

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AXION BIOSYSTEMS, INC.,
Petitioner

v.

AGILENT TECHNOLOGIES, INC.,
Patent Owner.

IPR2024-01467
Patent 11,906,508

Record of Oral Hearing
Held: December 12, 2025

Before GEORGIANNA W. BRADEN, DAVID COTTA, and
MICHAEL A. VALEK, Administrative Patent Judges.

APPEARANCES:

ON BEHALF OF THE PETITIONER:

JOSHUA NIGHTINGALE, ESQ.
GEOFFREY K. GAVIN, ESQ.
of: Jones Day
500 Grant Street
Suite 4500
Pittsburgh, Pennsylvania 15219
(412) 391-3939
jrnightingale@jonesday.com
ggavin@jonesday.com

ON BEHALF OF THE PATENT OWNER:

BRENTON BABCOCK, ESQ.
YANG WANG, Ph.D.
of: Sterlington, PLLC
530 Fifth Avenue
Suite 804
New York, New York 10036
(212) 433-2993
brent.babcock@sterlingtonlaw.com
yang.wang@sterlingtonlaw.com

The above-entitled matter came on for hearing Friday, December 12, 2025, commencing at 9:30 a.m. CST, at the U.S. Patent and Trademark Office, Southwest Regional Outreach Office, 207 South Houston Street, Dallas, Texas.

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

9:29 a.m.

JUDGE BRADEN: Good morning. We are convened for oral arguments in IPR2024-01467 which challenges claims in U.S. Patent Number 11,906,508.

I am Judge Braden. Also appearing via video are my colleagues, Judges Cotta and Valek. Welcome to the U.S. PTO Southwest Regional Outreach Office.

I will take this opportunity to address Counsel and their clients before we begin. As an inter partes review is a contested proceeding, today's hearing provides an opportunity for Counsel to orally advocate for positions on the patentability of the challenged claims as raised in the petition.

We understand that in every case that comes before us, the parties, both petitioner and patent owner, have a lot at stake. The judges, we're going to take our role in deciding this dispute seriously. We reviewed the briefs and evidence, and we are prepared today with questions. These questions and our answers will help us to decide the issues in the case.

In the interest of fairness and due process, we must limit our considerations to the arguments and evidence already present in the record. Our role as judges on the panel is to assess your arguments and evidence and weigh those in accordance with the burdens established by our rules and procedures and precedential authority, reminding parties that Petitioner has the ultimate burden of establishing unpatentability by a preponderance of the evidence.

1 We have the briefs and the evidence available to us on our computers,
2 so if we look away or look down during the hearing, we're consulting the
3 documents in the record or taking notes. Please know that we are paying
4 close attention to your arguments, and we are carefully considering the case.
5 And I apologize in advance, but when we interrupt you, we will do so to ask
6 you questions that may be essential to our resolution of the issues or to help
7 keep the hearing on track with time.

8 Now, we're going to go through a couple housekeeping issues.
9 Recording of any PTAB hearing is prohibited. The court reporter will
10 provide a transcript of the hearing that will become a part of the record in the
11 proceeding at a later date. To ensure the transcript of this hearing is clear,
12 we ask that you please speak directly into the microphone when talking and
13 to identify specific slide numbers, numbers and figures, and any other
14 pertinent identifying information when referring to demonstratives.

15 Please note that this proceeding is public and there may be those
16 listening on the public line. If the parties wish to discuss some confidential
17 information, please notify us before doing so, so that we can wall off the
18 public line.

19 In the hearing order, which is Paper 25, each party was given 45
20 minutes total time to argue their cases. Now, we have received -- or sorry,
21 Patent Owner's request for Mr. Wang to participate in oral argument under
22 the Legal Experience and Advancement Program, or LEAP. So, Patent
23 Owner will receive an additional 15 minutes of argument time during oral
24 hearing. That will bring your total time to 60 minute. We remind Patent
25 Owner that the LEAP practitioner must have a meaningful and substantive

1 opportunity to argue during the hearing today. That being said, there is no
2 set time requirement for that argument. It may be longer or shorter than the
3 15 minutes.

4 Petitioner will open the argument and may reserve rebuttal time which
5 may not exceed more than half of Petitioner's total argument time.

6 Petitioner may discuss their case in chief, the motion to strike, or any
7 objections that you may have. How you use your time is up to you. Patent
8 Owner will then respond to Petitioner's arguments and may reserve
9 surrebuttal time, also not to exceed more than half of Patent Owner's total
10 argument time. Patent Owner may respond to Petitioner's arguments, the
11 motion to strike, or any objections that you may have.

12 Again, how you use your time is up to you. But we do ask that you
13 please remember that your arguments should be limited to only those
14 arguments previously presented in your brief, and we ask that you please
15 make it clear which challenges and which claims you're addressing at all
16 times. We ask that the parties hold any objections that you have regarding
17 the party's arguments until it is your turn at the podium to note any
18 objections.

19 Now, we're going to go ahead and get started with appearances for
20 both parties for those who will be arguing today. If anyone is attending in
21 person or remotely with you today, but is not speaking, please identify them
22 as well. For example, please state if your client is attending or perhaps on
23 the public line. Following the hearing, we ask that you please confirm with
24 the court reporter to ensure that there are no questions regarding names or
25 spelling of any terms.

1 So we'll go ahead and start with Petitioner.

2 MR. NIGHTINGALE: Good morning, Your Honors. Josh
3 Nightingale with Jones Day on behalf of Petitioner, Axion Biosystems, Inc.
4 With me here today is my colleague, Geoffrey Gavin, also of Jones Day, and
5 we have several representatives of the client dialed into the public line this
6 morning.

7 JUDGE BRADEN: Very good. Thank you. And now Patent Owner.

8 MR. BABCOCK: Good morning, Your Honors. Brent Babcock. I'm
9 representing the Patent Owner, Agilent Technologies, Inc. With me is my
10 associate, Yang Wang. He's also a LEAP practitioner, and he's our
11 registered counsel here for the case. With us is Agilent personnel. We have
12 Jas Sagoo and Dan Hart in person for Agilent, and I believe we have a few
13 representatives from Agilent on the phone as well.

14 JUDGE BRADEN: Very good. Thank you, Counselor. Now, I will
15 maintain a clock, as you can see on the bench, and I will endeavor my very
16 best to give each party a five-minute warning during your opening argument,
17 and I will give you an appropriate warning near the end any reserved rebuttal
18 time.

19 Now, as you can see, the hearing room timer, I've got it set up for each
20 party with the specific allotment time, 45 minutes and 60 minutes. Now,
21 when the light on the clock changes to yellow, that means you're nearing the
22 end of your time, whether a lead or rebuttal. When the light is red, you've
23 run out of time and you need to finish it up.

24 So Petitioner, do you wish to reserve any rebuttal time?

1 MR. NIGHTINGALE: Yes, Your Honor. We'd like to reserve 15
2 minutes of rebuttal time.

3 JUDGE BRADEN: Very good. I would also recommend that both
4 parties please try your best to keep track of the time. And if you see the
5 clock behind me, if it does not start, please pause and remind me to start the
6 clock. Very good.

7 Patent Owner, do you wish to reserve any rebuttal time?

8 MR. BABCOCK: Yes, Your Honor. We reserve 5 minutes out of the
9 60 minutes.

10 JUDGE BRADEN: Very good. Are there any questions or issues that
11 the parties would like to raise before we begin, starting with Petitioner?

12 MR. NIGHTINGALE: No, Your Honor.

13 JUDGE BRADEN: Patent Owner?

14 MR. BABCOCK: No, Your Honor.

15 JUDGE BRADEN: Thank you very much. All right. Very good,
16 Petitioner. You can begin your arguments when ready.

17 MR. NIGHTINGALE: Good morning, Your Honors. Again, Josh
18 Nightingale of Jones Day on behalf of the Petitioner, Axion. As I
19 mentioned, I'd like to reserve 15 minutes of rebuttal time. And in my
20 presentation today, I'll be referring to our demonstratives which we filed as
21 Exhibit 1029.

22 So Your Honors, if you could please turn to Slide 2 of our
23 demonstratives. I'd like to first step through some procedural history of this
24 case. The '508 Patent issued the 30 claims, and our IPR petition challenged
25 all of them.

1 Ground 1 is an anticipation ground challenging Claims 23 through 30,
2 that's being anticipated by Xu-752. As we'll talk about, this is one of Patent
3 Owner's own patents.

4 And Ground 2 is an obviousness ground challenging the other claims,
5 1 and 22, based on a combination of Xu-752 and the second reference,
6 Jones.

7 Can you turn now to Slide 3, please? Patent Owner has disclaimed
8 several claims in its POPR for -- did disclaim several claims in its POPR.
9 These are Claims 9, 10, and 23 through 30. And then after institution, Patent
10 Owner disclaims additional claims with this Patent Owner response. So the
11 only claims that remain now, Your Honors, are Claims 1 to 8 and 11 through
12 15. And these claims are obvious over the combination of Xu-752 and
13 Jones, as we'll be discussing today.

14 Turning to Slide 4, I'd like to just briefly run through some
15 background information before we get into the specifics of the '508 Patent.
16 So starting with Slide 4, the '508 Patent is generally directed to what's called
17 cell substrate impedance monitoring. In the '508 Patent, this analysis is
18 performed with what's called a microtiter plate with two or more wells. So
19 on this slide, we show a microtiter plate having 16 wells in a 2 by 8
20 configuration, two rows and eight columns. Through our electrodes at the
21 bottoms of these wells and by applying a voltage or a current to the
22 electrodes, impedance of the wells could be measured.

23 Then to perform the cell substrate impedance monitoring, biological
24 cells are added to the wells that are deposited on top of the electrodes. And
25 these cells themselves act as impedances, and the cells' impedances can be

1 monitored. So this is the general technology area of the '508 Patent. It's a
2 system for observing cells' behavior by monitoring their impedances over
3 time.

4 If you can turn to Slide 5, we point out this technology was not new at
5 the time of the alleged invention circa 2008, 2009. It dates back to at least
6 1984. We have here a seminal paper by Giaever and Keese that was
7 published in 1984.

8 Turning to Slide 6, nine years later, nine years after Giaever and
9 Keese, in 1993, we have the Ghosh Paper that we cited in this proceeding.
10 That paper describes cell substrate impedance measurements taken at a
11 millisecond time resolution. Ghosh used this technique to study
12 electroporation of cells. So you can see here that Ghosh describes using a
13 lock-in amplifier to take impedance measurements once every 10
14 milliseconds. And Ghosh said that his amplifier can take readings as fast as
15 once every 5 milliseconds.

16 Turning to Slide 7, Ghosh explains exactly why millisecond time
17 resolution measurements are necessary in the system. Ghosh explains that in
18 electroporation, a voltage pulse is applied to cells, and that causes pores to
19 form in the cell membranes. When the voltage pulse is turned off, the pores
20 start resealing. All of this is happening very quickly. Ghosh says that upon
21 application of the pulse, pores form within 100 microseconds, not even a
22 millisecond, and pore resealing starts within a few milliseconds.

23 So Ghosh's objective is to study the formation and the resealing of
24 pores. And Ghosh is telling us that in order to observe, study these very fast
25 cellular activities, the impedance measurements must be fast enough. They

1 must be on the time scale of the cellular activity that's being studied. Ghosh
2 concludes his paper by saying that using an amplifier that has a faster
3 response time, you can take data more frequently, would be an
4 improvement.

5 So at least as early as 1993, it was understood that there were
6 applications of cell substrate impedance monitoring that would require or
7 benefit from millisecond time resolution measurements.

8 Turning to Slide 8, in the early 2000s, the company ACEA entered the
9 market. ACEA was later acquired by our Patent Owner here at Agilent.
10 And relevant to this proceeding --

11 JUDGE BRADEN: So Counsel, real quick. So my understanding is
12 that Ghosh, as you said, was actually doing impedance-based cell analysis,
13 looking at the creation and sealing of pores.

14 How does that relate to the millisecond time resolution for
15 measurement, time measurement, as it relates to the challenged claims?

16 How can we read Ghosh to say, you need to be able to look at time
17 measurement when it was doing this impedance-based cell analysis?

18 MR. NIGHTINGALE: Well, what Ghosh is saying, Judge Braden, is
19 that it is taking measurements once every 5 milliseconds or it also talks
20 about once every 10 milliseconds. So it is taking measurements on a
21 millisecond time resolution.

22 And, you know, the big point of Ghosh is that that it shows that there
23 were these applications that demanded millisecond time resolution regimens.
24 Going back to '93, people understood that some things you essentially can't
25 measure if you don't have fast enough measurements, if you don't have

1 millisecond time resolution measurements. Again, electroporation is
2 happening so quickly. You're just going to miss everything if the
3 measurements are not fast enough.

4 JUDGE BRADEN: Thank you, Counselor.

5 MR. NIGHTINGALE: Turning back to Slide 8, I mentioned -- so
6 ACEA filed the Xu-752 Patent. That's one of the prior art references we're
7 relying upon. The set up of Xu-752, we'll see, is essentially the same as that
8 of the '508 Patent. So we have a multiwell plate, an impedance analyzer,
9 and electronic circuitry for connecting the impedance analyzer to the
10 electrodes of the wells, and there's a software program. So, this is the basic
11 system.

12 Turning to Slide 9, let's talk about the subject matter of this IPR, the
13 '508 Patent. So in May 2008, ACEA filed a provisional that started a new
14 patent family that eventually included the '508 Patent. The '508 Patent
15 doesn't claim priority to Xu-752 or the previous family, but there's
16 overlapping inventors.

17 And if you turn to Slide 10, we point that the '508 Patent shares
18 significant amounts of disclosure with Xu-752. So again, it's the same basic
19 setup, multiwell plate, impedance analyzer, electronic circuitries were
20 connecting the impedance analyzer and a software program. So that is all in
21 Xu-752. What is allegedly new in the '508 Patent?

22 If we turn to Slide 11, the '508 Patent suggests that it made
23 improvements so that cells can be monitored with less time between
24 measurements. The '508 Patent calls out two allegedly inventive features.
25 These are the features that are allegedly not included in Xu-752. They are

1 multiple ADCs and two, taking measurements at millisecond time
2 resolution.

3 So for the millisecond time resolution feature, I want to just point out
4 what we're talking about is the amount of time between two consecutive
5 measurements of each and every well in the system. It's not the amount of
6 time to measure one well. It's looking at all the wells in the system and the
7 time between two consecutive measurements for any given well needs to be
8 at the millisecond time resolution.

9 Turning to Slide 12, we see that independent Claim 1 recites both of
10 the allegedly inventive features. It has a feature of about at least two ADC
11 channels. And of interest today, we will recite where in the impedance
12 analyzer monitors the electrode arrays at millisecond time resolution. So
13 this is the independent claim that we'll be addressing today, Claim 1.

14 Independent Claim 16, by contrast, it only had a feature about ADCs,
15 nothing about millisecond time resolution. And Patent Owner, as we have
16 mentioned, has disclaimed Claim 16 and its dependence. Independent Claim
17 23 didn't have either of these allegedly inventive features, and that claim was
18 disclaimed as well.

19 Turning to Slide 13, let's start talking about the obviousness of the
20 remaining Claims 1 to 8 and 11 through 15 over the Xu-752 and Jones prior
21 art references. So we talked about X-752. It's providing the same basic
22 setup as the '508 Patent. The other reference, Jones, is directed to an
23 improved impedance analyzer. Jones' impedance analyzer has a plurality of
24 ADCs that are electrically arranged in parallel to each other. So more
25 specifically, Jones' impedance analyzer uses what it calls parallel daughter

1 boards, and each of these daughter boards includes multiple ADCs. Jones
2 says that it's -- or yes, its parallel multiple -- excuse me, parallel, multiple
3 ADCs enable, quote, high temporal sampling in massive parallelism.

4 That's what we see in Slide 14. On Slide 14, I also want to point out,
5 paragraph 2 of Jones, this is where Jones starts talking about his invention,
6 the first sentence that is actually describing the invention itself. He starts out
7 by saying, the present technology is novel in that it provides an impedance
8 measurement system with massive parallelism, high temporal sampling, and
9 a means for interconnecting multiple microtiter plate sensors to impedance
10 measurement channels. So one of Jones' goals is clearly to provide high
11 throughput. Using this massive parallelism, Jones says, I want to provide
12 high temporal sampling, fast measurements.

13 Turning to Slide 15, Jones is explicit in stating that his system, quote,
14 employs parallelism to obtain the required throughput. You can see that our
15 slide, Slide 15 here. That is in paragraph 3 of Jones the right side of our
16 Slide 15. So Jones is telling us, each system, its impedance analyzer, it's
17 more than just a parallel arrangement of ADCs. Jones is saying that it uses
18 simultaneous parallel measurements to obtain the required throughput, so
19 we're clearly talking about parallel simultaneous measurements here.

20 Turning to Slide 16 briefly, we're highlighting here some of Jones'
21 configurability and flexibility. So paragraph 25 says, for example, that you
22 can use one daughter board for every column of wells as opposed to one
23 daughter board for every row of wells. That's an example of Jones'
24 configurability. And paragraph 42 says that there's also configurability in
25 terms of the reference channels that are being used. In one embodiment,

1 Jones says we're going to use four reference channels, but paragraph 42 says
2 you can use different numbers. You can use three reference channels, for
3 example.

4 Turning to Slide 17, I mentioned that Xu-752 teaches all the
5 limitations except for at least two ADC channels and millisecond time
6 resolution limitation. Here on Slide 17, we're making the point that the first
7 limitation is not in dispute. Patent Owner does not dispute that Jones
8 teaches at least two ADC channels. Patent Owner also does not dispute that
9 a POSA would've been motivated to use Jones' impedance analyzer with at
10 least two ADC channels in the context of the Xu-752 cell analysis system.
11 So the only disputed limitation we're talking about today is the millisecond
12 time resolution limitation.

13 Turning to Slide 18, let's now start discussing the obviousness of
14 configuring the Xu-752/Jones system for millisecond time resolution
15 measurements. Slide 18 has a little roadmap for the rest of my presentation.
16 So what I'd like to do today is now first explain why a POSA would've
17 readily understood that Jones' impedance analyzer is capable of taking
18 millisecond time resolution measurements, and then I'll explain why a POSA
19 would've been motivated to utilize that capability in the context of Xu-752.

20 So turning to Slide 19, so very briefly, I want to mention that both
21 sides are now interpreting the term millisecond time resolution as
22 encompassing resolutions up to 500 milliseconds. We discussed in our
23 briefing this term does have definiteness issues, but the parties agree that the
24 Board does not need to resolve these issues to decide the unpatentability of
25 the claims.

1 Turning now Slide 20, let's discuss Jones' capability for measuring
2 impedance at a millisecond, excuse me, time resolution, my apologies. Now
3 according to Patent Owner, Your Honors, Jones provides a single disclosure.
4 According to Patent Owner, Jones has a single embodiment and it has a 1.5
5 second measurement resolution. Patent Owner is referring to the
6 embodiment of paragraph 30 in Jones. If you look at paragraph 30, in this
7 embodiment, Jones is measuring a 96-well plate. Jones has measured in
8 each well at multiple frequencies. He's using 8 daughter boards and 4
9 reference channels. Now, Patent Owner says that this is Jones' only
10 disclosure, and that's incorrect. If you look at paragraph 3 --

11 JUDGE COTTA: Counsel, do you dispute that's the only embodiment
12 that's disclosed in Jones?

13 MR. NIGHTINGALE: No. Yes, I do dispute that, and there are --
14 you know, Jones refers to alternative embodiments, alternative
15 configurations.

16 Your Honor, if you're asking whether Jones puts everything together
17 into one compact package with the number of measurement frequencies,
18 reference channels, daughter boards, paragraph 30 is the main embodiment.
19 That is true, but what we're doing today or what we've shown in our briefing
20 is that these different configurations that Jones expressly described, they
21 result in different measurement resolutions. They are different embodiments
22 when you apply Jones' different express teachings.

23 JUDGE COTTA: So can I interrupt with another question? What is it
24 exactly that you're contending would have been obvious in Jones in terms of

1 number of frequency of measurements and number of wells, number of
2 reference channels, number of daughter boards?

3 What is the exact configuration in putting it all together, to use your
4 words, that you contend would have been obvious?

5 MR. NIGHTINGALE: Well, there's no one single configuration,
6 Your Honor.

7 Our argument is that if you have these known applications that require
8 millisecond time resolution measurements, a POSA would've been
9 motivated to use the parameters that are expressly described in Jones, in Xu-
10 752, use those parameters to achieve those known applications. For
11 example, if you want to study electroporation of cells, where things are
12 happening on the scale of a few milliseconds, a POSA is going to know --
13 he's going to say, Jones has taught me I can use single or multiple
14 frequencies; I can use different configurations of daughter boards; I can use
15 different configurations of reference channels. That is how I'm going to get
16 the measurement resolution I need to perform this known application.

17 So it's not proposing speed for speed's sake. It's not -- we didn't -- Dr.
18 Kim didn't pluck parameters out of thin air. He's using the parameters that
19 are described in the prior art references in saying that POSA will know how
20 to configure the system to get the speeds that he needs.

21 JUDGE COTTA: And are you relying exclusively on your expert's
22 testimony for that?

23 Or are there references, for example, that suggest if you need to
24 measure more frequently, you should reduce the number of frequencies or
25 you should reduce the number of wells?

1 MR. NIGHTINGALE: I believe we are relying on our expert for
2 showing that a POSA would have understood these basic levers that you can
3 configure and change, and really are using our expert to show how those
4 different changes would affect the measurement resolution in Jones, starting
5 from that 1.5 second measurement resolution in paragraph 30. For example,
6 if I go from multiple frequencies to a single frequency, what is the effect of
7 that?

8 And our expert testified that when you make a single change, for
9 example -- and I'll point you to paragraph 72 of Dr. Kim's declaration.
10 When you make that single change, you keep paragraph 30, the paragraph
11 30 embodiment, exactly as it is, the two measurements have a single
12 frequency, which Jones tells you you can do in paragraph 3. Taking that
13 single change decreases the number down to the millisecond time range.

14 JUDGE COTTA: Does your expert provide testimony explaining
15 specifically why one would make that change?

16 MR. NIGHTINGALE: He does, Your Honor, and this goes back to
17 those known applications. Our expert testified a POSA knew about Ghosh.
18 He knew about the other references we cited. Yu, Mohr, Pancrazio, Heer,
19 other references, they all teach that. There were these applications that you
20 need millisecond time resolution measurements. Those applications, you
21 know, either benefit from fast measurements or cannot be performed if
22 they're not performed fast enough. That is the POSA motivation. POSA
23 will note, I can't study electroporation unless I configure the system
24 accordingly.

1 JUDGE COTTA: So just to make sure I understand your position,
2 your position is that it was known in the art that there are applications that
3 required millisecond time resolution, and it was known that there were
4 applications where things had been measured in millisecond time resolution.

5 And therefore, a person of skill in the art would have been motivated
6 to make whatever changes are necessary to Jones to get there?

7 MR. NIGHTINGALE: Essentially, Your Honor. Not whatever
8 changes, but a POSA would've understood, Jones gives me these different
9 configurations, different parameters that I can manipulate, that I can change;
10 if I want measurements -- again, in view of these known applications, a
11 POSA is going to use the different configurations, the different parameters
12 expressly described in Jones, to achieve the measurement speed that he or
13 she needs to.

14 JUDGE COTTA: Is it just common sense, or is there a specific
15 teaching in Jones that talks about what happens when you, for example,
16 reduce the number of wells or reduce the number of frequencies?

17 MR. NIGHTINGALE: No. So just to start to be clear about
18 the number of wells, our argument is that we're essentially applying Jones'
19 impedance analyzer to the 16- and 96-well plates of Xu-752. Those are the
20 plates that Xu-752 uses. In terms of does Jones come out --

21 JUDGE COTTA: So I just wanted to pause there because I want to
22 make sure I understand your position. I previously asked if there was a
23 specific number of wells, number of frequencies that you were contending
24 were obvious.

1 Are you now saying that what you're intending would've been obvious
2 is the 8 by 2 configuration?

3 MR. NIGHTINGALE: Well, I'm not -- I don't think contending that
4 any particular -- I guess these configurations are obvious, but I mean, I guess
5 what I'm trying to get across is that in our obviousness combination, we're
6 applying Jones' impedance analyzer to the 16- and 96-well plates of Xu-752.
7 And further, we've shown both the motivations for -- again, for manipulating
8 the different parameters to achieve the required measurement resolution. So
9 there's no one particular configuration, but the point is, is that Jones provides
10 us parameters, and it would be obvious to utilize those different parameters,
11 and it would be obvious to utilize Jones' capability when you need fast
12 measurements.

13 But as to your question, Your Honor, about whether Jones has any
14 express teaching about what happens when I go from multiple frequency
15 measurements to a single frequency, that is what our expert explained. Our
16 expert showed that when you use measurements at a single frequency, that's
17 going to be faster. Dr. Kim explained how exactly applying that single
18 frequency measurement, how that would affect the measurement resolution.
19 So this is our expert explaining how a POSA would've understood the prior
20 art.

21 So Jones doesn't need to come out and say, when I go from multiple
22 frequency measurements to a single frequency, I get this change in
23 measurement resolution. What matters is how a POSA would've understood
24 the reference, and that's what our expert testified as to. When we make this
25 change, here's how the measurement resolution changes.

1 JUDGE VALEK: So Counsel, just to be clear, Jones does not actually
2 come out and say that if you need to go faster, you can use less frequencies
3 or you can use less wells. That's something that is coming just from your
4 expert, correct?

5 MR. NIGHTINGALE: That's correct. A POSA knows that if you use
6 fewer frequencies, if you don't measure multiple frequencies, it's going to be
7 faster. You know, if you measure 16 -- you can measure 16 wells faster than
8 96 wells.

9 JUDGE VALEK: Is there a reference that you contend teaches the
10 millisecond time resolution limitation? Because I'm having trouble trying to
11 find it. Because you say Ghosh has these applications and Jones' analyzer is
12 capable of at least being set up to get there.

13 But is there a reference that actually teaches the millisecond time
14 resolution limitation in your view?

15 MR. NIGHTINGALE: Yeah, Jones does. In our view, Jones teaches
16 a millisecond time resolution measurement. He teaches the 1.5 second
17 example and then provides these other parameters. A POSA reads those
18 other parameters and understands this results in millisecond time resolution.
19 If you look at paragraph 72 of Dr. Kim's declaration, Exhibit 1003, Dr. Kim
20 explains how you make one change to Jones' paragraph 31, you take
21 measurements at a single frequency, and you're already a millisecond time
22 resolution range. A POSA understood that. So yes, our view is that Jones
23 does teach millisecond time resolution measurements.

24 JUDGE COTTA: Counsel, if you just go with the 8 by 2
25 configuration from Xu and make no other changes to Jones, does that get

1 you to the millisecond time resolution, or do you also need to adjust
2 frequencies of measurements, number of reference channels, number of
3 daughter boards, anything else?

4 MR. NIGHTINGALE: I'm not entirely sure, Your Honor. I believe
5 that if we look at paragraph -- the example of paragraph 137 of Dr. Kim's
6 declaration. I believe in this example, he is applying Jones' paragraph 30
7 embodiment to a 16-well plate and getting millisecond time resolutions, yes.

8 JUDGE COTTA: But he's using three reference channels, and at least
9 my recollection was that the embodiment of Jones in paragraph 30 uses four.

10 MR. NIGHTINGALE: Okay.

11 JUDGE COTTA: Is there a reason that he's gone from four to three?

12 MR. NIGHTINGALE: Yeah, I mean, the reason again, Your Honor,
13 is that -- the known application. If you want fast measurements, if you want
14 to study electroporation, if you want to study GPCR activation, what Yu
15 talks about, if you want to monitor -- excuse me, monitor cardiomyocytes,
16 which were known to have a beating activity in the millisecond time range,
17 that's why you make that change. A POSA looks at Jones and says, I have
18 these different levers; I can change the number of reference channels; I can
19 change the configuration of daughter boards; if I want this measurement,
20 Jones tells me how to do it; I manipulate these different parameters of Jones.

21 JUDGE VALEK: Counsel, if you don't mind me interrupting. Maybe
22 some education would help, some background here, because I don't think it's
23 ever really been clearly laid out. It seems like if you're giving up reference
24 channels where you're going from multiple frequencies to a single

1 frequency, you're giving up something in the capacity of the analyzer, and so
2 there's some sort of trade-off.

3 What happens when you give up -- when you move from multiple
4 frequencies to a single frequency?

5 Why would one of skill in the art think that it would be okay to use
6 just a single frequency in order to go faster, for example?

7 MR. NIGHTINGALE: That's a great question. Your Honors kind of
8 asked about this in the institution decision, saying that Petitioner didn't
9 account for the negative effects of changes. What we pointed out in the
10 reply is that Petitioner, we as the patent challenger, we didn't have an
11 obligation to preemptively address negative effects. That's the first point.

12 The second point is that Your Honors, I would say, invited Patent
13 Owner to identify negative effects, to tell us why a POSA would not make
14 those changes. If you look at the briefing, Patent Owner never came out
15 with any negative effects, never said, you know, there's a problem if you
16 change from multiple frequencies to a single frequency, nothing like that. So
17 we can sit here today. We can speculate that, you know, negative effects
18 would occur, but there's nothing in the record on that.

19 And the other thing I'll say, Your Honors, is that we know that when
20 we're dealing with Section 103 and obviousness, a particular combination is
21 not going to be all things to all people. You know, if you want data at
22 multiple frequencies, no, you may not be inclined to change the simple
23 frequency. But if you're a POSA and you want to study electroporation of
24 cells, you need these fast measurements, you may be willing to accept these
25 trade-offs, for example.

1 JUDGE VALEK: But it also occurs to me, Counsel, that one of skill
2 in the art may rule out Jones's analyzer for exactly this reason if they want to
3 do the application of Ghosh. It may be that it's just not suitable for that
4 purpose, and that's why it's important to consider these trade-offs, these pros
5 and cons.

6 And I get what you're saying. You're saying, well, we don't have the
7 burden. But the question here is Jones teaches, at least in its only specific
8 example, using multiple frequencies and using four reference channels, and
9 presumably it's doing that for some reason that one of skill in the art would
10 understand.

11 And what I've asked you is, do you have anything in the record that
12 explains why that setup exists in the first place and why one of skill in the
13 art, if they are motivated to pursue Ghosh's application, will understand it's
14 okay to go down to a single frequency; it's okay to eliminate these reference
15 channels; we can still do this and get accurate data?

16 MR. NIGHTINGALE: No, I mean, we don't have that type of
17 argument in the record, again, because Patent Owner didn't challenge.

18 JUDGE COTTA: Counsel, if we interpret Jones as disclosing, for
19 example, a range of frequencies of measurement, a range of numbers of
20 wells, a range of reference channels, a range of numbers of daughter boards,
21 you know, all of these are different parameters. And you have to pick
22 specific parameters in order to arrive at the claimed millisecond time
23 resolution.

24 Isn't it your burden to explain why you would pick the particular
25 parameters that you picked?

1 MR. NIGHTINGALE: It is our burden, Your Honor. And we believe
2 that we met that burden by showing the known applications, by showing that
3 in instances a POSA would've been motivated to apply these different
4 parameters. Maybe not all the time. You know, if you need lots of
5 measurements and lots of frequencies, if you need to measure a 96-well
6 plate, you're not going to do a 16-well plate.

7 In some instances, it would've been obvious to do this. Obvious
8 doesn't -- the combinations for Section 103, it doesn't need to be ideal, it
9 doesn't need to be the best option, but it doesn't make it nonobvious to do
10 this particular -- to do the particular configurations that we discussed.
11 Again, all these parameters are right there in Jones. We're not talking about
12 multitudes of parameters. We're saying that number of frequencies,
13 configuration of daughter boards, and number of reference channels. That's
14 it.

15 JUDGE BRADEN: Counsel, so Ghosh issued or published in 1993
16 using milliseconds time resolution between those two measurements for
17 wells. It's got a well plate. But then Jones, which issued in 2007, doesn't go
18 down to millisecond time resolution. Presumably, Jones was aware of
19 Ghosh and others like Ghosh that had no second time resolution. The fact
20 that it doesn't do that, I'm not sure how you can read in it to say it would be
21 obvious given that Ghosh was so much earlier.

22 How do I get there? How do I think that it would be obvious to use
23 the system of Jones when Jones itself didn't use its systems to get down to
24 millisecond resolution? How is that not hindsight analysis?

1 MR. NIGHTINGALE: Your Honor, excuse me, Judge Braden,
2 hindsight analysis is when you start with the claims and you -- and when you
3 start with the claims and use those as a roadmap to piece together the prior
4 art. You did not start with the claims. You started with these applications,
5 where these are applications where a POSA would've been aware of, and
6 that is the motivation for applying these different parameters.

7 I'll point out that the passage of time between 1993 and the '508
8 Patent, that is not enough to establish nonobviousness. We know, or Federal
9 Circuit case law tells us, that the passage of time needs to be paired with
10 secondary considerations of nonobviousness such as, like, folks were trying
11 to achieve millisecond time resolution measurements but they were unable
12 to. So we don't have any of that. So the passage of time is not enough.

13 And again, I'm going to disagree with you that Ghosh didn't -- that
14 Jones didn't teach millisecond time resolution measurements. If Jones only
15 gave us that paragraph 30, fine. But Jones tells us these different parameters
16 that when you apply them, you do get the measurements that we're talking
17 about here. You do get the resolutions of the claims.

18 JUDGE BRADEN: I think I understand your position, Counsel.
19 Thank you.

20 MR. NIGHTINGALE: If there are no further questions, Your
21 Honors, I'm going to save the rest of my time for rebuttal.

22 JUDGE BRADEN: Very good. You have 12 minutes and 17 seconds
23 for your rebuttal time.

24 And Counsel, please confirm that you would still like 5 minutes of
25 surrebuttal time.

1 MR. BABCOCK: Yes, Your Honor.

2 JUDGE BRADEN: Thank you.

3 MR. BABCOCK: It's always tough going second, Your Honors, and
4 good morning to -- we've already kind of got into the weeds, and our slide
5 deck starts at kind of a high level. I will address the questions that some of
6 you -- that Counsel addressed -- in my presentation, and of course, feel free
7 to interrupt.

8 Just for my edification, Your Honor, I see Judge Braden. I know
9 you're in the middle. I believe it's Judge Cotta --

10 JUDGE BRADEN: Yes.

11 MR. BABCOCK: -- on my left, Judge Valek on my right.

12 JUDGE BRADEN: That is correct. Yes.

13 MR. BABCOCK: Okay. They didn't put the signs up unfortunately,
14 so I -- but anyway, good morning. Good to see all of you.

15 Our slide deck begins on Slide 2. This is our roadmap for presenting
16 the case today. I'm going to be presenting Issues 1, 2, 3, and 4. My
17 colleague, Yang Wang, is going to be presenting Issue 5, and then I'll be
18 closing out with Issue 6 if there's time. We do have some comments on the
19 slide deck that Axion provided to the Board, so we can address those as well
20 depending on how quickly this goes. I'll try to go through some of the basics
21 pretty quickly since I think we're already beyond some of this.

22 Issue 1, it's on Slide 3, the parties' core dispute.

23 Moving to Slide 4, Claim 1. It's a pretty straightforward IPR, one
24 independent claim at issue. It recites three or four key limitations: plurality
25 of wells, not just one, but a plurality of wells; impedance analyzer to

1 measure impedance; at least two ADC, analog-to-digital conversion
2 channels; and then, of course, the key, millisecond time resolution.

3 All of the dependent claims on Slide 5, Claims 2 through 8, 11
4 through 15, all depending directly or indirectly on Claim 1. And for
5 purposes of this IPR, I think we're all in agreement that resolution of Claim
6 1 resolves all of the claims in dispute.

7 And we are focusing on Slide 6, millisecond time resolution as the
8 key limitation that's absent from the combination. And I think we looked at,
9 on Slide 6, from the petition that Axion acknowledged today, again, that Xu,
10 or Xu-752, does not disclose millisecond time resolution. So the question is
11 does Jones disclose millisecond time resolution?

12 Axion bears the burden. This is a single ground. It's Xu plus Jones.
13 It's not Xu plus Jones plus Kim declaration or plus Giaever and Keese. We
14 heard about Ghosh. We've seen Yu, Mohr, Pancrazio, Heer, Yang, Qiu. All
15 these references show up in their slides. Those aren't the ground. The
16 ground is Xu-752 plus Jones.

17 And this is not your typical reason to combine case. This isn't a case
18 like, typically, you have these other references to show a person of skill in
19 the art would've combined the two references, and this other background art
20 is relevant to show why you would've combined. This is a case where even
21 if you combine the references, you're missing the element. So this is a
22 missing element case.

23 So all the reasons to combine -- there's not a dispute in this case about
24 reasons to combine. We're not saying it's -- there would've been. We're
25 saying you don't need to go there because even if you combine Xu-752 and

1 Jones, you're still missing the millisecond time resolution limitation. So all
2 of the discussion about other art teaching you how to combine these things,
3 really irrelevant to this case.

4 Moving on to Slide 7. So Agilent used the Board's DI as what we
5 should do, which we probably should do is kind of guidance to help narrow
6 the issues and address what the Board's initial analysis was. We looked at
7 the petition and saw that Claims 23 to 30 probably should be disclaimed
8 based on the art that was raised, so we disclaimed that.

9 We looked at the DI, and while we thought the middle set of claims
10 was patentable, we saw the Board's initial determination that they were
11 skeptical. And we said, well, in light of that, you know, we think let's just
12 go ahead and disclaim those as well. Let's just focus on the key invention
13 here, which is the millisecond time resolution, and so we disclaimed
14 everything but this first set of claims, 1 through 8 and 11 through 15.

15 And you probably realize that the two middle claims were because --
16 again, we're using the Board's guidance here. The specific definition in the
17 definition section says less than 300. So we went with that and thought that
18 makes a lot of sense. The Board looking at the entire specs said, wait,
19 there's a few places where it says 500. What's up with the 500 versus 300?
20 And we said, you know, that's a good point, that under the law, we can
21 construe claims even if there's a definition specific. If there's other
22 disclosure that might supplement that understanding, go ahead and use that
23 as well. So we said, okay, probably 500 is probably the better way to go. So
24 that's the proposal for this limitation or for this IPR.

25 So bottom of Slide 7 --

1 JUDGE VALEK: Counsel, let me just interrupt you for a second.
2 You're saying that Patent Owner agrees that millisecond time
3 resolution is 500 milliseconds or less?

4 MR. BABCOCK: The number is correct. It's just -- it's not just a
5 scan of a single well. Importantly, it's a scan of all of the wells being
6 measured, so it's between two consecutive scans of all the wells being
7 measured. It'd have to be less than the 500.

8 So I would be pointing out here you see a lot of blurring between
9 what's a scan time, and the scan time is not millisecond time resolution.
10 Millisecond time resolution is like throughput or the update rate. It's the
11 time to do two consecutive scans of all the wells that are being measured,
12 and that's what Jones discusses in two places. Required throughput, that's
13 scanning all the wells in the plate in a given period of time. That includes
14 scanning the wells. It includes the switching time. It includes the settling
15 time and all of that, how long to do all of the wells from one scan to the next
16 scan. And it also says update period, the target update period. So that's the
17 1.5 seconds.

18 So we need to be careful not to say, what's the scan time, because
19 even in Jones, the scan time for a single well is 67 milliseconds. That's not
20 millisecond time resolution as the patent -- the way patent defines it. The
21 patent says, at least -- it has to be each and every well being measured
22 between two -- the time between two consecutive measurements for all of
23 the wells on the plate that are being measured. So --

24 JUDGE VALEK: Counsel, let me just make it clear, then. Your
25 position as the Patent Owner is that the term millisecond time resolution

1 means that the time between the measurement for every well on your plate
2 has to be 500 milliseconds or less?

3 MR. BABCOCK: Correct. That's correct.

4 JUDGE VALEK: Thank you, Counsel.

5 MR. BABCOCK: So bottom of Slide 7, millisecond time resolution
6 is the key dispute here. It's the sole dispute, really, that we're focused on in
7 this IPR. And the question is, we know Xu doesn't disclose it; does Jones
8 disclose it? And the answer to that is no.

9 Slide 8, again, missing limitation, there's nothing in this IPR that
10 would suggest that there needs to be some kind of motivation to combine
11 these references. I mentioned before this is a missing element case. So even
12 if you combine them, you're not going to get that missing limitation.

13 Moving to Slide 9, you'll see this is -- Slide 9 on the left shows the --
14 I'm going to put claim chart in air quotes because you see the claim chart
15 that Axion put together. But of course, it misses millisecond time resolution.
16 So there's nothing -- they can't -- they don't point to Jones on the right to
17 show millisecond time resolution, which is the key missing limitation.

18 Let's go to Slide 10, which was the next segment of our presentation.
19 Let's talk about the express definition, and this gets to Judge Valek's
20 question. Here's the definition, and this is the express definition from the
21 patent, column 9. That's the definition section. Column 10 says a series --
22 to perform a series of at least two consecutive impedance measurements
23 within milliseconds of one another for each and every well of the system.
24 That's what millisecond time resolution means.

1 And it says, measurements are less than 300 milliseconds from one
2 another. Express definition, not just talking about the scanning of a single
3 well, we're talking about at least two consecutive measurements within
4 milliseconds of one another for each and every well of the system. Very
5 safe for the Board to adopt this definition with a slight modification, as
6 Judge Valek discussed, of using a few other places in the spec to say that
7 300 should be 500 for purposes of this IPR.

8 Slide 12, Axion wants to run from this definition. Their petition just
9 says, plain meaning, even though there's an express definition in the patent.
10 And they say they're going to use ordinary meaning for that definition.
11 Board should not use ordinary meaning when the patent expressly provided
12 a definition.

13 And it's not just in that one place. If we go to Slide 13, you can see a
14 variety of places where the patent is consistent with saying the impedance
15 measurements for each and every well at millisecond time resolutions. For
16 each and every well, they measured two consecutive measurements between
17 each and every well.

18 And these, on Slide 13, are just some examples of the places, but it's
19 all consistent that we're talking about the entire -- I'll use the word
20 throughput or update rate, using the terminology that we're familiar with
21 Jones, what's the entire time that you scan all the wells and the time between
22 two consecutive scans. So you have a plurality of wells. You've got to scan
23 them all. What's that time period? And that's what millisecond time
24 resolution means. It has to be under 500 milliseconds.

1 I'm going to Slide 14. You can see that there in the patent, it says
2 each and every well, less than 300.

3 But then we, on Slide 15, saw that there are places in the patent where
4 it does say 500. And there's a couple of examples there on Slide 15 where it
5 uses the same analysis in each and every well. But it says in some cases,
6 500 is sufficient. So I think for the Board to be safe and for us to be
7 consistent with how the law requires the Board to construe patent claims
8 which would use the entirety of the specification for 500.

9 Moving to Slide 16. I think the Board recognized this in the DI and
10 pointed out that difference as I mentioned earlier. Dr. Sanchez looked at it
11 and said, yeah, the 500 milliseconds makes sense. And for this IPR, it
12 doesn't really matter, right? Jones is 1.5. If the Board determines the correct
13 construction is 300 and 500, it doesn't really matter for this case. It's not like
14 there's a -- there's a prior reference that's at 400. And certainly that
15 difference might be different, but that situation doesn't exist. So we just
16 wanted to eliminate that issue, that dispute, deal with 500, that situation.

17 Now onto the third section, Jones, the big fight here about what does
18 Jones disclose. Slide 18, I think it's important to understand that Jones is
19 from MDS Sciex. That's their assignee. And what they were trying to do is
20 to take a big system and make it compact and use boards, like, along with
21 new specs, requires you make this a very small compact system, so a smaller
22 form factor. Nowhere in Jones has it ever said anything about increasing
23 speed. Improving throughput, not in there. It does talk about increasing the
24 accuracy and maintaining required throughput and the target 1.5 second
25 update rate.

1 So you have what's in the art, and we will show you -- we've showed
2 you in the briefs what was in the art in 2006. Well, the CellKey was in the
3 art, and it was a two-second update rate. You can do two-second or you can
4 do ten-second. That was what was known, and so what Jones is doing is
5 saying, how can we take that big CellKey device -- and I'll show you on
6 slide -- there it is, on Slide 44.

7 So there you have a big commercial product. And how do you take
8 that and make that small? My screen just went out. So I'm back now on
9 Slide 18. So the goal of Jones was shrink it down, but what happens when
10 you shrink something down? You're putting everything close together. It's
11 getting hot. And so you look at all the Jones figures, and it's about airflow
12 and maintaining cooling so you can keep this thing cool enough to do what?
13 To maintain the same system specs as what they want, which is -- MDS
14 Sciex was 2.0 seconds. Jones is 1.5 seconds. That's what you want to
15 maintain. That's your target goal, making it a small form factor.

16 So if you go through and you see when does Jones talk about the key
17 issue, the time it takes two measurements or more -- the time it takes two
18 measurements of all wells. It discusses it twice, the word throughput, and he
19 doesn't just say -- he never says increase throughput or improve throughput.
20 He says required throughput. He doesn't give a number initially. He just
21 says required throughput. That's the system spec.

22 And then in paragraph 30, which we've discussed a lot in our brief, the
23 target. Not just a number that's thrown out. That's the goal of this system is
24 1.5 second update rate. That's the time to do all of the measurements of all
25 the wells. So that's --

1 JUDGE VALEK: Counsel, can I ask you a question?

2 MR. BABCOCK: Of course.

3 JUDGE VALEK: Does Jones ever explain why that's the target
4 update period?

5 MR. BABCOCK: He doesn't, but the reason we put in the evidence
6 from the art, contemporaneous art, was that that's what was done at that time
7 period. That's what MDS Sciex was selling in the CellKey. Two seconds
8 was what was -- that was the commercial goal. That was the specification of
9 the system.

10 JUDGE VALEK: Counsel, does your expert explain why that's the
11 target update period?

12 And if so, can you point us to where in your expert's declaration that
13 explanation is?

14 MR. BABCOCK: He does discuss the CellKey device and discusses
15 that it's a two-second update rate, so that's part of his declaration. We can
16 dig that out where he discusses that. And that is a two thousand -- I think
17 circa 2006 device, so that was what was known as an impedance analyzer
18 system available for commercial use.

19 JUDGE VALEK: Maybe do that on your sur-reply. It's just helpful,
20 Counsel, for us to know where in the record the evidence is.

21 MR. BABCOCK: Let me find that for you.

22 JUDGE VALEK: You don't have to do it now.

23 MR. BABCOCK: Okay.

24 JUDGE VALEK: You have that sur-reply period. But it would be
25 helpful if you could point us to the evidence.

1 MR. BABCOCK: Right. And I'm sorry, Judge Cotta?

2 JUDGE COTTA: Yeah, I was wondering if you could address
3 Petitioner's evidence that there were specific applications that require
4 millisecond time resolution and that there is, in fact, prior art that takes
5 measurements in millisecond time resolution or is not limited to 1.5 or 2 to
6 10 seconds.

7 MR. BABCOCK: Right. So Your Honor, that's a good question, and
8 everything they pointed to talks about a measurement speed making a single
9 measurement. It's like the Jones 67 millisecond reference. It's not -- they
10 say, oh, that's the millisecond time resolution. Yet, that's not understanding
11 what that -- that term means something inside of the art, this patent. It's not
12 just, oh, it's milliseconds. It's millisecond time resolution.

13 That's how their petition treats it. It's like, oh, if it's less -- you know,
14 67 milliseconds, that's millisecond time resolution. That's not what the
15 patent defines it. So none of the references they point to discuss doing
16 exactly what the claim requires, taking two consecutive measurements over
17 all the wells being measured. Ghosh is a petri dish. There's no discussion of
18 multiple wells and taking serial measurements. There's no discussion of
19 that. None of the other references do, either.

20 JUDGE COTTA: Counsel, Ghosh does say that they set up an
21 amplifier to take a measurement once every 10 milliseconds.

22 Why wouldn't that -- aside from the plurality of wells problem, why
23 wouldn't that be a millisecond time resolution?

24 MR. BABCOCK: Because, again, the claim requires a plurality of
25 wells, and when you design a whole new structure to say, now we're going

1 to do a -- instead of a petri dish of a single plate, you're going to now do an
2 array of multiple wells. You have to figure out how to design all of that.
3 Ghosh has nothing to do about measuring multiple wells in a sequence in a
4 millisecond time frame. Again, it's no better than Jones, which just says you
5 measure a single well at -- you know, in a certain period of time. There's no
6 discussion in Ghosh about measuring multiple wells and how long it would
7 take to do that. You could -- Dr. Kim speculates, comes up with calculations
8 that says, oh, a person of skill in the art could do all of this, but that's not in
9 Ghosh. That's all extra testimony to try to embellish what Ghosh actually
10 teaches. So none of those references teach plurality of wells, measuring
11 from two consecutive time periods.

12 In fact, the reason that Jones is 1.5 seconds is because -- I think Judge
13 Valek raised this issue. We have 67 milliseconds for one measurement.
14 Why is it that millisecond time resolution? Because the trade-off is that you
15 have to -- when you're doing all this switching, you have all of these
16 switching times, and you have all of these settling times, and you have a lot
17 of extra time, all of the different channels that you're measuring to maintain
18 accuracy.

19 You see, in Jones, he does talk about maintaining accuracy, improving
20 accuracy. He talks about improving the ability to make sure the machine
21 actually gives accurate and repeatable measurements. That's not just taking
22 a measurement. So that's why Jones takes a lot of time, and that time has to
23 be factored into the throughput or the update rate.

1 JUDGE COTTA: Counsel, your mention of switching time, that's
2 something we haven't discussed yet, and I know there's a reference that's
3 subject to a motion to strike which addresses switching time.

4 Is there any evidence beyond that document as to how much time
5 would be required for switching time?

6 MR. BABCOCK: Let's look at Jones itself, Your Honor. Exactly
7 there. So on Slide 21, this is the paragraph 30 reference. And we have 12
8 wells plus 4 reference channels. That's what paragraph 30 says. You have
9 16 channels. He has 68.2 milliseconds per channel. So you multiply that by
10 the 16, you get 1,091 -- 1,091 seconds.

11 Notice he doesn't say of all the update -- the switching time is a
12 certain amount. What he does is he says, now our target, we know our target
13 is 1.5 seconds, so we're going to use every amount of leftover time for what?
14 For time left for multiplexer switching and signal settling. And so he takes
15 the 1.5 seconds, he backs out the measurement stuff, and then he says, okay,
16 that leaves, leaves -- he says leaving. That's a remainder, what's left over.

17 So it's not a fixed number. What Jones is teaching here, and our
18 expert says, is he's saying 1.5 seconds is the target. And no matter what
19 your measurement times are, in order to maintain your accuracy, you're
20 going to fill in that gap up to 1.5 seconds with switching and settling in
21 order. Why? To try to keep your accuracy together.

22 We have our -- yes, there's a motion to strike. This is just basic -- let
23 me go back to the diagram. Basic signal circuitry or signal processing is that
24 when you have -- here on Slide 20, when you have multiplexer switching
25 and you're going from well to well to well to well, which Jones teaches, and

1 you're going to have these transients. And our expert discusses there on the
2 right of Slide 20. He says, you're going to have transients. It's going to take
3 time for settling and for switching, and you want that signal to settle down
4 enough to get an accurate measurement.

5 So that's why there's this trade-off, and I think Judge Valek discussed
6 that earlier about why do you have multiple reference channels where you
7 have switching time, settling time? It's because you're trying to maintain
8 accuracy, and Jones discusses that. If you go back to our slide deck, you'll
9 see this is Slide 24. Paragraph 23 says, they want to maximize accuracy,
10 maximize immunity to noise, eliminate key thermal expansion problems,
11 minimize the size, thermal stabilization, maximize immunity to noise, on the
12 right side, accuracy and repeatability, temperature control.

13 So none of this says, make it go faster, increase throughput. That
14 wasn't his goal. There's nothing in Jones that says he wanted to go faster. It
15 says, we have a spec, either the required throughput or the target update
16 period, and we want to maintain that consistent with what was done in the
17 art. And we want to make sure that when we do that, by making this thing
18 so compact and expose it to a lot more heat, because all this stuff is
19 generating heat, that we don't mess up the accuracy and still make this a
20 commercially competent system.

21 So that's what Jones is all about. It's not about increasing throughput.

22 JUDGE COTTA: Counsel, is there any evidence of record that would
23 allow us quantify what the minimum time is that's required to preserve
24 accuracy for settling and switching?

1 MR. BABCOCK: There isn't, which is not our burden. I mean,
2 Example 30 is what Jones teaches. So I think what Jones teaches by, one,
3 saying the required throughput and, two, saying the target update period is
4 that this is probably sufficient according to him. According to Jones, by this
5 -- this setup, it turned out, it worked for him. He thought this was going to
6 be sufficient to maintain accuracy. He doesn't say that specifically, but I
7 think we can rely on this example to say, what is his target throughput,
8 what's his target time to get through all these. And the target is 1.5 seconds.
9 And if your measurements or any other --

10 JUDGE COTTA: Is there any evidence that would address how the
11 switching time, settling time changes if the number of wells or referenced
12 wells or frequencies is changed?

13 MR. BABCOCK: There isn't specifically, although our expert does
14 testify that you have this settling time. Every time you switch between one
15 well to the next, this isn't just take a bunch of measurements and then you
16 have this settling time at the end. It's take a measurement or well, doo, doo,
17 doo, doo, doo. Take another measurement, doo, doo, doo, doo, doo.
18 Another measurement. So this happens between each and every
19 measurement. And you want it to be -- and our expert says it's a balance.
20 It's a trade-off. You want to go fast enough to get your throughput, but you
21 also want to make sure it's long enough for accuracy.

22 So the answer is there's no calculation that says what's the minimum
23 because Jones doesn't teach that, but Jones does teach that there is a
24 significant amount of time that's going to be required in order to reach an

1 accurate measurement. And that is what's shown in the example on
2 paragraph 30.

3 And I think, again, it's important for the Board to realize that this isn't
4 just a calculated 409 by saying -- answer to your question, Judge Cotta.
5 They're not saying, okay, for a given well, you need X number of
6 milliseconds for settling signals. He doesn't say that. He says leaving. He's
7 not calculating that number based upon per well. He's saying, I'm going to
8 use as much of that time that's left over as possible to get that signal settled.
9 So if you go faster in measurement, he's going to leave more time for signal
10 settling and switching to keep that accuracy even better. He wants to
11 improve accuracy.

12 So he's not going to -- there's nothing in Jones that says, oh, I'm going
13 to increase my update period. He's saying, I'm going to keep -- I'm targeting
14 1.5, and here's what I need for measurement. Whatever is left over, I'm
15 going to use it for signal settling and switching. And if you have more time
16 left over, you're still going to have a target of 1.5; you're just going to have
17 more signal time and more switching time.

18 That's exactly what he's saying here. He's not saying, oh, you need a
19 certain amount of time per well. He's saying, leaving 409 milliseconds.
20 He's subtracting the target, 1.5, for the measurement. And he says, what's
21 left over, that's all I got. It's going to be as accurate as it can be. And if I
22 can do it quicker, I would. But he doesn't saying anything about making it
23 faster. The reference needs to suggest somewhere that you can go faster.

24 Importantly, there's nothing in Jones about configurability. There's
25 nothing in Jones that says you can switch or you can adjust. This is a

1 complicated machine. There's nothing that says, oh, you can adjust
2 throughput by turning a valve or some kind of adjustment. Dr. Kim says,
3 oh, a person of skill in the art could go in and change electronics, and you
4 can adjust the circuitry, and you can adjust the software to make it go faster.
5 Our person of skill in the art here has a bachelor's degree in electronics or
6 engineering, a couple years of experience. They can operate one of these.
7 But there's no suggestion in any of the record that this is configurable, that
8 there's a switch or some kind of dial that you can change these parameters.
9 We --

10 JUDGE COTTA: Counsel, can I ask one more question just to make
11 sure I understand the settling correctly?

12 Where you have that 409 milliseconds, that is not one consecutive
13 time, 409 milliseconds. It's the sum of all of the extra time between wells
14 and between one cycle of analysis.

15 MR. BABCOCK: That's correct.

16 JUDGE COTTA: Multiple individual millisecond increments put
17 together.

18 MR. BABCOCK: Excellent. That's exactly right. And our expert
19 says that. He says it's a -- this is a cumulative amount of settling time. But
20 like I was saying, it's a little bit of settling time, the switching time for each
21 and every time you switch. And he's just basically adding all of that up here.
22 So --

23 JUDGE COTTA: All right, thank you.

1 MR. BABCOCK: Okay. With regards to configurability, you'll see
2 that CellKey was two -- there's two discrete values. This isn't two through
3 ten. It's not just, this is two, three, four, five. It's two or ten.

4 JUDGE VALEK: Counsel, let me just interrupt you for a bit --

5 MR. BABCOCK: Of course.

6 JUDGE VALEK: -- because I'd like you to address this. This is on
7 your Slide 9, so maybe go there. And you're quoting here something from
8 the Petitioner's reply. But if you look at their claim chart, they're referring to
9 the actual disclosure in Jones there. And you can see, for example, that
10 Jones seems to say in paragraph 3 that you can use their ZMS impedance
11 measurement system for either a single well or a multiwell system. So it
12 seems to be saying that you don't have to do 96 wells as described in
13 paragraph 30.

14 And then in that same paragraph, it says you can do single or multiple
15 frequencies. So it does, at least the disclosure in Jones, and I get that the
16 commercial embodiment may be different, but the disclosure in Jones seems
17 to suggest that you're not limited to just this big, large, 96-well plate, and
18 you're not limited to doing just multiple frequencies. You can also do single
19 frequencies. And so doesn't that teach to some degree that it is configurable
20 or that you can apply these teachings and make them configurable?

21 MR. BABCOCK: It doesn't, Your Honor, because nowhere does it
22 suggest that you would do this for the purpose of trying to make it faster.
23 You can adjust. There's various parameters that the system can operate on,
24 but it doesn't even suggest that the user can adjust that.

1 If you look at the examples that we provided of the CellKey, and,
2 again, we went beyond -- we don't have to prove a negative, but we went
3 through and we showed where people were using the CellKey in this time
4 frame, and they were all using it as specified by the manufacturer, two-
5 second update rate. They weren't adjusting, and they're using the same
6 frequency sweeps that was specified by the manufacturer. They're using the
7 same specification manufacturer. They're using the two-second update rate.

8 So a person of skill in the art isn't going to be able -- again, I'll read
9 you the definition of a POSA: A person of skill in the art would have had a
10 B.S. in electrical, mechanical, biomedical engineering or biological science
11 for a related field and approximately two years of relevant experience or
12 equivalent study in systems and methods of bioanalysis of cells. That's the
13 definition that Axion proposed that the Board sent for the purposes of the
14 institution decision, and we said it's okay to us for purposes of this IPR.

15 So a bachelor's in science isn't going to be taking a device like this
16 and opening it up and reconfiguring the circuit boards and the circuitry. Dr.
17 Kim says -- he says, any modifications of the electronics, connections,
18 interface necessary to utilize it would've been something a person skilled in
19 the art could've done. Not a person with a bachelor's degree in electronics
20 would not take a CellKey device and tear it open and start changing the
21 boards and electronics and circuitry, the programming. If there's a knob that
22 says, okay, here's your inputs, maybe, yeah, sure. A lot of people know how
23 to do that. There's no evidence here that this was configurable at all. Jones
24 says --

1 JUDGE COTTA: Counsel, would a person of ordinary skill in the art,
2 would they have been able to say, reduce the number of wells? Is that a
3 great skill?

4 MR. BABCOCK: Well, you have -- Jones is about a plurality of
5 wells. And you could use -- I think he says you could do 8 by 12 or 12 by 8,
6 right? An 8-well system is pretty much what was -- that's about as small as
7 they go, unless you're talking a petri dish which isn't what's claimed. The
8 claim is not about a single well.

9 So the board -- the daughter board in the example in paragraph 30 is
10 pretty much what you're talking about. It's 12 wells or 8 wells. And that's
11 going to take 1.5 seconds to run through that. You look at the structure, the
12 device that's disclosed. You see all the daughter boards that he's discussing.
13 It's all about the daughter boards. Those are all multiwell, multiple well
14 plates. And so I think example 30, he says you can do 8 by 12 or he says
15 you can do 12 by 8. But either way, everything else is roughly the same.

16 So yes, the drafter said you can change these parameters, but there's
17 nothing in Jones that says -- you'd maybe do that maybe to increase
18 accuracy, but there's nothing in Jones that says you could do this to increase
19 throughput to make it faster to increase the target update rate. There's
20 nothing in Jones that says that, and there's no reason you would do that.
21 Jones doesn't discuss even what cells he's measuring. It's just a generic --

22 JUDGE COTTA: Why wouldn't you try to do things to speed up the
23 measurements if you were seeking to measure a, for example,
24 cardiomyocyte, which is one of the examples Petitioner provides evidence

1 requires millisecond time resolution? Why doesn't that provide some
2 motivation to take a faster measurement?

3 MR. BABCOCK: That's what our patent figured out, right? That's
4 what our inventors have figured out.

5 And the reason it's different is because -- you saw it in Jones. He's
6 doing multiplexers. There's a lot of discussion in Jones, everything's
7 multiplex. Their claims -- go back to their claims. Jones is all about not -- if
8 you're doing -- Slide 19, if you're doing Jones, he says, each -- multiplexing
9 circuitry allows one or more measure of channels to address the sensors for
10 each and every one of the row. Claim 1, I mean, the longest claim talks
11 about multiplexing circuitry. Paragraph 30, the one we're discussing, talks
12 about well and gain multiplexer switching.

13 So when you're reading Jones, you think, yeah, it's a multiplexing
14 system. Well, that's not a system designed for speed. That's a system
15 designed for an expanse because you don't have the ADCs, right? You don't
16 have the expensive ADCs per channel. And in fact, you know, we point out
17 in the art that using an ADC per channel does speed things up. You don't
18 have to wait for all the settlement time. There's nothing in Jones about that.
19 It doesn't say you're going to eliminate the ADCs. It just says you're going
20 to do every well sequentially.

21 So a person of ordinary skill wouldn't redesign Jones and say, hey, I'm
22 going to change all these parameters like Dr. Kim does as an expert and
23 reengineer the system, which is what Dr. Kim does. He reengineers the
24 system, redesigns it from scratch essentially, changing all the various
25 parameters to say, oh, how -- this is how I would build it. Well, that's not

1 what a person of ordinary skill in the art would do. There's nothing in
2 Jones that says you should do that. It says there's different parameters.
3 Okay. But still, what it says, what is my target throughput? What is my
4 objective? What's my required throughput? My target update period says
5 1.5 seconds. And everything in the art that we have in this record says two
6 seconds was what was the goal. And two seconds is pretty fast. Two
7 seconds, that update rate for 96 wells, it's pretty fast. Not fast enough for
8 this particular patent, but it's pretty fast. So there's nothing in the art that
9 suggests that you want to go faster.

10 Let me let Yang come up and give his discussion so we don't run out
11 of time.

12 MR. WANG: Good morning, Your Honors. My name is Yang
13 Wang. I'm the backup counsel for the Patent Owner, Agilent in this case,
14 and also a LEAP practitioner. I want to start here as PTO and Your Honors
15 read my petition.

16 So now we move to the fifth issue, which is Axion improperly
17 introduced a number of new arguments for the first time in their reply. So as
18 we can see on this slide, Axion presented two grounds of unpatentability in
19 their application and only two grounds. And the first ground challenged
20 Claims 23 to 30, which is moot because the Agilent disclaimed that claim.
21 And as we talk about the issue today is Claim 1 to 8 and 11 to 15 which is
22 on the second prong, and that challenge is based on Xu-752 and Jones.

23 Ghosh was not a stated ground for patentability. And yet, as we can
24 see on the right side of this slide, Axion's reply faced with Board's concerns
25 about Dr. Kim's supporting the modification of Jones is hidden. And our

1 highlight here, as the Board can see, this is what the Petitioner claimed. The
2 '508 Patent's alleged invention is at most, there emphasized, a minor
3 variation on Ghosh and would have been obvious for all the reasons stated in
4 the petition.

5 So they claim that the '508 Patent is just a minor variation of Ghosh,
6 and it would be obvious, and this is an improper and impermissible
7 introduction of the new theory of unpatentability. The Board has been very
8 clear on this point as recited a relevant case here, *Henny Penny*. The Board
9 had said, we disregard Petitioner's alternative position as it was an attempt to
10 raise a new theory of unpatentability improperly for the first time in the
11 reply. This is exactly what the Petitioner did in this case. So our position is
12 the Board should not consider Ghosh as a relevant ground for
13 unpatentability.

14 JUDGE VALEK: Counsel, I have a question for you. I think that
15 Petitioner might see it a little bit differently. I think that their argument is
16 that Ghosh evidences a motivation to set the parameters that are described in
17 Jones in such a way that you would achieve millisecond time resolution.

18 So they're not relying on it to teach this limitation. They're relying on
19 Ghosh and some other references about these very fast occurring phenomena
20 where you need to look at the measurements quickly as evidence that one of
21 skill in the art would be motivated to apply Jones's teachings in a particular
22 way.

23 So how do you respond to that? And what makes you think that
24 they've crossed the line here over to a new theory?

1 MR. WANG: Our position is first, Ghosh is not a stated ground of
2 unpatentability the Board should not consider. Then we move to our second
3 position is even the Board give any weight to Ghosh its irrelevant and it's not
4 analogous which we're going to show on the next slide.

5 So on this slide, we can see there's -- you know, we put a number of
6 citation from Ghosh. And as Petitioner claimed, it is for electroporation,
7 which is for a different purpose in a different field comparing this '508
8 Patent. And the voltage different and use different materials, apparatus. So
9 our conclusion here is a POSA back in 2008 seeking to increase throughput,
10 as my colleague Brent stated, that's the invention in the '508 Patent. For the
11 multiwell impedance system, they will not look at Ghosh as a relevant prior
12 art reference.

13 And the next slide, it shows a table that we prepared. I think this table
14 clearly summarizes the differences between Ghosh and the '508 Patent. As
15 we can see here, the Ghosh purpose is for electroporation. The '508 Patent
16 purpose is continuous vapor-free cell monitoring. Ghosh uses a massive
17 electrode with the size of 2 square centimeters and a high membrane-
18 disrupting voltage between 1 to 5 volt.

19 On the other side, the '508 Patent uses micron scale electrodes and
20 millivolt level voltage. If you compare the electrode, one is two 2 square
21 centimeter. One is millimeter. It's just comparing an elephant with a cat.
22 You're trying to fit the elephant in the cat's cabin. It doesn't work. It's
23 incompatible.

24 And another key difference is Ghosh is a single sample. It's on the
25 petri dishes. And the '508 Patent is a high throughput multiwell system. So

1 our conclusion is they're totally different. They're for the different field.
2 They're for a different purpose. They solve different problems.

3 And move to Slide Number 40. That's -- we have some citation from
4 Petitioner's petition. And on the left side, we can see the idea of impedance-
5 based cell analysis track. The understanding, it's a multiwell on a microtiter
6 plate, and it said it's for the -- and it's for multiwell microtiter plate for
7 biological cells in a well on a plate will block some of the current and thus
8 act as impedance. On the right side, they also acknowledge that the purpose
9 of Ghosh is to measure -- is to calm down while studying cell
10 electroporation.

11 So back to our conclusion. Ghosh is directed to a completely different
12 field to solve a completely different problem. The system, the purpose, the
13 voltage, the apparatus we compare with Ghosh and the '508 Patent, they're
14 completely different. A POSA would not look at Ghosh as a relevant
15 priority.

16 I move to our Slide Number 41. Here the timeline itself is telling, as
17 Judge Braden pointed out. Ghosh was published in 1993. And the '508
18 Patent, the priority date is 2008. There's a 15-years gap between the two.
19 So the obvious question to ask is, if the concept of applying millisecond
20 times resolution to a multiwell system was so obvious from Ghosh teaching,
21 which is a single-sample system, why did it take 15 years for someone
22 eventually to make it? So this prolonged absence of multiwell millisecond
23 time resolution system is powerful objective evidence that the invention in
24 '508 Patent would not have been obvious. This is as the Federal Circuit

1 pointed out in *Leo Pharmaceutical*: Such a long time lapse can be indicative
2 of nonobvious.

3 Now we move to another change of position by Axion. So in their --
4 JUDGE COTTA: Counsel, before you -- if I can interrupt. I'm sorry.
5 Several of the exhibits, there's a particular motion to strike related to Ghosh.

6 If we find that Petitioner is not making a new argument, do you have a
7 basis for why it is being permitted to introduce those exhibits?

8 MR. WANG: For that question, can I leave to my colleague, Brent, to
9 address that?

10 JUDGE COTTA: Move on.

11 MR. WANG: Okay. So I want to quickly move to the next point that
12 is, as Brent already talk about, that 409 millisecond time for switching and
13 settling time is crucial. It's not optional for the system in Jones, and the
14 Petitioner changed their position, as we can see in their petition. They
15 acknowledged this 409 milliseconds for multiplexer switching and signal
16 settling time, and they also mentioned multiplexing circuit or circuitry at
17 least four times in their petition.

18 And now we move to the next slide. As we can see in Petitioner's
19 reply, they change their position. And that critical 409 milliseconds for
20 multiplexer switching and signal settling time has vanished. Their new
21 calculation as we can see on page 20, they misrepresented their own system.
22 It thinks only the measuring time that matters. And it's not. It's the
23 measuring time and the settling time. You put them together. It's the target
24 update period. So this is not a careless mistake. It is a deliberate omission
25 of a key teaching in the prior art. And the Board should reject it.

1 And my colleague, Brent, has talked about his system. This is -- our
2 position is this is a real-world, contemporary evidence that a POSA at a
3 relevant time back in 2008 is working on systems that are on the second
4 scale update, not millisecond resolution. And in Petitioner's reply, they call
5 this evidence beside the point. Quite opposite, it is directly to the point. It
6 shows that it was not so obvious to modify this complicated, contemporary
7 system to achieve the millisecond time resolution.

8 As we point out, the purpose of '508 Patent and all the relevant prior
9 art at that time, they want to strike a balance between speed and accuracy.
10 And 1.5 or 2 second, it's already fast enough. And you don't want to
11 simplify the accuracy just to achieve a higher speed or maybe it's not even
12 possible at that time.

13 JUDGE VALEK: Counsel, let me push back on that just a little.
14 Don't these references like Ghosh and the other ones that are cited in the
15 petition evidence that there are cellular biological phenomena that occur
16 very quickly?

17 Doesn't that show you that at least in certain instances, certain
18 applications, it's not already fast enough? It needs to be sped up. Otherwise,
19 you'll miss what it is you're trying to analyze in the first place.

20 MR. WANG: Your Honor, I agree with your point. That's something
21 in substitution the people would want to achieve.

22 But the point back to our hearing here is the '508 -- the Jones as a
23 prior art and Ghosh and other prior art cited by the Petitioner, it does not
24 teach that. So this is -- maybe there's a motivation to be faster, to do it faster
25 and achieve millisecond resolution, but the point is the prior art cited by the

1 Petitioner has no teaching or suggestion for that. So that's our position on
2 this issue. So now I hand back the podium to my colleague, Brent.

3 MR. BABCOCK: Thanks, Yang.

4 In response to your question, Judge Cotta, so when Ghosh showed up
5 in the reply, we were like, that's not in the ground. They said, oh, we cited
6 and we mentioned it in our petition. We're, like, oh, yeah. I guess it was
7 there. It was certainly not a ground, and it certainly was never suggested, as
8 they said their Reply, that it's a basis for unpatentability that they said in the
9 Reply. It's that you can take Ghosh as essentially a ground of obviousness.
10 And we're, like, well, that's not correct.

11 So we didn't -- we only put in a couple things that we thought were
12 helpful. First of all, Ghosh doesn't tell you what the system setup was.
13 Ghosh said, oh, we use a setup of Giaever. And so with that it's perfectly
14 fair to give you Giaever which says, oh, it's a petri dish, a 60-millimeter petri
15 dish. So okay, you can say, well, we don't really want to know. It's only fair
16 for this panel to understand what's the technology involved here. What is
17 Ghosh doing? Ghosh doesn't exactly say what its hardware was. So we say,
18 well, here it cites Giaever. It says, look, see Giaever to understand what we
19 used. So we said, okay, here's Giaever. And Giaever explains that we used
20 a 60-millimeter polystyrene dish. So that's helpful for the Board.

21 And then, well, what is a well in a multiwell system? How big is that
22 compared to 60 millimeters? I didn't know, even though I'm technical. You
23 guys probably already did, Your Honors. But we said, well, listen, it's at
24 least helpful to give the Board contemporaneous evidence of what's the size
25 of a well in a multiwell plate. The basic technical background is not

1 argumentative. I don't think there's any dispute that the catalog we provided
2 is just an example that a well is like 7 millimeters. So it's very, very
3 different than 60 millimeters.

4 So the Board in its discretion can consider new evidence that is
5 helpful for it to make a determination. You don't have to make a decision in
6 the dark. And so we think it's perfectly fair for us to have submitted that
7 basic technical background. It's not argumentative. I'm not trying to change
8 the grounds. Just saying in light of this new emphasis on Ghosh, here's a
9 little bit more for the Board to consider with regards to Ghosh.

10 And I think Judge Valek asked the key question, you know. Why
11 wouldn't you look at Jones and what to speed it up? And it's because Jones,
12 it's a multiplexing system. We have to focus on the two places where it
13 discusses throughput. And both places, it says required and target, required
14 throughput and target throughput. So Jones isn't trying to speed it up. Jones
15 never says it's configurable to speed up. Yes, there are some different
16 parameters you can change, but you're still targeting, or the spec is still
17 going to be the same. Even if you run it with different frequencies, he's still
18 saying your target is 1.5 milliseconds, and you're still going to have
19 multiplexing switching and you're going to have settling time.

20 So there's nothing in Jones that you look to, to say, oh, we could
21 reconfigure this. This is simply a question of the Petitioner's expert realizing
22 that when they saw 67 milliseconds in Jones and said voila, we had
23 millisecond time resolution. We come back and say, that's not what
24 millisecond time resolution means. And I still hear a little bit of that
25 language floating around. Like, well, Ghosh is -- a single measurement is

1 not millisecond time resolution. When you look at the entire time for two
2 consecutive measures of all wells, we've got 1.5.

3 And now they're using our patent not just to reconfigure. There's
4 nothing in Jones that says there's a configurability. Never did Jones say,
5 well, you can adjust these parameters to make it go faster. They're
6 reengineering Jones with a goal in hindsight to hit below 500. And that
7 would require massive reengineering. It wouldn't just require -- there's no
8 evidence that there's a knob or a switch. In fact, the evidence that we
9 provided says there's two settings, two or ten. Jones doesn't say that. Jones
10 doesn't say anything. But he says, my target is 1.5.

11 So that's the spec, 1.5. And there's nothing to suggest that you'd go --
12 the user, the POSA, would go and change any of that. Dr. Kim, super smart
13 guy, he could go in and reengineer it and redesign it, open it up, redo all the
14 boards, the software, the programming. Could it be done? I suspect that it
15 could. Certainly the folks at ACEA figured out how to do it. They didn't do
16 it -- the key is that they figured out that what's important is using the second
17 part of that claim, which is having a -- I think we pointed it out -- having an
18 ADC converter per well for at least two wells. That was critical.

19 So I'm running into my rebuttal time. That's the answers. In this IPR,
20 in the constraints that we have, there's nothing -- a person of skill in the art
21 wouldn't be reading Jones and say, oh, this is the mechanism that I would
22 use to speed it up. There's nothing in Jones that says that. Thank you, Your
23 Honors.

24 JUDGE BRADEN: Any further questions, Dr. Valek -- or I'm sorry,
25 Judge Valek or Judge Cotta?

1 JUDGE COTTA: No, thank you.

2 JUDGE BRADEN: Thank you, Counselor. Counselor for Petitioner,
3 you have 12 minutes 17 seconds left for your rebuttal time.

4 MR. NIGHTINGALE: Thank you, Your Honor. Okay. Excuse me.
5 Thank you, Your Honors.

6 I'd just like to make a few quick comments on rebuttal. Counsel for
7 Patent Owner has argued that Jones has no configurability, and there's a
8 suggestion that Dr. Kim's examples are making these massive modifications
9 to Ghosh that a POSA is opening up the hood and, excuse me, adjusting the
10 electronics. That's not true and certainly not for all of Dr. Kim's examples.

11 I'm going to point you again to paragraph 72. When Dr. Kim talks
12 about changing from a multi-frequency measurement to a single frequency
13 measurement, that puts you into the millisecond time resolution range. That
14 change, it doesn't require popping the hood. It's not a change in the
15 electronics. It is a software configuration. I'm going to measure one
16 frequency, not multiple. So we're not talking about massive changes here to
17 get millisecond time resolution measurements. We're talking about some
18 simple ones like that.

19 Dr. Sanchez has not disputed that if you make this change, if you do it
20 for multiple frequencies to one frequency, you do get measurements within
21 the millisecond time resolution range. No dispute on that. Their expert did
22 not contest it.

23 I'll also point out we can't ignore Jones' disclosure about these
24 different parameters, different configuration. We know about the Section
25 103. We need to consider the entirety of the prior art reference and all that it

1 expressly teaches and all that it fairly suggests to a POSA. So our point
2 throughout this entire proceeding is that Jones' disclosure teaches, suggests
3 to a POSA that you can take measurements at different resolutions, and here
4 are the parameters. These are the different parameters. They provide
5 different measurement resolution.

6 Your Honors questioned me about changing from a multi-frequency
7 measurement to a single frequency. I'll point out that Xu-752 uses
8 measurements at a single frequency. Jones uses measurements at a single
9 frequency embodiment. Neither of those references point out any
10 drawbacks. It's a parameter used in both of our references. And Counsel for
11 Patent Owner mentioned that Jones doesn't tell you which cells, which types
12 of cells that he studied and that's correct. And that just shows that Jones is
13 intended to be broad.

14 JUDGE BRADEN: Counsel, sorry to interrupt you. But both of these
15 references give you the single frequency.

16 Do either of the references show improvement in the scan time or the
17 time that it has based on that single frequency?

18 MR. NIGHTINGALE: The POSA understands that, Your Honor. I
19 don't think there's any dispute that you measure a well -- you know, multiple
20 frequencies when changed to a single frequency, that's going to speed things
21 up. As a matter of fact, the Exhibits 2027 and 2028 --

22 JUDGE VALEK: Counsel, let me ask a question about that because
23 as I understood Patent Owner's argument is that according to Jones's
24 teaching, the target time is 1.5 seconds. And so in a specific example, they
25 have in paragraph 30 there's additional 409, I think, milliseconds left after

1 you do all the measurements for the switching and cleaning up the signal.
2 And they take all that time in order to achieve accuracy.

3 And so their argument is that if you lower the frequency, maybe to a
4 single frequency, meaning that you wouldn't need as long for the scanning of
5 each well, you would still take the remainder of whatever it took to scan
6 those wells between that and the 1.5 second target time and use that to clean
7 up the signal and achieve the most accurate data.

8 So what's your response to that argument? They're saying, no, one of
9 skill in the art wouldn't look at it as speeding it up because they would still
10 use all the time they had available to include the accuracy of the system.
11 They're saying that's what Jones is teaching sort of taken as a whole would
12 motivate.

13 MR. NIGHTINGALE: There's no dispute that the paragraph 30
14 embodiment uses a 1.5 second measurement resolution, but Jones nowhere
15 suggests that that is the only measurement rate of his system, that there's
16 something magical about that number. Their expert has never explained
17 why, you know, 1.5 seconds is sufficient or useable in all of these instances.
18 And in fact --

19 JUDGE VALEK: Again, where does your expert explain why
20 making these changes to Jones that you would use the same amount of
21 frequency cleanup time and multiplexing that's in example 30?

22 Where is your expert explaining that it would be okay to do that if
23 you're making all these other changes to the system? Because, again, you
24 have the burden as the Petitioner in this case.

1 MR. NIGHTINGALE: So for the switching and settling time, we --
2 excuse me. If you look at paragraph 70 of our expert's declaration, he looks
3 at paragraph 30 in Jones and says that, excuse me, we have a 1.5 second
4 measurement resolution. 1,091 milliseconds are spent measuring. 409
5 milliseconds are spent for switching and settling time.

6 Dr. Kim said, looking at that, that tells me that for each well, I do the
7 math, 409 divided by 16 in this case. That would result in a switching and
8 settling time of 25.6 milliseconds per well. So Dr. Kim says that -- Dr.
9 Kim's testimony is that if Jones is saying that 25.6 milliseconds per well is a
10 good enough switching and settling time for the paragraph 30 embodiment,
11 then I can apply it to my examples, too.

12 So there's no -- we did not treat -- Dr. Kim did not treat switching and
13 settling time as negligible. He didn't get rid of it. He applied the teaching of
14 the 409 milliseconds and what should be sufficient for each well.

15 JUDGE VALEK: It seems to me that he made an assumption, and
16 this may not be a correct assumption, but he made an assumption that the
17 switching time described in the paragraph 30 embodiment that that would be
18 sufficient in the other instances where you changed a bunch of other
19 parameters, right? That's what he did.

20 MR. NIGHTINGALE: That's correct. He applied -- yeah, he used
21 that to determine the switching and settling time per well, correct.

22 JUDGE VALEK: And so where does he say that was enough for
23 him?

1 Where does he say that that would be okay if we use less reference
2 channels or we use less frequencies? Because again, I don't see any
3 explanation of what happens when you do that other than you just could.

4 MR. NIGHTINGALE: So, sorry, Your Honor. What is the question?

5 JUDGE VALEK: Sure. The question is this: it seems like your
6 expert has made certain assumptions based upon the example that's given in
7 paragraph 30 of Jones where he's taking certain things that he liked out of
8 that paragraph and throwing other things away or changing them. And I'm
9 just trying to figure out where it is in his testimony that he's accounted for
10 what's going to happen when you do those different things.

11 Because it seems like the other side has offered a somewhat
12 reasonable explanation of what one of skill in the art's understanding of
13 Jones would be. And that is that Jones wants to improve accuracy in this
14 multiplex environment and so it's going to use every bit of additional time
15 that it has in order to clean up that signal in this multiplex environment.

16 So where does your expert address that? And if he doesn't address it
17 here, is there any other place in the record where it is addressed?

18 MR. NIGHTINGALE: So I think the point, Your Honor, is that this
19 characterization of Jones about, you know, needing to provide a compact
20 package, thermal stability, that is an unduly narrow reading of Jones. Jones
21 teaches much more than that. If you look at the second sentence of Jones, I
22 talked about this earlier, but he says the present technology is novel and that
23 it provides an impedance measurement system of massive parallelism for
24 high temporal sampling.

1 So that sentence makes no mention about thermal stability. It makes
2 no measure about compactness. Jones is saying in that very first sentence
3 describing invention speed matters. And in fact, if Jones only cared about
4 thermal stability, he only cared about compactness, he wouldn't have a
5 bunch of daughter boards in parallel. That's contrary to having thermal
6 stability and compactness. So Jones is absolutely not limited to the 1.5
7 second measurement resolution. Jones is not only about compactness,
8 thermal stability. And our expert explained that.

9 For these applications, for certain applications that require fast
10 measurements, a POSA would've been motivated to apply those parameters.
11 Again, these parameters, they may not be perfect. They may not be ideal for
12 all situations. But in certain circumstances, it would be entirely obvious to
13 use a parameter tied in that reference and for Dr. Kim to explain what effect
14 that would have on measurement resolution.

15 JUDGE COTTA: Counsel, can I interrupt with a question about the
16 dependent claims. So you have two dependent claims with 20 second and 5
17 millisecond resolutions.

18 How do you account for the 25, if I'm remembering correctly,
19 millisecond settling time when you're alleging those Claims 13 and 14 are
20 obvious?

21 MR. NIGHTINGALE: That's a, excuse me, great question, a great
22 point, Your Honor.

23 If you look at Slide 23 of ours, we have this table that lists -- it's kind
24 of a summary of Dr. Kim's various examples. When you get down to the

1 bottom two rows of that chart there on Slide 23, you'll see that there are --
2 essentially, there's -- we're not using any reference channels.

3 For the paragraphs 173 example, Dr. Kim showed that a POSA would
4 be motivated to use one daughter board for each well. So what Dr. Kim
5 testified, Your Honors, is that if you're trying to get to these very fast
6 measurements, like you mentioned, less than 20, less than 5, you need to get
7 rid of switching and settling. It's basic. You can't measure at 20
8 milliseconds. You can't measure at 5 milliseconds if you have 25.6
9 milliseconds of switching time.

10 So Dr. Kim explained why if you're measuring this fast -- and I'll refer
11 to paragraphs 171 to 175 of his declaration. If you're taking measurements
12 this fast, the thermal issues, the temperature compensation that you use those
13 reference channels for, you're not going to have a lot of variation at that time
14 resolution.

15 So in this particular case, you're trying to get very low, very low
16 measurement resolutions. That is the approach you have to give. You have
17 to be aware of switching and settling times.

18 JUDGE COTTA: And does Dr. Kim explain why you don't need a
19 reference channel? That seems counterintuitive.

20 MR. NIGHTINGALE: He absolutely did. And I'm not going to do it
21 justice here in the 17 seconds I have, but paragraphs 171 through 175
22 explain in detail his methodology, his testimony about the use of reference
23 channels in configuration of daughter boards. He explains why you can
24 jettison that in a certain circumstance. If there are no further questions, my
25 time is up.

1 JUDGE BRADEN: Judge Cotta, Judge Valek, do you have any
2 further questions for Counsel?

3 JUDGE COTTA: No, thank you for asking.

4 JUDGE VALEK: No, thank you.

5 JUDGE BRADEN: Very good. Thank you, Counselor. Counsel for
6 Patent Owner, you may begin your arguments when ready.

7 You have 4 minutes and 32 seconds left in your surrebuttal time.

8 MR. BABCOCK: Thank you, Your Honor.

9 Okay, Your Honors. My final remaining minutes, I think, Judge
10 Valek, was it you that asked about the record reference? Maybe no, it was
11 Judge Cotta, I'm sorry, about where in the record does the expert discuss the
12 signal settling time, and it's per well.

13 So this is Exhibit 2009 and paragraph 42. This addresses that point
14 specifically, and Dr. Sanchez says that the multiplexer switching and signal
15 settling, in the above illustration, would be interspersed throughout the entire
16 1.5 second update period. Electrical transients occurring after each
17 multiplexer switching operation between wells and reference channels in a
18 row to the microtiter plate.

19 Then he goes on to say that Axion misinterprets millisecond time
20 resolution as a single measurement rather than the time required between
21 two consecutive measurements to all the wells. So that is where we get the
22 testimony in the record about how long it takes or at least how the signal
23 settling time would work.

24 There's nothing in Jones that suggests that you can eliminate that.
25 And again, this is just Dr. Kim trying to get to those low numbers and just

1 saying, well, I can't get there with Jones. So I just have to reengineer and
2 refabricate it. When you have a multiplexing system and you have
3 switching between each well. Oh, Your Honor, you didn't set the clock.

4 JUDGE BRADEN: Thank you.

5 MR. BABCOCK: You're welcome. You can take off -- I'll only be
6 one more moment.

7 So you can't just reengineer that since these are a person of skill --
8 ordinary skill in the art wouldn't reengineer the system.

9 I have one more point. I have to switch my slide. Okay. I'm looking
10 at Slide 13. And this kind of addresses the discussion that Judge Valek had
11 with Axion Counsel. You'll note that in paragraph 30, there is a discussion
12 of different kinds of parameters. And he does say that step frequencies
13 supposed to be typically 15. It still has to be sufficient cycles, sufficient --
14 the embodiment was chosen for well and gain multiplexer switching
15 transients to settle.

16 But at the end of the day, even though he's suggesting, yes, there are
17 parameters that are going to be altered, you got to look at that final sentence;
18 it says target. Whatever parameters you're trying to set this up at, still your
19 goal, your required throughput or your target is 1.5 seconds. So even
20 though, yes, you can potentially -- a person will say, yes, you can change
21 these parameters, right. You could do a burst or you could do multiple
22 cycles or maybe make some changes to the parameters. But at the end of the
23 day, what's your goal? What are you trying to accomplish?

24 And he says it. You're trying to do 1.5 seconds; that's my target. And
25 I leave -- Judge Valek, you said it exactly correctly from our perspective

1 which is, whatever time is left over in the measurement, you're going to use
2 that time to figure out how to get that signal down to get improved accuracy.
3 And that's why when Dr. Kim eliminates the settling time, or he treats it as a
4 constant, oh, 409, that's a constant. So let's just apply that across the board.
5 That's not what Jones does. Jones doesn't say, oh, I need 409 milliseconds
6 and I divide that by 8. No, he's saying I'm taking whatever is left over,
7 whatever time I've got. I got to hit that 1.5 mark. That's the system spec. I
8 think whatever time I've got left over to try to get that accuracy as good as
9 possible.

10 So that's exactly what Jones would teach a person of skill in the art.
11 That's not saying, oh, we're going to try to improve throughput. If there was
12 somewhere in Jones that said, increase throughput, increase speed, Axion
13 would be jumping all over. It's just not there because that wasn't what Jones
14 was trying to do. He wasn't trying to speed it up. He was trying to keep it as
15 accurate as possible and maintain that 1.5 or that 2 second throughput that
16 was the standard at that time. So that's exactly what Jones is doing.

17 This combination doesn't show obviousness. And they cannot rely
18 upon other references to try to fill that gap. And I think really what they're
19 trying to do here is Xu plus Jones plus Dr. Kim. And the Board has been
20 very clear. You cannot use expert testimony to fill in the gaps. And that's
21 all that's being done here is Dr. Kim is the third reference. And the Board
22 should not adopt that approach. Thank you, Your Honors.

23 JUDGE BRADEN: Judge Valek, Judge Cotta, do you have any
24 additional questions?

25 JUDGE VALEK: I have one question for Counsel.

1 MR. BABCOCK: Yes, sir.

2 JUDGE VALEK: When you filed these new exhibits with your sur-
3 reply, at that time, were you aware that our rules general preclude the
4 introduction of new evidence with a sur-reply in an IPR?

5 MR. BABCOCK: I should have been aware of that. I've been doing
6 this for a long time. It didn't cross my time at the time. Nothing seemed
7 problematic, but I should've known that.

8 JUDGE VALEK: Okay.

9 MR. BABCOCK: But I didn't.

10 JUDGE VALEK: So in the future if you were to do something like
11 that, the appropriate action would be to seek authorization.

12 MR. BABCOCK: Of course, of course, yes. Our initial reaction was,
13 these are appropriate and they're not argumentative. But you saw their
14 objections. We're, like, wait, oh, yeah. I should've known that because
15 that's what the rule says.

16 So to the extent the Board takes umbrage, it was not meant to be
17 offensive. We think the Board has -- this is not a typical scenario where
18 we're trying to add any new arguments or create new issues. We're simply
19 just -- now that new issues have been raised in the reply, we're trying to say
20 here's our response. And it's nice to have a little bit of evidence and support
21 that response as opposed to just me saying it in a brief.

22 JUDGE BRADEN: Very good, Counselor. Thank you.

23 MR. BABCOCK: Okay. Thank you, Your Honors.

24 JUDGE BRADEN: Any further questions, Judge Valek or Judge
25 Cotta?

1 JUDGE VALEK: No.

2 JUDGE COTTA: None here. Thank you.

3 JUDGE BRADEN: Very good. I'd like to thank everyone for your
4 appearing here today and for answering our questions. Your answers have
5 helped the panel.

6 We would like to especially thank our LEAP practitioner, Mr. Wang,
7 for appearing today to participate in the oral hearing. PTAB benefits from
8 your participation, so we are appreciative to you for your willingness to take
9 part, to your law firm, and to the client for allowing you this opportunity.
10 We hope that you gain valuable experience from your participation today.

11 Now, we will take the case under advisement and issue a decision in
12 due course. As a reminder, we ask that you please stay back just a little bit
13 longer to answer any questions the court reporter may have regarding
14 spelling.

15 Otherwise, we wish you a very good day. Thank you, and the hearing
16 is now adjourned.

17 (Whereupon, the above-entitled matter went off the record at 11:31
18 a.m.)

PETITIONER:

Joshua Nightingale
David Maiorana
Geoffrey Gavin
Laura Kanouse
JONES DAY
jrnightingale@jonesday.com
dmaiorana@jonesday.com
ggavin@jonesday.com
lkanouse@jonesday.com

PATENT OWNER:

Brenton Babcock
Dan Liu
LOEB & LOEB LLP
brent.babcock@sterlingtonlaw.com
dliu@loeb.co