 392:18	bear 346:10
anticipates 364:19	arrow 328:19,24		beginning 277:23 387:8
aperture 330:7,12	arrows 328:13,17		benefit 330:24 334:21 371:9,10
apertures 325:5	art 273:6,15 274:2,4, 15 275:2 280:15 281:18 286:17 289:3 290:20 292:3 296:1, 9,25 308:7 319:1 324:14 331:5,10 333:9 334:5,12 335:16 336:25 337:12 344:3 350:15 352:3,22 356:7 360:17 361:8,18 362:6,18 364:13 366:9 370:5 371:10 375:21,25 376:2,6, 19 377:25 380:2 382:8,13 384:6,25		bias 391:21
apparatus 276:15 277:24 278:14	arterial 358:13	back-end 288:7 359:16 360:3,18 364:14 365:21	biomedical 378:11 379:6 384:14 390:10 391:8
appears 328:4	article 392:8	background 270:22 319:8 337:24 370:8 371:7,11	biosensor 293:22,25 294:12,16 295:15 296:15 300:10,25 301:10,12 378:21 381:3
Appendix 385:19,23	assume 332:16 352:20 364:9	band 349:5 350:7,8, 11,12,24 351:2,14, 15 352:16,25 353:8, 10,11,12,13 373:7 374:11,17	biosensors 378:15 380:22 382:2 390:4, 7
application 350:12 376:20	assuming 352:23 365:3	bands 374:16	black 305:2,10 306:23,25 307:5 308:18 322:12
applications 376:23 378:5	attached 385:18	bandwidth 341:6,24 342:21 343:2,9,12, 14,17 344:4,14,20 346:19 347:5,8,25 348:24,25 349:4,7, 14 350:2,4,6,16,17, 18,19,25 352:4,5	blocking 321:15 322:11,22
applied 338:2 370:15	attempting 380:7	bandwidths 345:22 346:24 347:17,19 354:8	blocks 321:15 322:13 363:10
apply 273:22 314:25 315:5 318:10 320:11 335:17 337:1 370:6 377:23	attention 272:7 275:8 354:2 376:15	based 270:22 278:8 313:1 314:5 316:5 344:4 350:25 364:22 388:3	blood 337:17 358:12, 13,19 361:10,15,16 381:2,6 389:21 390:8,15 391:4,11
approximate 378:17 379:21,23 380:12 384:10	author 392:7		blue 292:15 305:23 306:23,25 307:5
approximately 328:5 372:13,17,18 373:17,18	authored 276:18,22		Board 299:11 361:23
APRIL 270:2	automation 389:2		body 319:25 337:17
arbitrarily 340:8	average 374:16		bold 277:24 278:5,13, 19
arcs 313:5,10	axes 378:20		bottom 304:1,13 321:16 354:3 387:7
area 331:13,14 332:19 379:14 383:5 385:12	B		
argument 364:20	bachelor 388:20		
arrange 372:14			
arranged 290:12 365:4			
arrangement 364:3,			

bounce 329:14,17 330:4,11	22,25 368:5,9,15,17, 18,19,22 369:7,12, 13,24 370:14 371:12,20 372:4,13, 21 373:6,12,15 375:5	25 299:2,5,8,11,18 300:13 301:1,13 303:4 305:19 315:12,16 317:23 320:17 322:20 323:11 326:1 329:19 330:8,18 332:1 333:5,7,15,23 334:2, 24 335:5,6 336:17 338:5,8,10,22,24 339:7,9 340:1,16,20 343:6 348:3 349:12 350:1 351:7 352:18 353:15 354:14,20 356:22 360:21 362:15 365:1,16 366:2,21 368:20 369:2 370:1 371:24 373:23 374:18 375:10 379:15 380:14 384:20 385:17 392:15,21 393:4	319:1 324:23 342:3 348:10 cited 279:3 345:9 cites 369:15 citing 277:9 279:15, 17,18 282:6,8,10,19, 21,22 369:13 claim 272:7 275:15 278:6 280:3,9,23 304:16,22 305:3,10, 11,25 307:3 308:23 309:12 310:7 311:7, 22 312:13,21 313:10,22 314:9,20 316:3,13,19 341:3, 11,12,13,14 355:11, 14 356:1,15 362:7 claimed 361:23 369:10,20 claims 274:21 302:17,22 303:8,21 367:3,7 369:11,20 clarify 374:8 379:1 class 390:9 clause 377:14 clean 299:14 clear 282:11 290:9 295:22 298:18 299:12 326:9 345:21 362:6 366:3 368:21 close 295:6 co-author 392:7 co-cited 392:8 coating 330:2 331:2, 23 333:2 338:2 339:19,23 coatings 336:8,16 337:10
box 292:15 297:9,22 298:4,5 366:11	Carlson's 370:6,14 371:1,5 373:25		
boxes 290:12 297:25 298:1 363:22 364:1	Carnegie 388:20		
break 310:12 314:15 315:13,14,19 316:6 354:16,18,23 392:19	case 300:11 325:3 349:6 376:11		
Brian 270:7	Cassidy 270:7		
bridges 304:9 309:5	catch 283:25		
broad 379:14	cavity 317:4 318:16 324:22 325:2,17 326:5		
broadly 290:1,5 291:14 294:8 384:11	center 344:11,12,17, 18,19 373:8 374:15, 17		
broken 290:7	Certified 270:8		
built 390:25	change 273:20 274:13 353:6 375:13	circuit 281:14 286:15 301:11	
bunch 386:25	changed 347:21 388:11	circuitry 280:18 281:7,13,15,21 283:1 286:14 287:4, 14,16 288:7,8 289:11,12,17,18,19, 25 292:10,14 293:20 294:6,21 295:7 297:10,14 299:23 300:8,17 301:5 303:12 359:14,17 360:3,11,18 361:22 363:5 364:15 365:10,20,21	
buy 349:18,21,25	characteristics 281:23 303:15		
C	charm 302:14		
calculate 363:2,3	chat 271:20		
calculated 296:14	check 392:16		
calculation 358:20	choose 326:7,8 350:24		
calculations 361:13	CHRISTOPHER 270:12 271:23 274:17 275:7 283:4 285:2,22 287:5,20 288:16 290:14 291:19 292:18 294:1,24 296:18,20 297:12 298:7,9,20,	citation 342:8 357:23 citations 357:16,19 cite 277:1,5 278:10, 14,20 279:1,7,10,14 282:3,13 283:16	
California 270:8			
Cambridge 270:24			
capability 345:24 347:1,7,13			
captured 307:2			
captures 379:21 380:1			
Carlson 367:7,9,15,			

coding 304:20	committees 386:22	345:22 351:23 363:20 364:1 377:11	contained 293:20
coffee 381:24	common 281:10 303:10,14,16	comprise 293:22 309:25 310:6	contemplates 276:12
collect 319:15 377:12	communicating 350:22	comprises 309:15 311:10,15 356:16	context 297:20 368:17
collected 365:13	compact 391:25	comprising 308:2,5, 10	control 289:17 380:1
collection 319:5 337:21	comparable 377:19 378:3	computation 389:13	controlling 319:2 337:18
color 304:20 307:4	compare 358:25 377:17	concept 280:18	conversely 320:1 373:2
colorblind 307:18	compared 307:6 331:17 365:13	concepts 281:11	copy 271:14 301:15 385:18
colors 306:20,24 309:9 355:14	comparing 355:15,20 356:3,9,18 357:9,10 358:10 359:2 360:16 361:3,4,13,24 362:7 363:13 366:17	concerned 332:11	copying 336:6
column 283:17,18,22 284:1,18 285:5,6 286:22 289:10 291:22,24 342:4,7, 14,22 343:19,20 345:15 347:3 353:22,23,24 354:4, 5 357:23 358:2,4,5 359:6,20 360:1,15	comparison 303:13 356:10,23 360:19 362:2,12,19 363:13 364:15 365:5,19 366:10	configuration 290:11 317:9 318:17 322:14 325:7,10 337:7 363:25 364:10 366:8	correct 274:2,3,22 275:15,20 276:24 277:4 278:3,11,15 279:2,8,13 280:4,5, 24 282:5,15 284:18 285:9 286:5 287:21, 23 293:14 294:7,22 296:4 297:16 300:18 301:5 302:25 303:22,23 305:13, 20,21 306:1,16,17 307:7,8,14,24,25 308:9,15,19,25 309:1,12,21,22 310:9,10,17,20,24, 25 311:8,19 312:5, 14,15,21 313:5,11, 22 314:11,21 315:2, 3,9,10 316:3,15,16, 20,23 317:21 319:21 320:4 321:1,9 322:24 323:16,23 327:24 328:17 329:4,9,23 330:12, 20 331:7,8 332:8 333:12 334:9 340:5 341:3,12 342:9,22 343:9,14 347:3,14 348:11,13 350:4,19 351:16 353:1 354:10
combination 284:6 296:15 320:10 333:2 336:3 337:25 338:13 339:10,20,22 340:7 351:3 352:17 363:1 365:11 366:19 369:12 370:13 384:16	comparisons 363:3	configurations 296:12 303:14 363:25	
combinations 297:25 298:1 365:14,24 366:5 378:17 380:12	complete 270:18 273:11	configured 278:7 314:24 315:5	
combine 318:5,10 336:9 363:1	completely 304:4 333:18,24	confine 322:14	
combined 276:6 289:12 298:6 365:12	complexity 291:17 351:22	confining 337:18	
combining 319:2	complication 392:13	confirm 319:18 369:14 370:17	
comment 370:22	component 276:6 284:16 285:7 292:2 349:15 350:3 352:14 362:12,17 365:3	conjunction 334:13	
commercial 384:19	components 285:16 286:8,12,18,25 287:2,8,22 288:1,5, 9,20 289:14,23 290:2,7,21 336:1	connected 287:16	
commercially 391:18		connection 271:7 387:11	
		considered 382:13	
		consistent 276:9	
		constrained 323:9,14	
		construct 366:20	
		consulting 387:5,15	

355:4,11,22,23 356:12,25 357:16,24 358:24 359:24 360:19 363:6 364:16 366:11 367:4,8 368:1,12 369:11,21 370:15 371:4,15 372:24 373:5,19 374:5 375:1,22 376:3,4,9 378:3 381:7 385:1,20 387:1 388:1,4,17 correspond 344:16 correspondent 344:17 Corroborated 361:17 corroborating 343:4 cost 291:17 350:9 351:11,13,14,20,23 352:13 353:6,14 counsel 270:10,11 271:2 298:20 338:22 393:1 couple 382:22,23 391:16 courses 389:25 391:8 court 271:17 cover 325:5 covered 325:15 created 304:20 curriculum 383:24 curve 326:15 curves 327:21 custom 290:25 291:11 CV 385:18 386:14,19 387:19 390:22 cycle 358:12	D data 303:16 361:7 364:6 date 353:18,20 376:19 386:11,20 dec 348:2 370:24 decades 391:16 December 353:19 386:19 decision 341:10 355:22 decisions 312:14 313:11 314:11 315:9 declaration 271:13 272:2,8 275:9 276:19,23 277:3,6, 22 278:18 279:2 282:5 283:6 292:20 293:12 295:1 301:16 302:2 303:19,25 304:17 306:2,4 308:13 309:4 310:14 311:2,23 313:14 314:16 315:22 317:24,25 321:3 324:3 325:20 326:25 338:11,25 339:5 340:12 341:17 345:5,10 346:4 348:6,10 354:13 355:1 357:3 360:23, 24 368:3,6 370:3,20 375:12,15 376:1,3 379:20 381:12 385:23 387:21 388:12,14 declarations 277:2 279:11 282:4,14,20 385:19 387:12	defined 317:4 324:22 325:3 326:6 defining 385:15 definition 381:4,5 degradation 295:10 degree 381:15 388:25 389:6 deliver 336:16 delivered 335:19 delivery 319:5 337:21 demonstrate 336:14 deoxyhemoglobin 311:13,17 depend 351:17 352:8 dependent 311:7 312:21 313:21 316:3 341:3 355:11 367:3 depending 383:24 depends 330:22 382:20,25 383:2 deposition 270:6 271:3,8 299:6 derivatives 345:25 347:2,8,14 describe 275:3,21 280:25 282:1 292:7, 12 293:16 294:17 330:1 336:22 343:3 355:23 361:1 380:11 389:18 391:12 describes 273:16 287:25 321:13 322:18 323:3 describing 282:18 290:1,5 294:8,11 300:3 321:12 342:24 374:10	description 322:10, 18 378:16 379:23 380:11 384:7,9 design 291:7,15 297:22 331:22 350:5,23 351:19,23, 24 376:24 377:7,20, 21 378:20 389:2,14 390:12 designed 351:1 391:3 designing 300:8 350:9 designs 377:6 378:6 detail 370:16 detect 275:22 284:3, 11 285:13 294:20 296:3 297:1,15 298:14 299:20 300:10,15 301:3 363:3 detected 276:14 detection 276:7 285:21 292:3 293:24 295:16 296:13 301:5 359:15 371:14 detector 293:19 295:7 296:16 297:11 359:15 371:8 374:5 375:1 detectors 303:15 308:17 313:4,9 370:10 371:4 380:23 detects 276:2 283:13 284:16 285:8 293:7, 13 determine 276:15 278:8 344:4 358:18 361:7,9 362:21 determined 287:18 295:17
---	---	---	---

determining 281:22	21 285:1,15 286:8, 12 288:19 296:13,16 317:2 318:14 325:14 341:22 342:25 343:10,21 345:20 346:18 347:5 357:7 358:9 359:13 360:2, 8 361:2,6 367:15,22 368:1,9 369:7,19 372:13	downloaded 345:1	efficiency 319:4 335:19 337:20
develop 379:8		downloads 271:16	EKG 390:12
developing 378:13 382:1,7,12,19 383:5, 12,15,18,20,21,22 384:1,15,23 385:9		draw 297:24 332:16 380:7	electrical 377:9 378:11 379:6 384:13
device 300:9 303:11 338:3 347:10 349:1 351:21 378:20		drawing 290:12	electro-mechanical 389:2,13
devices 382:2,7,12 383:12,14,15,16 384:16,24 385:10 390:3	disclosure 343:13 362:4	drawn 297:23 323:1, 17,25 328:2 332:20	electronics 291:6 390:10 391:8
difference 273:6,20, 24,25 379:18	disclosures 386:23	drew 328:7	electrons 380:24
differences 272:22 274:10,25 376:12	discuss 271:1 280:8 281:24 315:18 354:22	drive 337:21	element 272:13 275:14,19 278:3,11, 15,25 279:12,21,25 280:3,22 307:19,23 308:1,8,16 309:9,11, 14,23 310:7,17 314:20,24 315:7 349:19
differing 272:21	discussed 276:7,18 283:20 305:25 360:15 362:22 363:10,19 370:16	driver 303:11,12 307:20 308:2,5,9,10	elements 280:9 377:24
differs 305:12	discusses 358:17	duration 383:7	eliminate 392:12
difficult 307:19	discussing 271:13,24 272:5	E	embodiment 287:2 289:23 320:13,24 323:13,15 334:13 336:6,13 343:22
digital 276:11 281:7 282:24 291:2,12	discussion 277:13 278:2,10 316:5 368:18	e.g. 357:8,10	embodiments 284:2 286:24 288:8 289:13,20 324:25
diodes 272:25 310:23	discussions 277:6	e.g. 346:19 348:7 367:16 369:8 372:16 382:2	emits 341:6,24
direct 272:7 275:8 334:22 337:11,16 354:2,25 358:2,7 376:15	disparities 392:10	ear 317:12,20 319:21, 24 320:4 325:9	emitted 317:10 319:2 331:16 337:18 344:5,9 350:4
directional 273:18	distinction 345:25 347:2,7,13 380:8	earbud 317:2,4 318:14 320:25 321:8,14,22 322:1,5, 23 324:11,15,20,22 325:1,3,4,20,25 326:4,6,14,19 327:5, 14,15,16,19 328:16 329:3,6,7,21,23 330:10,11 332:5 333:9 334:6 336:19 338:15 339:12,16 340:4,9	emitter 328:4,8,23,25 329:4,8
directly 282:13 329:3	distributed 290:2	earlier 277:6 305:25 306:2	emitters 317:11,20 318:19 327:24 328:2,12 331:6 334:8
disagree 299:10	divided 288:4 289:14	education 378:10,17 379:5,13,24 380:12 381:15,17 385:4	emitting 272:24
disambiguate 391:17	documents 271:6		
disclose 342:21 343:9	domain 382:18		
disclosed 324:20 347:11 357:1	dotted 323:2,9 329:15		
discloses 275:22 276:5 277:23 281:6, 11,20 283:12 284:1,	double 367:16 369:9 372:15 374:10,11		

331:18	equivalent 385:13	exits 323:14 328:12, 23	factor 391:25
emphases 306:8	error 276:13 283:13	expand 350:22 379:2	factors 351:24 352:8
emphasis 304:15,22 305:2,10,23 306:8	284:3,12,17 285:9 291:22 292:4 293:14 294:21 296:4 297:2, 16 298:15 299:21 300:16 301:4 328:13	expectations 352:11	faculty 392:9
emphasized 307:4		expensive 291:3,4 351:15 352:4,25	fair 271:19 277:15 352:1 365:22 386:18
employment 386:24	errors 275:23	experience 378:13,18 379:7,12,13,14,24 380:13 381:25 382:6,11,17,18 383:2,17 384:15,23 385:6,8,14	fall 334:17
employment's 387:1	estimate 358:12 361:15		familiar 347:24 351:5
enabling 317:13	estimates 380:24	experiences 384:10, 12	familiarity 376:23 377:5,15,17,19 378:2,6,19,22,23 379:4,10,19 380:6
end 271:3,7 278:17 279:3 281:10,18 287:14 289:11,19 291:3 293:19 306:6 309:23 317:13,14 342:10 357:15 389:23	estimating 381:2,6	explain 273:9	fast-forward 391:16
ended 272:6 390:13	evasive 299:6,13	explained 301:10	faster 342:15 386:6
ending 387:8	eventually 329:17 330:10	explaining 298:22 299:1	features 276:11
energy 325:4 332:25	exact 364:10 365:18 366:7 383:1	explains 289:8 296:11 333:21	fell 331:17
engineering 381:18 388:20,21,24 389:1, 16	EXAMINATION 270:11	explicit 343:13 362:4	field 378:12
enhance 335:18 339:24	examples 363:6	explicitly 281:11,25 284:21 285:15 288:1,19 289:8 296:11 333:4 342:20 343:9,10 362:8	fields 379:7
enhances 295:9 319:4 337:20	excluded 290:4	expounding 333:17	figure 285:23,24 286:5,17,19 287:9 288:25 290:10,18 291:25 292:1,11,16 295:18,24 296:7,10, 22,24 297:6,8,13,19 298:3,14 299:19 300:1,2,7 320:18,23, 24 321:5,7,19,23 322:8,17 323:13,15, 23 324:8,11,25 325:20 326:3,11,16 327:10 328:2,3,9 335:11,24 336:1 338:16 339:13 363:6,15,20,23 364:8,10,12,22 365:3,4,9,19 366:8
entire 297:20 299:6 329:12,21 330:9 332:6 333:10 334:6	excuse 279:25 305:2, 24 348:12 381:19,23	extensively 362:22 380:10	figures 321:12 323:24 332:20
entirety 285:19 289:7 296:10 297:6 324:15 325:22 345:12	exemplary 287:8 292:1	eyeballing 332:18	filed 376:21
environment 384:18, 19 385:9	exhibit 271:21,24 281:19 283:17,23 301:19,22 316:18 337:13,14 340:17 342:3 343:20 344:21,24 345:4 353:21 358:2 371:19,22,25 372:3 376:1	F	filter 347:9 348:25
envision 291:10	exhibits 319:1	fabricating 383:19 384:3	
equal 320:2 352:2,21, 24	exists 295:25 365:9	face 334:17	
equally 273:22	exit 325:4 330:11	facility 390:18	
	exiting 323:13 328:4	fact 287:21	

349:4,5,7,14,20,22, 23 350:2,9,13,17,18 351:3 352:16 353:12,13 367:16,17 369:9 370:7,8,14 371:1,6,12,16 372:15,21,24 373:2, 5,7,15,16 374:3,11, 23,24 375:8 filtering 371:11 filters 347:8 348:24 367:16,23 368:1,10 369:8,19 375:5,6 377:24 380:22 final 278:24 393:6 finally 278:17 find 351:9 388:12 finish 370:21 fire 352:10 flexibility 290:6 291:16 297:22 flow 337:17 focus 317:19 318:18 319:20 focused 317:11 325:8 365:18 366:7 379:16 389:12 focusing 285:3,4 337:8 footer 304:13 footnote 304:7,10,12, 21 306:6 forever 333:25 form 274:7,23 282:16 284:19 285:10 286:20 287:10,24 289:5 290:24 292:6 293:15 294:23 296:5 297:3,17 298:17	299:24 300:19 301:6 303:1 305:15 317:22 320:5 322:6,25 325:23 329:10,24 330:13 331:12 332:9 333:13 336:4,21 338:17 342:23 347:15 349:8,16 350:20 352:6 353:2 356:13 360:20 362:14 364:17 365:7,23 366:12 368:13,24 369:22 373:20 374:6 375:2 378:25 380:9 384:8 385:2 391:25 formed 274:18 345:12 forming 345:7 forms 362:12 formulated 384:21 found 276:1 280:16 281:9 293:5 fraction 367:17,23 368:10 369:9 frame 353:16 384:22 frequencies 349:6 373:8 frequency 344:18 Friday 271:11 front 272:1 281:17 287:14 291:3 292:23 293:19 323:20 330:17 334:17 349:20 front-end 280:17 281:5,6,13 286:14 288:6 289:10,18 291:2 292:10,14 295:7,12,14 296:17 297:10,14 299:23	300:7 301:11 359:14 360:10 361:22 362:25 363:5 365:20,25 full 326:8 330:5 function 385:6 functionalities 289:21 290:13 functionality 276:5 282:25 284:21,24 286:24 287:12,17,18 288:4,6,9 289:9,10, 13,17 290:2,4,8 291:11,12 293:24 294:10,15,16 296:11 300:4,9,25 363:9 364:2,6 365:8,12 366:15,17 functions 281:10,22 funded 388:7 funding 392:12 G gain 382:16 gained 378:9,10 381:14 385:4 gaining 379:3 382:11 384:23 385:7 gave 293:11 general 273:17 320:7 330:1,15 380:1 generally 351:15 352:3,22 353:3 373:6 383:21 generate 356:8,21,24 363:12 generated 318:19 356:2,17,21 357:9	361:3,21,24 364:6 generating 356:12 365:14 generic 303:11,13 give 270:18 298:11 299:15 368:17 380:18 386:4 giving 333:15,18,23 gold 313:5 good 270:13,14 376:21 377:3,18 378:1,4,23 379:3,18 380:5 great 271:15 green 304:21 306:23, 25 307:4 341:5 group 297:22 grouped 300:5 growing 276:10 guess 392:7 guide 319:11,15 328:22 336:11 337:11 H half 327:9 381:21 385:11 halfway 372:13 389:18 hand 377:25 happen 285:21 hard 383:1 392:9 hat 383:22,23 head 366:1 hear 338:21
---	--	--	--

heart 390:15	illustrated 322:14 324:25	331:16	integrating 276:10
held 270:1 315:14 354:18 392:19	imagine 328:11,22,24	inconsequentially 332:24	integration 295:6,13
helping 337:16	imaging 281:20	inconsistent 393:5	integrity 295:9
helps 319:15 342:15	implementation 363:21	incorporate 288:14 291:6	intensities 357:11 358:10 360:16 361:14,24 362:20 364:16 365:5,19
hemoglobin 345:25 347:2,7,13 358:13	implemented 319:13 336:2	incorporated 277:12 300:9	intensity 358:24 359:1,3
high 318:2 346:19 347:5	Implementing 281:17	incorporates 323:6	interacting 274:14 275:5
high-performance 389:12	implicitly 300:2	increase 347:25 371:13	interest 325:13
highly 295:8 361:15	implied 359:4	increasing 319:6 337:23 371:18	interested 375:7
hitting 334:15	impossible 275:24 276:3,8 283:14 284:4 293:7	independent 280:3	internal 304:9,13 329:13,22 392:11
Hold 304:4	improper 333:19	indicative 275:23 283:13 284:3,12,17 285:8 291:21 292:4 293:14 294:20 296:3 297:2,16 298:14 299:20 300:16 301:4	internally 334:8
hole 329:18 330:7 331:20	improve 311:25 312:9 318:13 337:3 347:9 348:25	indiscernible 321:17	interpret 344:8
hour 354:15	improves 319:6 337:22	industry 362:5 378:15 379:8 382:3 383:23 384:19	interrogation 317:14
housing 317:2,4 318:14 321:1,8,14, 22 322:1,5,24 324:11,15,20,22 325:1,3,5,15,21,25 326:4,6,14,19 327:5, 14,15,17,19 328:16 329:3,7,21,23 330:10,12 332:5 333:9 334:6 336:19 338:15 339:12,16 340:5,9	incident 329:2	inexpensive 353:4	introduce 318:1 368:5
hypothetical 329:11 330:14,21 332:15	inciting 277:8	information 317:15	introduced 368:17
	include 277:13 291:2 294:13,16 297:10 302:17,22 303:8 326:13 336:19 338:15 339:12 360:4 361:13 363:8 373:11,14,25 374:22 383:19 384:2	infrared 310:1,6 357:11 361:5	invisible 310:1,6
	included 290:5,8	inherent 391:20	involve 390:1
	includes 281:13 286:13 290:18 308:9 321:14 383:20	inherently 350:25	involved 387:16
	including 271:2 290:22 296:10 308:4 355:14 390:3	insert 340:4	IPR 301:22 314:11 315:9 340:18 341:10 344:25
	inconsequential	inside 300:17,24 323:10 329:14	IPR2025-01250 344:21
		inspection 322:15	IPR2025-01252 301:19
		integral 382:16	IPR2025-01254 271:21,25
		integrated 301:9 349:22,24	IPRS 302:24 303:22 304:24 305:6,13 306:10,16 307:6,24 308:25 309:20
identical 272:14 304:23 305:4,17,21 309:1			
identify 362:11			
ii 270:6 272:25			

310:9,24 311:19 316:14 387:16 IR 343:24 344:16 357:11 361:14,17,25 362:3 isolation 296:7 issue 334:20 335:1,2 390:2 IX.A.2 276:7 IX.A.3.A 277:7 278:3, 14 IX.A.3.G 277:7 278:11 IX.B.2 370:17	375:2 378:25 380:9 384:8 385:2 392:25 393:8 kind 326:15 327:9,20 knowledge 350:10 376:22 377:4,18 378:2,4,8,9,24 379:3,4,11,18 380:2, 6 381:14 384:12	12,16,24 351:2,11, 14,15,21 352:4,5,8, 13,16,25 353:1,8 392:11 LEDS 287:13,15 291:8 331:6,22 332:3 341:24 342:21 343:1,10,17 345:22 346:24 347:17,18, 22,24 352:22 353:3, 5 354:7 left-hand 354:4 length 382:14 383:3 lenses 377:23 380:22 level 311:12 318:2 375:21,25 376:2,5 384:13 levels 379:24 license 270:9 lie 308:17 lifetime 352:11 light 272:24 273:2,8, 11,18,19 274:1,6,13, 20 275:1,4 289:1,2 290:19,22 293:19 296:16 303:12,15 308:2,4,8 314:1,8 316:8 317:3,10,19 318:13,15,19 319:2, 5,15,20 320:3,14 321:15,25 322:11, 13,15,22,23 323:2,7, 12,14,18 324:21 325:2,8,16 326:5 328:3,11,15,22,25 329:2,8 330:3,11,16, 19,20,25 331:3,11, 15,17,19,23 332:3,7, 12,13,15 333:3,11 334:7,14,22 335:19 336:11,16 337:3,8,	11,16,18,21 341:6, 24 344:5 346:18 347:5 350:4,7 353:10 358:20 359:2 361:16 365:13 370:9 371:3,7,12,17 372:16,23,25 373:3, 16,18 374:3,25 375:7 377:12 380:23 391:15 light's 329:13 light-emitting 310:23 limitation 272:15 273:13 274:16 275:3 280:10 281:1 282:1 283:3 305:11 306:15 307:5,23 308:23,24 309:19 310:8,23 311:18 312:8,12 314:9 315:4,8 316:13,19 355:19 362:7 364:24 limitations 272:6,22 282:7,19 302:18,23 303:6,8,19,20 304:16,22 305:3,12, 24,25 306:9 307:3 313:10 limited 381:6 Line-- 286:22 lines 323:17 328:8 342:4,7,17,22 357:24 360:7 Lisogurski 273:12 275:19,22 276:5,12 277:23 278:21 279:4,8,14,15,17 280:10 281:1,6,11, 15,25 282:6,7,9,10, 18,21,22,24 283:2, 12,16,21,22 284:1, 15,20,23 285:1,6,13,
J	L		
job 383:25 386:15	lab 383:19 384:3 390:16 label 292:15 labeled 325:24 326:9 labeling 328:19 language 341:11 356:1 leave 335:4 leaving 334:15 Leboeuf 316:18,21, 22 317:2,19 318:1,2, 4,5,7,13,17 319:19, 24 320:2,7,9,19 321:5,7,10,11,13 322:4 323:15 324:8, 20,22,23 329:25 330:24 331:6 333:4 335:24 336:20 337:7 338:1,14,16 339:11, 13,18,22 340:5 Leboeuf's 318:8,10 335:17 336:23 337:1 led 331:10,11,14,17, 19 332:8,11 333:1,3, 11 334:15,18,22 343:2,12 344:4,6,9, 10,13,19 349:7,14, 21,22 350:4,7,8,11,		
K			
KIM 274:7,23 282:16 284:19 285:10 286:20 287:10,24 289:5 290:24 292:6 293:15 294:23 296:5 297:3,17 298:17,22 299:1,4,7,10,24 300:19 301:6 303:1 305:15 317:22 320:5 322:6,25 325:23 329:10,24 330:13 331:12 332:9 333:13,20,25 334:10 335:4 336:4,21 338:17,23 339:3,14 342:23 347:15 349:8,16 350:20 352:6 353:2 356:13 360:20 362:14 364:17 365:7,23 366:12 368:13,24 369:22 373:20 374:6			

19,25 286:5,8,12,22 287:6,12,25 288:11, 19,23 289:6,7,8 290:16 291:10,22 292:5,9 293:17 294:5,9 295:11,12, 19 296:8,9,11,13,15, 23 297:7,24 298:5, 16 299:20 300:1,3, 21,22 301:8 316:21, 22 320:10 326:10 328:2 335:18 336:2, 7,19 337:25 338:1, 14,15 339:11,12,18 340:4 341:22 342:3, 8,9,11,13,20,25 343:8,14,16,20 355:24 357:7,16,20, 21 358:1,9,17 359:6, 12 360:2,8,15,22,25 361:2,5,11,20 362:5, 10,12,17,23 363:8, 12,16,21,24 364:3, 19,20,21,23 366:14 367:6,9 369:13,19, 23 370:14 371:2,14 373:11,14,24 374:22 Lisogurski's 276:2,9, 14 280:17 281:5 293:6,13,21 294:2 318:11 337:2,4 370:7,10,15 371:3,6 list 387:8,19,25 listed 373:4 374:4,25 lists 387:8 literally 368:8 369:6 live 387:21 located 270:23 313:4, 9 317:13 318:21 325:10 location 303:10 long 321:19 382:10	longer 383:8 looked 353:4 371:20 loss 331:2 lot 290:6 391:19 M made 323:4 362:6 392:12 393:4 main 272:22 major 386:18 majority 280:10 make 291:5 307:10 326:7,8 350:22 353:14 368:15 376:12 377:7 380:24 391:22 makes 291:17 making 326:22 332:24 364:19 368:14 manufactured 351:2 manufacturing 351:22,25 marked 271:22 301:20 344:22 371:23 Massachusetts 270:25 master's 388:21 389:6 material 319:4 322:13 336:15 337:15,20 materials 323:4 330:25 matters 387:20 393:10	matured 376:20 meaningful 319:3 337:19 means 372:22 measure 311:12,16 380:23 389:21 390:7 measurement 303:13 311:25 312:9 347:10,21 349:1 389:3 measurements 345:24 346:20 347:1,6,12 measuring 391:4,11, 14 mechanical 378:11 379:6 384:14 388:25 medical 281:20 meet 361:23 meeting 282:18 meets 273:12 274:2, 15 275:3,19 281:1 282:1,7 364:23 melanin 391:23 Mellon 388:21 memory 360:4 mention 358:23 mentioned 351:8,10 379:5 mentioning 359:1 met 280:10 355:24 methodologies 315:1,6 methods 303:16 Mine 393:9 minimum 341:23 361:20	minute 290:16 minutes 339:2 392:16 misstated 374:14 MIT 270:24 387:2 388:21 MIT.NANO 390:19 mix 384:1 mixed 291:12 modification 292:17 294:18 298:15 modifications 295:23 296:22 299:21 modified 293:21 294:4 300:25 363:4 373:14,25 374:22 modify 292:9,13 294:12 300:22 320:14 336:18 338:15 339:12 340:4 363:2 373:10 modifying 297:13 300:1,2 module 337:17 moment 286:7 308:22 342:6 346:10 351:8 368:18 moments 288:18 291:20 monitoring 281:12 286:13 287:3 289:24 337:5 361:6 378:14, 20 380:21 382:1,7, 12 383:12,15,16 384:16,24 385:10 monitors 319:13 382:19 383:6 monolithic 291:5 morning 270:13,14
--	--	---	---

Omni MedSci Ex. 2046

Samsung Electronics Co. Ltd., et al., v. Omni MedSci - IPR2025-01252

331:9 335:16 336:24 362:1 364:13 370:5 375:21,25 376:2,6, 19 382:13 orient 318:1 339:4 370:18 orienting 368:15 outer 377:22 output 278:8 281:8 282:23 312:2,11 313:25 314:7 315:1, 7 316:8 318:13 337:3 356:2,8,12,15, 17,21,24 357:8 361:2,23 overlap 273:11 357:22 overlapping 274:11 275:2 overview 318:4 368:22 OWNER 270:11 oximeter 391:1 oxygen 358:12,19 361:10,15 381:2,6 389:21 390:8 391:4, 11 oxygenated 361:16 oxygenation 390:15 oxyhemoglobin 311:12,17 P p.m. 270:3 393:11 package 349:24 pages 304:9 367:11 painted 322:12	paper 386:2 papers 386:23 387:25 390:1 paragraph 272:8,11 273:10 275:9,13,17 277:16,21 278:18 279:21,24,25 280:2, 6,13 281:1 282:2,5, 9,15,18,22 283:5,6, 10 286:11 289:9 292:8,19 293:2,17 294:3 295:4 302:2,8, 12,15 303:6,7,19,25 304:6,8 307:12 308:12,16 309:4,11, 24 310:13,16,20 311:1,2,6,22 312:5, 16,20 313:13,15,21 314:13,16,19,23 315:22,25 316:2,17, 25 318:7 322:8 323:3 324:2,7,18 326:24 330:2 335:7, 8,14,23 336:23 339:5 340:22 341:2, 16 342:9,11 343:3 344:23,24 346:4,6, 12 348:6,16,18 349:10 354:12 355:1,10 357:2,5,19 358:8,16 361:2 366:22 367:2,11,14 368:3,8,16 369:5,15 370:2,4,23,25 372:2, 6,12 373:12,15 374:2,4,23 375:1,11, 13,14,20,24 376:13, 14,17 381:12 387:4 388:13,14,16 389:17,23,24 390:17 paragraphs 277:3,14 parameters 312:1,10 361:8	parentheses 381:16 part 273:9 277:12 278:7,8 292:14 293:25 300:10,24 301:12 315:1,6 325:15 334:25 337:17 349:7,14 355:15,20 356:3,9, 17 357:9 361:3,24 370:24 partial 326:8 partially 317:3 318:15 323:6 324:19,21 325:1,16,22 326:4,7, 12 pass 322:23 323:5 367:17 369:9 372:15,23 373:7 374:10,12 passage 283:20 343:7 passes 322:1 passing 321:16 322:19 323:2 373:4 patent 270:11 271:13, 25 272:9,13,15 273:21,22 275:10,15 276:19,23 277:2,4, 22 278:19 279:2 280:4,24 281:19 282:3 283:7 292:20 297:20 301:16 302:16,22 303:8,22 304:1,22,24 305:3,5, 6,13,25 306:9,10,16 307:6,24 308:13 309:5,12 310:14 311:3,7,19 312:21 313:14,22 314:10,20 315:7,23 316:3,13, 19 324:3 337:12 340:13 341:3,11,17	346:5 354:13 355:2, 11,22 357:3 367:3 369:20 375:15,22 376:21 381:13 386:23 388:15 390:2 patent's 272:23,25 273:16 304:16 patents 274:21 282:4, 14 302:24 376:7,9 path 328:12,23,24 paths 329:16 pattern 273:17 PDF 275:10 279:22 283:7 286:1 295:19 302:6 304:1 307:15 309:5 312:18 313:16 314:17 315:23 320:20 340:24 342:15 345:17 346:12,14 353:22,25 355:7 358:6 366:25 367:12 372:10 375:18 376:16 385:24 386:4,8 387:4 people 391:21 percent 332:18 383:8 perfect 271:17 311:6 313:20 332:16,22 335:14 perfectly 330:22 332:25 364:19 performance 291:17 318:13 320:14 337:4 performed 286:25 288:6,10 289:18,21 388:4,5,7 performs 281:7,21 292:3 360:19 362:18 364:15 365:4
--	---	--	--

period 383:6 385:11 permeable 372:16, 22,25 person 273:5,14 274:4 275:25 280:14 281:3 285:14 286:17 289:3 290:20 292:2 293:4,17 295:5 296:1,8,25 308:7 318:9 324:14 331:5, 9 333:8 334:5,11 335:16 336:24 344:3 350:15 352:2 362:1, 18 364:13 370:5 371:9 376:19 378:22 379:2 382:8,10,13 384:5,22,25 perspective 353:17 pertains 364:9 Petitioners 388:9 Ph.d. 389:8,14 photons 380:23 phrase 308:2 309:9, 14,24 310:5 311:15, 23 312:4,23 313:1,3, 24 355:15 383:10 phrases 272:21 313:7 378:1 379:19 380:5 physically 270:23 340:4 physiological 281:12 286:13 287:3 289:24 312:1,10 317:12,15 318:21,23 319:3,12 325:9,12 337:4,19 360:10 361:6,7 378:13,20 380:21,25 382:1,7,12,19 383:5, 12,14,16 384:15,24 385:10 391:19 392:10	physiologically 275:24 276:3,8 283:14 284:4 293:7 331:24 332:13 334:23 pick 375:6 pieces 277:17 pink 314:2 316:9 324:11,16 325:21 327:7 329:12 place 279:15 303:11 365:13 places 320:15 362:24 364:2 366:16 play 351:25 plurality 308:5,10 312:23 313:1,3,7,8 314:1,8 316:9 356:16 point 277:15 295:3 326:22 332:2,23 352:1 pointing 282:6 321:3 points 358:11 portion 278:24 279:12 280:22 284:9 305:11 308:16 311:21 314:24 319:16 321:16 327:19,20 328:15 329:3,6 337:23 346:13 348:10 360:14 370:20 376:15 portions 278:20 326:19 355:13 POSITA 274:11 275:25 281:8 284:23 285:18 287:11,15 288:2,14 290:9	291:4,7,9,14 292:11 294:9 295:12 296:10 297:8,19 298:2 300:6,8,22 301:8 319:10 320:9 326:7, 10 330:23 331:21 332:10 338:3 339:22 343:1,11,15 344:7,9, 12,15 347:18,23 349:17 350:5,10,23 351:4 352:15 353:13 364:21 366:13,20 375:5 379:2 380:2 positive 331:3 possibility 363:9 potential 274:10 potentially 349:18 384:17 power 351:19 352:10 practical 378:18 379:24 380:13 practices 362:6 precision 351:1 premium 354:8 preprocessing 281:21 present 386:20 presupposing 336:12 prevent 371:2 373:3 374:3,25 previous 274:9 previously 271:22 272:16 276:22 280:23 301:20 306:15 312:13 344:22 363:11 371:23 price 353:5 354:9	print 386:3 prior 274:2 276:7,19 277:1,9 279:1,11,16 282:4,8,15,20 302:24 303:22 304:23 305:5,13 306:10,16 307:24 308:24,25 309:2,20 310:8,24 311:18 312:14 314:10 315:9 316:6,14 340:6 341:10,13 355:22 356:12 376:3 priority 376:18 probe-off 275:24 276:3,8,14 283:15 284:4 293:8 294:14 300:11,23 problem 304:7 proceed 270:10 proceedings 271:7 283:23 371:22 376:7 387:12 process 295:12 359:16 360:9 361:7, 21 364:7 365:12 377:12 380:24 processed 357:8 processes 359:17 processing 280:17 281:2,3,5,6,8,13,24 282:24 286:14,15 287:13,14,16,17 288:7,15 289:11,18, 19,25 292:10,13,14 293:20 294:5,13,17, 21 295:7,14 296:17 297:10,14 299:23 300:8,17,24 301:5, 11 303:16 314:25 315:6 359:14 360:3,
--	--	--	---

11,18 361:22 362:23,25 363:5 364:14 365:9,10,20, 21 366:1,17 376:24 377:6 378:7 389:13 processor 280:14,17, 21 281:4,10,14,17, 25 283:1 284:22,25 285:17,21 286:9,15, 19 287:4,9,19,23 288:15,21 289:3,12 290:23 291:1,11 360:4 362:21 363:12 364:5 product 389:21 professional 386:21 projects 389:25 propagates 328:25 propagation 273:17 properly 350:21 properties 275:6 380:25 proportion 319:7 proportions 332:19 proposed 299:22 336:2 338:13 339:10 370:13 proposing 336:5,18 338:14 339:11,16 340:3,7 369:23 375:4 provide 275:18 359:16 pulse 358:11 390:15, 25 pulse-ox 391:20 392:11 purple 310:2 312:4, 24 327:24 328:7,13,	16,19,24 355:16,20 purpose 317:18 319:18,19 371:1 put 271:15,18 288:1 294:10 295:14 297:9,13,22 330:25 351:9 362:24 383:1 puts 364:1 putting 299:22 363:9 Q qualified 384:25 quality 347:22 question 273:5 287:7 288:17 290:15 298:12,19,21,23 299:9,15 301:3 303:3 319:17 325:19 333:14,17,21,22 334:3 338:7,12,19, 23 339:1,4,6,8 340:2 345:3 348:4 349:11 352:19 362:16,17 364:9 366:4 368:23 369:1,18 373:22 374:8,20 380:4 387:18 questions 392:22,25 quote 288:18 317:11, 13,14 quoted 287:6 311:22 quoting 286:11 R racial 391:20 392:10 radiation 273:17 rainbow 307:11	range 344:5,9 347:11 348:9 372:17 373:9, 18 374:12,13 378:19 379:11 384:10 ranges 344:16 rate 352:9 390:15 ratio 319:6 358:20 361:11 371:13,18 391:14 ratios 358:20 361:11 re- 349:9 re-ask 299:15 303:3 334:3 339:8 349:10 373:21 374:19 reabsorb 331:10 reach 328:15 370:9 371:8 reaches 377:22 reaching 371:3 374:5 375:1 read 290:16 299:12 338:12 340:16 342:17 343:8 346:23 368:18 369:15 370:20 reading 284:23 285:18 287:11 290:9 291:14 295:12 298:2 300:22 308:7 314:24 317:24 321:17 322:4 326:10,11 330:24 338:25 343:16 344:8,9,13,15 348:6 364:21 366:13 367:20 368:16 reads 277:23 278:6 308:17 339:1 346:17 realize 288:3 289:2 290:21 338:4	realized 281:14 282:25 284:22,25 285:14,16 286:9,14, 19 287:3,9,23 288:20 289:25 296:12 rearranging 363:20 364:11 reason 270:17 280:8 reasons 295:9 recall 276:18,20 286:10 288:22 291:23 351:11 receive 313:25 314:7 316:7 318:12 337:2 359:15 360:9 received 281:23 359:3 360:10 391:14 recent 386:17 392:4 recently 353:5 386:16 recite 303:10 recited 316:19 356:14 recites 308:1 reciting 277:11 recognize 345:4 372:3 recollection 393:8 record 270:5,22 299:15 301:21 315:13,14 340:17 354:18 387:5 392:16,19 393:2,3, 11 red 306:7,14,20,24 307:20 309:15 310:20 311:13 315:2 343:22 344:16 357:11 361:5,14,17, 25 362:3
---	--	--	--

red/green 307:18 redirect 313:25 314:7 316:7 318:12 319:11 337:2 reduce 318:22 325:11 371:17 reduces 295:10 337:9 refer 278:2 279:4 294:2 351:13 377:15 380:15 390:17 reference 328:3 343:4 345:4 370:23 372:4 referring 294:4 303:20 363:4 reflect 329:8 331:15 332:23 reflected 331:11 332:7 333:11 334:8 reflection 329:22 330:4 331:1 reflections 332:17 reflective 313:24 314:6 316:7 317:3, 18 318:7,8,11,15 319:4,11,14,19 320:3,8,13,15,25 321:8 322:4 323:7 324:16,19,21 325:2, 16,22 326:5 329:7, 13,22 330:2,6,10,22, 25 331:2,23 332:6, 12 333:2,10 334:7, 12,14,15,22 336:8, 10,15,24 337:1,10, 11,15,20 338:2 339:17,19,23 340:8 region 274:11 275:2 317:12,14,20 318:20 319:20,25 321:15 322:11,12,22	323:21,22 325:9 331:25 332:13 334:23 337:9,17 regions 318:22 319:3 325:11 337:19 regression 314:25 315:5 relate 383:21 related 362:7 378:12 379:7 380:20 relates 333:22 relative 303:21 307:23 309:20 310:8,23 311:18 313:11 314:10 315:8 319:7 323:23 331:14,25 334:18 337:23 363:5 381:23 382:17 relevant 318:23 325:12 332:13 334:23 337:23 338:2 377:24 378:12 381:25 382:11 383:17 384:14 385:6 390:2 reliable 319:9 relies 331:1 relocated 294:6 rely 316:18 361:23 relying 340:3 remove 320:2,13 rendered 362:9 renders 277:24 341:23 361:21 367:7 reorientate 276:17 repeat 369:1 reporter 270:8 271:17	representative 290:10 329:15 require 290:25 294:21 382:8 required 287:1 289:22 requirement 309:18 310:22 requirements 275:19 requires 301:5 356:2 rereading 349:10 374:9 research 388:3,6 389:11,12 resend 320:21 respect 336:23 respectfully 279:15 338:6 restart 302:10 resulting 319:8 377:12 reveal 368:5 review 271:6 345:7, 11 368:21 reviewed 342:18 reviewing 294:25 321:10,11 360:22 368:2 ridiculous 338:24 339:2 right-hand 326:15 ring 389:19 robotics 389:3 rough 393:6 roughly 353:20 routinely 319:13	S Samsung 387:8,15 388:7 saturation 358:13,19 361:10,15 381:2,7 390:8 391:4,11 Saturday 270:2 392:18 scatter 317:3 318:15 323:7 324:21 325:2, 16 326:5 school 384:17 Science 388:20 390:14 scope 273:25 screen 326:21 scroll 283:5 372:9 section 277:7 278:3, 11,14 279:1 370:17, 23 387:3 segment 354:16 select 367:17,23 368:10 369:9 selecting 347:24 350:6 351:11 selection 354:8 semiconductor 272:24 308:6,11 312:23 313:8 314:1, 8 316:9 sense 291:17 sensing 376:22 377:9 378:5 380:16,19 381:1,5 sensitive 391:22 sensor 276:2,9,15
--	--	--	--

290:19 293:6,12,21 294:3,6,15,19 295:8 296:2 297:1,14,15 298:13 299:19,23 300:12,15,17 301:12 337:14,16 366:1 370:7,10,15 371:6 373:11,25 390:3 391:20 sensors 377:9,11 379:8 389:3 sentence 272:19 279:4 283:10 284:10 285:6,12,19 289:8 292:22 293:2 302:9, 12 317:1,7 341:21 342:10 346:16 348:5,21 357:6,15, 23 358:23 373:4 377:15 379:17,20,22 380:7,15 381:11,13, 22 separate 291:8 298:4 306:20 349:15,19,23 350:3 separated 308:18 313:4,9 service 386:22 set 291:5 shape 273:18 274:14, 15 share 326:21 sheet 353:5 Shoot 390:10 short 310:12 314:14 315:13 354:16 shorter 383:7 Shorthand 270:8 show 344:24 371:19	showed 306:8 showing 286:4 369:5 372:4 shown 286:18 287:9 290:21 292:1 296:24 298:3,13 299:19 320:24 323:15 324:11 328:12,16 337:12 338:16 339:13 363:6,22 364:1,10,12 365:4, 18 sic 386:19 side 326:16 Sideways 327:13 signal 275:23,25 276:4,9,14 278:9 281:8,23 282:23 283:13,15 284:3,5, 11,16 285:8,20 291:21 292:3 293:8, 13 294:14,20 295:9, 10,17 296:3,14 297:2,16 298:14 299:20 300:11,16,23 301:4 312:2,11 314:25 315:2,5,7 319:7 337:22,23 356:2,9,12,17,21,25 357:8 359:15 361:3, 23 365:14 371:14,18 376:24 377:6 378:7 389:13 signal-to-noise 319:6 371:13 signals 281:22 312:12 318:22 319:9,12 325:11 337:9 355:15,20 356:3,9,18,20,23 357:8,9 359:16 360:10 361:3,21	362:7 363:3 364:7 377:13 significant 353:7 similar 305:24 308:24 391:13 simple 301:2 single 276:6 282:23 284:22,25 289:7,12 291:5 situation 329:12 330:15,21 332:5,15 size 332:3 351:24 skill 273:5,15 274:4 275:25 280:15 281:3 286:17 289:3 290:20 292:2 293:4,18 295:5 296:1,8,25 308:7 318:9 324:14 331:5,10 333:8 334:5,11 335:16 336:25 344:3 350:15 352:2,22 356:7 360:17 362:1,18 364:13 366:9 370:5 371:10 375:21,25 376:2,6,19 382:8,13 384:6,25 skin 391:22,23 skip 381:19 slightly 297:23 353:12 small 319:16 345:21 smaller 323:21,22 solar 377:22 solution 291:4 someplace 330:5 sort 298:15 353:9 363:8 374:11	sounds 271:10 332:4 source 289:1,2 290:19,22 293:19 296:16 308:2,5,9 350:11 353:10,11, 12,13 sources 272:24 303:12,15 308:6,11 312:24 313:8 314:2, 9 316:9 346:18 347:5 space 291:8,15 spatial 308:17 spatially 313:3,8 speaking 352:22 353:3 specialty 389:1 specific 338:12 339:1 384:21 specifically 282:19 285:3,5 290:17 352:20 specifications 351:18 spend 382:11 384:22 spending 385:8,11 split 288:1,13 spread 320:3 stack 349:22 stamping 340:9 standard 362:4,5 start 280:1 313:2 359:21 starting 284:18 286:23 291:23 342:14 345:16,19 347:3 354:2 359:12 360:1,15 375:20
---	--	--	---

387:24	sum 295:5		362:9 363:7,11
starts 334:25 346:12	supervised 388:5,7	T	364:3 366:14 370:7
355:7 358:8 386:8	supported 362:5		371:2,5 375:4
state 368:8 375:24	surface 313:24 314:6	takes 385:10	technique 303:13
388:19	316:7 317:19 318:8,	taking 318:6 320:9	362:4 381:1
states 284:10 288:23	11 319:15,19 320:3,	321:19	techniques 361:8
346:24	25 321:8 322:5	talk 292:8 324:19	376:22,25 377:6
staying 323:8,10	324:17 325:22	336:9 360:24	378:5,7 380:16,19
STENOGRAPHER	329:21 330:22,23	talked 286:3 308:21	381:5 390:14
270:5 393:1	331:13 332:6,18	321:19 322:21	technologies 390:1
step 355:25	333:10 334:6,12	talking 291:21 320:6	telescope 377:21
sticking 291:25	336:24 337:1	321:2 327:15,16	telling 370:19
stopped 271:12	339:17,20,23 340:8	328:18	tenth 385:12
straightforward	surfaces 318:7,8	Tam 343:4 345:2,4,7,	term 273:7 274:5,6,
333:17	319:11 320:8,13,15	15,19 346:18,23,24	19,20 280:21 303:6
strike 296:19 297:4	332:12 334:15,22	347:3,4,11 348:10	terminology 379:17
298:7,18 309:9	336:10 337:11 338:3	353:21,23,24 354:7	terms 273:20 274:2,
333:6,14 334:24	surrounded 337:15	Tam's 345:11	12 275:1 336:7
338:9,18 373:12	system 275:22,23	target 335:20 336:11,	352:9 377:8 380:8
structure 322:13	276:2 281:12,20	16	testified 387:20
students 386:25	283:12,13 284:2,3,	targets 291:18	testimony 270:18
390:1,12	11,12,16,17 285:8,9,	taught 350:10 362:8	271:2 294:4 315:18
study 378:12 379:7,	12,14,16 286:5,9,13,	364:22 366:19	354:22 365:17 366:7
12	16 287:3,8,22	373:15	text 278:5,13 305:10
studying 378:13	288:20 289:24	teach 333:1 334:21	306:7,14 307:20
379:8 382:1,6,11,18,	290:22 291:21	353:7 390:9	308:18 309:16
21 383:11,14,17,18,	292:1,4 293:6,13,14	teaches 283:2 295:11	310:2,20 311:10
20,21 384:1,2,15,23	294:3,20 295:25	296:8 297:7 300:21	312:4 314:2 315:2,
stuff 384:16	296:3,22 297:2,16	301:8 318:17 330:1	25 316:6 341:5
sub-figure 292:17	298:14 299:21	333:4 337:7 354:7	364:23
subheading 275:14	300:16 301:4 304:21	361:20 362:23	thereof 284:6
substantially 272:14	318:12 335:18	364:20	thing 288:12 300:11
305:4,16,21 308:24	337:2,5 352:14	teaching 339:21	329:13 330:5 349:24
309:1	356:15 358:18	363:24 373:6	389:9
sufficient 378:18	361:6,9 363:22	teachings 291:10	things 288:13 306:21
379:25 380:13	364:12 365:3 376:24	298:4 318:6,9,11	320:2 352:1,20,23
suitable 284:5	377:6,20,22 378:6	319:23 320:7,9	tighter 354:8
	389:2,14	335:18 336:7,14,24	time 298:10 334:4
	systems 377:9 389:4	337:1 338:1 339:17	339:2 343:1,18
	390:12	340:10 345:12 351:6	

376:20 382:14,15, 17,21 383:3,4,6,8 384:22 385:7,8,11, 12,13,16 392:22,23	353:21 358:1 359:20 366:22 367:10 372:2,6 375:11,14 376:13,14 380:23 387:3	understands 330:24 352:23	volume 270:6 331:15 332:3 380:2
time's 302:14	turns 272:21	understood 273:15 276:1 279:20 280:15 281:4,9 284:24 285:20 293:5,18 295:6 318:25 319:10 337:12 362:2 379:16	W
Times 392:8	type 378:9 388:24 389:15	undertake 390:1	wanted 338:20 350:7, 8
tiny 332:24 334:19	typical 343:2,12,17	unwanted 318:22 325:11 337:9 370:8 371:6,11	wanting 373:7
tissue 275:5 335:20 336:11,16	typically 385:5	U	wavelength 343:22, 24 344:11,12,18,19 351:18 367:16 369:8 372:15,16 373:8,17 374:24
today 270:19,23	U.S. 281:19 337:12	up-to-date 386:13	wavelengths 303:14 309:15,19,25 310:1, 6,7 311:10,25 312:3, 9 344:5 349:6 355:16,21 356:4,10, 11,16,19,20,24 357:10,12 358:11,19 359:2,3 360:17 361:4,5,10,14,25 362:3,8,13,20 363:14 364:7 366:10 367:18,24 368:11 369:10 372:22,23 373:3 374:4,25 375:6,9 391:17,24 392:4
tone 391:22	Uh-huh 277:20 292:21 319:25 341:20 369:4	updated 386:16	
top 272:11 289:9 326:18 327:9 328:8 376:16 386:10	undergraduate 378:10 379:5 381:15,17 384:13 385:4	upper 327:18,20	
topic 333:16	understand 270:15 273:6 274:5,11 286:18 287:12,15 288:3,14 289:4 290:10,20 291:15 292:3 294:9 295:13 296:2,9 297:1,8,21 298:3 300:7,14,23 301:9 308:8 324:15 326:12 331:21 332:2,11 334:12 343:1,16 344:10,13, 15 347:18,20 349:13,18 352:3 356:8 360:18 362:16,18 364:14,22 366:6,9,16 369:1 371:10	upside 327:10,12	
totally 333:16		usability 351:24	
tradeoff 291:7,15 351:14		user 276:13,16 278:20,25	
tradeoffs 350:6,9 351:10,23 353:14 377:7		V	
transcript 393:3		values 374:3,24	
transmission 322:13		variation 391:23	
transmits 349:5		varying 378:17 379:23	
transmitting 322:16		verifying 376:10	
travels 328:23		version 294:5 328:9 363:4 386:2,3,4,13, 17	
trend 392:5		versus 383:22	
trends 276:10		VIDEOCONFERENCE 270:1	
true 373:1		view 308:24 316:21, 22 330:9 367:6,9 369:24 378:1	
truthful 270:18		visual 328:22	
turn 283:21 302:2 303:24 307:12 308:12 309:3 312:16 313:13 314:13 315:21 319:5 324:2 337:22 340:12,21 345:15 346:3 348:15	understanding 297:7 326:23 377:10		ways 288:2,3 290:3 300:5
			wearable 303:11 319:12
			Wednesday 393:7
			well-known 280:18 281:5,18 319:13 361:8 362:3
			Western 270:7
			wholesale 336:6
			wider 350:8,12 351:2, 15 352:4,16,25

353:13	yesterday's 271:3,8	
width 347:9	York 392:8	
wireless 370:7		
wondering 373:24		
389:15		
word 285:11 310:19		
words 351:9		
work 383:5,19 384:3		
389:19 391:21		
working 376:22		
377:3,18 378:2,4,24		
379:4,11,18 380:5		
392:2		
worn 276:13,16		
278:19,25		
wrap 392:17		
wraps 326:15		
write 280:7,13 304:14		
341:21 357:6		
written 387:25		
wrong 304:5		
wrote 272:12,20		
283:11 293:3 302:9,		
13,15 317:1,8		
335:15 348:23		
369:16 376:17		
381:22 389:24		
Y		
years 382:22,23		
383:1 385:5 387:22		
390:22 392:2		
yellow 313:5		
yesterday 271:12,16		
272:6 276:17 283:21		
286:4 301:15 321:20		
322:21 393:5		