UNITED STATES
COURT OF FEDERAL CLAIMS

COLTEN SNYDER BY AND THROUGH KATHERINE SNYDER AND JOSEPH SNYDER, HIS NATURAL GUARDIANS AND NEXT FRIENDS,	)	
Petitioners,	)	
v.	)	Docket No.: 01-162V
SECRETARY OF HEALTH AND HUMAN SERVICES,	)	
Respondent.	)	

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UNITED STATES COURT OF FEDERAL CLAIMS
OFFICE OF SPECIAL MASTERS

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Petitioners,	)	
v.	)	Docket No.: 01-162V
SECRETARY OF HEALTH AND HUMAN SERVICES,	)	
Respondent.	)	

Courtroom 56
U.S. District Court
401 West Central Boulevard
Orlando, Florida 32801

Tuesday,
November 6, 2007

The parties met, pursuant to notice of the Court, at 9:10 a.m.

BEFORE: HONORABLE DENISE K. VOWELL
Special Master

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C O N T E N T S

E X H I B I T S

PETITIONERS' EXHIBITS:	IDENTIFIED	RECEIVED	DESCRIPTION
4	301	--	PowerPoint presentation

P R O C E E D I N G S

(9:10 a.m.)

THE COURT: We're back on the record in the case of Colten Snyder, 01-162. Mr. Powers, are you prepared to proceed?

MR. POWERS: Yes, I am, Special Master. Good morning. The Petitioners in this case are going to now call Dr. Ronald Kennedy to take the witness stand.

THE COURT: Dr. Kennedy, if you could come up.

Whereupon,

RONALD C. KENNEDY

having been duly sworn, was called as a witness and was examined and testified as follows:

DIRECT EXAMINATION

THE COURT: You may proceed, Mr. Powers.

MR. POWERS: Thanks, Special Master.

THE COURT: And I will add that we have marked as Petitioners' Trial Exhibit 4, a PowerPoint presentation from Dr. Kennedy that we're going to use in hardcopy at least until we spring his computer from the guards.

MR. POWERS: The computer quarantine.

BY MR. POWERS:

Q Good morning, Dr. Kennedy, to make our record here, can you spell your name and give us your academic affiliation.

A Okay. It's Ronald (R-o-n-a-l-d) Curtis (C-u-r-t-i-s) Kennedy (K-e-n-n-e-d-y). I'm a Professor and Chair of the Department of Microbiology and Enterology at Texas Tech University, Health Sciences Center in Lubbock Texas.

Q Thank you, Dr. Kennedy. Now, before we get into the specifics of your testimony, I want to make it clear on the record your history in participating in the autism proceeding, the Omnibus Proceeding. So now, in the case captioned Cedillo v. Secretary of Health and Human Services, that was a case that was heard in Washington, D.C. in June of this year, correct?

A Correct.

Q And in that case you had filed an extra report?

A Correct.

Q You appeared and gave live testimony on Direct, you were cross-examined, and then I believe you also filed supplemental report in that matter, is that all correct?

A Correct.

Q In the Cedillo case the issues that you were testifying about included issues of general causation that would be applicable to the Petitioners' theory of combined exposures to Thimerosal and MMR, leading to ASD symptoms, is that correct?

A Correct.

Q In the Cedillo case, in addition to the general causation testimony, you also offered testimony that would be used to resolve Michelle Cedillo's individual claim also, is that right?

A Correct.

Q In the proceeding today, is it your understanding and your belief that your testimony is being given for those same dual reasons of general causation and case specific causation for Colten Snyder?

A Correct.

Q Given the --

THE COURT: I'm sorry?

MR. MATANOSKI: Just for the record, you know that we've lodged an objection.

THE COURT: You've lodged an objection in the Cedillo case.

MR. MATANOSKI: That's correct, that's correct. I'm sorry.

THE COURT: Okay. You don't object to my considering anything that I've heard so far in this case?

MR. MATANOSKI: That's correct, ma'am.

THE COURT: So I can consider the testimony in Cedillo as well as the testimony in Hazlehurst?

MR. MATANOSKI: Yes, ma'am.

THE COURT: Okay. Just making sure that we have the record clarified there.

MR. POWERS: Understood. So, Dr. Kennedy, what you might have just picked up on is that Respondent has an objection to relying in this case on testimony from another case. But your understanding of your appearance here is to rely in part on what you testified to in Cedillo, in addition to the expert report and the testimony you're giving today, is that correct?

A Correct.

Q Given the extensive testimony that you provided in the Cedillo case, and an expert report, and a supplemental report, my understanding is that what we're going to talk about today will leave out a bit of that in order to avoid redundancy, is that correct?

A In part, yes.

Q And in part, to avoid redundancy, by doing that you're not waiving, so to speak, or abandoning any of the points and positions that you took in the Cedillo matter, correct?

A Correct.

Q I just wanted to lay out those ground rules. And now let's move through some of the specifics of the testimony today. And in a perfect world you would have your computer and I would pull the cap off the projector and begin a PowerPoint slide presentation, because you have prepared a PowerPoint slide presentation for your testimony today, is that correct?

A I have.

Q And this is marked as Petitioners' Trial Exhibit No. 4.

(The document referred to was marked for identification as Petitioners' Exhibit No. 4.)

THE COURT: The pages, however, are not numbered. So I'm hand numbering them now, and I'm going to refer to the page numbers, and I'm including the title page as a page-numbered page.

THE WITNESS: Can I get a copy of the, I

didn't memorize my PowerPoint presentation.

THE COURT: That's why one of those nine copies was for the witness, just in case.

MR. POWERS: Okay. So doctor, I'm going to take a two-minute pause, well, if you don't mind, Special Master, while I get my computer screen up here.

THE COURT: Not a problem.

MR. POWERS: We're getting word on the computer.

THE COURT: Okay.

MR. POWERS: Still no computer.

THE COURT: Okay.

BY MR. POWERS:

Q Okay, Professor Kennedy, if I could direct your attention to what's been marked as Petitioners' Trial Exhibit No. 4, if you take a look at that, what is that, what does that appear to be to you?

A My PowerPoint presentation.

THE COURT: Just for the update and for the record, the, our letter to the court did list Dr. Kennedy's computer, you all did everything right. Apparently, when the local clerk's office prepared the authorization, which has to be signed by a judge, in order to get equipment, a local judge, in order to get

equipment into the courtroom, electronic equipment into the courthouse, Dr. Kennedy and Dr. Kinsbourne's computers were both left off.

So we'll, we're, that's being rectified by the clerk's office but they have to find a judge to sign it. So as soon as they find a, track down a judge who is not otherwise in trial we'll get them in.

THE WITNESS: And actually, I'm not that computer literate so I'm probably better off with a paper copy.

THE COURT: Fair enough.

MR. POWERS: And if it would be possible, Special Master, the copy that we handed to the court reporter, will I be able to use that up here? I had to give him my original to copy.

THE COURT: Certainly. And we'll just give it back to him. I want the court reporter to have it so he could use, use it for spelling purposes when he prepares the record. I'm court reporter friendly. So go ahead, Dr. Kennedy, you may proceed with your testimony.

THE WITNESS: I'll try not to use any complicated spellings and words.

BY MR. POWERS:

Q Okay. So, Dr. Kennedy, if you look at that

report that's Petitioners' Trial Exhibit No. 4, the first page obviously is the cover page. And did this describe the scope of your testimony today, if you could just tell us what the cover title is?

A Yes, it does. It talks about measles virus characteristics, replication, and detection.

Q If you turn to page 2 of Exhibit No. 4, can you describe to the Court, not just reading the slide, but mention what's on the slide and why it's significant to your testimony in the proof of this case.

A It's a cartoon of the measles virus, and shows the structural proteins that encompass the virus. And it also gives the definition of the genes and the gene products that produce the virus particle. So, specifically, we talk about something called the F gene and the H gene, and these encode respectively the fusion protein and hemagglutinin or the host cell attachment protein.

Q And that essentially summarizes the significance of Slide No. 2, is that correct?

A Correct.

Q Let's go on to page number 3 in Exhibit 4. The title of that page is replication. Can you explain to the Special Master the significance of this

slide and what it means to the case?

A Actually, the Special Master has heard this before in great detail from both myself and Dr. Ward. And it is just reviewing, in my own mind, the process of how the virus infects a cell, and how it replicates, how the viral RNA becomes message, and then is turned into protein. And how that protein, then it's assembled into new virus particles. And it is essentially a step-by-step process of how the virus replicates.

And the first step is that the H-Protein, the hemagglutinin, attaches to the cellular receptor, and the primary cell to the receptor for measles virus is a molecule called CD46. And then it discusses how, after attachment, replication of the virus takes place in the cytoplasm of the cell that it infects.

THE COURT: We have the computer. Do you want to stop so you can --

MR. POWERS: I was, after all of this build up to it, I'm feeling this has got to be a really good slide show, so if we could --

THE COURT: Sure.

MR. POWERS: -- not to even go off the record.

THE COURT: Why don't we take a 10-minute

recess and let you get this set up.

MR. POWERS: I appreciate that, ma'am.

THE COURT: Court's in recess.

(Off the record.)

THE COURT: All right. We're back on the record in the Snyder Case, and Dr. Kennedy remains on the witness stand, and we have the computer program up and running.

BY MR. POWERS:

Q Okay. Dr. Kennedy, before we took that brief break to get the computer set up, we'd actually gone through slides 1, 2, and 3. And so in the interest moving things along, if you could go ahead and put Slide No. 4 up on the screen there. It's a slide that is the second slide in the series that you have entitled replication. And, go ahead, pick up your testimony and explain what's going on with this slide, please.

A Well, this slides talks specifically about the fact that this was a relatively unique group of viruses that contains it's own RNA transcriptase, which is used to generate the messenger RNA, which then becomes protein.

The RNA transcriptase is also packaged into the infectious virus particle at the end of the

process when new virus progeny are formed. And it

talks about how the positive strand of RNA serves as a template to generate more negative strand RNA to be packaged into the virus particles, that can then infect additional cells.

Q And what just flashed on the screen, so that we can have the court reporter keep up with it here, is page 5 of Exhibit No. 4.

A So this is page 5. And it talks again about replication as the process occurs, as protein is being made from the measles virus RNA. It talks about specifics, and the importance of the protein. So the M protein is necessary for assembly and for the virus to be released from the infectious cell.

The F protein, and we'll hear a lot about the
F gene and F protein, is responsible for fusion of the virus envelope in the host cell membrane following attachment.
And the N protein is the nuclear protein, and it functions also in virus replication, and it's involved in, in encapsulating the genome RNA. So it kind of forms the first shell of the virus that protects the RNA.

Q And the fact that you have several slides up there describing replication, what's the significance

of replication, just very briefly at this point, in Colten Snyder's case.

A With the measles virus, replication occurs in a very orderly fashion from the left side of the genome to the right side of the genome. And we had talked about this before, that it's so orderly that proteins are produced in a specific order. And the F gene is one of the genes that's late in order. So if the F gene RNA is detected, the other RNA's have been produced, suggesting that the replication process is ongoing and that RNA is being made, and then protein can be made. So it's an orderly process.

Q Is this an orderly process that can be detected through laboratory testing?

A Yes, it can.

Q Okay. We'll talk about that in more detail as we go through your testimony, but I just wanted to make it clear to the Special Master why replication, at this point, is significant in the case.

So, let's go ahead and look at Slide No. 6 to Exhibit 4. This is a slide that's called Types. And if you could describe what's going on with this?

A Well, the measles virus belongs to a group of viruses, which is called Morbilliviruses. And

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Morbilliviruses are very host-cell-specific and host-specific. So they infect only a certain host and not others. And the diseases they produce are somewhat similar, depending on the host that it infects.

So, for instance, in the Morbillivirus group is the canine distemper virus, it's a virus that infects dogs, foxes, snakes, wolves, and it's associated with a neurologic disorder. If we go down to the phocine and dolphin Morbillivirus, which infect seals, and dolphins, and porpoises, respectively, this is a, again, a virus that causes neurologic manifestations.

Rinderpest virus, on the other hand, which is also in the same group, which infects cattle, African buffalos, and yaks, and was a major problem in Africa, results in death as a result of infecting the gut and causing symptoms associated with the gut. It is not a neurotropic Morbillivirus, whereas measles virus, canine distemper, and the phocine and dolphin Morbilliviruses are.

Q And what is the significance of the neurological involvement of these types of viruses in the same family to this case?

A The fact that there are viruses, which are closely related but different in host specificity,

that can cause neurologic disorders, and can be isolated from the brains of infected animals.

Q Let's go ahead and move on to the next page, which would be page no. 7 to Exhibit No. 4.

A And simply, I'll talk a little bit about diagnosis, because diagnosing measles oftentimes does not require any laboratory or elaborate tests, it has very specific manifestations that are well known.

So oftentimes measles virus is easily diagnosed by certain clinical features such as fever, a particular type of rash, something called Koplik's spots, which occurs in the buccal mucosa. And there are other symptoms that are associated with measles virus that are very characteristic with the infection process.

Q And so then let's, if we continue on to page 8, there's a visual discussion about diagnosis and presentation of measles, is that right?

A Yeah. So, this is essentially a child with Koplik's spots. And this slide was taken before HIPAA laws were in effect, so we don't have to blind his eyes. It appears about two days after the prodromal syndrome starts, and it's commonly associated with those white nodules you can see on the buccal mucosa underneath the tongue, and it lasts for one to two

days. This is very characteristic of measles and measles virus infection.

Q Let's go on to page 9 then, Dr. Kennedy. It looks as if we're moving away from clinical or symptomatic manifestations of measles virus into some laboratory issues, is that correct?

A Unless we want to look at the next slide which shows Koplik's spots with little, so --

THE COURT: We're still on slide 8, but you're looking at --

THE WITNESS: Slide 8, yes.

THE COURT: -- the bottom.

THE WITNESS: The bottom one, the bottom picture.

THE COURT: Okay. And that's the teeth and tongue?

THE WITNESS: The tongue with the white spots.

BY MR. POWERS:

Q And then, now we're on page 9, sorry about jumping the gun on the last slide there. But it does look, in this slide there's a moving from a discussion about clinical presentation to laboratory diagnostic work, again, the infections.

A And again, diagnosis of measles virus

infection can also occur in a laboratory. And there are two major methods that are used, serology and antibody detection. And those methods have been referred to as ELISA the inflammation, inhibition and the neutralization. And direct detection of the virus, even through cell culture and virus isolation and detection, and you'll hear about PCR, in this case for measles virus, reverse transcriptase, or RT-PCR.

Q Let's go ahead and move on to page 10 then. And what do see being described in, in slide 10 to Exhibit No. 4?

A Well, I think at issue here is the persistence of measles virus, and how does measles virus persist in a host. And there are a number of different viruses and virus groups that cause persistent infection. Some you're very familiar with, others not so familiar with. And my point here is that we really do not understand the mechanisms of viral persistence for a lot of the viruses.

For DNA viruses in the Morbillivirus group, an example is the human papilloma virus, which has been associated with cervical cancer. Probably one of the better studied viruses from a standpoint of persistence and how it maintains itself in a state that prevents it from being destroyed by the immune

system.

In some individuals that persistence will result in cervical carcinoma. In other individuals that are infected they will remain healthy and be quite fine for decades without any symptoms, any symptomology, any indication of infection other than detecting it by very sensitive techniques such as PCR.

And the same with the RNA viruses, so retroviruses include things like human immunodeficiency virus, and a neurotropic virus called HTLV-1, which has been associated with adult T-cell leukemia.

And in this situation these viruses can persist, a mechanism od persistence, is better known in a lot of viruses, because their replication cycle requires the stage where they integrate into the host genome. But, for instance, with HTLV-1, in a subset of individuals it will cause a neurologic disorder that's called TSP or tropical spastic paraparesis, and I'll give you the spelling for that.

So if you're latently infected with HTLV-1 and it persists, in some individuals they can get TSP. In other individuals they'll get adult T-cell leukemia. In other individuals they'll be fine for 30 to 40 years. So the mechanisms of persistence are not

well known.

Q And this issue of persistence and replication, that's significant in Colten Snyder's case because it's your testimony that the vaccine strain measles virus was replicating in his system and therefore persisting in his system long after the administration of the MMR vaccine, is that correct?

A That's correct.

Q And so if these, the context of persistence and replication are critical to understanding the presence of measles virus in Colten Snyder's body several years after his immunization, is that fair?

A Correct.

Q So let's go ahead and move on to the, to the next slide, Which I believe is no. 11, Exhibit 4.

A Okay. And I've shown this slide during the Cedillo testimony, but I thought it was still relevant here in that how can a virus persist in a host when they have a functioning immune system. And the easiest way for viruses to persist is in an individual that's immunodeficient or dysfunctional.

And I give examples of immunodeficiency, or immunodysfunction in individuals that can either be caused by primary or inherited defects. And, for instance, one in 500 individuals in the United States

have what's called a common variable immunodeficiency. And the most common variable immunodeficiency is the selective IgA deficiency.

There's also immunodeficiency, or immunodysfunction that can be acquired. Infection of the immune system is an example of acquired of immunodeficiency, HIV, human immunodeficiency virus, which causes AIDS, is an example. HTLV-1, which I just mentioned, causes to develop T-cell Leukemia and TSP. Measles virus, chronic malaria, are examples of immunodeficiency or immunodysfunction that is acquired.

Also things like heavy metal exposure, malnutrition, cancer, age. When we're young we don't have a competent immune system. And when we get old our immune system wanes. So it can result in a immunodeficiency or an immune dysregulation.

Q And if you recall from the presentation of the evidence in the Cedillo case, do you remember the testimony of Drs. Vasken Aposhian and Vera Byers?

A Yes.

Q And do you recall those two expert witnesses, both in their testimony and their report, describing in the Cedillo case the immunosuppressive

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effect of mercury contained in pediatric vaccines. Do you remember that testimony?

A I remember reading and hearing about it, yes.

Q And so you're not here to offer testimony as a heavy metal toxicologist, but you would be relying on the testimony of those experts in Cedillo to identify opportunities for immune suppression in Colten Snyder, is that correct.?

A Yes, I only give testimony on heavy metal bands.

Q So aside from heavy metal bands, and relying on Dr. Aposhian and Dr. Byers, you also do talk about measles virus as a agent, so to speak, of immune suppression. I know we're going to get into the summary of your expert report in just a moment. But while we're on this slide, is it going to be your testimony that the measles virus immune suppressive effect was a factor in Colten Snyder's presentation here?

A I would certainly say yes, and more likely than not.

Q And when you say, more likely than not, that's to a reasonable degree of scientific probability?

A Correct.

Q Okay, let's move on then in to the summary of your expert report. And this is slide 12 to Petitioners' Exhibit No. 4. And I'll just ask you to, as we said early on, this was not to regurgitate the entire report, but distill it to bullet points, and I'm going to ask Dr. Kennedy to walk through some of these, and interrupt with some questions as we go so that we can move through this efficiently. So, Dr. Kennedy, if you could start off with a summary of the report you submitted in this case.

A Okay. So measles virus, and closer related viruses in the same subfamily and genus are neurotropic and can cause neurologic disorders and sequelae in humans and other species that they infect.

Q And I'm going to do my first interruption. What do you mean by neurotropic?

A That it infects cells from the central nervous system.

Q Go ahead.

A Measles virus and other Morbilliviruses can cause persistent infection and have been detected in cerebrospinal fluid, CSF, and the brain of individuals that exhibit neurologic disorders.

Q And when you say "persistence," that's the

process that you were referring to earlier in the slides, which is the continued presence of the virus in the body without destroying the host cells?

A Correct.

Q Okay. And then you have a final point on page 12.

A The measles virus infection and replication requires the presence of measles virus RNA.

Q And measles virus RNA is, again, what you described in the, it's a very distilled version of the formation and the replication of the measles virus in your slides, is that right?

A Correct.

Q So let's go ahead and keep moving through this summary. We're now at page 13 to Exhibit 4. Tell us a little bit about the immune dysfunction here.

A Immune dysfunction is a term that encompasses problems associated with a normal function of the immune response. Viruses in general do not persist in a host because the host has an ineffective immune response. Viruses in general persist in a host because of an ineffective immune response.

Q So in other words if a host has a fully functional and healthy immune system, the viruses that

are introduced would simply not persist, they would be eliminated from the body?

A In general.

Q And by not persisting, that means they would'nt be in the body replicating, correct?

A Correct.

Q So this really talks about there's no persistence and there's no replication in a body that has an effective immune response, is that right?

A For most viruses in general. There are examples where that's not the case.

Q Would it be your testimony that any of those examples are going to be relevant for the case here?

A No.

Q Okay. Well, we'll go on to slide 14 then to Exhibit 4.

A Okay. Again, there are a number of contraindications for administering the MMR vaccine, which are described in the Physician's Desk Reference. Adverse events involving the MMR vaccine have included neurologic disorders. Studies in immune dysfunctional children have shown measles virus replication based on a detection of measles virus RNA by PCR up to 60 days after clinical symptoms. Presence of measles virus RNA at multiple sites indicates an ineffective

clearance and a potential for persistence.

Q Now, in describing some of these studies and the adverse events, I know that in your expert reports in Cedillo and in this matter, you included bibliographies and citations, is that correct?

A Correct.

Q And your testimony in the summary is based on the citations and the references contained in the materials already on file in this matter, is that right?

A Correct.

Q So let's go ahead and move down to slide 15 in Exhibit 4.

A The laboratory of Dr. John J. O'Leary, and his colleague, Dr.Orla Shiels, at Trinity College in Dublin, is highly competent and skilled at performing molecular-based techniques and molecular-based diagnoses.

Q And why is it significant in this case that Dr. O'Leary and his colleague are competent and skilled in doing the lab work we're going to talk about in detail?

A Because this is the group that diagnosed the measles virus RNA in Colten Snyder's CSF.

Q Continue.

A In particular, Dr. O'Leary continues to receive prestigious awards and honors for his work in Europe in molecular-based diagnosis, including the St. Luke's Medical Chair, which, St. Luke's Medal, which was given him to the Royal Academy of Medicine, and Endowed Chair in Pathology at Trinity College.

Q And as far as you know, Dr. O'Leary continues to conduct PCR work, is that correct?

A Correct.

Q Continues to publish that work, is that correct?

A That's correct.

Q Work that he publishes is in peer-reviewed scientific journals, correct?

A Yes, it is.

Q Now, the last point of your slide describes PCR, if you could just tell us what you're talking about in this summary?

A So PCR is a standard technique to demonstrate measles virus persistence. And it's an established technique used by a number of investigators in the field.

Q And at this point would you like to explain to the Special Master a summary of what PCR involves?

A Okay. So, in this case PCR, RT-PCR, reverse

transcriptase PCR, involves the detection of measles virus RNA in biological fluids. It's a standard practice. The differences that can occur are based on primer probe pairs.

We've heard in the past some concern about the techniques, contamination issues, primer design issues, probe design, false positive issues. And a number of other issues that are technical challenges to developing PCR methodology. And a competent laboratory can recognize these issues, and resolve these issues very rapidly.

Q We'll talk about that resolution of some of those issues in a moment. But let's then move on to slide 16.

A The detection of the measles virus RNA. The high levels of measles virus RNA detected in CSF samples of Colten Snyder at the time point when an effective MMR vaccine-induced immune response should have cleared the measles virus, indicates the measles virus RNA has amplified as a result of replication and persists in part of his body where it is not expected to be found.

Q And go ahead and continue. I'm going to have some questions getting back to the whole slide, but I want you to go through it first, please.

A Okay. The detection of measles virus RNA in the CSF supports evidence of viral persistence in the CNS and the brain. And then, similar to other neurotropic Morbilliviruses, the presence of viral persistence in the CNS and brain will result in neurologic disorders and manifestations.

Q And the opinion that's summarized here on this slide, is this opinion, is this an opinion that you hold to a reasonable degree of scientific probability?

A I do.

Q I want to talk about high levels of measles virus RNA. What do you mean by, high levels. Is that equivalent to high count?

A No, it's an inverse relationship.

Q Okay. So explain.

A So the high levels found in Colten Snyder were 3.7 x 104 , copies per nanogram of RNA. And in studies that have been published using PCR, using real-time PCR, if you look at a lot of the figures in different papers where they start showing quantitation is 100 copies and above.

So 100 copies oftentimes is the base line used in figures of numerous papers. So this is well above that 100 count, and I would consider anything

above 1,000 relatively certain high positive.

Q And is it significant that the count you're looking at is in cerebral spinal fluid?

A Yes, I would not expect to find anything in cerebral spinal fluid.

Q And when you say you would not expect to find anything, that is you would not expect to find, a few years after immunization, you wouldn't expect to find any measles RNA in the cerebral spinal fluid, is that correct?

A No, I wouldn't.

Q And so now, we're not only seeing a little, or none, we're seeing a lot, is that correct?

A Correct.

Q What is the significance of that high level to you in forming your opinion in this case?

A I think that that high level is, gives me a high level of confidence that what they're detecting is measles virus that shouldn't be where it is.

Q And not just measles virus, but measles virus that would have come from the vaccine strain contained in the attenuated MMR immunization, is that right?

A Correct.

Q Now, evidence of replication and

persistence, you've talked about the RNA and the PCR techniques that pick up the presence of RNA. That's been, in summary, what you've discussed as proof of the viral persistence, correct?

A Correct.

Q In addition to the presence of RNA as evidence of persistence and replication, what other evidence might you look for, and a laboratory look for, to determine whether a virus is persisting or replicating in a system?

A The presence of the virus at multiple sites. The presence of different genes from the virus, different gene products. The presence of protein from a virus. All these, to me, would be indication that replication had occurred.

Q And when you say the presence of proteins, are you familiar with literature that describes the presence of proteins as part of proof of replication of a virus?

A Yes, there's numerous publications in the literature. For RNA viruses an example would be Sindbis virus.

Q I'm sorry, Sindbis?

A Sindbis, S-I-N-D-B-I-S, Sindbis virus.

Q Okay.

A That clearly shows the detection of protein and the presence of RT-PCR positive gene products in infected cells.

Q So it's not just the RNA, because that, while it sounds like strong evidence, you now have combined the, the production of proteins?

A Right.

Q And these are proteins that can be identified in the case of measles virus in that orderly strain, is that correct?

A Correct.

Q So at some point, if you detect not just the RNA but actual protein products, at a certain point in the chain where those products are produced, you know that all the preceding products were being produced also, correct?

A Correct. And if I could show my first slide in my appendix, it's a slide that you've seen before, but it gives an example of the orderly replication that I was talking about.

Q And this would actually be slide 18, slide 17 is the cover sheet for the appendix, so we're at page 18 of Exhibit 4. So Dr. Kennedy, go ahead and tell us what's going on in this --

A And actually the Special Masters have seen

this slide before. And it just shows the order of the measles virus genes as they're involved in replication, the production of more messenger RNA, and the production of protein. And the genes of interest are the F, the H, and the N. So the N is the first one to produce more N genome product should be, I'm sorry, and more. And more, can you hear me? Is this good?

THE COURT: Move it back just a little bit.

MR. POWERS: Just a little bit.

THE WITNESS: Okay. And the N should be the most abundant gene product, and also should be the most protein that one can detect in an infected cell where replication has occurred. So if you detect the F gene, the N gene, the P gene, and the M gene should also have been produced. And if you detect the H, then an F, M, P, and N should also be produced.

Q And it sounds, from your earlier testimony, not only should they be produced, but given the orderly replication process that goes on with measles virus as a matter of necessity, they would have been produced, is that correct?

A Yes.

Q Okay. And the idea that every preceding

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gene in this sequence is a necessary precursor to the final one. That's well established in your field of expertise, isn't it?

A Correct.

Q So any testing then that would identify an F gene, for example, in a tissue sample would necessarily mean that N, P, and M had been produced sequentially before the F, correct?

A Correct.

Q Why is that significant in Colten Snyder's case?

A Because the F gene was detected.

Q And who detected the F gene?

A It was Unigenetics, the laboratory of Dr. O'Leary.

Q And this is using the reverse transcription PCR technology that you talked about?

A Correct.

Q And in my layperson's understanding, there are three processes that go on in PCR involving solution, Taqman and in-cell, is that correct?

A Correct, in situ.

Q In situ, thank you. I'd never take a chance at Latin without knowing how to say it. So those three are all designed to identify the RNA, is that

correct?

A Correct.

Q Now, you also mentioned the persistence and the presence of proteins. What is the process by which the proteins are identified?

A A classic mechanism is immunohistochemistry.

Q And when you say, classic mechanism immunohistochemistry is something that is fairly standard procedure in labs that use PCR to identify proteins, is that correct?

A Correct.

Q And in fact, that was the procedure that the O'Leary lab used, is that correct?

A Correct.

Q It's a also a procedure that the authors of the Uhlmann paper, that has been discussed at length in the Cedillo matter, that immunohistochemistry was used in the results that generated the Uhlmann paper, correct?

A Correct.

Q So, in the Uhlmann Paper, and in Colten Snyder's case, is it fair to say that there is evidence through PCR and immunohistochemistry, both of measles virus RNA and measles virus proteins?

A As I testified in the Cedillo case, that the

detection of the N protein, which is described in the discussion of the Uhlmann paper, clearly indicates that replication had occurred and the infected cells, or infected samples being examined, were well on the way of producing additional virus particles.

Q And then the immunohistochemistry that's cited in the Uhlmann paper essentially confirms the findings of the three RNA methods, is that right?

A Correct.

Q I just want to make sure that's a fair way to describe the analytical approach to the laboratory results.

Now you were here yesterday, it seems like longer ago, but you were here yesterday I believe, and have seen in any case what's been labeled as Respondent's Exhibit AA, that was a letter from Dr. Oldstone to Dr. Ward that was filed in this case. Are you familiar with that?

A Yes, I am.

Q Okay. That letter describes some dispute between, apparently Dr. O'Leary and Dr. Oldstone about samples that Dr. Oldstone sent to Dr. O'Leary's lab for testing, is that correct?

A That's correct.

Q Are you familiar, through your personal

knowledge, outside of what you saw in that letter, are you familiar with the facts surrounding that dispute between the Oldstone and O'Leary laboratories about sampling?

A Yes, it was a very major part of the discussion that we had during our, during the visit to the U.K. with Orla Shiels.

Q And let's put a little bit of context on it. You said, visit to the U.K. with Orla Shiels. I know we talked about this in the Cedillo matter, but as briefly as you can, can you just give us some setting or, sorry, excuse me, some context to describe the setting where this meeting with Dr. Orla Shiels came up. In fact, Orla Shiels is a colleague of Dr. O'Leary's.

A Correct.

Q And Orla Shiels worked with Dr. O'Leary in his Unigenetics lab doing the PCR work.

A Correct.

Q And she is one of the co-authors on the publications that the O'Leary labs were, ultimately was used in.

A Correct.

Q So we're talking about Drs. O'Leary and Dr. Shiels, these are two folks working together in the

same place on many of the same projects, correct?

A Yes.

Q Using the same technology?

A Yes.

Q Using the same facilities?

A Yes.

Q And using the same facilities that produce the data for the Uhlmann paper, as well as the lab results in Colten Snyder's case?

A Yes.

Q Okay. Just so folks have a clear idea as to who the players are here. So go ahead, and with that given, and describe, to the extent that you can, the interaction between these two labs that are at issue in the letter which we'll see in file.

A I was asked by a former colleague, John Marchalonis if I'd be interested in attended a meeting that dealt with measles virus adverse events, and the immunology and virology associated with it. And it was going to be held in the United Kingdom, and I said, sure.

The meeting turned out to be a meeting of the expert witnesses at the time that were being put together by Alexander Harris, based on some litigation that was ongoing in the U.K. And I went over and

attended the meeting, had a good amount of time with Dr. Shiels, and a number of other respected virologists, individuals that I didn't know personally, but knew by reputation through publication, et cetera.

And Dr. Shields presented the data that was being generated by the O'Leary lab. And it was a lot of discussion, and a lot of grilling, criticism, clarification, convincing, and discussion of how the O'Leary lab was doing their measles virus RT-PCR.

Q And in the course of those discussions, did this issue that Dr. Oldstone's and Dr. O'Leary's lab have disagreements about some of the findings on samples from Dr. Oldstone's lab, did that come up?

A Yes. At the time, Dr. Oldstone was developing a transgenic mouse model that contained the CD46 human host cell receptor for measles virus, and was looking to develop, develop a better mousetrap, per se, to examine aspects related to measles virus replication more mimicking the human situation.

Q And so, doctor, excuse me, not Dr. O'Leary, but Dr. Oldstone's lab then was handling a significant amount of measles virus material at that time, is that correct?

A Correct.

Q And as part of the work that Dr. Oldstone was engaged in, apparently from the letter that we see in file, he sent samples that he believed to be negative to Dr. O'Leary's lab, correct?

A Correct.

Q Are you familiar with that?

A Yes.

Q Tell us what you know about, about that, please.

A Well, there was discussion on the inability to replicate certain measles virus detection in tissues from these transgenic animals that had been inoculated by various means with measles virus, either orally or intracardiac, or intraperineal.

And the argument led a number of us to say that, you know, maybe this is issues related to low detection, that you've got such low copy numbers you can't detect it, or a situation where something's coming up positive that should be negative. Is there contamination? Tell us about the contamination issue.

And we discussed in detail the possibility of contamination the way the O'Leary lab and Unigenetics handled the material gave, at least myself and a few others at the meeting, confidence that the contamination source was not the O'Leary lab, because

they were not dealing with actively replicating measles virus. So they had either samples from SSPE individuals or they were using plasmids as controls that they had, which just contained partial sequences of measles virus.

Q So it sounds like the dispute here is that material from Dr. Oldstone's lab that he presumed to be negative for measles virus, some portion of those samples when sent to Dr. O'Leary's lab and were tested actually tested positive. Is that --

A Yeah, that's --

Q -- the dispute?

A Yeah.

Q And what you're saying is that you have a high degree of confidence that any potential contamination that might have generated a false, or not false positive, a contamination that might have occurred, you're confident it was not at Dr. O'Leary's lab, correct?

A I believe they actually resolved that, because Dr. Oldstone sent additional samples, and that those samples, when sent again, turned out to be negative. So there was some discordance between samples being sent, what was positive. It was clear that contamination had occurred.

And, you know, with contamination it's who contaminated it. You know, did it come from the source, or did the source who was doing the assay contaminate it.

I think the point that we were looking at was, if it got contaminated how could the O'Leary lab have contaminated it. And the other thing is that we felt it really wasn't a big issue because it was identified as contamination, and it was easily fixed and rectified.

Q And fixed and rectified at the O'Leary lab end of things, correct?

A Correct.

Q So it's entirely possible then that the reason the O'Leary was detected, was getting some positive low count results on samples from Dr. Oldstone's lab, is that those samples from Dr. Oldstone's lab in fact were not negative. Is that a possibility?

A That's a possibility.

Q And if they were not negative, that would be a result of contamination in Dr. Oldstone's lab, correct?

A Correct.

Q And it's entirely possible based on what you

saw, and what you had experience with that that possible contamination of Dr. Oldstone's lab actually could be the reason that the O'Leary folks were finding positives in purportedly negative material?

A Correct. But it was also my understanding that they were working through the issues, and that indeed they had figured out what the issue was. It was contamination, one wasn't blaming the other, and that it had been resolved.

Q And you also mentioned that the, this, the issue of contamination seemed to come up based on copy numbers, or count.

A I think the issue was that no one had any problem with high copy numbers. So if the sample had high copy numbers there was not an issue. It was this low copy number window of, you know, is it positive, is it negative, that was really part of the issue and level of discussion.

Q And when you say there wasn't an issue involving high copy numbers, is it accurate to say that what, what you mean by that is that the Unigenetics Lab and the Oldstone Lab, analytically agreed on positives and, excuse me, on positives when they were high copies?

A I, at the time I was not sure that the

Oldstone Lab was doing RT-PCR, they were doing more classical viral isolation techniques. And they wanted to look at very sensitive techniques to see if they could find measles virus replication in tissues where you wouldn't anticipate it would be in a mouse that was transgenic for the measles virus cell receptor.

So that's why the collaboration, my understanding is, between Oldstone and O'Leary occurred initially. But the issue had always been low copy numbers.

Q And your impression, again, is that when it was high copy numbers there was really no disagreement between the two laboratories, and the results were equivalent at the high copy numbers.

A No, and they had some, some of the tissues from the Oldstone transgenic mice had smoking numbers of, of high copies in the types of organisms they were examining.

Q And the results on those type of tissue samples would have been equivalent between the two laboratories when they did their testing?

A I'm not sure, again, if Oldstone was doing RT-PCR at the time for direct comparison. But certainly, the isolated virus through tissue culturings, you would anticipate that there's a, a

good amount of virus there.

Q And high copy numbers, you talked about for a few minutes, why do you think that the high copy number issue, that is these two laboratories that seem to be in conflict based on this, but it sounds like the two laboratories were actually in agreement on high copy samples. Why is that significant in Colten Snyder's case, the case that we're here about?

A Because Colten Snyder has high copy numbers of measles virus RNA.

Q I want to get off of that topic for just a moment and get you back into the presentation here and ask if there's anything else that you feel you need to talk about on page 18 that describes replication of measles virus?

A No, I think that the Special Masters have seen that slide, and probably have it better memorized than I do.

Q Okay. Well, let's go ahead and move on to the next page, which would be --

A And actually, those were just examples if, if the Respondent had questions from the standpoint of, I was anticipating some questions that might occur from the standpoint of PCR contamination, how you might rectify it. And the other one was just the

course of how measles virus infects various human tissues.

Q And that will be slide 19. Please, let's just take a quick look at slide 19.

A Okay.

Q This is the one that's called measles virus pathogenesis. And I understand you have it prepared primarily to help guide folks through any issues on cross. Let's go ahead and just quickly summarize what you're showing on this, on this page.

A It's from a standpoint of infection, the infection with measles virus normally occurs through the respiratory tract. Then it goes to the lymph nodes, gets into the blood, and causes viremia, which is the presence of measles virus in the blood. To the reticula endothelial system, then it causes a second viremia, and this is also associated with the clinical symptoms, the fever, the rashes.

And then from the second viremia it can go to various places, like the central nervous system, the GI tract, blood vessels, urinary tract, respiratory tract, conjunctiva of the eyes. And these are all associated with a lot of the clinical symptoms that one can see during measles virus infection. Particularly when it's not controlled well.

Q And understanding that you're not a clinician and a neurologist, there will be other discussions from other folks about what happens in this pathogenesis when the central nervous system and the GI tract are involved. So I think we'll just leave it at that and move on to the final slide because this talks about PCR contamination.

And I'd like you to address the contamination issue a little bit, because a moment ago you described in your work over in the various meetings, and the conversations you were privy to in the U.K., issues about resolved, testing for resolving contamination issues, were they could either be anticipated or actually happened?

A Contamination issues with PCR happen all the time in all the laboratories. And the point is to recognize contamination or actively, and fix it rapidly. And how do you recognize contamination? You recognize contamination by running the appropriate controls.

And what I show here is an example of a contamination that happened in my laboratory. It's not with measles virus, it's with simian virus 40, a large tumor antigen, which is an issue that we're dealing with, finding it in places where it shouldn't

be and issues of persistence where it shouldn't persist.

And in this instance we were looking at mesothelioma, biopsies from individuals that had mesothelioma. And there's a hypotheses that along with asbestos, SV40 may play a role. So if you take a look at panel A, this is an issue where we have obvious contamination.

What do I mean by obvious contamination? If you look at lane two, and you look at lane 10, lane 10 is our positive control. You see that very bright band on lane 10? Lane two is our negative control, it's one of the negative controls that contains no template. So with no template no in there, there should be no amplification by the primers, and you shouldn't see a band. We see a band.

Now you look at lane three, another control, that's just a water. So we don't see anything there. But what we do see is if you look in lane seven, and you look in lane nine. And lane nine is baboon kidney cells, and baboons are notorious for being, harboring simian viruses.

You can see a positive for nine, and you can see a weak positive for seven, the mesothelioma samples. So that data would tell us that, yes, SV40

plays a role in some, can be detected in some mesothelioma samples.

And that would be fine except our negative control is positive. So what did we do? Well, we have a normal process on how we fix this. And the first process is to change the water, blame it on the water.

And if you take a look at the panel B, and these are just agarose gels, the lane designations are the same, but you see in panel 10 the positive control is positive. Two, three, and four, lanes, which are our negative controls are all negative, you don't seen any band. And the baboon kidney cells, and the three mesothelioma, four mesothelioma samples, five, six, seven, and eight, are all negative.

And it took us about eight hours to rectify that particular contamination. We've had others where the primers have been contaminated, or we got contaminated primers from other individuals, or we've had laboratory contamination of cells.

It is something that you have to be very diligent about. And anybody who's competent at doing this type of molecular diagnosis has the appropriate controls to know when contamination occurs, and contamination does occur.

Q And so it's not, some contamination does occur and is actually expected, is that correct?

A Yes.

Q And so the presence of contamination in and of itself doesn't meant that there's necessarily a problem with the lab, right?

A No.

Q What it means, and what you really have to look for then is whether the laboratory has procedures, protocols, and responses in place to deal with the anticipated contamination, is that right?

A Correct.

Q Based on your knowledge and your experience with the Unigenetics lab, can you describe for the Special Master your opinion on whether they met the proper standards for recognizing and dealing with contamination?

A They were as competent as any laboratory I'd ever seen, and probably more competent because of the issues that they were dealing with.

So they took special conditions, had special laboratory, special hoods, special processes, special procedures, to prevent issues related to contamination. And in, at this time it was specifically for measles virus. These days it's more

for diagnosis of various types of human cancers.

Q And it's also, it should also be clear that at the time that the O'Leary lab was doing this work not only were they observing the protocols that you just described, they were under scrutiny, and had people flying in from all over the world, including yourself, to specifically address these issues of contamination and how to deal with contamination, correct?

A I wasn't there so much to deal with the contamination as I was to evaluate the immune response and look at other aspects. It was just that I had some background in molecular biology and some of the technologies that I was asked to see in one of the presentation by Dr. Shiels.

Q So you were present and that created a confidence on what you heard that in fact they were, they were doing that, and doing it under fairly intense scrutiny, correct?

A And I watched all the other individuals who were in the room pretty much feel the same way. Although we did leave still arguing about low copy numbers.

Q But you left with no argument about high copy numbers?

A None whatsoever.
Q And high copy numbers are the issue in this case with Colten Snyder's CSF findings. Right?
A Correct.
Q Now, I believe there's been some, both testimony about, even argument from the Respondent's side that the O'Leary lab's work has, has never been replicated. Are you familiar with some of those arguments?
A Yes.
Q Do you have an opinion as to whether those arguments are correct as a matter of fact?
A There has been some replication of the data. At the meeting I was at I specifically knew of replication of data relative to high copy number positive in CSF from various individuals in the U.K.
Q And do you recall who any of those U.K. individuals were?
A As far as the, the specific patient or --
Q Or the folks that were doing the work.
A Oh, who the laboratory, you mean. So the, there was a large discussion about how are you doing the confirmation, you know, how sensitive, you're not participating with the large cohort that's, you know, doing the direct comparison. How are you confirming

this?

And Dr. Shields discussed a collaboration with a doctor who, Cotter (C-o-t-t-e-r). And I believe Dr. Cotter, at that time, was at the Well Hospital London, which is associated with the university, University College in London. Dr. Cotter was also a molecular biologist, a PCR expert.

And Dr. Cotter initially had some problems in replicating the work of O'Leary because of the number issues related to primers, primer design, sensitivity, et cetera. And what happened was that they went through the process of getting things to work again providing, synthesizing new primers, providing the primers electrolyzed, so he rehydrated them in his laboratory, and that he was able to reproduce the high copy number.

And I believe the reason that the O'Leary laboratory selected Dr. Cotter was that he was also someone who was interested in pushing the window on detecting low copy numbers.

Q And so in the, the work that Professor or Dr. Cotter was doing, he was using the same protocols, the same PCR protocols as the Unigenetics Lab?

A Yes, the Unigenetics Lab provided the primers, they provided the probes, they provided the

samples. The only thing that they didn't provide was the isolation kits, and didn't provide the water. And water is important with this technology.

They sent samples from tissues of the transgenic mice infected with measles virus, among other things. And that's how the laboratories got up and in accordance. But it took a lot of effort.

Q And as they progressed through doing the work, and when I'm talking about they is Dr. Cotter's laboratory. As they progressed did ultimately, did they produce results that they could then compare to the O'Leary lab results?

A I believe so. During our conversations we did not see specifically Dr. Cotter's PCR methodology, we, there was discussion of it. There was discussion of the problems they had, there was discussion how they rectified it, and there were problems with how they were detecting, and how it was comparable. But we did not see the specific hard data.

Q You didn't see the data? And just to then make it clear, when you talk about the problems they had you're referring to the difficulties they had in getting the primers that would be efficient enough --

A Right.

Q -- and specific enough to do the PCR testing

on the samples?

A Correct. So they had to resynthesize the primers and probes.

Q And the probes?

A Yep.

Q And the probes were the ones that would have been used in the Taqman --

A Correct.

Q -- procedure. Okay. But aside from having to redo their primers and the probes, there weren't any other problems that you're aware of that either of these labs had in doing their, for layperson's terms, a validation study?

A Right. And essentially, I do remember them validating high copy numbers in CSF.

Q And is it your understanding that as copy number went up and got higher and higher, the results from the two labs actually converged and became more and more equivalent, is that fair?

A Correct.

Q Now, you're talking about things based on your knowledge. As far as you know, has any of what you've just described been reduced to writing anywhere?

A Yes. It's in the U.K. litigation files.

Q And is there any reason that you're not able to show up here and present those writings to the Special Master in court?

A Yes, because it's my understanding the U.K. litigation, which is over, is sealed by a court order. So I am not free to produce any of those documents or documentation I may have.

Q And you're simply limited to testifying based on your personal knowledge, and the facts that became aware to you in the process of working in the U.K. litigation?

A Correct. And sometimes it's hard with all that knowledge not to, to put your own personal opinion in. But I'll try not to do that --

Q And avoiding personal opinion, again, to an expert opinion. And so based on everything that you said here today, would it be your opinion, to a reasonable degree of scientific probability, that the results in Colten Snyder's case generated by the O'Leary lab are scientifically credible?

A For the cerebral spinal fluid, yes.

Q And would you say for the cerebral spinal fluid, the cerebral spinal fluid presence of measles virus --

A Correct.

Q And is it your opinion, to a reasonable degree of scientific probability, that vaccine strain measles virus persisted and replication in Colten Snyder's body from the time he got his MMR up through the time he had his lumbar puncture taken?

A Yes.

Q And is it your opinion, to a reasonable degree of scientific certainty, that the laboratory work that generated the results that you're basing that conclusion on are trustworthy and reliable?

A Yeah, you usually give awards and honors to individuals who are less than diligent, is a good term.

Q There has been at least in one of the Respondent's expert reports that referred to Dr. Ward, and there's a statement that contamination at the O'Leary lab was more plausible than the, it was a more plausible explanation for finding of measles virus in Colten's CSF than the actual presence of measles virus. What's your reaction to that?

A I would say then we should have seen measles virus in the blood sample.

Q But again --

A Didn't.

Q It's also been said in that report and in

0other places that the O'Leary labs have, that the fact that there might have been contamination of the O'Leary lab at some point invalidates the results and makes the prior results of any of the work the laboratory has done unreliable. What's your take on that issue?

A Absolutely not. Contamination issues, and the other issues relative to PCR's specificity and sensitivity are dealt with daily. And a laboratory that's competent recognizes it rapidly and can fix it rapidly.

Q And that gets back to your earlier point, and this is to a reasonable degree of scientific probability, that the O'Leary lab in fact can deal with contaminations in a scientifically appropriate way?

A Exactly.

Q And they could do it in a way that would make their ultimate results reliable because they wouldn't be relying on results where they hadn't applied the contamination protocol, correct?

A Correct.

Q And that's based on, again, your personal knowledge working with those folks and consulting in the U.K.?

A Correct.

Q There's also been testimony from the other side, in Cedillo and in reports in this case, that there's little evidence that vaccine strain measles virus is neurovirulent, what's your opinion on that statement from the Respondent's case?

A I guess I would argue that the MMR vaccine contains a attenuated version of the measles virus. But it's still capable of replicating, and it's still capable of doing the same sorts of things that the measles virus itself can do, albeit at potentially a lower level.

And there was a publication by Weibel in 1998 in Pediatrics that discussed the adverse events reported for the MMR vaccine in, for the last, oh, from I believe '71, I probably have my dates wrong, for a 20-year period. And I believe there were 48 cases of individuals that had adverse events, and those adverse events were associated with a neurologic sequelae.

Q Now we talk about neurologic sequelae in another point that's been raised by the Respondent's side and the folks they're relying on, is that the disease model of viral persistence, which doesn't fit your extrapolating from canine distemper and things

like that just isn't applicable.
Can you describe for the Special Master your response to that would be, but basically the disease model that you're describing, and that Dr. Kinsbourne has described, just doesn't fit here with the symptoms of this virus?

A I would just say that animal models are an important component of any sort of research investigation into pathogenesis into developing new methodologies for detection, into looking into any aspect, be it vaccine efficacy, vaccine safety, new treatments, et cetera. And how close the model mimics the human situation is very important. One thing nice about the animal models is that you can do a brain biopsy on a canine distemper infected dog, and actually isolate canine distemper virus from the brain biopsy, which is something that's very difficult to do in humans.

And I think the important aspect is if you look at the situation with canine distemper, look at other situations that have been described in the literature, that when you've done brain biopsies, not everybody who had measles virus isolated, not every dog, was dead. So they were harboring the virus, it was causing some issues, but those issues were not

fatal at the time.

So in 10 years, or a dog's life, you know, 10 years in a dog's life, would that become fatal? It very well could, but we know so little about persistence, and we do know that if you can have persistence and have mild symptomologies, such as human papilloma virus and things like dysplasia, or you can have very major situations like cervical carcinoma that metastasizes and, you know, results in death.

So there are different degrees relative to what persistence can cause. And I think that the animal models suggest that MMR can be neurotropic and can do the types of things that we're seeing in Colten Snyder. It doesn't necessarily mean it does it in all individuals, but in certain situations I think that, that it's comparable.

And there are studies with, in nonhuman primal models, using MMR and using measles virus, and that very closely mimics the human situation.

Q So I, it sounds like from what you just said you would disagree with one of the statements and one of the expert reports that for the Morbilliviruses that appear in animals the appearance of symptoms that is virtually inevitable harbinger of death. You would

not agree that that's necessarily the case in these animals or in conditions of all MMRs in humans?

A I would not agree with that statement, correct.

Q Well, Dr. Kennedy, we've covered a lot of ground today, it covers a lot of ground from Cedillo.

MR. POWERS: I'm going to go ahead and be done with my questions now, Special Master. I anticipate Respondent's going to cross and obviously, would have an opportunity to redirect if needed.

THE COURT: Thank you, Mr. Powers. Government?

MR. MATANOSKI: If you wouldn't mind, ma'am, if we could take our morning break now?

THE COURT: Sounds fine to me. How about we reconvene at 11:00.

MR. MATANOSKI: Thank you, ma'am.

THE COURT: Okay.

(Off the record.)

THE COURT: Okay, we're back on the record then in the Snyder case. Dr. Kennedy is on witness stand, and Ms. Babcock, you may begin cross-examining.

CROSS-EXAMINATION

BY MS. BABCOCK:

(Away from microphone.)

Q Good morning, Dr. Kennedy.

A Good morning.

Q As Mr. Powers stated on your direct examination we obviously understand that you have been here before in this proceeding to testify. And so I will certainly attempt to not ask the numerous questions that have already been asked in Cedillo. Bear with me, because there's certain things that I do want to highlight just as we go along. Now measles virus has been the focus of your scientific research, correct?

A Correct.

Q And reading from your Texas Tech biography, your research focuses on AIDS, chronic hepatitis, and cancer.

A And non-human primate models.

Q Okay.

A Developing the immune system. That seems, in general.

Q And that was going to be -- while you have worked in the development of -- vaccinations, none of your work has involved the MMR vaccine, has it?

A No, it hasn't.

Q Most of your work is done on primates, as you just stated?

A Correct.

Q And in all of your publications there is one

that deals with the MMR vaccine and the measles virus?
A That's correct.
Q And that's the 2004 review with Dr. Byers and Dr. Marchalonis?
A Correct.
Q We'll talk about that a little bit more later of course. Now you're not a medical doctor?
A I am not.
Q And you're not involved in the diagnosis or treatment of patients with measles virus?
A No, I'm not.
Q Okay. Now you talked about the Morbillivirus family on your direct, and do you agree, in general, there is some contention as to how often it's fatal? And generally once they've reached the brains of their natural host animal it usually results in death?
A I would say, in general, correct.
Q Okay.
A But not always.
Q Fair enough. Now you discuss canine distemper in your report. Measles virus is closest, most closely related to rinderpest, correct?
A Rinderpest, yes.
Q Rinderpest, okay, forgive my pronunciation.

And I believe you stated this in your 2004 paper

rinderpest

viruses have never been found in the CNS of a natural host.

A Correct.

Q And nor does it cause neurologic disorders -- or related sequelae?

A It's all, the pathogenesis is all gut-related.

Q Now we, you also talked a little more especially at the end, about the canine distemper virus. Would you agree that canine distemper is fatal in the majority of the time, and, especially highly fatal in puppies?

A Yes, although, in older dogs it's fatal, but it takes a long length of time.

Q But it is eventually fatal?

A Eventually fatal.

Q It's a much shorter period of time with puppies?

A Correct.

Q Okay. Now I want to talk a bit about measles virus replication, which was obviously in your slide presentation. In your report, on page four, you describe the different proteins involved including PCMV proteins?

A I can go to that.

Q It's actually just a general question --

A Oh, okay.

Q My notes have what page everything is on.
A Okay.
Q Is it still your opinion that the R protein is a truncated form of the P protein produced by ribosomal shifting?
A Let me see.
THE COURT: About five lines from the bottom of page 4 of your report, Dr. Kennedy.
THE WITNESS: The proteins, replication, there's possibility -- yeah the R protein is produced by ribosomal shifting.
BY MS. BABCOCK:
Q Okay, and is it a truncated form of the P protein?
A It's actually in a different bleeding frame so it's, that's, that's a nebulous term. I would say it's not truly a truncated form as you would, for instance, with the hepatitis viruses.
Q Okay.
A But it's, it's another protein that comes off that gene with a different mechanism, ribosomal shifting instead of coming off a different initiation of.
Q Okay. And it's your testimony today that that is involved in measles virus replication?

A That the R protein is involved in measles virus replication, no, the L is the catalytic site. I think my statement said the R protein, which is a truncated form of the P protein, is produced by ribosome frame shifting, and that the L protein that is the catalytic component of polymerase and is involved in RNA transcription and replication.

Q Okay.

A It's an accessory protein, Your Honor.

Q Let me rephrase that. Which is your testimony that the R protein is, exists in the measles virus?

A As far as its being a structural protein, you can find the RNA. Can you find the protein often? On occasion, it has been reported, but you have to use very sensitive techniques, which require radioactivity and radio labeling.

Q And these are techniques that you don't use though, because measles virus isn't a primary focus of your --

A I have used with other systems, like HIV.

Q But not with measles?

A Not with measles virus, no.

Q Okay. Now on page 6 of your report, you stated that the inactivated form of measles virus has

been reported to result in atypical form of measles that can occur two to 13 years after the administration of the inactivated vaccines. Page 6, middle of the paragraph, under the big one. Middle of the top paragraph.

A Middle of the top paragraph, okay.

Q Should follow along.

A Okay. So, events, yeah, got it.

Q Isn't this only the case with a person who's had an incidence of a wild type measles infection earlier in life?

A Correct.

Q So there isn't any evidence that Colten Snyder had a wild-type measles virus infection before the MMR vaccine, is there?

A Not to my knowledge.

Q Now you also mention the effects of a high dose live measles vaccine and mortality in girls, I believe this is the, perhaps the next line down actually. And hypothesize that the mechanisms could reflect an altered immune response or immune suppression. You don't have any actual data to support this, correct?

A Actually, the recent data is so jumbled from the stand point of whether the high titer measles

virus component in

MMR, in association with DTaP in association with the inactive polio virus, you know, is it a combination of that, is it DTaP, is it measles, is it kids in Kinshasa, Zaire, versus kids in Sudan.

So I think the recent publications that have come out in 2006, 2007, the real role of the high titer measles virus, does it set the situation up, does it require a combined event with another vaccination, is it a site specific event, it is very unclear relative to how that occurs.

Q So just to sort of rephrase, and tell me if I'm wrong, we don't know how if at all, measles is involved, or What immune mechanisms -- might be involved, if there are any at all?

A We don't know.

Q Okay. And of course this is not the vaccine that Colten Snyder received?

A It is not.

Q And furthermore, this is not a vaccine that has ever been administered in the United States?

A It has not.

Q Now wild measles, wild measles infection doesn't cause autism or ASD, or isn't known to cause autism or ASD, is it?

A So wild measles is not known to cause

autism, I'm sure I can find in the literature where it says that it is hypothesized. But in my opinion, no, it does not.

Q Fair enough. Now, you talked a bit about HIV, both in your report and on your direct, is it fair to say that individuals with HIV are immunosuppressed?

A After they're infected, yes. And I would have to change that because the virus has been changing over time, probably becoming less pathogenic, at least in the United States cohorts. And I would say that the virus is evolving to the host.

Q You'd agree that MMR is routinely administered to children who are HIV positive?

A There is evidence that, let me answer your question first. Yes, it's administered --

Q Okay.

A -- to children that are HIV positive in the United States.

Q And in some other countries as well?

A Yeah, in some of those other countries there's now issues relative to that.

Q But in those situations, those children do clear the measles virus?

A They're delayed in clearance.

Q But they do clear the measles virus eventually?

A Actually, the last study I saw, which is an e-publication 2007 out of Griffin Lab, moved the clearance from the publication by Lamar in 2001 from 60 days now to 90 days and greater. So I'm not sure if they got the final, is everything cleared by 90 days, because it's still out there.

Q But don't you think if there was some indication that it couldn't be cleared that paper would have reflected that they just moved the time out a bit further?

A I think it's an ongoing study, that's, that would be my assessment. Because it, the conclusion is similar, but just the time period's longer.

Q Okay. And to turn that around, there's been no, there's no evidence that it doesn't clear?

A There is no evidence that it doesn't clear.

Q Now, you testified earlier that an individual with a properly functioning immune system should have no problem clearing the attenuated measles virus, correct?

A Correct.

Q In order to offer an opinion that MMR persisted in a child, do you need evidence if there

was preexisting immune dysfunction?

A Not necessarily.

Q Have you reviewed the medical records for Colten Snyder?

A I reviewed Dr. Bradstreet's initial, what would I call it, his initial group of papers.

Q His reports or his medical treatment record?

A His filing system, how's that?

Q Okay.

A It was much nicer when the nurse went over it.

Q So is it fair to say that you are at least somewhat familiar with Colten Snyder's medical course, obviously, you were here yesterday --

A Yes, yes.

Q -- in the courtroom and listened to them say all the things. Realizing that you're not a clinical immunologist, taking into account the materials in this case, do you believe that Colten Snyder had any evidence for immune dysfunction and immune suppression prior to receiving his MMR vaccination?

A I would say that there was some indication that it might have been possible.

Q And what specifically are you relying on when you say that?

A Some reoccurring infections that appeared to occur, and some of the, the selective IgA that was just one point, but it's, it's not hard evidence but it's suggestive.

Q Okay. So then it's your opinion that Colten Snyder did have evidence of, or could have had evidence of a preexisting immune -- dysfunction?

A Could have, there is some suggestions. Although Dr. Bradstreet was clear to say he didn't. So I would have to go back to what Dr. Bradstreet's opinion was, because I didn't get a chance to, there were things that were missing that would have strengthened any suggestion I might have that weren't available in the reports.

Q Okay. So you would defer to Dr. Bradstreet's opinion on -- that issue?

A Absolutely.

Q And so, the fact that when Dr. Bradstreet reclarified that on cross-examination in his 2004 paper, that Colten Snyder was child-free, or he clearly stated that he did not think, he thought this was a new onset of the immune dysfunction, so you defer to him --

A I, yeah.

Q That there was new onset?

A Yes.

Q And on page -- just to, okay, I'm going to ask you now, I won't ask that question now, never mind. Do you believe that Colten suffered from clinically relevant immune suppression after his MMR vaccine?

A I'm going to defer to Dr. Bradstreet on that. Again, as I say, the records that I had to look at were not in very good order. So it was kind of difficult for me to put a timeline together.

Q Okay.

A But his testimony yesterday, you know, clearly, it was his opinion that Colten was indeed immunosuppressed after the MMR administration.

Q Okay. So in general then case-specific -- conclusions -- taking Unigenetics out of it, obviously, but in terms of Colten, what might have happened before or after you're going to defer to Dr. Bradstreet, you're not offering an opinion today --

A No, no.

Q -- about that?

A No. My opinion was just meant in general terms on how viruses can persist.

Q Okay. Now I noticed that you added a new section to your paper, in comparing it to the last one

in Cedillo. It's the second full paragraph on page 6.

A Okay.

Q Now twice in that paragraph you cite to Diane Griffin's chapter in Field Virology, correct?

A Yes, 2001.

Q Okay. And you were here during this, actually, you know what, let me back up. In general, do you think that MMR can cause clinically relevant immune suppression following vaccination?

A That was an excellent discussion that occurred with Dr. Griffin at the Cedillo, and I do.

Q You do?

A Yeah.

Q Okay. And --

A I think the fact that clearly there is a loss of DTH activity, delayed-type hypersensitivity, specifically for skin testing, that in me, in my mind, that suggests that there is a pretty good form of immune suppression.

Q Now let me be clear, by asking about clinically relevant I'm not referring to transient changes that then go away, is that still, is your answer still yes --

A Okay. From a, so you're talking, you're talking whole body --

Q Yes.

A -- clinically relevant, not --

Q That were --

A I would say a combination of everything going on could have a high potential to cause clinically relevant. The individual would be more susceptible to other events.

Q Which is essentially what you said in your new paragraph. Now you, as you just said, you were here during Diane Griffin's testimony in Cedillo?

A Yes.

Q And I believe you acknowledged during Cedillo you certainly wouldn't question her knowledge of the measles virus --

A Absolutely not.

Q Or the -- the MMR vaccine?

A Absolutely not.

Q So does it surprise you then that she very clearly stated during her testimony that she did not believe MMR, attenuated measles virus, causes any clinically relevant immune suppression or -- following vaccination.

A In light of her 2001 chapter, a little bit.

Q Now of course she gave her testimony in June of this year --

A Correct.

Q -- so that of course reflected her opinion as of June 2007?

A Correct.

Q And you have no reason to disagree.

A I would say that, you know, she's the expert. I'm certainly going to defer to her on those situations, but I have a minor disagreement with that, yeah.

Q Now, is it also true the Colten Snyder had measles virus antibodies in his blood, correct?

A I was not able to find that aspect.

Q Okay. Is Petitioners' Exhibit 207 --

A Okay.

Q -- page 1 is Dr. Singh's first testing. Do we have a copy --

A Can I get a copy of that? Maybe I don't need it. Let's go with the question.

Q It was just my question that he did have evidence of an immune response, he had an immune response -- following the MMR?

A Okay, if he had a, yeah, okay.

Q That was the extent of it. You'll accept that it exists in medical records Dr. Singh shows an IgG --

(Multiple voices.)

A If you guys tell me --

Q Was seropositive for IgG

A -- it's in there, that's fine, I'm good.

Q Okay.

MR. POWERS: Excuse me, which exhibit was it, again?

MS. BABCOCK: Exhibit 207, page 1. The measles virus was not --

THE COURT: Provide it to, just go ahead and provide it to them, let him take a look at it.

THE WITNESS: Yes, according to Dr. Singh, has IgG measles virus antibody from his reference laboratory, okay.

THE COURT: And that's the specimen dated 3/8/00.

BY MS. BABCOCK:

Q So, again, you would agree that there was an immune response, Colten Snyder had an immune response following his MMR vaccine?

A Yes.

Q To the extent that he had measles antibodies in his IgG?

A Correct.

Q And do you know of any published literature to support your theory that MMR vaccine causes immune suppression that allows the measles virus to persist?

A I'm sorry, ask that question again? I thought you asked something different so I was on a different, different focus.

Q I changed directions on you --

A Okay, yeah.

Q Do you know of any published literature to support your theory that the MMR vaccination causes immune suppression which allows the measles virus to persist?

A I would say that with certain conditions, like MIBE, is that what you're asking or --

Q No, I'm actually asking the postulated theory here, you know, that allows the measles virus to persist and result in ASD?

A So I guess what I'm confused at, is there are instances where measles virus, you get a response, an antibody response, it's not controlled, and then it causes neurologic issues.

Q And those two issues would be SSPE and MIBE?

A MIBE is one, and SSPE is a little too long for me, I like shorter stuff.

Q Okay.

A There's issues of a ataxia being caused, of other issues. But again that's not, that's in the presence of immune response. Well, let me let you ask

your question. I'm trying to --

Q I'll ask it again.

A Okay.

Q Any published literature to support the theory that measles virus, attenuated measles virus from MMR vaccine causes immune suppression which then allows the measles virus to persist, with the exception of SSPE and MIBE?

A Then I would defer to the, the Pediatrics 1998, Weibel, where there were a number of indications, I believe 48 children that had issues that were in some sort of neurologic issue of ataxia, things like that. So that, it isn't specifically a report that those kids were immunosuppressed, but they didn't handle the virus and the virus caused neurologic issues.

Q So you're relying on Dr. Weibel's paper for that?

A Weibel is an example, there's probably some others. ter Meulen -- if I can bring in an animal, animal models --

Q I'd rather that you used humans or --

A Okay, sorry. That's an example of one that I'm --

Q Okay, that's the one that you can think of?

A Right. And again, I would say MMR can cause immunosuppression, MMR can cause neurologic events. Therefore, immunosuppression could play a role in those events using a, A is B, to B is C so A + B = C.

Q You know that math scares lawyers. Now go back now to the MMR can cause immune suppression, I don't mean to beat a dead horse with this, but you said that Diane Griffin -- you might have a small disagreement with her, but generally you deferred to her as to her --

A Right.

Q -- opinion on that issue? Okay. Now do you think in order, in order for you to think more likely than not that the measles virus has persisted, do you need a finding, and caused ASD, do you need a finding of measles virus RNA?

A Yes.

Q Now, you've talked, in your report and, well, at some length today about Unigenetics. Obviously, it's clear that you use PCR technology. Would you agree that PCR is highly sensitive?

A Very.

Q And if the operator is less than diligent you can invalidate results?

A Absolutely.

Q And would you also agree that the only laboratory evidence here of the measles virus persistence is the testing done out of Unigenetics?

A The one that was presented for this case is Unigenetics, yes.

Q And Dr. Singh's lab was unable to find the measles virus in Colten Snyder's CSF. Were you aware of that?

A No, I'm not aware of that.

Q Do you want me to bring that, I think that's Exhibit 207, page, do we have evidence 207, page 2 here, that one?

A And Dr. Singh's the individual from Utah State?

Q Yes, the one who tested, also tested for the IgG.

A Okay. I'm not aware that Dr. Singh's laboratory does molecular-based diagnosis, I believe he's all serology. He's the one that did the anti-myelin basic protein?

Q yes.

A I'm not familiar that his laboratory does anything like that.

Q He tested the CSF, if you want me to show you.

A Well, it, you can --

THE COURT: It was, yes, Ms. Babcock --

MS. BABCOCK: I apologize.

THE COURT: -- you're looking for two different, we're looking for apples and oranges here that, both are fruits but --

MS. BABCOCK: But in the fruits they are so --

THE COURT: They're both in the fruit family, yes.

THE WITNESS: I can't --

(Multiple voices.)

BY MS. BABCOCK:

Q Would you --

A Yes, I think --

Q -- and --

A -- he found it in --

Q -- and tested for antibodies in CSF, he did not find any.

A Yes.

Q Now there were no, there is no discussion of immunohistochemistry in Colten Snyder's laboratory results, was there?

A Not to my knowledge. But there was general discussion of laboratory observations on CSF from

"unknown individuals" in that U.K. discussion.

Q But not for Colten Snyder's results?

A I'm not, I wasn't aware of the names. I would assume, you know, they talked in numbers. You know, 48 positive CSF, you know. We looked at, I think, eight U.K. kids. So, and not all of them were CSF positive.

Q Now, there is no indication that Colten Snyder's test results were vaccine strain measles virus, is there?

A I believe they did a discrimination, but I'm not 100 percent sure on Colten Snyder. Again, that was in that -- it's unfortunate that my, to answer your question I'm, anyway, to my knowledge, with what I'm allowed to talk about, is that there was allelic discrimination on CSF from multiple individuals. I'm not sure if Colten Snyder was one of those individuals.

Q Well, what I'm talking about right now is for the purposes of material that were filed with the Court, the Unigenetics lab results. Those weren't --

A There is no indication that there was a AD discrimination, I mean, allelic discrimination.

Q Okay. Now again, is it an important principle in PCR to demonstrate repeatability and

concordance when analyzing

samples?

A Absolutely.

Q And this especially true if you have a low copy number?

A Absolutely.

Q And this is because a low copy number often results, hovers around detection limits.

A Yes.

Q Is there any evidence, based on what's been filed in the Court here today, that Unigenetics attempted to do this with respect to Colten Snyder's samples, to repeat the testing to demonstrate repeatability -- and concordance.

A No, but based on my knowledge, there's nothing in the written documents that you have. But based on my knowledge of the laboratory, with the gut issue being 7, I would suspect that that was repeated at least a second time.

Q And actually moving on to that there was a gut issue, you just walked right into my next question. You agree that Unigenetics has not convincingly demonstrated that there was measles virus vaccine in Colten Snyder's gut, correct?

A I am, that is one that is in the, a low range for me. And the only reason I say I believe it

might be a low positive is because the blood was negative. So if it's contamination, it should have been in the blood also. And they run the samples at the same time, concurrently. So I would say that I'm more positive about that 7 copy number if I had a 7 copy number in blood. Does that make sense?

Q Yes, although, I mean, you could also have measles virus in blood if it's, the theory is that measles is going from the gut to the brain.

A Yeah.

Q Correct?

A Yeah.

Q So it kind of cuts both ways.

A Yeah, but I would argue that that is a low copy number, and I would rather err on the conservative side, so I would say that is a low positive or a indeterminate.

Q Now, let me just quote from your report, there were very low copy, I'm sorry, I want to see, page 9. I believe your line was that, it had very low copy numbers and was considered indeterminate for the presence of measles virus at this site.

A That's my opinion.

Q That's your opinion. It's indeterminate, and you can't say whether there was measles virus --

A I am uncomfortable in saying that it's absolutely positive, yes. With my scientific 99.99 percent certainty, I would have a hard time saying that that is anything but indeterminate.

Q Well, you obviously know our, our standard here was more likely than not. So I presume you wrote that with that in mind?

A No. I wrote it in my scientific mind, sorry.

Q So a very low copy number that hovers around the limits of a PCR level of detectability, are you saying that it's more likely than not that measles virus was present in Colten Snyder's gut?

A And that's 50 percent or 51 percent?

Q 50.1 --

A 50.1, okay.

THE COURT: 50 percent and a feather, Dr. Kennedy.

THE WITNESS: Yeah, 50 percent and a feather. You know, that's, I don't like going that low. So I would just rather leave this indeterminate. And I would refer back to Dr. Bradstreet who had the clinical stuff. I could give you reasons why it was that low, could be that low if I wanted to tell you it was positive, but we don't need to go there.

Let's just say it's indeterminate.

BY MS. BABCOCK:

Q And I just want to turn to your slide presentation slide 14. There's a point here where you say, point 4, copies of measles virus RNA at multiple sites indicates an ineffective clearance, and a potential for persistence. Is there, at least with respect to Colten Snyder, you are comfortable saying today, you do not have presence of measles virus at multiple sites?

A As Colten? I'm concerned just about the CSF of Colten.

Q Okay. So here, with Colten Snyder, we do not have presence at multiple sites?

A I would say it's indeterminate in the other site, yes.

Q So we can't apply this fourth point to Colten Snyder?

A That fourth point, actually, I would not use it for Colten Snyder. I only use it for transgenic mice, and I will use it for other situations, but not for Colten Snyder.

Q Okay. Now I want to go back to PCR, if you were to run the test that Unigenetics did on Colten Snyder's gut, blood, and CSF in your own lab, about

how

much would the materials cost you? Assuming, I'm not including lab equipment, just the materials to run the test?

A Probably, from the single test, or are you, usually buy in bulk, so you want me to kind of --

Q Yes, I don't want that, just --

A 50 bucks.

Q 50 bucks --

A It'd be 50 U.S. dollars, if you automated and, but you're not talking about the cost of equipment or any amortization or anything then, all the accountants will have to do to come up with a justified price?

Q I don't know.

A Just supplies and --

Q Just your supplies.

A Yeah.

Q About $50?

A And that's not technical time, that's not development time, that's just, yes.

Q You mentioned during your testimony in June that you understood Unigenetics to be a for-profit laboratory created by Professor O'Leary?

A That was my understanding.

Q Is it, would it surprise you then to hear

that the Irish companies registration office listed it as a private company limited by shares?

A No, that wouldn't surprise me.

Q And Dr. Bradstreet discussed it briefly yesterday, and it's also in the medical records, but are you aware that Unigenetics was charging a thousand Irish pounds to run the test? Petitioners' Exhibit 12 at 426

A For a specialized test that doesn't surprise me?

Q A thousand dollars or a thousand pounds? I'm not going to try and do that math conversion because that --

A You know, people do different tests, I mean, individuals have sold a, a milligram of a monoclonal antibody that cost them, you know, $60 to produce for $10,000. So there are worse mark-ups than that.

Q But fair to say they were making a substantial profit, Unigenetics?

A Oh, yeah.

Q And do you have any idea of how many samples Dr. O'Leary tested while Unigenetics existed?

A I would say quite a few. So, at that price it's probably a pretty good, pretty good profit.

Q Now you said here today and in Cedillo that

part

of the reason you're confident in the test results is due to the extremely high copy numbers?

A Yes.

Q Fair to say you have confidence for the same reason in Colten Snyder's case with the CSF at least?

A Yes.

Q In determining the copy numbers of measles virus present in each sample, it's a calculation involving the virus and the housekeeping gene, correct?

A Correct.

Q Which was GAPDH?

A Correct.

Q The Unigenetics test? And if there were errors in the way the GAPDH was calculated you would also have errors in copy numbers, correct?

A Correct, but it was not, also my understanding, and I will come back to this, that they ran a standard using their different positive controls to determine standards. The GAPDH was more for the integrity of the, the RNA, and to normalize --

Q Okay.

A -- the runs.

Q So if your test found that they weren't doing a calculation every time, is that what I'm

understanding --

A No. So, in other words, my understanding is the GAPDH was used as a standard housekeeping gene for -- RNA and for essentially normalizing each run, that knowing that you're loading a similar amount of that. So the calculation does involve the amount of GAPDH that's picked up, but it also involves a standard curve that's run on the specific gene product that you're looking at, which is usually the, a clone, a PCR clone product into a plasmid.

Q Okay. And we're kind of saying the same thing you're just a little more -- now earlier today you discussed that you're, you've just been in a meeting, you were a consultant during the U.K. MMR litigation?

A Yes.

Q Who was at that meeting?

A Richard Tedder, Steve, geez, I just saw him about three weeks ago, he's in the National Institutes of Neurologic Science, works on HTLV-1. I can picture him, I can't remember him. Steve, there were six or seven of us. The names Marchalonas, Dr. Marchalonas was there, there were, there was a pediatrician from the University of Washington, Washington University. I believe I may have mentioned Steve's last name in

the Cedillo trial.

Q Do you know what their backgrounds in measles virus was, I'm talking about the whole collective group?

A No, they were just general virology types that were familiar with PCR technology.

Q So was there anyone there who added a particular expertise on measles virus?

A To my knowledge, I am not sure of Dr. Tedder's publication record, but certainly he ran a clinical laboratory that probably did measles virus isolation, and was, he has a clinical laboratory familiar with protocols and procedures. I can't state that he's published on the measles virus.

Q So to your knowledge there is, probably most of them just have expertise in PCR, not with the measles virus and probably --

A Right. Virology, molecular diagnosis, PCR, persistence. So kind of the general, general GAPDH, if you'll have it.

Q How long was the meeting?

A So the meeting was over a three- to four-day period, though a specific moment will last about six hours.

Q Was Dr. O'Leary at that meeting?

A No, he wasn't.
Q Was he at any other subsequent meetings?
A No. Dr. O'Leary, at that time, did not fly.
Q So where was your meeting at?
A In the U.K.
Q In London?
A Yes, London.
Q And he didn't want to fly from Dublin to --
A No. Have you seen a picture of Dr. O'Leary?
Q I haven't had the pleasure.
A US Air plus Dr. O'Leary is not a workable combination.
(Laughter.)
Q Very well. During that meeting, or at any subsequent time, were you able to physically visit the Unigenetics lab?
A No, I never have.
Q So you didn't inspect the equipment?
A Did not. Have a list of the equipment that was available and kind of the general layout of the floor plan of the facility, but did not have, did not visit onsite.
Q And was Dr. Cotter present at any of these meetings?
A Dr. Cotter was present at a couple of the

meetings. He was, I believe, in a transition in laboratories. I believe he's, his first name's what, Finnegan, Finnegan Cotter?

Q I just know him as Professor Cotter.

A Oh. Finbaugh Cotter. Unusual name. He was in a transition, I think, to go to, from the University of, College London, to Bart's and London School of Medicine. So there were individuals from his group that, I believe, attended all the meetings. But physically, he was not at the one with the, with Orla Shiels and Tedder, and those individuals.

Q So to be clear, Professor Cotter was perhaps, that was hired by the -- claimants in the MMR

A I don't have a report produced by Professor Cotter, so I don't have access to what was produced at the U.K. But I know that Professor Cotter was an expert in molecular diagnosis, PCR-type technology. Looking at things were on low levels, like cancer-associated-type situations. That was one of the reasons that the O'Leary group had selected Cotter.

Q Okay. And --

A And my understanding was, I'm sorry, was kind of a collaboration. I wasn't aware that it was a fee for service, but I could be wrong.

Q Okay. But as you said on your direct today,

there came a time when Professor Cotter was working with Unigenetics to try and replicate some of the results?

A Yes, yes.

Q And I believe you alluded to this, but it is true that Professor Cotter did have difficulties replicating some of the results.

A Initially, absolutely.

Q Now, when you were talking about subsequent efforts this morning, that eventually the labs, I think you said, came into line with the high copy numbers?

A Yeah. And actually, they got pretty, my recollection is they got pretty close on the low copy numbers, and the low copy numbers were predominantly found in the tissues of the transgenic mice with the CD46 cell receptor, and tissues that had very low copy numbers. So that was the low copy numbers that they were coming in line with. High copy numbers was never an issue.

Q But just to clear, there were problems.

A Oh, yes, absolutely.

Q Okay.

A In fact, the problems were the primers. So Unigenetics sent primers over, and the primers were

not as sufficient as they should have been, and they rectified it by resynthesizing the -- primers and not hydrating them, sending them over. And then, in the laboratory they rehydrated them in their own water, and they seemed to do, do fine.

Q Now when you were talking about the subsequent work that Professor Cotter did, is that not then his, from his expert report in U.K. litigation?

A I assume it is. I --

Q Okay. So this is, what you were talking about is from his expert report?

A That's my understanding.

Q Okay. Now you also talked about --

A But I can't talk about his expert report.

Q I understand, more than you know. Now you talked about Dr. Oldstone a bit on direct. You're suggesting that there might have been contamination in Dr. Oldstone's lab?

A Yeah, it happens. I mean, it was, you know, a heavy discussion on, you know, who contaminated, who didn't contaminate. And it's, it's easy. But my understanding was it was rectified because they sent a new sample of uninfected vero cells that then turned up negative like it should.

So I had thought everything was rectified.

That the positive and negative was rectified, okay. That they initially called something positive which should have been negative, and that that was rectified because the new sample was sent over and prepped. And that high copy number was never an issue, the issue was a low copy number in some of the tissue from these mice.

Q Okay. So you're talking about the first time there were problems, they sent it over, the second time, the second time they were fixed.

A That was my understanding, yes.

Q Okay. But when reading Dr. Oldstone's letter it sounds, from Dr. Oldstone has said, at least related to Dr. Ward, that there were problems the second time as well.

A Yeah, it does appear to be that. But as I read that, it was, the, in my recollection I thought, well, he's talking about the low copy number.

Q Okay.

A And not, you know, not necessarily the positive were negative in the negative control.

Q But you don't know that for sure?

A No. I know it, but I, again, have difficulty talking about it.

Q Now to the extent that it is your suggestion

that the contamination came from Dr. Oldstone's lab. Do you agree that Dr. Oldstone is a very eminent virologist?

A Absolutely.

Q Suspect he's probably received some awards?

A Absolutely.

Q Published very frequently in the field?

A Absolutely.

Q And yet his lab, according to you, may have made errors and had contamination problems?

A It's common in a lot of laboratories where we've got technical staff, I mean, the classic contamination is the, the AIDS virus. -- contaminated the initial sample, sent it to Gallo and broke the contaminant. I mean, that's, you know, and they're fairly well-known in the, the medical field. So contamination happens. Except, my understanding is O'Leary never published on the contamination. You got situations where -- may have published on his virus, and Gallo published on his.

Q And generally, I didn't mean to cut you off --

A No, sorry.

Q But generally when, you know, labs encounter contamination, as long as they're diligent about it

they can fix it?

A Absolutely.

Q And that requires them to be diligent about it and to --

A Right.

Q -- fixing the problem.

A You know, and occasionally, it's just as simple as when you've got multiple samples of labeling stuff wrong, it not even have been contamination, it could have been a labeling error. I mean, there's all sorts of things, a pipetting error, I, that's not necessarily contamination. And it is, it's routine, especially large laboratories where you've got a huge chain of command.

Q Now in your recently filed rebuttal, which Mr. Powers referenced at the beginning dealing with Unigenetics. You, there's some more discussion of Uhlmann, which I know was talked about a lot, but we're going to talk about it a little bit more. Just for the record, here is Petitioners' Exhibit 42. The first issue, I believe, is the F gene sequence Gen bank UO8146, which I think we all agree now is a plant sequence.

A Plant sequence, yes.

Q And I am correct in paraphrasing your

recently filed

response that O'Leary and Uhlmann used this sequence deliberately as an irrelevant negative control?

A I did not discuss that with them specifically, but in my scientific assessment, why would you use something so diverse that you report the gene bank access, accession number, and then you do the blast sequences on, that there is absolutely no relationship. And why would you have so many measles virus sequences included and have this one plant outlier?

In my assessment, that, I wouldn't have thought that, we think of it now, but in prior design, previous, you know, I wouldn't have thought of it. In fact, I wasn't made aware of it until I read Dr. Bustin's expert testimony.

Q Okay.

A And when he pointed it out, that it was a mistake. That, you know, it's not measles virus, then when we looked at it and said, well, plant, what's he doing with a plant. And then went through the reverse, took the plant sequence and blasted it against everything that we could find, and saw it come up with only plant sequences and nothing with measles virus, I thought, you know, hey, these guys are pretty, are really sharp.

Q So your suggestion isn't based on an actual conversation with the paper authors, correct?

A No.

Q Your --

A My expert, my scientific opinion.

Q Okay.

A May not even be expert.

Q And then, with all due respect, may not be correct?

A Could be.

Q Okay.

A Could be.

Q Now, they didn't even identify it as a negative control in table one of their paper, did they?

A No, no.

Q And they didn't list it, in terms of their list of the F gene primers and probes, it was buried right in the middle of of all of them.

A Right.

Q It wasn't listed at the beginning or --

A Right.

Q -- at the end, to sort of differentiate it.

A Right.

Q And do you know if they identified it as an

irrelevant control elsewhere on the paper?

A To my knowledge, I've scanned it pretty good. Didn't see it anywhere else. In fact, they didn't even identify it as a plant sequence. The only kicker was when you looked it didn't have accession numbers that were measles sequencelike.

Q Sure. Which is, actually a bit curious, because if you look on page 86, they do identify the other irrelevant controls that they used. Did you read it, maybe you need to see it?

A Yeah.

Q Okay.

MS. BABCOCK: May I approach?

THE COURT: Certainly. And you are approaching with what has been identified, for the record again.

THE WITNESS: This is the Uhlmann manuscript?

BY MS. BABCOCK:

Q Yes.

A Yep, but those are viral-specific. So that's human herpes virus 6 and human papilloma virus.

Q But it is elsewhere in the paper where they identified irrelevant controls, they did specifically set out what they used.

A Well, exactly. But I think that the issue here was they were using this for a primer probe design, not to run in this specific assay, but in the design of primers and probes, it would be very discriminatory. And that statement on the negative control, on what's using specific primers designed for other viruses, to be actually used in the assay. So that's the difference.

Q So they all are saying that's the virus for all the controls they use.

A Right.

Q They say nothing about.

A Right, they say nothing about.

Q Now, that same Uhlmann paper doesn't mention allelic discrimination, does it?

A No, it doesn't.

Q It has no explanation in that paper then for the C to T substitution and the consensus sequence, is there?

A No, there's not.

Q And don't allelic discrimination assays employ two probes to allow accurate designation of allele A and allele B?

A Yes, they do.

Q Now you also commented on the laboratory in

notebooks with respect to Professor Bustin's testimony, you stated, it's unknown whether they fixed the problem later.

A Right.

Q Now, wasn't one of the problems Dr. Bustin identified actually a change in the lab notebook which exists, which occurred between the time it was first disclosed by the claimants and when it was second, disclosed later again?

A If I'm not mistaken, the notated, there was a notation made and dated. So --

Q And subsequently changed?

A And subsequently changed.

Q That's a bit curious, don't you think, considering --

A I would have to see the order of how it happened and the individual involved. I would assume it would be Kara, oh, I can't remember her last name, who was a student in training who's now a doctor in the laboratory, Kara Wilson, Kara Rodgers? Anyway, she was someone who ran a lot of the testing as the result of her --

Q Certainly, but the alteration of the laboratory notebook as a, just a general concept, can be cause for concern?

A Yeah, I would have to see it, I would have to see it in the context. I mean, for instance, I had a great idea, and I just got done working out, and I was sweating all over the place, all I could find was paper towels. I wrote on a paper towel, and then had someone tape it into the notebook and said, you, this is the date of conception on your notebook, on a paper towel taped to the notebook.

Q But you would admit that that's perhaps unusual, that was not a normal course of conduct?

A No, no.

Q Okay.

A If that's a repetitive practice then, then I would have an issue with that.

Q We might worry about your ability to competently run PCR.

A Not mine, theirs.

Q Now, to your knowledge, does Unigenetics exist anymore?

A To my knowledge, no, it doesn't.

Q And if I told you it was dissolved in April 11, 2005, that sound accurate?

A Yeah, I would, defer to your --

Q I can show you the papers.

A That's okay, I trust you.

Q Now you were asked a number of questions

during earlier testimony in Cedillo, and again, I'm not looking to repeat everything, but I just have a few very brief points.

Specifically about your 2004 MMR review paper --

A Let's go.

Q Since your testimony in June, is it, did your opinion change that there are large gaps in our understanding with respect to etiologic mechanisms in ASD?

A Yes. Oh, has my opinion changed?

Q Has your opinion changed?

A Oh, no, it hasn't.

Q Okay, good, you scared me. Or the calculation-based studies have been unable to detect a link between MMR vaccine and ASD.

A Has not, has not changed at all.

Q Or that conflicting data exists regarding the Wakefield studies and their reports of finding persistent measles virus?

A Those statements still hold.

MS. BABCOCK: I have no further questions.

THE COURT: Thank you. Dr. Kennedy, I have a few questions for you.

THE WITNESS: Yes.

THE COURT: You mentioned something about

running gut, blood and CSF samples together.

THE WITNESS: Right.

THE COURT: Make sure I understand what you're saying. Are you saying that if you have samples from one individual, let's say Colten Snyder, and you have blood, gut, and CSF all arriving at your lab at the same time, that your understanding of the way the Unigenetics lab would put them in the same run?

THE WITNESS: Yes.

THE COURT: So row, or column, whatever you call them, would, 3 might be the gut sample, 4 might be the blood sample, and 5 might be the CSF?

THE WITNESS: My understanding of how it would, how it worked was that they would receive the specimens, they came in at the same time, they knew things were coming in, they would hold and then run everything at the same time.

THE COURT: For the same individual?

THE WITNESS: For the same individual. And they would do their first set of experiments, their first runs, on a 1 to 10 dilution.

THE COURT: Okay.

THE WITNESS: Because the samples were somewhat limited.

THE COURT: All right.

THE WITNESS: And then if they didn't see anything at a 1 to 10, then they would run it neat.

THE COURT: Okay. And so if there were contamination of the, you indicated that because there was no negative finding in the blood you would suspect that there was no contamination?

THE WITNESS: Correct.

THE COURT: And that would presume that all the samples were stored in the same place?

THE WITNESS: Not necessarily stored, but run at the same time. I'm sorry, I'm missing your question --

THE COURT: Okay.

THE WITNESS: So storage --

THE COURT: What I'm trying to get to is, is you're saying there would no opportunity for contamination to occur.

THE WITNESS: Right. And if it occurred it would occur on all the samples. So it would be, you would have contaminated the water that you dilute with, you would have contaminated your primers that you add. So it would be a technician error. And the contamination would be found in the negative controls, which would tell you there was a problem. And if there was mass contamination it would be found

throughout the whole run.

THE COURT: All right. When you are preparing the dilutions, would you prepare the dilutions at the same place, the same, relatively the same time?

THE WITNESS: Yeah, in a different laboratory from where you did the extraction.

THE COURT: Okay. So you would extract it from the sample, you would then dilute the sample, put the sample in the, the tray that you are running. And then you would --

THE WITNESS: Correct.

THE COURT: -- run them all at the same time?

THE WITNESS: And then keep, keep the neat sample back for testing later.

THE COURT: Okay. And would there be any, and it would be not uncommon then to have the rows for an individual sample adjacent to one another without anything in between them?

THE WITNESS: There would be, yeah. So, in other words, it would, lane one would be your, yeah, your lab --

THE COURT: Yes.

THE WITNESS: Lane 2 would be control, lane 3 would probably be a control, 4 four would be a

control. Then you'd have --

THE COURT: Oh, 5, 6, and 7.

THE WITNESS: Lanes five and six would be blood, seven and eight would be --

THE COURT: Okay.

THE WITNESS: And if you saw a problem, then you would probably do alternating. But usually only when you see a problem.

THE COURT: And by "see a problem," what do you mean?

THE WITNESS: So, in other words, if everything came up contaminated you'd want to find the contamination.

THE COURT: What other contamination?

THE WITNESS: Where the contamination occurred.

THE COURT: So you would put a negative or --

THE WITNESS: Right. In the control, yeah.

THE COURT: -- a water control or something in between.

THE WITNESS: Right.

THE COURT: Okay. And I realize we're plowing old ground from Cedillo, but just to make sure //

that I understand the testimony today, PCR detects the actual virus versus the protein it is -- coded for.

THE WITNESS: It detects the RNA of the virus --

THE COURT: The RNA of the virus --

THE WITNESS: -- versus the protein, yes.

THE COURT: -- versus the protein. And when you are referring to copy numbers, how do copy numbers compare with the term viral load?

THE WITNESS: Copy numbers are often used and equated to viral load. So for HIV, when they talk about viral load, there's two ways they express it. One is with a commercial assay that is a mean, you know, nanogram of RNA, so a specific amount. The other way is as how it's done here.

THE COURT: Okay.

THE WITNESS: Copy per nanogram of RNA.

THE COURT: Okay. And you've referred to the sample from Colten's cerebral spinal fluid as having a very high copy number.

THE WITNESS: Yes.

THE COURT: And by very high, I guess I'm trying to get how you --

THE WITNESS: I consider 1,000 high.

THE COURT: Okay. And 1,000 high under what

circumstances? That is, 1,000 high in cerebral spinal fluid?

THE WITNESS: I would, 1,000 in anything I would consider high, and very high above that --.

THE COURT: Okay. Let's say I have an individual with SSPE and we take a cerebral spinal fluid sample, and we run PCR on it. Would you expect that sample to be as high as Colten's?

THE WITNESS: It could be, and it depends on how it was prepped and where they took the site. Let me say what I would consider high. If you took the virus and grew it in tissue culture at a, an exponential phase --

THE COURT: Okay.

THE WITNESS: -- and you pull that.

THE COURT: Right.

THE WITNESS: And you analyze that knowing that it's very concentrated. That is what I would consider high.

THE COURT: Okay. That's what I was getting at, what are we measuring high against? I mean, I can say I can, I can run an eight-minute mile, but if you don't know that other people run, you know, sub-four-minute miles I'm not very fast.

THE WITNESS: Right.

THE COURT: So you're looking at growing a concentrated virus in some sort of tissue culture?

THE WITNESS: Correct. Or an infection in a small model that occurred where the virus is causing major pathology.

THE COURT: Okay.

THE WITNESS: So, like the transgenic mouse model.

THE COURT: All right. So let's say we have a kid in active wild-virus measles infection, would you expect a copy number to be high in that case?

THE WITNESS: I would expect him to, you know, probably 1,000 going upwards, depending on the individual, where the specimen comes from, what you get. I would say the higher would come from isolating the virus.

THE COURT: Okay.

THE WITNESS: That would give you the highest.

THE COURT: So compared to what you would say the highest would be, how does Colten's sample compare?

THE WITNESS: I would say a, a high high, an extremely high high would be in the 10 to 60 million range.

THE COURT: Okay.

THE WITNESS: I would say very high would be in the 10,000 to 100,000 range.

THE COURT: And that's where Colten's sample --

THE WITNESS: Correct.

THE COURT: So it would not be the equivalent of a concentrated sample that you grew deliberately to be concentrated?

THE WITNESS: Correct.

THE COURT: How would it compare to a sample in someone in acute viremia, let say?

THE WITNESS: Higher.

THE COURT: Colten's is higher than someone with an acute viremia?

THE WITNESS: Let me say this, in acute viremia, there's a different, different issue there, because you're looking at, it's a, it's comparing apples to oranges, I guess that's what I'm saying.

THE COURT: Okay, well.

THE WITNESS: So you're looking at viremia. If you're looking inside cells, or if you're looking at plasma viremia. So if you just look at free, there's going to be two different things. So Colten would be comparable to, in some instances, lower than

some instances, and higher in some instances. Does that make sense?

THE COURT: It makes sense in terms of where you are looking. That is, am I looking in serum cells, am I looking in --

THE WITNESS: How's this --

THE COURT: -- lymph nodes.

THE WITNESS: -- if you give 500 copies per nanogram of RNA of infectious virus you'd give a monkey measles, a monkey of 60 pounds.

THE COURT: Okay.

THE WITNESS: You'd give them active measles.

THE COURT: So this is enough to cause active measles?

THE WITNESS: This is enough to, depending on what's available, it could have symptoms involved with measles, yes.

THE COURT: Okay, all right. Now let me, do you have your slides up there still?

THE WITNESS: I can put them up.

THE COURT: Well, you don't need to put them up.

THE WITNESS: Oh, I've got my --

THE COURT: You've got your written copy --

THE WITNESS: Yeah, I've got my --

THE COURT: -- we can talk about that, I think it'll be -- look at slide 13 for me. All right, your bottom point, viruses in general persisting because of an ineffective immune response.

THE WITNESS: Okay, yeah.

THE COURT: I want to go back and talk a little bit about some of the examples of persistent virus.

THE WITNESS: Okay.

THE COURT: Ineffective immune response can say something about an individual --

THE WITNESS: Right.

THE COURT: -- or something about a virus, correct?

THE WITNESS: Both.

THE COURT: That is, most people who are infected with HIV mount an ineffective immune response. There may be some isolated cases of people who appear to not have a problem.

THE WITNESS: Right, correct.

THE COURT: So that says something about the type of virus.

THE WITNESS: Right. So they produce IgG to HIV, but they still get --

THE COURT: The IgG is unable to clear the virus from their system?

THE WITNESS: Yes.

THE COURT: And so, when you are talking about the measles virus in Colten you're saying that there's something about him that was unable?

THE WITNESS: Correct.

THE COURT: And in measles virus in general, it, most people are able to clear it. So it's not something about the virus per se, it's something about the individual?

THE WITNESS: Correct.

THE COURT: And then if you'd look at slide 15, you talked about Dr. O'Leary and his colleague, Dr. Shiels.

THE WITNESS: Yes.

THE COURT: And you talked about a laboratory. You are not referring there to the Unigenetics laboratory?

THE WITNESS: At this point I was referring to the laboratory at Trinity College relative to citations in 2006, 2007.

THE COURT: So this is an academic, not-for-profit lab that is looking at things.

THE WITNESS: Yes, correct.

THE COURT: So when you talk about that laboratory, you are not talking about --

THE WITNESS: Unigenetics, no.

THE COURT: Okay, two different labs we're talking about.

THE WITNESS: Two different labs.

THE COURT: Okay.

THE WITNESS: Individuals overlap with those labs, but two different labs.

THE COURT: But we don't know if they brought their full staff from Unigenetics over with them to Trinity College, for example.

THE WITNESS: Based on what I've been able to tell relative to certain things, quite a few have gone over to, as I said, the person I couldn't remember her last name is now a doctor, so she received her --

THE COURT: Okay.

THE WITNESS: -- her doctorate during the process of, of training at the Unigenetics.

THE COURT: Okay. As I understood your slide 18, and as you were explaining, in fact your slide, well, let's deal with slide 18. What you are saying in terms of the sequence in which the proteins

are produced also has to do with the proportions of proteins --

THE WITNESS: Right.

THE COURT: -- that are produced. That is, you have to have a lot more N in order to get one F?

THE WITNESS: Correct.

THE COURT: Okay. And that would hold true for, would the proportions go down as you, as you move out on the virus?

THE WITNESS: Correct.

THE COURT: Okay. And moving to slide 19. As I understood this slide, and what your testimony, there are two periods of viremia in a human measles virus infection?

THE WITNESS: Yes.

THE COURT: The first is, is the virus is reproducing in the lymph nodes?

THE WITNESS: Correct.

THE COURT: And then second, it reproduces in what you call the -- endothelial cells?

THE WITNESS: Right.

THE COURT: And so there are two different, and how do those --

THE WITNESS: Two different stages, seven to days apart.

THE COURT: Okay. That's my next question, thank you, you anticipated that. So the initial infection comes into the respiratory tract, the virus travels to the lymph nodes, reproduces in the lymph nodes.

THE WITNESS: And that's the initial symptoms, and secondary symptoms with the rash occurring on the second set, and then it can fan out from there.

THE COURT: Okay.

THE WITNESS: And then this, this is more a general slide that I show medical students.

THE COURT: Okay. And with regard to what you've talked about, this visit to England you made in the course of British litigation, and please, I'm not asking you to answer anything that is covered by the British protective order. You did not visit the lab itself?

THE WITNESS: I did not.

THE COURT: So you don't know how they did it, except as was reported to you?

THE WITNESS: Correct.

THE COURT: So it's possible for people to know what to do and not to do it correctly.

THE WITNESS: It's possible that people,

yes.

THE COURT: Or to have the people who worked for them not do it correctly?

THE WITNESS: Correct, that, that is possible. Although, with this situation, it's pretty easy to tell if they're not doing it correctly.

THE COURT: Would this situation, meaning --

THE WITNESS: From a standpoint of a PCR. I mean, that's one of the easiest things to see, when it's not done correctly. If you inoculate, let's say a monkey, incorrectly, instead of giving him, you know, 500 copies, you know, you accidently give him five and he doesn't get sick. Well, that's hard to tell, you have to wait until he gets sick and then you don't know what happened. Here --

THE COURT: You should be able to see.

THE WITNESS: Absolutely.

THE COURT: Okay. So as I take it from your testimony today, you're saying that it should be easy if a lab has a contamination problem to see that they have a contamination problem?

THE WITNESS: Absolutely.

THE COURT: All right. Now, I want to move to Dr. Oldstone's letter now.

THE WITNESS: Okay.

THE COURT: Because it seems to me that

basically what Dr. Oldstone is saying in the last part of his letter is that, for example, if I take a sample, and I take a clean pipette, and I take some of the sample from my water bottle, and I label it sample A. And then I take a clean pipette and take another sample from my water bottle, and I label it sample B. If the same lab, using the same primers, using the same probes, runs that, runs sample A and sample B, that both should either test positive or negative depending on what's in my bottle.

THE WITNESS: Correct. But here's what happens. So --

THE COURT: Well, let me finish my question and --

THE WITNESS: Oh, I'm sorry.

THE COURT: -- then I'll let you answer.

THE WITNESS: Okay.

THE COURT: Okay. I'm just making sure that we're on the same sheet of music.

THE WITNESS: Okay.

THE COURT: What Dr. Oldstone appears to be saying to me is that sample A tested positive in some cases, and sample B tested negative in some cases. And that when you switched them you would not necessarily get the same result. In other words, if

I, if they labeled some, some samples when tested twice under different code numbers switched from positive to negative. So this is my, my basic sample, and I take two aliquots from it.

THE WITNESS: Right.

THE COURT: One is labeled A, and one is labeled B. How would sample A test positive and sample B would test negative?

THE WITNESS: Low copy number. You're at the very extreme limit of what you can detect.

THE COURT: And so you're at that, that level where one more cycle would have pushed it over into positive, but I'm not going to cycle it again because I'm stopping here?

THE WITNESS: That's one way.

THE COURT: Okay. How else?

THE WITNESS: It could also happen from a standpoint of the technical person having two bottles of water, and being too busy, and pulling one and labeling it A, and instead of being a replicate or a duplicate, labeling it B. So, in other words, taking two different samples. So when you label it to ship it out, so it could be a technical error at that point.

It could also be a situation where when

you've got, so the process has evolved. When you've got the thing you want to detect, so I'm sure you've heard this that, you know, having measles virus in the lab is bad for a laboratory who does measles virus PCR, because it's very easy to contaminate things. You need to separate the two, they have to be in different labs or --

THE COURT: You have to have very specific procedures to avoid contamination.

THE WITNESS: -- very specific procedures to, to have that happen. If the person who takes swab A takes the new swab and dips it in, that swab may not produce the same amount.

THE COURT: Now let's say I take an aliquot from my water bottle, and I take just one aliquot. And I put that aliquot in test tube A and test tube B, clean test tubes. Is there any way one would test positive and one would test negative?

THE WITNESS: That's very low level we're talking about, it's right at the verge of, you know, what one calls positive or there's on that calls negative. So they have a very low copy number would be the most likely answer.

THE COURT: Okay. You've referred to the article by Weibel or Weibel.

THE WITNESS: Weibel.

THE COURT: And this is the one that is, that Dr. Ward referenced in his --

THE WITNESS: Yes. Pediatrics 1998.

THE COURT: -- 1998 article. And it seems to me that what you were saying was that ataxia, for example, which is one of the neurological symptoms that was associated with vaccination, at least in this article, was evidence of immune suppression?

THE WITNESS: No, I was saying that, that it was evident, well, indirectly, that --

THE COURT: And that was --

THE WITNESS: -- the person, the person didn't handle it, so therefore it caused issues related to secondary conditions.

THE COURT: Well, didn't handling it is indicative of immunosuppression or immune --

THE WITNESS: An ineffective immune response.

THE COURT: Okay. An ineffective immune response. And you used an example, and I'm not sure I caught what examples you were using as you were gesturing, basically giving a logic if A then B then C.

THE WITNESS: Okay.

THE COURT: Can you go over that one with me again?

THE WITNESS: Yeah. So if, if we read that MMR causes immunosuppression, and if we agree that MMR can cause neurologic issues --

THE COURT: Ataxia.

THE WITNESS: Ataxia. Then by virtue of getting MMR first, and ataxia later, that MMR can cause the immunosuppression resulting in an ineffective immune response prevents control that then results in ataxia. Does that make sense?

THE COURT: Okay. Not sure that it makes sense logically to me, Dr. Kennedy. And what I'm getting at is --

THE WITNESS: If we go back to --

THE COURT: -- just go back to slide 8 then.

THE WITNESS: So let's for the purpose call this, call, the MMR vaccine, the respiratory. We'll start right there.

THE COURT: Okay.

THE WITNESS: And it goes to the lymph node, it causes viremia. That viremia then results in an immune response, goes to the artery system. And then second viremia is modified or prevented, because you have vaccine induced effective immune response.

THE COURT: Okay.
THE WITNESS: So you don't get that second.
THE COURT: So you don't get the subsequent symptoms.
THE WITNESS: And it might even block the first.
THE COURT: Okay.
THE WITNESS: Okay. So that never occurs. Then if that never occurs, then you can't get down to CNS.
THE COURT: Okay.
THE WITNESS: Does that make sense?
THE COURT: It makes sense, but I'm not sure I followed your logic that immunosuppression has to be the reason someone gets ataxia.
THE WITNESS: Oh, I, it's a possibility. It's not the total reason. So the, my reason is it's the virus that is resulting in the ataxia. Does that make sense? But the virus gets hold because it's immunosuppressant and doesn't allow --
THE COURT: Okay.
THE WITNESS: -- to block those stages. Does that make more sense?
THE COURT: Because, you're saying because the body doesn't mount an effective immune response

you get ataxia development?

THE WITNESS: It can. But remember this, this Weibel paper. I mean, they looked at, you know, tens of thousands. This was, you know, MMR vaccines, and I believe they only reported 48 adverse events. So it was rare in this group. So it's, it's almost like an individual situation. So it's not the normal situation.

THE COURT: Okay, we'll just have to disagree. I don't follow your logic in terms of, I follow your logic to the extent that there is, because the body fails to mount, to clear the virus.

THE WITNESS: And I'm --

THE COURT: If someone gets sick with measles and therefore develops the respiratory tract symptoms, the GI tract symptoms --

THE WITNESS: So my point is that in some individuals that immunosuppression is not clinically relevant.

THE COURT: Okay.

THE WITNESS: In the majority of the individuals it's not clinically relevant. In some individuals the clinical relevance is that inability to, to mount that effective thing that blocks those processes. You want the vaccine to block those

processes. And the vaccine is highly effective at doing that.

But in certain situations, certain individuals, because I forget, forget the numbers, but that, the Weibel paper is, you know, they looked at huge numbers and could only find a relatively limited number that showed those neurologic manifestations. So it was essentially a survey of the, the adverse reporting systems.

THE COURT: Okay, all right. You've made several comments about the inability to talk about what happened in the British litigation. Have you been asked to support release of your U.K. report?

THE WITNESS: No.

THE COURT: Thank you. Questions from either side based on mine?

THE WITNESS: Although a signed, no.

THE COURT: Okay.

THE WITNESS: But --

THE COURT: Orally?

THE WITNESS: I was orally told that there might be issues if I discussed it. And I like London, so I didn't want to be arrested when I arrived --

THE COURT: Okay, no. I meant have you been, let me rephrase that. Have you been asked to

support the release, that is, to get --

THE WITNESS: No, no.

THE COURT: -- access to the --

THE WITNESS: No, I have not.

THE COURT: Okay. Do you have any objections to the release? Okay, thank you.

THE WITNESS: Absolutely not.

THE COURT: Okay. Go ahead. Questions based on mine?

MR. POWERS: Questions based on your and also opportunity for redirect based on cross that you --

REDIRECT EXAMINATION

BY MR. POWERS:

Q So Dr. Kennedy, I want to address a couple of issues that were raised on Respondent's cross-examination. Draw your attention back to a discussion about whether immunohistochemistry was performed on Colten Snyder's sample. You were asked whether there was anything in the record in his case to indicate that that had been done by O'Leary lab. Do you recall that question?

A Yes, I do.

Q And do you recall your answer being that you could not tell from the record in Colten Snyder's case

whether that had been performed?

A Correct.

Q Now it's true that in the Uhlmann paper, the same laboratory actually did do immunohistochemistry on all the samples that were reported in that paper, correct?

A Correct.

Q And there's no reason for you to believe that they would have done the procedure any differently in Colten Snyder's case than they did in the samples that were in the Uhlmann paper, is that right?

A None whatsoever.

Q And to find out absolutely positive whether there's documentation of that, you would need access to documents that were generated in the U.K. litigation that, as the Special Master just discussed, are not available to us right now?

A That's correct.

Q And that's that same information, excuse me, those same documents presumably would provide information about allelic discrimination, whether that testing had been done on Colten Snyder's sample, correct?

A Correct. Although my, my understanding of

the U.K. documentation was their eight or nine lead cases. And it was restricted to individuals in the U.K. So it was not related to U.S. individuals. So I'm not, yeah, that makes sense.

Q So there's a obvious wealth of information that would be contained in this U.K. reports that would be informative both to your opinions on general causation and to specific issues to in Colten Snyder's case?

A Yes.

Q As a scientist, and then let's say, not as a testifying expert in this case, but as a disinterested scientist looking to resolve some of the debate between the various labs involved here and the results overall of O'Leary lab, one would find it necessary to have that information, is that fair to say?

A I think that would be very fair.

Q And not just necessary, but really it'd be essential to the, one could look at data sheets, protocols, how many cycles were run, so that we are, at every level, comparing apples to apples and oranges to oranges in terms of samples and methodology, correct?

A I would agree that would be extremely important and of, to all parties involved.

Q And not just to the parties, but presumably to the folks who are going to be making the decisions in these cases?

A Correct. I didn't mean to exclude you, Special Master.

(Laughter.)

Q Now you described, and were asked questions about the mechanism of, of viral persistence. And if I recall the answer, the series of answers boiled down to that, the actual mechanism of persistence of viruses in general, and measles virus in particular, it's not something that's clear at this point, is that a fair statement?

A It is better known for some viruses. It's not well-known for a measles virus. And I think, Dr. Griffin, in her testimony talked about that we just don't know, with these new sensitive techniques, what is actually going on from a standpoint of persistence, and how, and in what form does it persist.

Q So regardless of whether we can describe a mechanism of persistence, does that change your opinion at all that in fact, again, regardless of the mechanism, that in fact we have a persistent measles virus in Colten Snyder's body?

A No, it doesn't change.

Q Does it change your opinion at all, you know, the inability to describe in detail the mechanism, does it change your opinion that the persistent virus was replicating in Colten Snyder's body?

A At that level, no.

Q And is it fair to say that the mechanism of persistence, whatever it is, it's not the mechanism of injury in this case? That is, the mechanism of injury is the endpoint of persistence, which is the virus?

A The virus is the injuring, it's the virus.

MR. POWERS: No further questions.

THE COURT: Ms. Babcock?

MS. BABCOCK: Yes, just briefly.

THE WITNESS: That's okay, you can't hear my stomach growl.

(Laughter.)

THE COURT: We'll just --

RECROSS-EXAMINATION

BY MS. BABCOCK:

Q Now Dr. Oldstone wasn't involved in the U.K. litigation, was he?

A No, he was not.

Q And this whole thing with Oldstone, just to be clear, occurred entirely outside of that. So

you're not limited in your ability to

talk about that by the U.K. litigation?

A No, but I don't know all the details. I would assume that there is a chain of, you know, communications that I'm not, haven't been privileged to that probably occurred.

I mean, if this is going on, and I'm thinking from a scientific standpoint, if I want the answers, and I already know them, and I'm sending them over, and they're not coming back the way I want them. Then you're going to kind of communicate to try to work that out. I mean, that's how the normal scientific collaboration process goes.

Q This whole thing with Dr. Oldstone has actually come up in an incredibly public forum meeting, specifically a congressional hearing, correct?

A Yeah, yeah.

Q So certainly there's public knowledge of this, this circumstance and what have you.

A The details from that I wasn't really sure of how things transpired.

Q Mostly because Dr. Oldstone has not elected, until this point, to talk about it?

A Right.

Q Now, just a followup question on

Unigenetics, you don't know where the plasmid room was in relation to where the PCR was done, do you?

A I have no idea.

Q And, I'm sorry, maybe that was --

A No, let me --

Q One more question.

A Okay, let's do Oldstone then, ask me that one again.

Q Okay, sure.

A Because I do have some idea, but it was only, I didn't see the operation, but I saw the layout of how they had things set --

Q On a piece of paper?

A -- on a piece of paper.

Q Okay. So you didn't physically inspect --

A I didn't physically inspect, the boundaries that were there were based on physical, piece of paper, I didn't see them. The hoods that were there were on a piece of paper, but I didn't see the hoods. I know where things were in relation to a supposed loading dock, but I didn't see the loading dock.

Q And its your understanding, again, getting back to Dr. Oldstone, you know, he knew that the reason he was sending the samples to Unigenetics was - because they were attempting to replicate what he was

coding as being positive and negative?

A Yes.

Q So presumably he would have taken some care to ensure that what he was coding as positive, was positive?

A Yeah.

Q -- and what he was coding as negative was negative, and identifiably so by Unigenetics, because that was the purpose of?

A (Non verbal response.)

Q Now Mr. Powers just asked you about mechanisms, and we don't understand necessarily the mechanisms. How is it that the measles virus causes autism?

A I'm going to have to defer to Dr. Kinsbourne or, you know, someone that understands the processes. I, my knowledge of autism is very limited, and, you know, I'm lucky to remember what is a DSM-IV from a standpoint of the textbook and the psych patients. So I'm going to have to defer to Dr. Kinsbourne, or someone who is more in tune with the aspects related to autism and CNS issues.

Q Okay. So you don't know?

A No, I don't know. I can postulate highly, if you'd prefer, but I don't want to waste anybody's

time.

MS. BABCOCK: Nothing further.

THE COURT: Okay. Do we excuse Dr. Kennedy,

or are you going to keep him handy for rebuttal?

MR. POWERS: I'm sorry, well, rebuttal on Friday if need be, Special Master.

THE COURT: Okay.

MR. POWERS: But for direct and cross today he's excused.

THE COURT: Okay. Then it would appear to be an appropriate time to take our lunch recess. By my watch it's 12:25, let's be back here at 1:30.

(Off the record.)

THE COURT: All right, let's go back on the record in the Snyder case. Before we have you call your next witness for the Petitioners, Dr. Kinsbourne, there's an issue I'd like to address.

In your opening remarks, Mr. Powers, you raised anew the issue of the U.K. litigation. Then of course that came up in the course of Dr. Kennedy's testimony. Based on my recollection some five months ago, we invited Petitioners to make application to the U.K. as their law apparently permits private parties to do, to seek release of whatever data it was that you thought you needed in this case. Have you done so or do you contemplate doing so?

MR. POWERS: We made inquiries to legal counsel, and legal counsel informed us that at that

point we could not get release of those documents. It's not a confidence that's held by the party that submitted the information.

THE COURT: Right.

MR. POWERS: But we are actively investigating or working up what we need to do in order to make it, and I don't know --

THE COURT: Yes.

MR. POWERS: I just talked to the people that know that and I'm told that we're doing what we can to pursue or gain the release of those documents. But it's not something where an individual person can say I waive any confidentiality or I waive the applicability of an order as to my materials.

THE COURT: Well, at least in the terms of what the government told us in the course of the leadup to the Cedillo hearings, it did not take them five months to do so, number one. And number two, it apparently, securing the permission of the individuals whose data or whose reports were being released was a factor that persuaded or helped to persuade the U.K. Judge in that matter.

I'm concerned that we're now five months down the road. We're finishing the last of the first theory cases. Even with the posttrial briefing

schedule, if you're going to submit more evidence that may necessitate some additional evidence by the government, that we are running out of time.

MR. POWERS: Understood, Special Master --

THE COURT: So on my behalf, if not that of my colleagues, I urge you to do so with speed and diligence.

MR. POWERS: Understood.

THE COURT: Okay.

MR. MATANOSKI: Special Master, on that last point?

THE COURT: Yes.

MR. MATANOSKI: Just so that it's clear, we did want, the government was trying to get --

THE COURT: I understood you were trying to get the whole thing.

MR. MATANOSKI: Yes, and so we would be supportive of efforts to try to secure that information.

THE COURT: I just felt that it was necessary to make those issues clear on this record given the posture of this litigation.

MR. POWERS: I completely understand both the rationale for putting it on the record and more importantly, I think, the substance of your remarks.

And I will take Mr. Matanoski's comments to heart too, because if we can more actively pursue this, that would, I think, be very fruitful.

THE COURT: No, again --

MR. POWERS: Again, to the parties, really, it's about getting information to you -- to make the best decision you can on the evidence tha's out there.

THE COURT: I know that on behalf of my colleagues and myself, that we would like to have the most complete record possible. We are cognizant that we not only deciding one case, but that we are developing a record that will help us decide 5,000 other cases and we would like to make not just the correct decision on the record before us, but the correct decision.

MR. POWERS: Absolutely, and I'm happy to work with Respondent's counsel to see if we might even be able to pursue that together in some way.

MR. MATANOSKI: And just in case it's not clear, there was some discussion with Dr. Kennedy about Dr. Oldstone. Dr. Oldstone, any information about Dr. Oldstone that he was exchanging with Dr. O'Leary was not part of the litigation. Those efforts were not, so that's not privileged in any way.

THE COURT: Okay.

MR. POWERS: Yeah, we understand that.

That's just a practical matter of that letter coming in when it did that, injecting a specific issue around a specific person with specific statements and an interchange. That means we need to go out and develop the evidence we can, which we will do very quickly because, I entirely agree. That's not privileged. It's not confidential. It's not in the U.K. I have already developed a pretty good idea of where it is, what it looks like and who has it and will develop that as quickly as we can.

THE COURT: Great, wonderful. All right. With that, are you prepared to call your next witness?

MR. POWERS: We certainly are Special Master. The Petitioners in this case would like to call Dr. Marcel Kinsbourne.

THE COURT: Who has come prepared with his water bottle.

(Laughter.)

DR. KINSBOURNE: It's a long haul.

THE COURT: It is.

MR. POWERS: And also Dr. Kinsbourne, it's much easier to get into the building with a bottle of water than with a computer, so we will not be using computer displays here today --

THE COURT: Okay. Would you raise your

right hand, Dr. Kinsbourne?

Whereupon,

MARCEL KINSBOURNE

having been duly sworn, was called as a witness and was examined and testified as follows:

DIRECT EXAMINATION

BY MR. POWERS:

Q Good afternoon, Dr. Kinsbourne.

A Hello.

Q So that we have a good record here with the court reporter, if you could go ahead and state and spell your name and give us your academic or professional affiliation if you would.

A Yes. Marcel, M-a-r-c-e-l, Kinsbourne, K-i-n-s-b-o-u-r-n-e. Off the record, am I echoing too much? Okay. My address is 158 Cambridge Street, Winchester, Massachusetts. And I'm, I'm a professor at The New School in New York.

Q Now Dr. Kinsbourne, I know that you were here earlier today when Dr. Ron Kennedy testified. And as a preliminary matter, I want to cover some of the same issues with you that I did with Dr. Kennedy so that we make a clear record for the proceedings in this case.

In the Cedillo matter, which was the first

of three designated test cases brought on behalf of the Petitioners' steering committee, you testified in the Cedillo matter back in June of 2007, is that correct?

A That is correct.

Q And your testimony as I understand it included the submission of an expert report, the presentation of direct, oral testimony, cross-examination, is that right?

A That's correct.

Q Now my understanding is that there is no supplemental report or rebuttal report that you've prepared or have in the works anticipating to file of the Cedillo matter, is that right?

A That's also true, yes.

Q In your appearance here today, as was the case in the Cedillo matter, my understanding, and I want to make sure that it's your understanding also, is that you're here in a sense wearing two hats. The first hat is that you're offering testimony on issues of general causation that might apply to other cases in the omnibus proceeding, is that a correct understanding?

A Yes, sir.

Q And then secondarily, I shouldn't say

secondarily, but just the other hat because they're both equally important, the other hat is that you're offering expert testimony to be used in the resolution of the individual claim here, Colten Snyder's claim for compensation.

A Yes.

Q And that was the case in the Cedillo matter. You were offering individual case testimony in that matter.

A Correct.

Q You're appearing today and offering a report and your testimony. The idea is that everything in the Cedillo matter, from the Petitioners' side, we are treating that as on file and available to the parties and the Special Masters in this proceeding so that we don't have to repeat all the evidence and all the testimony, is that your understanding?

A Yes.

Q So in your report today and your testimony today, I am assuming that there are moments or points where you will not go into detail that has already been covered in Cedillo in order to avoid redundancy, right?

A Yes, indeed.

Q But by avoiding redundancy, it's not to be

construed as somehow waiving an argument or unmaking a point that you made before, correct?

A Absolutely.

Q Okay. I just wanted to establish that for the record and I'll pause now because I anticipate the Respondent may have a, if there's an objection to make to doing that as he did earlier.

MR. MATANOSKI: No, ma'am.

THE COURT: Okay.

MR. POWERS: Okay.

BY MR. POWERS:

Q Now Dr. Kinsbourne, we already discussed that you were here earlier today and heard Dr. Kennedy, but you were here yesterday morning when the parties presented opening statements, is that right?

A Yes, I was.

Q And you recall in Mr. Johnson's opening statement, a mention of Andy Wakefield's work. Do you recall that reference?

A I do.

Q And do you recall a reference to 10 years of time since Dr. Wakefield proposed a hypothesis and began the area of inquiry, but in the intervening 10 years that theory has been, I think the word was "debunked."

A I remember that.

Q My understanding is that you have some comments to make about the idea that Dr. Wakefield's theory has been debunked and that those comments would be relevant to proving the case here. If you could go ahead and share with the Special Master your thoughts on that issue.

(Away from microphone.)

A Thank you. Apart from the fact that that rhetoric of "debunked" has no place in discussions with medical science, putting that aside, I'd like to make a distinction between Dr. Wakefield's specific theory of causation as offered at the time, that time being around the end of 1998 or so, and the way that the science of autism has moved in the intervening period, the fact being that the science of autism has, to coin a phrase, "surged tremendously" since about that time. How much it has to do with Dr. Wakefield's comment, I'm not sure about, but I bet somewhat has to do with it.

At any rate, there are a number of areas in which the perspective of medical scientists working in autism have been transforming. The first and most sweeping one is a change from considering autism as a static deficit -- to considering it as

an ongoing disease happening every moment of the individual's life with autism.

Now the background of autism theories is of course that initially the approach was psychodynamic. Next the approach became cognitive, that it was a language disorder that was thought for quite a while and that the rest of the symptom was a spinoff from the language difficulties. That was abandoned and a strong feeling emerged that it was a genetic disorder of its own kind. And when I say "it," I'm referring to that large, say 80 to 90 percent of autistic children who don't have syndromic autism, which is autism in association with other deficits due to identified genetic abnormalities or toxic abnormalities.

Now the idea that the, that autism is an ongoing disease is a really important one. It suggests different causations and it suggests quite a different approach to management. And both these options have been taken up by the science that ensued. In a way, the roadblock to taking a very active therapeutic approach to autism has been this genetic idea with genetics having a sort of predestination, the child's genes aren't right, that's why he or she is the way that they are. And until recently, no one

knew to alter

to anything at that level of analysis.

However, it's now increasingly realized that genetic does not exclude environmental, but rather that many genes predispose the individual to react in different anomalous or abnormal ways to particular environmental exposures, meaning that having a genetic predisposition is necessary but not sufficient for the development of autism in that particular case. But when the exposure occurs which might be an exposure that for almost anybody else is innocuous would be harmful to the child who has that genetic predisposition.

Q And Dr. Kinsbourne, if I can interrupt for a second, you just mentioned that there's increasing scientific attention being paid to this issue of environmental and gene interaction. You're aware, I assume, that the Institutes of Medicine just this past year held a two day meeting and they discussed a wide variety of ways in which the genes and the environment can interact to produce autistic symptoms in children. Are you familiar with that?

A I am indeed, and other manifestations, one is in the person of sir Michael Rutter, who is longstanding -- belongs -- authority on autism who -- previously took the language point of view -- and now

has written excellent articles on the importance of gene environmental action in psychopathology. And there are other reputable scientists I

submitted to the Court in the Cedillo matter, articles by Dr. Martha Herbert at Harvard University representing the point of view the Court is unitelligible -- I'm sure, with it.

Q And also even some of the federal agencies that are involved in a sense, the client agencies here of the Respondent, various bodies within the CDC, the NIEHS, a lot of those entities are involved and either participating directly or funding research into possible environmental contributing factors to autism, isn't that correct?

A That is true. It's also true that the M.I.N.D. Institute at the University of California at Davis has an active program in, in these matters. The third point that where there's been I think a, considerable change is that until recently it was assumed that autism is a brain disease. It is becoming more recognized that it is a disease which affects the brain, among other organs. The other organs of note of course being gastrointestinal system and the immune system.

Now, the effect of these changes is to shift another assumption and that is the assumption which was tacitly -- present for a long time that those children with non-syndromic autism, namely autism, 80

or 90 percent of them, basically your typical autistic child, all suffer from a

condition called autism. And now most everybody concedes there are clearly multiple causes of autism and that's just taken for granted now. It's not even controversial.

The one important effect of that to cases like Colten Snyder's is the view that's taken of those autistic children who regressed into autism after an initial period of normal, or near normal development. Why do you think, if you think that there is a condition called autism, would you find that a certain percentage, say 30 percent of children regress? Well, that's one of the ways that autism presents and you don't necessarily ask further questions.

And in fact, regression into autism has been known for numerous decades and curious enough to my knowledge, has never been separately, specifically studied as opposed to being included in larger studies of autism, of which of course there have been very many. Once one considers that actually autism has multiple causes and presumably multiple pathogeneses then one can look at regression in a different light, namely as a, a progressive encephalopathy of unknown cause. The fact that the outcome is autism doesn't give you the cause and it doesn't persuasively tell you that its cause is the same as the cause of autism

in

these other children. Maybe, maybe not.

So I take the view and people increasingly take the view that a regressive autism should be studied in its own right. And on the face of it, something is happening to the child's brain at the time that the child is regressing and it is not sufficient to say in a post hoc -- fashion, oh well, since autism is genetic, there must be something to do with the timing of the gene effects. Now that is a speculation. Unlike most everything we're discussing in this case which is not a speculation, this is, no evidence whatever for it.

So a pediatric neurologist particularly, takes most seriously a state of affairs when a child loses intellectual capabilities. That's one of the most alarming situations and in any other such case other than in regressive autism, these children are intensely investigated and get great attention, not always with much therapeutic effect, unfortunately.

Q And Dr. Kinsbourne, again to focus on Colten Snyder's case, is it your opinion that what Colten Snyder experienced was in fact a regression into autism -- at a certain point

A It clearly was, yes.

Q And I know you say it in your report, but I

just want to make clear, that's based on your review of Dr. Bradstreet's records and all of his medical records, correct?

A Yes.

Q And that's based on your sitting through and hearing the testimony of family members and caregivers, is that correct?

A Right. I don't see it as controversial.

Q Right. And so all of that goes into form your opinion that it's more likely than not to a reasonable degree of medical probability that Colten was -- neurotypical and then regressed into autism at some point.

A I believe that's so.

Q Okay.

A So as a consequence of that particular perspective of regressive autism, it would be my opinion that if we were to study it in any way, it should be studied in its own right and that would include epidemiology. And I don't find epidemiology about autism, in general, informative about the issues with regressive autism. And ultimately in terms of the epidemiological approach to causation with respect to MMR, I would have thought an obvious study to do would be a case control study in which one compares

autistic children who have received

MMR to autistic children who have not received MMR. And for now that data is available but certainly hasn't been published.

Q And then even within that sort of a study, it sounds like it would be important to make distinctions in the outcomes at least between a broadly defined autism diagnosis and a regressive autism diagnosis, is that fair to say?

A I'm talking specifically of regressive. I'm not even considering the other kind. That's still a lot of children and as the Court knows, the incidence of autism has enormously increased over the last 10, 15 years and that includes incidence of regressive autism. And as a comment on that, it has been pointed out quite cogently that you can't necessarily assume that that increase or incidence is 1 to 1 in relation to the increase in the actual prevalence of the disorder, because there may be changes in classification, changes in ascertainment, -- more or less vigilence and knowledge about the condition.

But I have to say that whereas it is clearly easy to be uncertain what's going on with a child with classical autism who slowly begins to develop in a not very typical trajectory and wonders is it if have we as -- have parents done the wrong thing and so on.

When a child loses skills that he or

she had, I don't quite see how it could be overlooked -- so I do think it very likely that he, the real incidence of regressive autism has been increasing. Obviously, I don't know why. I've already given the opinion there are multiple causes, so any, or any combination of those multiple causes might be responsible and just only cause attention to this particular point of view.

Q And another thing, Dr. Kinsbourne, when you talk about multiple causes, I assume you're talking about multiple causes within a population, but also multiple causes in an individual. So when you say multiple causes, are you talking about in an individual you may have genetic predispositions and environmental exposures, so you have multiple causes for one person as well as across a population?

A Yes. I think that in, a proportion of children with autism there was in fact an interaction between a susceptibility and a triggering event what some people would call a double hit -- I have no position as to how many such children there are within the population. I just don't know, it's a large number or a small number -or a medium number.

One more point of changing science because these are enormous changes to my mind from how we

looked at things only ten years ago is that we were looking for

a rather classical neuropsychological type of database through asking which areas have to be malfunctioning to generate those symptoms and those, and those impairments. So one looks at, one has -- looked at the hippocampus the amygdala and the cerebellum, these were the earliest areas incriminated -- and there, there's nothing wrong with that. But there is now an increasing tendency to think not so much of static deficits or failures to develop in those particular areas as changes in the way the network is functioning, broad changes of network interaction and there are a number of articles recently published, the important ones giving evidence for that to be the appropriate approach and making suggestions as to what these changes are.

It so happens that one of, I think one of the most important approaches is the one that I cited by submitting the article by Rubenstein and Merzenich -- who talk about a change in the excitation inhibition ratio as accounting for autistic behaviors in at least some of these children, which is personally gratifying to me because I had argued decades ago that overactivation explained autistic symptomology and have submitted to the Court two of my articles to that effect.

So in all, there has been an enormous increase in interest in autism research and to come

back to my initial point, whereas Dr. Wakefield's specific proposition has not been firmly validated, the approach that he took is very much in tune with the way the science has been going since he first presented his ideas. It so happens that the specific mechanism of causation, which Dr. Wakefield supported, namely a gut - brain interaction with an opioid overflow and opioid damage -- damage to the brain has, has neither been proven or disproven.

It's still a possibility, but it, our knowledge has not in that respect much advanced. The theory that I'm proposing is a different theory from Dr. Wakefield's theory.

Q And we'll talk in some detail about the theory of what happens with a persistent measles virus when it gets into the brain. We'll get to that point eventually. But I want to fill in a few of the steps that get us from here to there and particularly in the case of Colten Snyder.

Now you would agree, and again, this is just to avoid completely regurgitating the expert report that you filed and the testimony in Cedillo, but your conclusions here ultimately are based on the presence of a persistent replicating measles virus in Colten Snyder that got into his brain, is that correct?

A That is correct.

Q And the evidence that you have that that has occurred is the presence of the measles virus, RNA and protein in the cerebral spinal fluid indicating that it's in the brain, is that correct?

A Yes, sir.

Q In reaching the conclusion that the measles virus actually exists in the brain as you describe in your report and your testimony, you're relying on the testimony in part of Dr. Kennedy who we heard before and all of the lab results and the academic work that supports his conclusion.

A I am.

Q So really if there is measles virus in the brain as Dr. Kennedy has explained and if the evidence is reliable as he has explained, that gives you the basis for your opinion that the measles virus in the brain can then initiate a process that causes --

A That is completely correct.

Q Now one of the issues that's come up, and we've heard it in testimony and reports in Cedillo, we haven't heard testimony from the Respondent yet, but on cross-examination and in their reports, there is issue made of, in general, the presentation of symptoms we see in autism are not symptoms that are typically seen in other measles infectious cases. I'd

like you to address to the extent that you can that argument and perhaps explain why you are able to make the leap between measles virus exposure and neurological injuries as you're describing in here.

A Right. As was pointed out and as is obvious, we do know at a scientific level of certainty of two disorders of the brain caused by the measles virus, and they are SSPE and MIBE. Now one point of interest in both of these disorders is that they demonstrate that the measles virus and in most cases the wild measles virus, can indeed persist in the body. In the case of, of SSPE, the interval of time between the initial measles infection and the first presentation of this deadly brain disease ranges between eight and 30 years and it is considered that the measles virus has been lurking in neurons all this time.

In the case of MIBE the period of time is more in terms of month than of years, but there has been a case of what, which I submitted in Cedillo -- Bitnun in which it was verified in one such case that the virus that had caused the, the condition and the, and death was actually vaccine-type.

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Now having delineated these two known ways for the measles virus to damage the brain, I cannot agree that we should close the book and argue that as it were, that's all the measles virus is, is allowed to do with regard to the brain that we got exhausted the neurotropic and neuropathic potential of the measles virus. I mean, that's not true in any aspect of medical science.

Actually, Dr. Kennedy happened to give a dramatic example this morning of how the, the same virus can cause either a spasticity in the nervous system or leukemia. There is no reason to foreclose the possibility and sometimes the probability that the measles virus can in fact, manifest in, neurologically in a third way, or for all I know in a fourth way.

I might mention, although, I mentioned an article by Dr. Paul Dykken which I have not filed, but now find maybe it would be helpful to the Court, you know, if I were to file it -- subsequently, Paul Dykken is a known expert on SSPE and he is in charge of the world registry of SSPE. And he has written, and he was one of the colleagues who visited the British case and I met him there. And he wrote an article, in which he said there is SSPE and then there's this condition which we're discussing here

which he has his own name for, which is an atypical response of the brain to the measles vaccine virus.

He finds it not at all difficult to think of neurological disorder caused by the measles virus which is neither MIBE nor SSPE. So I don't see the strength of the argument for closing other possibilities.

Q And can you give examples that you're aware of, of measles virus causing neurological injuries?

A Okay.

Q And in particular, vaccine strain measles virus that causes injury.

Q Oh, yes. The, the more usual way for the measles vaccine virus to cause neurological injury is to do so with a week or so rather than in a delayed fashion, but when I say usual that of course isn't really a good word to use because we have to remember these are rare events and they're all rare events and that, that makes a difference in terms of how we judge the plausibility of them occurring relative to surveys of common events, what happens commonly.

But in fact Dr. Kennedy mentioned the article about Weibel et al., which, this was a group of investigators from the CDC who analyzed submissions to the VAERS program over a number of years, set up their criteria for validating the causation and then described the pattern of pathology and the time it was

that they found, they listed a number of neurological

manifestations in various combinations of encephalopathy, convulsions and ataxia and occasionally death. And the timeframe which was typically within the second week after onset.

So as far as I can tell, this is well accepted. I haven't heard much argument about it, yes, the measles vaccine virus on rare occasions can damage the brain.

Q Now, so you've talked about instances where the measles vaccine virus can damage the brain and you've just discussed how the measles virus, although it can cause known diseases, that doesn't rule out the possibility of it causing other diseases. I want to move on and talk a little bit about viral persistence.

Now again, you were here earlier and you heard Dr. Kennedy testify about the persistence of measles virus, is that correct?

A Yes.

Q During his testimony, he described not being able to provide a mechanism by which the measles virus persisted in the body. Do you recall that testimony?

A I do.

Q Would you agree with Dr. Kennedy? Do you have a model or a mechanism of measles persistence that would either be different from or more expansive

than his?

A No. As a neurologist, I wouldn't be in the position to go into cellular level of it. No doubt it -- persistent cells and I know that it could persist in lymphoid tissue and could persist in other areas. But I can't be specific about it. All I can say in that connection is that I have read that passing which is the known measles virus can persist substantially. As long as the virus is there, it can persist for decades, actually. And although obviously the question of whether the measles vaccine virus persists like that is a controversial issue or we wouldn't be here -- it's not at all unreasonable to suppose that it can.

Q And at some point the presence of the measles virus in the cerebral spinal fluid and in a child like Colten Snyder, talking about the proof being in the pudding, and that's the proof that you would need even absent a model, a mechanistic model of how the persistence occurs, is that correct?

A Yes, indeed. To me this is a dramatic and key finding and I've said that before and it has, you know, the most important implications because as Dr. Kennedy pointed out and others have, if a virus materially is in the cerebro spinal fluid, it's in the

brain because they're in direct connection. So the finding of the virus material in the CSF opens a pathway to considering

possible mechanisms of injury in terms of the presence of some amount, some level of the virus material in the brain.

Q Let's talk about immune suppression also. It's mentioned in your report. It was an issue that you addressed at least in Cedillo. I want to talk about it here. The argument is that Colten Snyder's immune system was likely suppressed at the time his MMR was given and that created an inability of his body to clear the virus and that was in a sense part of the chain of events that lead to persistence. Is that your understanding of the theory of this case?

A Well, right after Dr. Kennedy explained that it seems, it seems totally reasonable prima facie given the burst of infections that he had after receiving a vaccine that's known to be immune suppressive, that would be a reasonable thing to suppose.

Q And when you describe the possibility of immune suppression after vaccination, what evidence are you referring to? Is this the medical record of his course of illness?

A Well, in Colten's case the medical record -- infections. Again, like any other child, he had infections before and they came and they went. But

somehow for some reason they just kept on happening

after the vaccination. It's not proof positive, but it's a reasonable probability -- I might add that for me to make that, that suggestion doesn't mean that I, I'm of the opinion that clinical infection actually increases after giving the measles virus as a matter of course and on the millions that receive it. I don't think the vaccine would be used if we found that children got more and more infections after it.

So I think that, that cannot be the case in practice, but biology being what it is, it could surely be the case on rare occasions in certain children.

Q And would it be fair to say that the cluster of infections and the recurring infections that Colten Snyder experienced after he got the MMR is at the very least consistent with an immune suppressed system?

A I think "consistent" is a correct word.

Q And you're also familiar with the testimony in the Cedillo matter of Dr. Byers and Dr. Aposhian, is that correct?

A Yes.

Q And in that testimony in particular they described the immune suppressive effect of Thimerosal or excuse me, of mercury, as contained in the Thimerosal do you recall the testimony in those

reports? Now you're not a toxicologist, correct?

A I'm not.

Q And you're not an immunologist.

A I'm not any of those people.

Q And those are the people that testified in Cedillo. So to the extent that you would identify or rely in your ultimate opinion on the notion that his immune system might have been suppressed when he got the shot, you would be relying on the evidence developed in Cedillo around Dr. Byers and Dr. Aposhian's testimony, is that fair?

A To, if I can rephrase that, I would say, I would say that relying on Dr. Byers and Dr. Aposhian it would seem reasonable to think that maybe the child's immune system has been sensitized or in some way made vulnerable to the further effects of the immune suppressive effect of the MMR. But as I say, this is an opinion relying on other experts.

Q Exactly. And so it's not an opinion that you would be stating to any degree of medical certainty and you would be relying on those other folks.

A That is correct.

Q Okay. So we talked in general terms, again not hitting everything in your report, about the

measles virus getting into the system, persisting in the system, the types of symptoms that are known to be caused by measles infections. We talked about the measles virus then getting into the brain with the evidence from the CSF.

I would like you to go ahead and talk a bit and in some level of detail about what you believe in your expert opinion happens when the measles virus gets into the brain and how it might be related to autism symptoms.

A All right. One takes note in developing such a, a notion of what is known of the neuropathology in autistic individuals who've come to autopsy, and what is known is that there are abnormalities of the organization of the neurons in various parts, but rather limited evidence of actual loss of neurons. Certainly what has not been reported is necrosis which means ongoing dying neurons. What has been reported is a shortage of pyramidal cells in the cerebellum and --

THE COURT: I'm sorry. What was that word? The type of cells?

THE WITNESS: Pyramidal.

THE COURT: Pyramidal, yes, okay.

THE WITNESS: I may not have the

pronunciation.

THE COURT: No, you're pronouncing it properly, but I'm trying to make sure I understood the word.

THE WITNESS: Correct.

THE COURT: So the pyramid of cells in the brain.

THE WITNESS: Let me explain that properly.

THE COURT: Please.

A There are several types of neurons in the brain. It's actually suprising that there are only a few different types. One of them is a large cell which has a pyramidal shape, like a pyramid.

THE COURT: Okay, so it's three sided, triangular.

THE WITNESS: Let me describe what it looks like under a microscope.

THE COURT: Okay.

A And these are large cells which have axons that often go long distances and there's a notable layer, a pyramidal layer in the cortex of the cerebellum. And looking there, one found those cells missing as reported. But it's not really an, in fact an option to say that autism is caused by losing lots of neurons. That's not the case as it may be in some

other disorders.

Rather it would seem, it seems more attractive to develop a hypothesis which appeals to a combination of inflammation and the effects of inflammation on neurotransmitter function. This is essentially the model that I describe in my, my article in my report. And I hasten to say there and I'll say it again, I'm not arguing that. I know that this is the case. And this is not an argument to a scientific level, I present it here as a reasonable approach to suggesting such a mechanism.

Now the basis for making it attractive to, I assume that there is inflammation occurring in the brain, is the well-known work by Vargas and colleagues from Hopkins, the group led by Dr. Pardo and in which includes Dr. Zimmerman, who contributed apparently to it, who have in fact found inflammation in the brain. And they found inflammation in two ways. They found it in autopsy specimens of people who unfortunately died while autistic -- for other reasons and they found neuroinflammation markers in the cerebral spinal fluid of other children, obviously living autistic children

And finding those inflammatory markers was interesting was because what they found in the autopsy

specimen in terms of inflammatory substances corresponding to what they found in living children in the cerebral spinal

fluid. And also corresponded to what Dr. Jyonouchi found in the blood of autistic children of a regressive type in her investigation.

So there's, a database has been building up of evidence of inflammation in autistic children and evidence that that inflammation involves the brain, can also obviously involve other parts such as the intestinal lining, but that's not my topic at this time. So using as a working model the, the idea that there is indeed neuroinflammation in Colten Snyder's brain as there was in quite a few of the children that were autopsied, not just one or two, by the Vargas group - one, then notes the fact that this inflammation indicated the activity of what's called the innate immune system, the innate immune system being a generalized response to foreign bodies, invaders, as opposed to the adaptive immune system which hones in on specific targets.

The innate immune system is represented in the brain by glial cells, g-l-i-a-l cells, which are called microglia and they are the counterpart of macrophages in the blood and in the general system of the body. And activation of the microglia causes the production of what are called proinflammatory cytokines. These are substances that cause

inflammation which was observed by the Vargas group.

THE COURT: Dr. Kinsbourne, I just want to interrupt for a minute.

THE WITNESS: Yes.

THE COURT: When you say microglia, you're referring to the word m-i-c-r-o-g --

THE WITNESS: M-i-c-r-o.

THE COURT: So, okay, we might pronounce it micro, but --

THE WITNESS: Yes, yes.

THE COURT: I'm thinking of the court reporter. I am not quarreling with your accent.

THE WITNESS: That's all right, Special Master.

THE COURT: Okay.

THE WITNESS: I sometimes lapse into the English way of saying things.

THE COURT: Okay.

A While I am on this topic I should make the following distinction. Glial cells are the cells which are not the neurons. They've got multiple other functions. They are supportive to the neurons in many ways, and the, the, there are three main categories. There are the astrocytes star shaped there are the microglia and those are the oligodendrocytes, which are not relevant to my discussion. So coming back then to how those are involved, the microglia then launch an attack on the apparent invader, obviously,

if they were to destroy the invader through the chemicals they release, they would be no further -- disease. That's not the case here.

Sometimes they are able, actually, to

destroy the new, the cells within which the invader is hiding. It's called etolysis, the cell breaks up, we don't have much evidence of that, in what we know about the autistic brain. However, it also happens that the invader harbors safely within cells while the innate immune system keeps battering at it, keeps throwing out what one may call its "firendly fire," which then instead of eliminating the invader, it damages the cells that were lying in the vicinity, such as, for example, the astrocytes and there was also evidence of astrocytic activation and some evidence of the destruction of astrocytes based on the report of admittedly small amounts of what's called gliosis. Gliosis means scarring of -- caused by the deaths of glial cells.

BY MR. POWERS:

Q And excuse me, Dr. Kinsbourne, what evidence would there be of astrocytes having died? Would that be the same evidence you'd see through the death of glial cells?

A Well, it was reported by the Vargas groups, that it was microglia and astrocytic activation. So I'm relying on that report.

THE COURT: By activation, you're not saying dying or are you?

THE WITNESS: No. Activation, well, they begin to do what they are equipped to do but aren't necessarily doing. What happens in practice is that

they produce chemicals which they then release. As I already mentioned that the microglia release proinflammatory cytokines, the astrocytes can actually release glutamate and that's part of the picture that I'm presenting to the Court.

THE COURT: Okay. So these are astrocytes and the astrocytes release the glutamate because of the proinflammatory cytokines.

THE WITNESS: Yes.

THE COURT: -- action against them.

THE WITNESS: Exactly.

THE COURT: So they're attacked in friendly fire.

THE WITNESS: Exactly.

THE COURT: To use military terminology, and then they react by releasing glutamate.

THE WITNESS: They do.

THE COURT: Okay.

A And then at times they actually die. Now I need to explain how the astrocytes relate to the glutamate neurotransmission and glutamate synapses. I'm prefacing that by stating as I did in my report that glutamate is the predominant excitatory neurotransmitter in the cerebrum and brain in general.

Now glutamate is well known for being a

substance that the brain needs to keep under tight

control. So on one end it's very prevalent, and yet it must not exceed in its amount certain limits because it is going to be excitotoxic. In other words, it causes activation to a degree that the activated neuron can no longer sustain metabolically and that neuron dies. This is being investigated in many other contexts in the context of stroke or neonatal brain damage and so on. Now the, there are several ways in which the amount of neurotransmitter released at the synapses is controlled. And one of these ways is that there are enzymes to break it down.

Another way, an important one is that some of it gets reabsorbed back into the neuron. That's done by what is called a transporter. So at glutamate synapses, you have them on other things, glutamate transporters that mop up. The glutamate, which doesn't go straight to the target, so it shouldn't spread outside the synapse and, as it were, it bathes the network -- it turns out that the astrocytes, also have glutamate transporters, they pick up glutamate and then they recycle it back to the neuron that secreted it in the first place.

Now the upshot of the pathology is that if the astrocytes are wrapped around the synapse to do this job, if they die or malfunction or cease to do

their transporting, then the amount of glutamate is out of control and the levels rise and that's the bottom line of what happens when this mechanism goes awry. So assuming that is the case,

you now have a brain with more glutamate than is healthy for it and then it requires to keep it in an appropriate activation-inhibition balance.

So now I need to talk about this balance because the balance that is in the brain, it cannot have absolute -- levels of things, you constantly have opponent processes, you have influences going in opposite ways. They can stabilize each other or change in a graded way. The excitation of glutamate in the brain is counteracted by the inhibition of a neurotransmitter called GABA,
G-a -- capitalize -- G-a-b-a. So the glutamate, GABA ratio is the main determinant of the level of excitation or activation in the brain. I mean, it, it varies within certain permissible parameters in normal brain function.

If the glutamate levels rise out of control, then obviously the ratio is changed in the direction of excess activation and, and a number of consequences occur. The first and, and most obvious consequence is that there is over excitation which leads to a tendency to have seizures. And if not actual seizures, at least to abnormal EEG's and it is interesting and notable that sooner or later 30 percent of people with autism in fact have some --

seizures and that around 70 percent have abnormal EEG's short of having seizures.

So the increase in the activation level of -- due to, excess glutamate is consistent at least with that

fact. Obviously, it isn't the only possible explanation the -- but it is consistent -- now the, the second point that I can bring up now in terms of relating overactivation presenting it as a feasible model of autistic behavior, is to say that a lot of autistic behavior can be described as stimulation avoiding. The people, they like not to be with crowds. They go out of control at birthday parties. You can't take a kid with autism to a birthday party. They will turn away. They will avoid eye contact. The human face is very much of course a source of stimulation.

And unpredictability, they shun anything that's unpredictable. They don't like things to be changed and they behave as if they were trying to hold things constant under control. They do not need stimulation. They react excessively to certain sounds and other, other stimuli. A lot of the behavior seems like a, an attempt to keep stimulation no higher than it already is, given that it's, it's already too high.

And furthermore, that over stimulation is not just a neurological fact. It's also a subjective fact. It's what we experience objectively when we are anxious and particularly when we are in a state of panic, that is what it's like for the brain to be

overstimulated. And I suggest that children with autism very much pull their attention inward. They'll

remarkably ignore most of what's happening outside, except when they absolutely have to pay attention to, because of what's going on inside them subjectively.

And there is a, a phenomenon that has been known in, in cognitive psychology since 1959, actually, when it was first described which is to do with the effect of increasing activation level on the focus of attention. And it was shown then and it's been much confirmed that as a person becomes more overactivated, overaroused and anxious, their focus of attention becomes narrower and narrower and narrower until finally they're just focusing on one thing.

And an extreme example of all this, an example was called weapon focus when the person under such terror not even noticing that he's holding a gun. And it is classical and otherwise perplexing why autistic children will notice not only just one object, but one kind of an object or one little component. They have this, this has been documented for many years, have this tremendously focused on attention and that is consistent with an overactive system.

One more major aspect of autistic behavior, actually there are so many more, but let me make one more point in principle. In the criteria for being

autistic, we have the forming of language, forming of

social perception and behavior and we have still the abnormal movements, the stereotypic mannerisms -- now I have proposed when I first wrote about this in an article in 1980 which was submitted in Cedillo, that the reason that the children go into their stereotypic -- routines is to decrease their arousal level. And I cited quite a bit of animal evidence that analogous behaviors in animals are induced when animals are put into situations of conflict or thwarting, and they seem to be using this, not deliberately, but by some mechanism to lower their arousal levels.

And it is quite consistent with a notion of overactivation in the autistic brain that from time to time they would go into routines that are otherwise inexplicable, but for some reason they do and I believe it's in a sense, to put it simply, to calm themselves down.

BY MR. POWERS:

Q And Dr. Kinsbourne, what you're describing here in general terms, I'm assuming, are things that you would see in the presentation of Colten Snyder's symptoms, is that correct?

A You would, and he is recorded, although he is not an extreme case of this, he is recorded doing what people in the field call it "stimming," which

it's a repetitive behavior of his.

Q And repetitive play behavior, for example --

A Yes.

Q -- did you hear the testimony about repetitive play behavior with toys?

A Yes, which was so vividly described. I see as using predictability to calm yourself down and I could give you more examples, but yes, that's correct.

Q And did you also find it significant in reaching the conclusions that you've reached in this case that from the testimony of his family and his caregivers that his play behavior changed from before and after the MMR? Does that affect your opinion in this?

A Oh, that was dramatic. That indeed is part of his becoming autistic. Yes, why would autistic children line up things all the time or to say that's a feature of autism is not going to explain anything and I'm attempting to, to produce an explanation which fits in with some information we know about the brain of autistic people.

Q And then so to pull some of these ideas together then, it would be your expert opinion to a reasonable degree of scientific probability that the measles virus that we've already described existing in

Colten Snyder's brain, it would be your expert opinion that that persisting virus is the invader that you were describing that triggered the cascade of neurological processes?

A Yes, sir.

Q And the persistent presence of the measles virus in the brain meant that those neurological processes would also be ongoing.

A Yes.

Q And that the inflammation process and the disequilibrium between excitation and the inhibitory process, that is ongoing because of the persistence of the virus.

A Yes.

Q And you see all of this as having not existed before he received his MMR and only existing after he received his MMR.

A I saw nothing in the medical records or in testimony to suggest it existed before.

Q And then these opinions are also supported by your expert opinion to a reasonable degree of scientific probability, that the measles virus is both neurotropic and neurovirulent, correct?

A Correct.

Q And that because of those two

characteristics, when in the brain they would be treated as a foreign body and would trigger the release of proinflammatory cytokines and the sequelae neurologically.

A Correct.

Q And all of that you believe to a reasonable degree of scientific probability.

A Yes.

Q So in this case, given the testimony that you've heard and given in the Cedillo matter and in this matter, and the review of the medical literature and in your experience and in your own research, could you say to a reasonable degree of scientific probability that a persistent measles virus via the MMR was a significant contributing cause of Colten Snyder's autistic symptoms?

A Yes, I can and I do.

MR. POWERS: I believe that's all I have for direct.

THE COURT: I'm assuming you want to recess before we do cross-examination?

MR. MATANOSKI: Yes, ma'am.

THE COURT: All right. How about we reconvene at 3:00.

MR. MATANOSKI: Thank you, ma'am.

(Off the record.)

THE COURT: All right, we're back on the record in the Snyder case. Dr. Kinsbourne is still on the stand, and Mr. Matanoski, feel free to cross-examine.

MR. MATANOSKI: Thank you, ma'am.

CROSS-EXAMINATION

BY MR. MATANOSKI:

Q Good afternoon, Dr. Kinsbourne.

A Mr. Matanoski.

Q Are there any changes to an infant's brain following birth?

A Did I hear correctly? Are there changes to an infant's brain following birth?

Q Yes.

A Do you mean immediately following or for the rest of its life?

Q Actually, for the rest of its life.

A Well, a well-known, major aspect of maturation, there are lots of changes. Perhaps you would --

Q What kind of changes are there?

A Well, let me begin by saying what doesn't change as a basis. A number of neurons don't change or hardly, hardly do. The changes in principle are

the connections between the neurons which become mature and more distant. At the beginning, the connections between the neurons are very local. And the other change of major importance and well known is myelination, is that the long processes or the axons that transmit information from cell to cell become myelinated and therefore transmit much more quickly.

Q Why does the brain change?

A There are, it depends on what one means what I believe you're asking is what, what influences the brain to change. There are several factors known only in a very general sense. First of all, there's genetic programming. Secondly, there are epigenetic factors and just to explain that for a moment.

When genes program say neurons to line up in a certain place, the gene is really like a commanding officer who says to the regiment, go there -- he doesn't tell an individual neuron or individual soldier to go there. The group then makes its way, in a general sense, to where the gene, down some gradient -- the gene establishes in a chemical fashion and the neurons will on the whole arrive at the appropriate station and there may be [unintelligible] in it, some may get held up on the way, there may be factors in the substrate that they cross which pushes some out of

the way and glial cells give them pathways along which to go and that may or may not succeed.

So what I'm saying is - and this may or may not be what is of interest to you - is that the genes give general instructions and the extent to which they are carried out specifically is subject to individual variation.

Q So the brain is not, it's not static from birth. It's changing.

A Oh, it's utterly dynamic, yes.

Q And that's a normal process.

A Correct.

Q As a matter of fact, if it didn't change, then we'd be in trouble, right?

A Well, we wouldn't really be able to take care of ourselves at all.

Q Now turning to your report on page 10, you were talking about regressive autism and in that you said, regressive autism, and I'm going to just paraphrase, is presumably from a triggering event, I guess because the person was normal beforehand. Is that why you're saying it's from a triggering event?

A Yes, but we have to explain why development was normal or near normal and why it took a sudden downward trajectory, which is very, very abnormal. So I think it would be reasonable if not obvious that something must have most likely have happened to

change the trajectory of development in such a radical

way.

Q You also mentioned that since regression doesn't always follow after an infection or vaccination, it has to have other causes.

A Oh, yes --

Q What are those causes?

A Oh, you see, it's not only not known, it's hardly been investigated as I presented to the Court in direct examination. The people haven't focused on what causes regression. They have focused a lot on what causes autism. But if, if you take my point of view as I represented, it isn't just my point of view, that regression may have its own separate set of causations, I still am persuaded there must be more than one but there really is no database to answer your question as to what the nature of possible causes is.

Q So you'd have no database on which to identify whether they're present in Colten Snyder's case or not, correct?

A Oh, that's, that is naturally the case, but I just want, want to be quite clear on that. You say, I'm not saying that every case of regression is caused by the measles virus -- that would be absurd.

Q And if you could and I'm sure that it's hard

to generalize, but could you tell me what you'd

normally expect in a case of regressive autism? What would the child's course be after the regression first manifested itself? Could you take us out for a couple of years after that to start with.

A Okay, with the proviso that obviously autistic children, vary even more than children vary and also second proviso -- that -- I intend to react to what people notice. Some, for example, changed behavior they would be more likely to assume it was their fault as parents, did something wrong, whereas stopping to speak suddenly would be really very alarming I would have thought, at any rate -- the change, the changes are often of the following nature, the child either speaks very little or falls silent or only uses his or her repertoire of words very rarely so whereas communicating in a normal fairly continuous rate with other people the words may just appear sporadically and not even when you would expect it.

Q And that's when it first manifests itself?

A Well, that, that would be one change which is a dropoff in speech use is what I'm, what I'm saying and I'm trying to describe the way it might appear, but ultimately it might happen as Mr. Snyder said, the child falls silent and sometimes there's two words left, sometimes they fall silent completely.

And that actually is what draws the most attention is stopping speaking.

Another thing that happens is that they seem to stop understanding. They, they don't seem to understand what's said to them or at least understand it less and sometimes it's hard to know whether it's because they couldn't or because their attention is elsewhere. The fact is they're not, they're, you know, they're not responding. Is that --

Q Yes, absolutely. About what time course are we talking for these to appear?

A Well, my impression is and again we don't really have decent data on it, my impression is that it's probably several months. And something like that could probably come to some kind of plateau.

Q And then they plateau?

A Yes.

Q And --

A -- totally flat. I mean they, they'll fracture it, but the decline seems to not, not go beyond a certain point.

Q Do they stay at that plateau or do they regain any of the function?

A Any? I've seen all three of these outcomes. In other words, I've seen it, cases where at least for a number of years a child then is oscillating around a certain level. And I'm going to qualify this in a

moment. I've seen children

plateau and then get worse again, often with the epilepsy beginning and I've seen some cases that get better and maybe even be getting well. The question of recovery from autism is now very important topic and one that I'm working on with a colleague. The question is have they really recovered to normality or have they learned how to be normal.

Q I do understand what you're saying. So if we're to say what usually happens, is it usually a downward trend, is it usually staying the same or is it usually improvement?

A It usually, in the majority of cases, they will remain autistic at a certain level.

Q So it's plateaued?

A Yes.

Q They don't get, they don't recover or they don't develop language at all?

A Oh, no, no I'll insert another proviso -- in developmental disorder, being on a plateau. doesn't mean having the same level of skills, because suppose one was at a plateau at a one-year-old level -- well that's pretty bad if you're two years old, but it's real bad if you're 10 years old, you know. In other words, what happens is in developmental disorders that you have your own trajectory of growth but it's

parallel to or lower than then the normal trajectory.

So a child with any kind of autism, whether

it's regressive or not, unless it's of utmost severity, like profoundly retarded it's going to make some, some progress. But it will be, it won't approximate anywhere closer to the norm.

Q If you wouldn't mind, would you put up the chart that I had mentioned. It's a little crooked, Doctor. I'll try to help with that. I'm going to show you a diagram that was prepared by Dr. Bradstreet and I thought this might be the easiest way to figure out where you stand in your opinion versus what he presented yesterday. And the reason why I'm doing that, Doctor, is he was presented as a treating doctor, not as the expert in this case. You're the expert --

A I understand.

Q -- presented. And I wanted to ask you a series of question about it. Thank you. This was a diagram that Dr. Bradstreet prepared in offering his clinical --

THE COURT: Can you identify this, Mr. Matanoski?

MR. MATANOSKI: I'm sorry. I think that was their Trial --

THE COURT: It's Trial Exhibit 2, but what page are we on? Do we have any idea?

MR. MATANOSKI: 23.

THE COURT: Okay, Trial Exhibit 2, 23. Thank you.

MR. MATANOSKI: Thank you.

BY MR. MATANOSKI:

Q Doctor, could you take a look at that and tell me which part of this you're accepting as part of your hypothesis and which part you don't necessarily accept? And I understand that it's not your chart --

A Well, let me start at the top. The measles vaccine I accept, because that's what we're talking about. And then I think can lead to immune dysregulation, we have discussed already and I explained the symptoms which I used that concept. Now for the role of mercury, as Mr. Powers pointed out, I'm relying on another expert's independent opinion on that.

Q I understand that. Let me stop you for a second, sir. You would take the, the part where it says measles vaccine down to immune dysregulation. You would accept that measles vaccine causes immune dysregulation?

A For, temporarily. I don't, I don't know that it's a cause of permanent immune dysregulation, but it's well known that for six or eight weeks or some such time if the case and it may be longer in

individuals. At this point it's immunology which I don't have, you know, total concept of.

Q And independently, or this notion that mercury causes, it looks like it bypasses at one point immune dysregulation and it goes right down and causes oxidative stress and glutathione depletion. Is that any part of your process here?

A That's the second group of three cases in which I'm not involved.

Q Okay, you mean the second theory, in other words.

A Yes, that's the one, the theory of mercury only, it's brain damage is one that I've considered and I have not yet come to a level of adequate conclusion to adopt that theory.

Q Thank you. So then the other part where mercury seems to be playing a role in Dr. Bradstreet's concept, down to immune dysregulation, are you relying on that in this case that mercury is the cause of immune dysregulation?

A I am not only because it's not necessary for, for me to rely on it. Basically my point of departure is that the child is autistic and the measles virus genomic material is found there. Now why is it there and normally it isn't, I think the idea that the immune system wasn't capable in this particular case, getting rid of it is of course very

attractive, and then one can ask why wasn't it capable and mercury is one of the possibilities. But

from my point of view, that's not something by which my opinion stands or falls.

Q Okay. And from immune dysregulation down to oxidative stress, glutathione depletion, does that play any role in your thinking?

A No. The immune dysregulation as such, you see, I go the other route, as you know. The way they're joined up is, I have to reshuffle them a little bit, you know. Once the measles, once simply a measles vaccine --

THE COURT: Dr. Kinsbourne, could you bring the mike over closer to you, just --

THE WITNESS: Yes, I'm sorry.

THE COURT: I understand you need to turn to face the slide.

A Yeah, for my purposes the, a window of time during which there was immune dysregulation, handicapping the immune system from disposing of the virus would be consistent with my views. But the fact the virus is there and even if there is a [unintelligible] makes no difference -- is there.

BY MR. MATANOSKI:

Q All right.

A So --

Q I'm sorry.

A I'm sorry.

Q I just, so I understand that, so immune dysregulation is not in your, from our understanding here, is your, your hypothesis doesn't have immune dysregulation directly causing oxidative stress or glutathione depletion.

A Well, it does once you get the measles virus into the brain, which is --

Q Well, yes, I understand that, sir. It allows the measles virus to go into the brain and persist.

A Correct.

Q In your view, and the measles virus itself, being there is stimulating the immune system.

A Correct.

Q And then causing these other problems that you, these glutamate problems you were telling us about.

A Yes, sir. That's right. So --

Q It's an indirect, indirectly by allowing them, in your hypothesis, indirectly by allowing the measles virus to persist, it plays a role ultimately.

A That is exactly the case.

Q The brain you've got inflammation. I didn't hear you mention that.

A Well, I already talked about brain

inflammation, which could, which ought to, for me to

be after MV persistence there's where the arrow should be like this: measles vaccine, immune dysregulation, MV persistence, brain inflammation. That's the sequence that I was talking about.

Q Okay. That make it, so in other words, we could just go measles vaccine, immune dysregulation, MV persistence and then glutathione, well actually, not glutathione.

A Brain inflammation and --

Q Brain inflammation.

A I really have no opinion on the dysbiosis. It's outside my field. And oxidative stress certainly is one of the effects of the activation I was discussing during direct, but that's as far as that goes. And glutathione, I don't, I don't know enough about that aspect to have an opinion.

Q So yours is a lot simpler than that schematic.

A It is, yes.

Q And you wouldn't adopt those other parts of that schematic for your hypothesis.

A Well, for purposes of my opinion, I, I don't need to, well, I'm not arguing, it's moot as far as I'm concerned.

Q I understand. So just to be clear though,

because this is general causation as well, would you adopt any of those others?

A Well, I, I did say I adopted the mercury effect on the immune system by adopting the testimony of Dr. Byers and Dr. Aposhian in the Cedillo case.

Q And that's not based on any, you're just relying on them.

A I have no --

Q That's not your independent opinion.

A -- adopt is exactly the right point. I am relying upon them.

Q And not independently come to that conclusion.

A Correct. As for glutathione and bacteria, I haven't been in a position where I've been asked about whether I would or I wouldn't, you know. There may be another case in which I would seriously consider it. I don't want to foreclose anything, but right now this would not be part of the sequence of cause and effect that I'm discussing.

Q Well, would you foreclose it if we didn't have a positive, what is purported to be a positive CSF finding with measles genomic material?

A If I didn't, oh, alright let me be very precise about that.

1 Q No.

A If, if there were, if it were in fact the case that the measles vaccine virus material had never been found as respondent is arguing, that these findings are spurious from the start, then I would not be able to give an opinion in this case. However, that doesn't mean that I couldn't see cases in whom personally the material wasn't found, maybe they didn't have a spinal tap and I still refer to the, the science on general causation and then apply that to the individual case. Have I explained that or should I do it again?

Q Well, I'm wondering what the science on general causation would be without that finding. If that finding were spurious, what would the science and general causation --

A Oh, no, if the finding is spurious, you see if the finding can spurious in one of two ways. It can be spurious in Colten Snyder.

Q Right, right.

A Do you see?

Q What if it were spurious overall?

A Then I wouldn't find causation

Q In any case?

A Well, I could be thinking it, think

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of another theory, but what I'm, what I presented you, I would not present to you today if I didn't believe as I do that in fact this is genuine.

Q That measles virus is persisting in some individuals.

A Correct.

Q In their brain.

A Yes, sir.

Q And causing autism.

A Right.

Q Okay. And then if we take that away and we're saying there's no evidence that it's persisting, a -- spurious finding not just in this case, but overall.

A Correct.

Q And just to make sure I understand you, your postulate of measles vaccine, immune dysregulation, brain inflammation, I'm sorry, measles virus persistence, brain inflammation, would you still hold that as being a likely hypothesis if no one had ever reliably recovered measles virus in the brain of autistic individuals?

A What I was responding to was a proposition that, here's what I was responding to, but you will correct me if I sound different, remember last time we

met we almost had a Perry Como moment -- if Dr. O'Leary

were to burst into this courtroom and say, I confess, I made it all up, I never found any of it, okay, then I would abandon this kind of, this direct attack theory, as you might call it.

Q Okay.

A However, if he didn't burst into this room in this manner, but as critical work in the case, one had only, one had found and confirmed the material in the gut and the blood, but, for example, not have access to the CSF, I might still have found causation, although I'm going to say --

Q I understand you, Doctor. In other words, but it's still key to you that they find measles virus persisting in these individuals and afterwards. So even if, not necessarily the CSF, but if they found it in the gut, in the blood, somewhere they're finding it, but if that were, we were to say, you know, we can't trust those findings at all, then it's a problem for you.

A Very much.

Q Thanks. I want to make sure I'm clear on when you think the immune dysregulation began. I just want to make sure I'm clear because I read your report and I seem to take from it that you think it might have begun before he got his MMR.

A Well, I could not myself see in the evidence or

the testimony of others evidence for immune dysregulation before the MMR. The most I can say is that the immune system might be made vulnerable by the, by, say, mercury or some other reason but that, if so, that probability only expresses itself subclinically as it happened after the MMR vaccination.

Q And as far as that may be made vulnerable, that's, again that's just based on Dr. Aposhian and Byers.

A Oh, yes.

THE COURT: Let me ask that question differently. Was there clinical evidence of vulnerability or dysregulation before the MMR?

THE WITNESS: Not that I could see.

THE COURT: Okay.

BY MR. MATANOSKI:

Q And how does the MMR cause immune dysregulation?

A Well, it depresses the various immune responses and that is well known and, and not controversial. I obviously rely on Dr. Kennedy for that expertise but you'll find it in the writings of Dr. Griffin and many other people. That is known and not debatable -- what is debated is to what extent and

in which formulation of, of the virus. But the principle that this happens does seem to be quite established.

Q Are you aware of any writings where immune dysregulation, to use the term that's, we've been using so far, caused by MMR resulted in infection?

A I haven't seen studies like that, but then I must say I haven't imposed on myself the task of looking for that treatment. I didn't see it as my domain.

Q Okay. So you're not aware of any, it's essentially up to others to figure out whether that's the case.

A That's correct.

Q How does the lack of measles virus in the blood in Colten Snyder and the lack of measles in the blood support your contention that there's immune dysregulation? And I'm going through your report because you had both of those in your report.

A There are, I understand that there was a measles antibody response to the MMR.

Q Yes, there was. In your report you said there wasn't.

A In the blood?

Q Yes.

A Then I was wrong

Q Okay.

A I should correct that.

Q Does that change your opinion?

A No.

Q Okay. So you had an antibody response, this is Colten Snyder.

A Correct.

Q And it was evidenced by the antibody in the blood.

A That's what the test showed.

Q But that doesn't affect your --

A No. I'm sorry, no, it doesn't.

Q This is all, I think this is all on page 8 of your report. Measles virus has a transient susceptibility to infection. You mentioned that there's a transient susceptibility. Do you recall whether that was wild or vaccine virus in your article when you mentioned in your report that there was transient susceptibility, do you recall whether that was wild or vaccine virus in that article that you referenced?

A I forgot the article, I bet it was wild, because as we had just discussed, I don't think that the epidemiological studies that show group data of greater susceptibility to infection. I don't believe that there are such studies.

Q You also mentioned that you thought that the immune suppression was particularly profound because the infection that he had at the time got worse and

there were recurrent fevers. Do you recall making that comment?

A Yes, indeed and --

Q So you --

A Yeah, okay, the answer is yes.

Q Okay. And I don't mean to cut you off. It's just so that you understand where my question is going.

A Okay.

Q The recurrent fevers then, in your view, were related to the pharyngitis or the infection that he had and it got worse, the nonmeasles virus if you will.

A Right. I don't know exactly and it was totally clear to me, but he seemed like that he was, he was having pharyngitis and as opposed to it coming and going a few days, it stayed and then it got worse and he had to actually go to the hospital, there was, there was an abrupt change in his condition with respect to infection. I am not saying that this was this was measles infection.

Q Right. I think, yes I understood it from your report. I'm just trying to make sure that I understand it. I understand from your report is there's another infection involved.

A That I thought he had some infection before the --

Q Right, right.

A -- vaccination.

Q And then he got the measles virus --

A And then he got the measles MMR.

Q Right.

A And then he got more infections and he was, he just got to a higher level having infection after infection.

Q Do you think those recurrent fevers that he had were from the measles virus or do you think they were from other infectious agents?

A Given that he was in the midst of having infections, I think it would be a more likely statement to say that due to ongoing infections; of course, the measles vaccine, vaccines is well known to cause fever particularly in the second week after it's given, but here I saw more than that. I think the infections were lasting for a month or more. I don't think that was all measles virus.

Q All right. This is some other, some other agent involved for the fevers in your view.

A Sure.

Q One other thing. I know you were trying to rely on Dr. Byers on the immune suppression, but my

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impression of her testimony in Cedillo is that she was making it very specific to the facts of that case and was unwilling to go beyond that in terms of her opinion --

A I don't, I don't remember to that level of detail, but if you could refresh my memory-

Q Okay. If you don't remember, that's, I was just thinking that in fact it would be difficult to import her general causation if she were just saying, I'm just saying it's immune depression in this case.

A Okay.

Q And obviously, you don't have an opinion, an independent opinion about immune suppression in this case.

A Yeah --

Q That's what you're importing from Dr. Byers --

A I mean, I, I read some of this myself, but the fact is that I defer to her, and also Dr. Kennedy, in this respect.

Q End of last time, you talked a lot about where the virus went in different parts of the body, and I'm not going to go through that again because we are, as you know, we've taken that testimony into this case. I would like to talk a little bit, though,

about when the virus gets into the brain.

A Yes.

Q And I hope not to have you repeat your testimony and I apologize if you do a little bit. I was listening very closely so I'll try not to do that. I just want to make sure that I understand your opinion. Is it your opinion when the virus, it's getting across the blood brain barrier in some way, this is the vaccine measles virus and how is it getting across the blood brain barrier? Because it's normally not going to end up in the brain, correct?

A Right, and macrophages are known to be able to carry virus particles across the blood brain barrier. Honestly, up in there it isn't all that complete in, in certain places, but I can't be more specific than that.

Q What could we look for in an individual to figure out whether they're more likely to have the measles virus cross the blood brain barrier?

A Well, I can only answer it in a more general statement that people who have meningitis or infections, infections and inflammation of blood vessels, have more permeable blood brain barriers such as larger particles can cross through the interstices virus particles as opposed to only electrolytes so that would be one circumstance because they might have an illness which facilitated that but I haven't

systematically listed in my mind what those conditions would be.

Q In this instance, do you think it's more likely the macrophages?

A I suppose. I mean, one can ask the same question, in SSPE. I don't really know,

Q So you don't know for sure how it's coming across?

A No.

Q Do you know to a 50-percent level that you're testifying to?

A I know that, well, first of all, I know viruses do get into the brain. I mean there's virus encephalitis, so-called aseptic encephalitis, and meningitis, so it's not as if it's at issue one would challenge. And quite how they do it, I haven't deeply considered the macrophage mechanism is one I happen to be aware of; there may be others.

Q I ask that because, obviously, a lot of these cases we're not going to have any kind of evidence coming from Unigenetics about whether the measles virus is in the brain or not.

A It will be in a lot of other cases.

Q So any kind of factors we can look at to understand some general causations, what we should be looking for, from a petitioner's standpoint.

A Well --

Q -- from a --

A I find it hard enough to deal with this

case, actually, at the moment. I don't really, you know, I would, I would, you know, I would be happy to be consulted at some point, but right now I couldn't even say.

Q Now when the virus goes into the brain, the measles virus, does it effect some parts of the brain more than others?

A Well, there's some thought, I mean, I've read in readings I've come across that, that there are more, it frequently settles in the medial temporal area -- the limbic system -- cerebellum and other parts, but I don't know what the basis is for that. Certainly in --

Q You've been reading about this?

A Well, I read about everything, yeah.

Q Is this from Dr. Griffin or who are you reading?

A No, I, actually I read that recently and I don't remember which article it was. But I did want to add that SSPE is very pervasive in the cortex, and especially the cerebral cortex. So it isn't that it's one particular area that is pinpointed.

Now if I may add something it is not an unreasonable question, because the herpes virus which is different, of course but not totally, is known to

affect the medial temporal area with predilection. So some viruses do do that. But I

don't know of comparable information in terms of localization of the measles virus.

Q In your talk about SSPE, when that gets in the brain, you said it's more widespread.

A Well, when it gets into the brain, it remarkably, it sits in neurons for years and then it spreads contiguously from neuron to neuron basically infesting in the whole network, the whole cerebral network.

Q And then the immune system does what in SSPE?

A The, the immune system reacts against it, but it can't do anything.

Q It's not effective in clearing it?

A No.

Q -- like what's postulated here?

A Well, I, I believe that the, the measles virus is sheltering inside the cells, the neurons, is able to keep the immune attack off it. To some extent, I know an analogy being to HIV, it can also do that. It can in a sense disable the attack on the cell on, within which it harbors, it is harbored.

Q Okay. So in SSPE, it harbors in the neurons.

A Right.

Q And then we're getting a different result

from what you're postulating here in terms of the microglia?

A Oh, it's a different matter it's a horrifyingly different matter, this is an inexorably deadly spreading disease. It's not really what I'm talking about here obviously.

Q Okay. So the virus acts differently in SSPE.

A Oh, yes.

Q And it actually does something different from what you've hypothesized.

A My understanding, -- and again, I just got this from reading, for example Dr. Paul Dykken has written about it, he's very expert-

Q I'm sorry?

A Dr. Paula Dykken, D-Y-K-K-E-N. It was his opinion that you get SSPE when the measles virus, which is usually wild measles virus, has undergone certain mutations. So it simply has some properties which the measles virus normally does not have. So the analogy sort of stops short at that point.

Q Okay. So in this instance, in SSPE, the virus is now going into the neurons, but you say the virus may look differently than it --

A Well, it's not that it looks differently,

it, first of all, the virus coexists with the neurons, while apparently they continue functioning, for, for years. And I've seen a report that after 30 years I mean, it's really remarkable, and then for reasons unknown, it breaks out "with authority" and then it attacks indiscriminately all

the cells, the neurons and the glial cells. But its spread is said to be in a neuron to neuron manner, not going outside to be, to mess with the immune system.

Q I understand. So --

A It remains in the cell.

Q So it's operating in SSPE different than how you've hypothesized it operates in autism cases.

A Very differently.

Q And in SSPE, we know that, how it operates because we have some data on that.

A Well, the people die so you have all sorts of --

Q Right.

A -- on autopsy information.

Q And in this case, your data is based on, for your hypothesis, is based on Vargas and the autopsies there.

A On Vargas --

Q And --

A Well, yes, -- it's based on a number of articles, of which Vargas is an important one. What Vargas reports are changes not in the least comparable to SSPE changes. I mean, they're, they are just, they're microscopic and as far as I can tell in the Vargas cases, the, the people didn't show signs of

encephalitis while they were alive, you know, and they were autistic but they didn't show -- I don't know if there were inflammatory markers, or if they were tested for them. But they didn't show gross signs -- of brain inflammation. Now in SSPE, you're getting a person who's in a wretched state of bizarre seizures and nausea and loss of consciousness and all sorts of neurological signs.

Q Right.

A It's a different thing.

Q How about a MIBE, Measles Inclusion by Encephalitis?

A I don't know as much, much about that.

Q So you don't know how the virus operates -- in that instance?

A Well, I mean, there are inclusion bodies, so the virus is, is in the cells. I mean, it's named as an inclusion body encephalitis. But I don't know about its spread.

(Electronic interference.)

Q So in MIBE what we're seeing when the virus gets into the brain, it creates giant cells, right?

A Yeah. It --

Q We see giant cells.

A You, you clearly have aggregations of the

virus enough for there to be inclusion bodies which you can see under the microscope.

Q So there is an instance of wild measles virus and SSPE is wild measles virus.

A If --

Q You thought there was a case where there was, an MIBE case --

A Well, I did submit this article by Bitnun. I haven't read it for a while, but as I recall it did present a verified case of the vaccine virus.

Q Okay. And in each of those instances the virus persisted, entered the brain, persisted and acted differently than the way you postulate the vaccine, the virus operates -- here.

A Correct.

Q And your evidence that you're relying on for your postulate is Vargas and anything else beyond Vargas?

A Well --

Q Just to make it clear, from the cellular level, of what's going on?

A Well, I mentioned Jyonouchi -- see there are numerous articles and literature, you're probably aware of them -- that find various inflammatory markers in autistic children as opposed to controls and most of this work is blood work for obvious reasons. And a picture built up of, of inflammation because finding inflammatory markers in the blood doesn't tell you where the inflammation is and might

indeed have to do with gut inflammation as has been discussed. Of

course, in little children we have inflammatory diseases associated with the inflammation in the brain.

Now the importance of the Vargas findings, where they found it in the CSF because they had access to that which the other people didn't, and what they found in CSF, It was chemically similar to what they found in the brain of the people at autopsy. So the connection there seemed very tight.

In fact, I think I mentioned this in my report, the Vargas -- the, the book, the Hopkins group got NIH funding to try the efficacy of an anti inflammatory drug. In other words, the NIH panel which is pretty stringent in its review, thought it was a good enough investment of public funds to permit this group to test the view that antiinflammatories would relieve autistic symptoms, which is indeed something in my view, which in part relies on Vargas, would also predict.

Q So in the instance of SSPE, the virus acts in the neurons a different way than what you have postulate. And in the instance of MIBE, the virus persists and acts in a different way than you have -- and we have evidence that that's how the virus acts.

A Right, -- they're different conditions.

Q And in your hypothesis, you're relying on evidence of inflammation in autistic individuals to

work back to a hypothesis that the virus must act this way. It acts differently than in any other case of SSP or MIBE.

A Well, the sequence, the logical sequence that I use goes at it the other direction. Although it's not different ultimately, I note that the there's evidence of measles vaccine virus in the CSF and in the brain. Now once I take the view that there's measles vaccine virus in the brain, I note inflammation has been reported in the brains of autistic individuals. And clearly, the measles virus could indeed provoke and would if present provoke inflammation as a response of the immune system against it.

So I'm not for a moment saying that the only possible cause of inflammation is the measles virus. It's just that in Colten Snyder that's what we, what we found in his CSF but for all I know, I'm not saying that every case that Vargas found and autopsied inflammation, had it because of the measles virus. I wouldn't know that. Nor am I even saying that the only way that the inflammation could have arisen is through a virus. Okay, but I don't have evidence of the other possible factors involved in Colten Snyder and I do have evidence of the measles vaccine virus.

Q Well, you have evidence of measles genomic

material, correct?

A Correct, and again --

Q And that's in dispute

A Relying on Dr. Kennedy, that's tantamount to replicating virus and I relied on that testimony.

Q Now, again if we were to discard that evidence then, there's no reason to even look at these other, if you're going to work from the presence of the virus to theory, then obviously if the virus is not present then you have no theory, correct?

A I've agreed with you on that point already. Now that doesn't mean that I would lose interest in the Vargas finding of inflammation. Then we wonder about all sorts of things, but I wouldn't have this theory which I present to the Court today.

Q Then the Vargas findings could indicate that, if they're accurate, that inflammation occurs in the absence of measles virus, correct?

A Yes.

Q Now in Vargas did they find any measles virus?

A They didn't look for it. You see, they didn't look for viruses nor did they look incidentally for heavy metals which could also do this. And, you know, people can't do everything at once. The fact is

that they

look for cytokines and -they reported what they found.

Q And let's see, they had six CSF samples they were going off of --

A They had about 15 autopsies --

Q 15 autopsies?

A Yeah, yeah.

Q Now you've postulated there's a regressive subtype that we're dealing with here.

A I'm sorry, what --

Q With this notion that MMR is causing autism, you've been very careful to say it's a regressive subtype of autism, correct?

A That's, well, that's my opinion, yes. But as I say, I'm not, I don't know which of the Vargas cases were regressive, they don't report that.

Q They do.

A Do they really? Then I've forgotten.

Q Yes. The CSF was from regressive cases.

A Oh, okay.

Q That's all they had. They didn't compare it with nonregressive cases.

A I'd forgotten that point.

Q And in autopsy cases, there were 15. Three were regressive. Several were unidentified and the rest were nonregressive and they had the same findings

1 across them, Doctor.

A Okay.

Q Whether regressive or not. That kind of indicates that inflammation, if Vargas' findings were accurate, particularly the ones on -- autopsy occurs in the absence of regression.

A As I said, I, I'm not arguing that all inflammation in the brain or regression is caused by the measles virus.

Q And we have to assume that the ones that did not have regressive cases, we don't even know whether they ever got vaccinations, but certainly that's not the clinical picture that you're talking about here.

A I'm very open to that assumption. As I say, the, I doubt that there's a single cause of inflammation and I'm pretty much persuaded there's not a single cause of regression.

Q So these findings from Vargas are going to be, if we accept these inflammation findings, they occur whether or not there's a finding of regressive autism, whether or not there's -- they didn't find any measles --

A I sort of lost track --

Q That's fine. When this virus, it gets to the brain in your hypothesis and it's acting differently than we see in SSP and MIBE, what we would

clinically see once it enters the brain? What should

we expect to see?

(Electronic interference.)

A I'm, I'm tuning out, I believe. Could, could you repeat this?

Q Sure. When the virus enters the brain and as I understand it, it attacks the microglia

A Yes.

Q Or actually, I'm sorry. The microglia -- get activated.

A Attack it, attack it.

Q -- attack it.

A Yeah.

Q What should we expect to see clinically? Fever, lethargy?

A Well, these act, what, what is happening is happening in the brain. I don't necessarily expect any systemic changes at all, and it's a matter of the scale of inflammation. It wasn't presented, you see it's not like a brain abscess you know, it was presented by the Vargas group as being like a prairie fire it now, it was local, it was inflammation which seemed like it could be smoldering on for a long, long time. But I wouldn't expect constitutional symptoms. I would expect the symptoms to be neurological.

Q If we were to do an MRI, what would we see?

A I think if you were to do a structured MRI, I suppose, considered it. You wouldn't see anything. If you did a spect scan, you know, functional testing -- there are some sophisticated methods for looking at energy metabolism, that you might find something. But --

THE COURT: Did you say spect scan, Doctor?

THE WITNESS: A spect --

THE COURT: S-p-e-c-t?

THE WITNESS: Correct, yes.

THE COURT: Okay.

A You might find changes, metabolic changes -- there might be some excessive use of energy because of the inflammation, which might affect itself. But I'm not an expert in imaging to tell you exactly.

BY MR. MATANOSKI:

Q When we have inflammation in the brain, and obviously that -- we have other examples than the one you're discussing, MRIs are, they don't show anything up?

A Yes, but there are other examples. Parkinson's, Parkinsonians have inflammation in their brain and then there are, there's this remarkable symptom after streptococcal infection, talking about behavioral disorders of the brain. Some, some

children have strep throat, it seems like any other

strep throat perhaps. And then they develop abnormal movements, chorea, and interestingly enough, they, they, they show signs of obsessive compulsive disorder.

So there are, there's brain involvement and I know there's some evidence, I won't go into it deeply, of brain inflammation occurring in these cases. This is, this is, I'm not saying that streptococcus is sitting there -- I mean, there might, there may be some reaction to that and it's not elucidated in Parkinson's, and possibly in Alzheimer's disease, the inflammation is thought to be a reaction to another agent which killed neurons releasing materials from inside the cell to which the innate immune system reacts with inflammation. And this is a current area of interest in the study of Parkinson's disease particularly.

Q And does the MRI show anything?

A I don't know, but I certainly don't know that it does. I doubt it, but I don't know for sure.

Q And let's say in the case of multiple sclerosis, do you see something on an MRI?

A Well, in multiple sclerosis, you, you certainly -- it's famous how much you see in these white, these patches corresponding to plaques in

multiple sclerosis. And in fact it is thought that where multiple sclerosis begins, it

actually begins with inflammation and plaques only form later as destruction.

And after, to add something of possible interest to the Court, it's not certain, one of the findings in autism recently uncovered by several groups, including Dr. Merbert (phonetic) at Mass. General, is a thickening of the white matter in the cortex, particularly subcortially, just below where the gray matter meets the white matter. And it's been of great interest to what is that thickened white matter. Is it the myelinated fibers, is there more myelin, and it looks, though I'm not, I don't believe it's been conclusively shown, that what you have there is more water giving the appearance, it's like hydrated, which is consistent with but does not prove inflammation.

So I am just trying to think of the kinds of markers one might be looking for, although what I say goes beyond, I'm not saying that you could go and do that right now, but that's an interesting direction.

Q And do they show up on an MRI?

A Yes.

(Away from microphone.)

Q So it's an instance where the inflammation has had an effect that's shown up on MRI.

A Well, there is something shows up on an MRI.

My interpretation of it is that it's caused by inflammation.

Q If we took a CSF sample at the time that the inflammation is occurring, in your postulate, what should we see? What kind of value should we get out of that?

A Well, you should be able to find the virus material.

Q What else do you normally look for in a CSF sample if you think there's an ongoing infectious process?

A Well, you would, with any infectious process, you would also look for, for the infectious agent, which could be bacteria or virus, I mean, that's standard. And beyond that, what we might find, the inflammatory markers, cytokines, and you might find breakdown of neurons. I think neopterin is one of the agents that one would look for, but --

Q Would you look for neutrophils, monocytes, lymphocytes -- isn't that one of the standards -- practices?

A You would, in the, in the, if you're talking about looking for the CSF in brain infection, of course you would look, you would find either leuhocytes if it's -- or lymphocytes if it's viral, to

simplify somewhat.

Q And if we would looking, in your postulate -- we were looking at the CSF, what should we expect to see apart

from, I understand you say we should expect to see the virus itself.

A Right. I usually expect to see cytokines, proinflammatory cytokines -- I don't know whether you would see cells at all. In fact, it's tantalizing that with all the instances autistic regression -- Colten Snyder gives another example. Nobody has gotten around to do a systematic investigation while the regression is going on. That's, that's a --

Q Right, during the acute process --

A Right.

Q How about --

A What ought to be most informative.

Q Right. But I understand your theory to be that it's a continuing process.

A Yes, but I believe it continues at a smoldering, it clearly continues at a low-grade level, because as has been pointed out, you don't have relentless decline to death (phonetic), you have some kind of plateau, but the inflammation goes on apparently for many years.

Q Well, under your postulate, though, why would there be a relentless decline to death, because you were saying the neurons, for some reason, are not, they're not attacked. They're not casualties.

They're not subject to the friendly fire. They're spared.

A Quite so. What I was saying is that the inflammation doesn't seem to get worse and worse and worse, because obviously if it got worse and worse and worse, it would be destroying cells. And if the glutamate levels got higher and higher and higher there would be excitotoxic destruction of neurons, a whole different picture than what we get.

So my conclusion would be that it's a smoldering, ongoing subacute process, which apparently can go on for many years particularly given, you know, what the, some of the Vargas people were -- I forget how old they were, but they were not even children.

Q So in this instance, and obviously the folks in the Vargas they're not talking about measles virus.

A Not talking about?

Q They're not talking about measles virus in the --

A No, they're not talking about, they're really not talking about any causative agent in --

Q That's right. They're just talking about an observation and --

A Correct.

Q So in your postulate, the measles virus is persisting. It's not causing cell, it's not causing neuronal destruction, staying the same, low level,

continues on through life, with low-level inflammation.

A You make it sound very peaceful. It isn't really.

Q I'm just trying to get it clear.

A Oh, yes --

Q Without neuronal destruction and if we were to test, if we were to look at an MRI, there would be no, nothing we'd see. And if we were to examine the CSF, or are there any markers there that we could look for?

A I'd think you would look for the same markers, perhaps, that Vargas found.

Q And not cells or anything else, even though there's a virus now present.

A Well, you might find a few cells, but it's not like an acute infection with a virus.

Q On pathology, what should we see in your postulate? What should the brain look like?

A I don't, -- again, going to the Vargas article. If we looked at the brain in the standard fashion we don't really find anything, after all, brains of autistic people have been looked at before. There are, the kind of findings you do get with the brains of autistic people, which are the neurons,

network is not working quite right, connected up in the right way in, loss of pyramidal cells -- there is some loss of synapses and dendrites.

-- in the hippocampus. There are these findings which have been confirmed on autopsy. And the Vargas people didn't really claim that the brain they looked at were any different at that level of microscopy -- they were, what they found, they found because they looked at what hadn't been looked at before.

Q If we were to look at, under your postulate, if we were to look at it acute, the brain acutely, what would you expect to see on pathology in the acute process?

A I don't know.

Q And chronically do you have any idea what we should expect to see?

A I would imagine that, well, all we know about is chronic because --

Q From the Vargas paper

A Right.

Q And that's not measles virus, per se. We don't know there. It's just an observational study.

A It could be or -- it could be in some cases, and in others; it could be another virus. I don't know. And I, I really would be guessing to the point that I'm slightly embarrased to do it in, in this setting. I, I imagine one would see something qualitatively -- like -- what Vargas saw. Whether

qualitatively, I don't know.

Q So you don't know what to expect?

A -- I can't, can't add to that.

Q Well, when you said that the astrocytes -- are the

casualties here.

A Yes.

Q What should we see if there's chronic destruction of astrocytes on pathology?

A Well, the, again Vargas they didn't find a lot of dead astrocytes they found some. They found activated astrocytes --

Q I'm sorry, they found?

A Activated astrocytes, astrocytes producing chemicals and perhaps, perhaps doing harm. They, this, this wasn't really a structural type of presentation by Vargas, except in minor repects -- it was really ongoing, abnormal chemistry so in terms of seeing, I'm not sure how to answer that.

Q So they didn't see evidence of chronic destruction of astrocytes.

A I cited, I forget whether they saw little or none. It's not a, it wasn't a major finding, an article that barely mentioned gliosis -- I can't say whether it was extensive or just a little bit. It's about as much as, as I know, and maybe as we know.

Q Just a final point on, I hope that it's a final point on Vargas, you rule out on page 8 or so of your report, all the epidemiology because you said they didn't, it's not differentiated between

regressive, they didn't differentiate regressive from all other types of autism, is that right?

A Well, I --

Q That's your criticism of the epidemiological evidence that's out there.

A -- I would say what I, what I found I was unable to rely upon and the problem with the epidemiology was in terms of relying on it -- for this purpose is that most of it wasn't really designed for this purpose, but you know, people looked at retrospective data collected by agencies and tried to mine it for relevant material, which is a good start but one needs to do a specific study addressing this problem. And I, maybe it's being done now -- and I suggested that the case control would be a more direct way of attacking it.

Even so, as you know, epidemiology doesn't -- it does not tell you causation -- if you find a positive epidemiology, that, that could support causation, you couldn't conclude it from just that. If you find, if you don't find it, you don't quite know why you didn't find it. One reason is because it wasn't there. Another reason is because the study lacks statistical power. It's very hard to draw firm conclusions from a negative but the fact is, I didn't find a study that I could really benefit from in this way.

Q And is your criticism of that, though, was primarily, as you said because they're undifferentiated -- they don't differentiate between regressive and other types of autism.

A Yeah, that's right. Even regressive cohort might have more than one etiology and to then have a majority of unrelated cases from that point of view fails as a null hypothesis, it's not a powerful way of asking the question.

Q On your neuroinflammation part of your hypothesis, we talked a little bit about Vargas and I gave you the numbers of cases that were regressive versus nonregressive that they were looking at, the raw numbers and the proportion, if you will. Do you know any other, the other materials that you've been relying on for really any part of your hypothesis, how many of those cases did talk about are regressive autism cases and how many are not?

A You mean regressive in -- I'm not totally clear of what you're asking.

Q You made the point that we need to differentiate between regressive and nonregressive. In your report, you mention a broad selection of literature. Do you know what amongst the literature that you've cited to, where it's specifically differentiating between regressive and nonregressive?

A There have been very few of the studies that have even mentioned that distinction. I think there was one recently and I forget the name of the author,

where they did look separately at regressive and

nonregressive, but not in, I couldn't draw conclusions from that study. But I would have to remind myself to tell you more about it, but there was one study recently that came out and all I remember is the first author is female -- which is a bit pathetic, but where at least regressives were given the courtesy of some separate treatment. But I, I'm waiting for a proper study with a proper control design and the problem is worth it.

Q So the evidence that you rely on doesn't necessarily differentiate between autistic and regressive, nonregressive and regressive autism.

A Right. You're talking about Jyonouchi for example with the cytokines in the blood, she studied regressive -- it's stated -- you've told me about the situation in the Vargas case. You're certainly right that in most of the studies, for example, in many of the studies that showed immune dysfunctions of various kinds -- in autistic children, most of them do not make that distinction at all.

So for instance, I couldn't, I don't know whether on one hand whatever immune problem was described was averaged out of the whole population or maybe even possibly there was a subset that contributed that mean figure over the population, it's

simply not clear.

Q In your postulate, what relation does the

number, copy number of RNA that was recovered play? What relationship does that have to play with the symptoms that you see?

A You mean to the severity of the autism?

Q Yes.

A Oh, I'm, I have no, I have no basis to answer that at all, there's enough bloodshed about the copy numbers in the first place. I mean, it's an interesting question and I certainly agree as well as rely on Dr. Kennedy in terms of emphasizing large copy numbers as being the reliable indicators. But whether large copy numbers sampled at one point in the child's life are valid index of the severity of the symptoms, I don't know that.

Q Would the inflammation in your postulate be tied in anyway to the amount of the measles virus in the brain?

A You would suppose so, but neurology is too tricky to really make those assumptions. I mean, this is the kind of thing that you might be able to study if you had a sample size of 50.

Q So you don't know --

A It would be statistical. It seems reasonable to suppose that, but I don't know it.

Q So more virus, more inflammation is a

reasonable --

A Well, I mean, in the limit. Enough virus, you're dead, you know, I mean, this is not rocket science in that sense, but whether copy numbers in the -- in the PCR -- you know going through the cycles and amplifications, how they map on the severity of the disease, I think, is way beyond obviously what I know about, but even beyond what anybody who specializes in this knows about.

Q So, just so I understand, if we, in your postulate, if we saw less severe symptoms, would you think that there was less virus?

A I hadn't thought about it really. All I can say is that that sounds reasonable, but I don't know it.

Q And in your postulate, if the, I guess the converse, if there is more then they'd be worse, right?

A Yeah, but I, I think this is really pushing at least my knowledge and opinion too far. I, I would just say I do not know the relationship between -- copy number --

Q I'm just talking, I'm sorry. I understand copy number, but just in terms of virus itself, if we're postulating the virus is of varying levels, would that affect, in your view, the amount of

inflammation and therefore, the amount, or the quality of the symptoms you would see?

A It would seem a logical conclusion, but I

have to caution there may be other factors at work as well. I doubt it's a one to one relationship -- the reaction, the inflammation is, is not what the virus does, it's what the brain does in reaction to the virus. And different brains may react differently to the same amount of virus to different degrees. So I can't push it too far.

Q So you don't know what to expect.

A Probably true.

Q Can you tell me when Colten's first symptom of autism occurred?

A In Colten's case?

Q Yes.

A Well, it's actually hard to say. There was lethargy, was actually the first description. There was the description of the child's not being the usual Colten.

Q And when did that occur?

A Oh, it was a few weeks, I can't remember exactly, a few weeks after the vaccination.

Q So that was the first sign?

A Huh?

Q That was the first sign?

A First?

Q Sign of autism.

A Well, you see, I don't, the problem was -- as you well know, it was, it was confirmed that, the fact the kid was sick. So your question is did his attitude change, did his mentality change, did his level of consciousness change in relation to an incipient decline, regression. Did he become passive and unreactive to the outside world, which is one way of interpreting the lethargy in this case, or was it because he was feeling ill -- now there was a statement that even when the kid had a high fever, he was active and alert and playful, which is such an intrigue.

And so one might argue that perhaps that what was seen as lethargy was a turning away from the world into himself, which would be a way for autism to begin to reflect itself in a child's behavior. But it's putting a lot on just one or two observations.

Q So you're not sure when it began?

A No, I am not sure -- with regression it's hard to be sure because it's so, so gradual -- when he was, he was playing in a deviant fashion and so on when it was very obvious, but that was a month or two later, I think.

Q So when do you think it began then; the best that you can do here?

A I would say between six and eight weeks after

the -- MMR.

Q And the symptoms were?

A Not speaking or two words -- a turning away from, from other people, particularly parents, a different play interest, different play styles. I think this is the way that regressions usually do come upon -- they don't, they're not totally abrupt; they creep -- on the child but end up quite severe. And the flagrant behaviors like echolalic and spinnings and all that, tend to come a bit later anyway. In typical, typical autistic children -- as well as regressives.

Q And in that six to eight weeks, what was the measles virus doing?

A -- in my postulate, it was in the brain. It was, it's not doing anything because viruses don't do things, but the brain was reacting to it -- in some cumulative way impairing function, perhaps in the way I described.

Q -- Perhaps in the way you described over a course of six to eight weeks, it manifested itself.

A Since I'm accounting for in my particular model for autistic systems by overactivation of glutamate, then it's logical to suppose that as the symptoms appear I'm assuming an underlying excitation-

inhibition balance change.

Q How long does that process take? Should it

take six to eight weeks?

A There's no way of knowing. We don't know enough about this to be able to make that kind of time prediction.

Q Is it because no one has studied this?

A No, no, no one has studied it to my knowledge.

Q So in Michelle Cedillo's case it was what, three days?

A In her case she had these fevers. She had a different onset within a week and that was dramatic. Most of the children I'm aware of take longer than that some -- a good bit longer.

Q So for the autism to show up after MMR?

A I'm sorry.

Q For the autism to show up after MMR?

A Yes.

Q Do you have an outer limit?

A I don't have a limit. I'm just aware of a number of such children and, and you typically find it presenting after two or three months. You see, it's also a function of when people find it and when it's taken seriously because you're aware of how hard it is at the time for people to figure out what's going on, but my impression is that it would typically be about

two to three months.

Q And this typically, why do you say that?

What's it based on?

A The basis is, it's not based on, the basis is -- cases of which I've been aware.

Q Okay. So it's based on cases that you've seen that you've developed an idea of what you would expect.

A Right.

Q It's not based on your postulate itself?

A No. My postulate isn't sufficiently detailed and documented to be able to give that kind of timeline.

Q Should, under your postulate, the symptoms first appear as soon as the virus is in the brain?

A I couldn't say that. I don't know -- that. We don't know enough about that.

Q Because it's a postulate.

A See, it's even, between the MMR and the first symptom, what's the virus doing? Either it's, it may not even be in the brain maybe harbored elsewhere, and it reaches the brain at that point, or it may be in the way and sit there quietly as happens antecedent to MIBE and SSPE. And elicit a reaction. These are variables beyond certainly my understanding and maybe beyond other people's, too, at this time.

Q So your expectation is not based on biology,

it's not based on neurology, it's based on seeing these cases that you've reviewed, your expectation of

the timeline?

A Yes. My expectation of when autistic regression occurs relative to vaccination is based on clinical experience -- absolutely.

Q The clinical experience and we discussed this last time, that was your review of the cases for litigation.

A My review of cases, in the British case, a lot of cases, and seeing some of them and being in charge of others. And actually, I'm trying to remember a very senior epidemiologist who is a member of the group put together, an article on the onset, on, on these timelines. And I'm sure I'm influenced what I'm telling you by what he found.

Q An article?

A Yeah.

Q You don't mean something that's published?

A Well, I don't know, I think it may have been published. And I'm about to say his name began with "W" and he's died since then. He was Canadian. I feel foolish, but I could make a search of it for this, for you if the Court would like me to.

Q And his epidemiology would have been based on the cases that you were reviewing for litigation.

A I'm not, yeah, I think he was basing himself

on -- over 1,000 cases in British litigation -- and he may have put it together from that or from other sources as well -- it's been years since I've looked at it but I may have it in my files, and I will be glad to look for it.

Q But from a biological, microbiological or

neurological standpoint, you don't have any expectation? You can't, you can't --

A I don't have any a priori expectation based on, based on my ideas of pathogenesis.

Q Can you tell me all the factors that lead to your opinion here that, all the factors in this case that led to your opinion that MMR causes autism?

A Okay. We have the child who was healthy and developing normally -- normally until the MMR was given, who began to show signs of, of regression into autism within what I take to be the approximate interval we just discussed.

Q The six to eight weeks.

A No -- two to three months.

Q Okay two to three months. Okay, so you're expanding it beyond this case. It would be two to three months.

A Right. And who had at the same time or close to then, also gastrointestinal disturbances he didn't have; he had diarrhea, which was described as quite striking -- before -- he had, what was taken as evidence of, clinical evidence of inflammation of the gut by a gastroenterologist and a biopsy which it was consistent with but ultimately inconclusive with respect to the presence of vaccine virus material we

had the finding of the genomic material in the cerebral spinal fluid. And I think there was some inflammatory markers too, but I think, basically, I told you the, the main,

the main supports for, for my opinion.

Q And you already discussed the genomic material and the CSF and what would happen if we removed that.

A If we removed what?

Q If we removed the genomic material in the CSF, you'd have a problem?

A Oh, if you removed it, then I would not, I would like to at least know that was this gene material in the gut, or the blood, or, ideally in the CSF. It doesn't have to be in the CSF. In fact , in Cedillo she didn't have a spinal tap so we don't know if was in CSF, but I would need this neurovirulent virus to be present in a child who manifested a condition which is it can't be explained, unexplained encephalopathy potentially caused by a virus and guess what, the virus is present in the body.

Now if there's no finding of any virus, then the only way I could arrive, because that's it, there are two ways of not finding virus. One is it's not there and one is you didn't test for it. And so, if it wasn't found at all, that would weaken my opinion certainly. If it wasn't tested for, then I would look at other cases which were more comprehensively investigated and determine whether the case I was

reviewing was sufficiently like them on other grounds for me to arrive at the same opinion without that evidence. But that's hypothetical at this time because I, that's not the exercise I've attempted at this point.

Q I'm sorry, I'm going to need to get a drink of water and I'd suggest you get the same. We've been talking for a while.

A Yes, yes. Sorry, I'm tempted to say cheers, but it may be out of place. Yes, sir.

(Laughter.)

Q I hope you're not going to be going too much longer, but I know that I was losing my voice and I'm sure that you're having the same problem. If the person wasn't normal, you said normally developing beforehand, if there was evidence that they were not normally developing beforehand, would that change your opinion?

A All right, let me be very clear about that. There's two ways of not normally developing. One way is showing suspicious signs of an incipient ASD, and another one is having trouble with milestones. These are the two and they're different.

If the child were showing evidence of an emerging autistic disorder beforehand, then I would

not attribute the causation to a vaccination. If a

child happened to be slow at sitting up or crawling or turning over or something, that would influence me less if at all because children who develop slowly are, I'm presuming, not immune to having the same kind of catastrophe.

In the case of Colten, his milestones at age one year were normal, therefore, he's always been normal up to that point. In other words, you can't be abnormal at four months and normal at six months and abnormal at eight and normal at a year. If you got there at, you know, if you got there at a year, you got there.

Q No, I understand. What you're saying is if there's evidence that looked like the development of an ASD prior, then --

A That would give me pause, absolutely.

Q You mentioned gastrointestinal inflammation.

A Yes.

Q In this case it was possible ileitis, ILNM. Would you want to see that?

A This, this was, you know, discussed in detail with Dr. Bradstreet. I am not actually basing myself, my opinion on that. I mentioned it to answer your questions, but that's not a --

Q So -- whether or not that was there, that's

not --

A I think if it, it if was truly

self- consistent, but you know, it's not particularly -- in other words, I don't believe that every case of, of autism where the measles vaccine virus is a substantial factor necessarily shows a clear enterocolitis.

Q If we were to have a case where you have a normal development beforehand, regression within two to three months of the MMR, gastrointestinal symptoms, but no genomic material recovered out of the gastrointestinal, I should say to be clear of gastrointestinal inflammation, but no recovery of genomic material from the CSF, or, from the gut --

A So from the CSF or the gut.

Q Yes, no genomic material.

A From the gut.

Q Or the CSF.

A Oh, or.

Q Would your opinion change? Would you in that case and that sort of case would you offer opinion --

A In, in that case, at this stage I would not offer an opinion. Now I'm offering an opinion in a proceedings at a certain stage which I think has something to do with setting up some parameters or I don't want to preclude later on offering such an

opinion given on intervening events.

Q Right, in case something else develops in the science or something like that.

A Correct, correct.

Q Okay, I understand. But at this point --

A I would normally --

Q -- normally developing regression within two or three months, these are some of the key factors for you normally, but we don't have genomic material from the gut or the CSF, you're not concluding that in that instance the MMR caused --

A I personally would not, evidence of that kind would not have risen to any level that I require, which is different from there being no evidence. I regard that as evidence, but not up to the criteria that I'm, I am set by the Court.

Q I really am almost done, Doctor. You had mentioned that you serve on editorial boards. Which editorial boards do you currently serve on? Which publications?

A I think the ones, do you have my list with you?

Q No. Is it in your CV which ones you're currently on?

A Yes. In my CV I distinguish between current boards and previous ones.

Q Thank you. I'm sorry. I didn't have it in

front of me. Have you ever served on an IRB before?

A On an IRB?

Q Yes.

A Before what?

Q Well, at any point.

A I am the chair of our University IRB.

Q Okay.

A Yeah. The answer is yes, before and now --

Q What would you require before you would approve a study that called for a spinal tap in an infant.

A I'm thinking. I understand the question. There are several components to that. The first component would be that it asks a scientifically legitimate question. And the second component would have a, a lot of attention goes to informed consent. I would regard it as coming under the category that's defined by the, by the law as a minimal, minimal risk. We tend to not to like to say that something is no risk because life isn't like that. But there is a minimal risk category and spinal tap generally, unless there's special circumstances, comes under that, under that heading.

Unless there were contraindications, for example, that the child was uncontrollable, would have

to have, you know deep anesthetic there are circumstances under

which one would question safety, but by and large I regard spinal tap as a, as an innocuous procedure which residents and medical students do and it's done all the time.

So I would find a legitimate scientific purpose plus appropriate arrangements for confidentiality and informed consent to be sufficient. And I expect that the Vargas group got their IRB approval on, on such grounds.

Q I'm just wondering in general. I wasn't even thinking of the Vargas article on this. I'm wondering in general, to perform this procedure on a child for a study purpose, you would approve it even if it wasn't medically indicated for some other reason, just for the study purpose?

A Well, I thought that there is a medical reason for doing, for doing a spinal tap. You're talking about in this kind of case, I would assume?

Q Actually, I --

A Maybe I misunderstood you. Do you mean spinal taps on normal children?

Q Yeah, well --

A I wouldn't, no, I, sorry. I wasn't in favor of spinal taps on normal children. I think obviously one needs to get controls for studies like, or the

kind that interests us. And what one would do there would be to solicit a commission from the doctors

clinics in some hospitals doing, routine spinal taps for unrelated conditions, noninfectious like headache, for example. And ask whether on could collect those fluids and, and test them.

Q You have an affiliation with The New School in New York.

A I'm sorry?

Q You have, I'm sorry, you have an affiliation with The New School in New York?

A I am a professor there, yes.

Q Since we talked in June, how many lectures have you given there?

A How many lectures do I give there?

Q How many have you given since we talked in June?

A Did you say lectures?

Q Yes.

A Oh, the semester began right after Labor Day. I teach two classes a week, so I give a minimum of two lectures a week and I guess, how many weeks has it been? Eight, I don't know -- so I guess about 16.

Q What were those lectures on?

A They're the course I'm teaching currently is Introduction to Neuroscience, so I'm lecturing on, I begin with the neuron, the synapse --

Q It's a basic course? Introduction to Neuroscience?

A Right, right. I've gotten up to motor control and learning --

Q Okay. Have you given any talks since we spoke in June on autism?

A Any thoughts to?

Q Any talks, any lectures.

A Oh, you mean public, like --

Q Yes, presentations to professional meetings. Have you attended any professional meetings on autism?

A No, actually.

Q I'm sorry?

A I haven't, no.

Q Have you ever given a lecture on measles virus that that would be the topic of lecture?

A No, actually, no.

Q You mentioned at a meeting that was held in Washington right about the time we had the, or earlier when you talking with Mr. Powers, he asked you a question about a meeting that was --

A A meeting in Washington?

Q Yeah. A meeting that was held, I think he said in Washington, it may not have been in

//

Washington. But a meeting that was held to discuss the environmental factors and autism.

A Oh, I wasn't at that.

Q Okay.

A I was away at the time, and in fact I had a colleague who went but I didn't go to it.

Q Were you invited?

A No.

Q Remember Dr. Fombonne testifying?

A I remember meeting him when he was --

Q I think he had to leave at some point to attend that meeting.

A I didn't -- well, I said hello to him, shook hands before then.

Q And you say that currently about 20 percent of those who are diagnosed with autism are regressive cases.

A The figure that's given is 20 to 30 percent, that's the general figure given.

Q What was the figure say, ten years ago?

A I think much the same.

MR. MATANOSKI: I have nothing further at this time.

THE COURT: Dr. Kinsbourne, I have just a few questions for you.

THE WITNESS: Yes, ma'am.

THE COURT: First off, I'd like to start with this article you mentioned by Paul Dykken --

THE WITNESS: Yes.

THE COURT: Can you describe what type of article this is? Is this an investigatory study, a review, an editorial?

THE WITNESS: I'm embarrassed to say, I have it with me, but I failed to find it. But I can certainly hand it over to the Court in whatever appropriate fashion. But yes, I began to tell you. It's a review. Here are the specifics. Paul Dykken, as I mentioned is an authority on SSPE, he at some point, he came to join the group in England and had the opportunity to examine a number of the children in the cohort and he drew his own conclusions, independently of --

THE COURT: The litigation?

THE WITNESS: The litigation, about what he was seeing and came to the conclusion that what he was seeing was a previously undescribed neurological disorder due to a measles vaccine. And in this short article, he contrasts SSPE which is his topic with this, as he thinks, new and different manifestation of measles infection of the brain.

THE COURT: Is he associated with an SSPE

registry of some sort?

THE WITNESS: He is the, in charge of it. He's the chief of it, he's very well known in the field.

THE COURT: Is this a governmental registry or a private registry?

THE WITNESS: Oh, gosh, I, I don't know any more than that about it.

THE COURT: Okay.

THE WITNESS: He's a senior reputable individual.

THE COURT: All right. You described in your theory of how the measles virus interacts with the brain and you talked about some of the findings in the Vargas autopsy and CSF studies. There are three, at least three other anatomic issues that I've seen in the literature identified as associated, brain anatomy associated with autism. And the Purkinje's cell loss --

THE WITNESS: Yes.

THE COURT: -- a problem with minicolumnar development and limbic system. Do you agree that those three are all associated with autism in autopsy?

THE WITNESS: Yes. I actually mentioned the first, I mentioned the Purkinje's cell loss and the

limbic system. The minicolumnar abnormality is

described, I think Buxtehude (phonetic) is the name of the investigator (phonetic), it's as you probably know, the gray matter lines the outside of the cortex, but the cells are actually much less distributed (phonetic) in their columnar arrangement and you have a nested situation where minicolumns make up macrocolumns and so on. It's just how the brain is organized and this particular set of investigators pointed out that the minicolumns were anomalous in the organization.

THE COURT: Okay.

THE WITNESS: I don't, I didn't draw further conclusions. I actually seem to remember, I'm not sure of this, that they are, did discuss some possible functional implications of that and it may well, it may have been that they did think that a certain amount of disinhibition or overactivation was part of it, but I'd have to go back and read the article again.

THE COURT: You indicated that you'd mentioned the Purkinje's cell loss. Can you tell me how that fit into your theory again because I apparently missed it?

THE WITNESS: The excitotoxic potential of the glutamate was a topic --

THE COURT: Okay.

THE WITNESS: -- and I was pointing out that whereas in more severe acute conditions excitotoxicity would destroy neurons and -- but here the only evidence really consistent with excitotoxicity was the lack of Purkinje's cells. And we do know that when glutamate is excitotoxic, the Purkinje's cells are the most vulnerable to that. So that's sort of fits without being conclusive.

THE COURT: So it fits in that they're missing and apparently something destroyed them.

THE WITNESS: That is my interpretation, yes.

THE COURT: Or they never existed.

THE WITNESS: Well, that's another interpretation. You see, you can't really tell.

THE COURT: Okay. Do we see any evidence of the death of Purkinje cells in autopsy or do we see that they're just simply not there or they're in reduced numbers?

THE WITNESS: As far as I recall -- I hope I'm giving the correct answer, that the counts are simply sparse but whether so many years later you can conclude anything more -- I don't know.

THE COURT: Now the information about the

limbic system changes, aren't those identified as probably occurring during gestation?

THE WITNESS: Well, that was the, that was the original idea when Bauman and Kemper were the first people to do autopsies and really examined them well, meaning let's spend six months on the brain --

THE COURT: Okay.

THE WITNESS: -- at that point. And they felt that the organization, that the, some of the things they saw suggested a disturbance in gestation. And I think that may have been in case. However, I also gave a reference, Ciaranello, in my Cedillo article which said that those very appearances are ones that you get postnatally -- now I'm not an expert in pathology or histology so I can't really say, but it does strike me that there are a number of conditions where autism clearly is not congenital. Landau-Kleffner -- they have to be more than three years old and become autistic. Certain encephalitic cases have been presented. So it may well be more likely that many of these cases arise during pregnancy, but I don't believe they all do.

THE COURT: And I'm not challenging that --

THE WITNESS: No.

THE COURT: -- that statement. I'm just asking how the limbic system findings fit in with your theory.

THE WITNESS: Right.

THE COURT: Those described by Bauman and

Kemper and others.

THE WITNESS: Just to, perhaps to supplement slightly, the limbic system includes the hippocampus and amygdala. Rubestein and Merzenich, in talking about excessive glutamate, as I recall, actually refer to a sparcity of synapses and dendrites in the hippocampus and related to their, to this excitation imbalance so that could, if that's the case then it happened when the imbalance occurred.

THE COURT: Now the Rubenstein article I have is not a study of its own, it's a review and postulating hypotheses.

THE WITNESS: Correct.

THE COURT: So it's looking at the evidence that's out there and saying maybe this, maybe that.

THE WITNESS: Correct.

THE COURT: So we are talking about the same article.

THE WITNESS: Absolutely.

THE COURT: Okay. And the final question I have has to do with a followup on something Mr. Matanoski asked you. And he talked, asked you initially about brain changes and how the brain changes from birth through infancy and on into adulthood. And basically you agreed with him that the

brain does change in many ways and if it didn't we'd

be in serious trouble.

THE WITNESS: Enormously, yes, yes.

THE COURT: Okay. We heard some testimony in the Hazlehurst case from a neurologist named Dr. Rust who testified that at certain points in development of a child or an infant, that a part of the brain that has been controlling behavior, motor skills, something, shifts control to another part of the brain. Do you agree with that?

THE WITNESS: Yes, it's called encephalization, if that's what he was talking about. And the particular example that's quoted, which was presented by a famous researcher, Patricia Gorman (phonetic), was that in the very young child doesn't really have a functional the cerebral cortex yet. It isn't myelinated. So typically, that really it's the basal ganglia which are the highest levels of the motor system and control behavior, which is after all, motor activity. And then there comes a time when the, the frontal cortex which is connected to the basal ganglia becomes functioning. And then, and by encephalization the frontal cortex takes over from the basal ganglia and assumes control. That's a construct that's been quite a while in neuroscience.

THE COURT: And it's generally accepted.

THE WITNESS: It's, yeah, it's legitimate.

THE COURT: All right. And my final question has to do with Colten's case in particular.

THE WITNESS: Yeah.

THE COURT: And that is if we remove, again taking the hypothesis that there is no measles virus in the cerebral spinal fluid, what signs or markers of brain inflammation exist in Colten's case?

THE WITNESS: Only the few that Dr. Bradstreet brought to the Court's attention.

THE COURT: And that would be the myelin basic protein.

THE WITNESS: Protein, and again neopterin perhaps.

THE COURT: Okay.

THE WITNESS: I don't have strong feelings about that, but in answer to your question, that's all really that I can perceive.

THE COURT: And so the MBP was very high at the time it was taken, but we have no idea of knowing what it was earlier.

THE WITNESS: Right, so it is consistent but not diagnostic of that.

THE COURT: Okay. And then the neopterin -- levels were not taken until much later --

THE WITNESS: Right.

THE COURT: At a time when Colten was

improving, in fact .

THE WITNESS: Yeah, yeah --

THE COURT: Intellectually functioning well, although there may have been some behavior difficulties.

THE WITNESS: Correct.

THE COURT: But no other signs or symptoms of inflammation that you can think of in his record?

THE WITNESS: The inflammation I was talking about --

THE COURT: Yes.

THE WITNESS: -- I don't, it doesn't come to mind.

THE COURT: Okay. Go ahead, Mr. Powers.

REDIRECT EXAMINATION

BY MR. POWERS:

Q And on the one hand I'd like to say I have just a couple of questions, but it's more than that. I hope it's not more than a few minutes because I understand we are right up at 5:00.

Dr. Kinsbourne, I want to cover several different areas with you here. One is talking specifically about Colten Snyder's medical condition after he got his MMR. If you recall, Mr. Matanoski had a lot of questions about the onset of symptoms.

You recall in preparing your report and preparing to testify, reviewing Colten Snyder's medical records.

A Yes.

Q And you saw Dr. Bradstreet's testimony where those medical records were reviewed and even some were put up on the screen.

A Yes.

Q And understanding that when you were being asked questions by Mr. Matanoski, the records were neither in front of you nor on the screen, I wanted to just ask you a couple of questions about the record to see if these were consistent with what you did see in preparing to testify.

A Yes, sir.

Q Okay. Is it consistent with your memory of the records in this case, that within 13 days of receiving the MMR vaccination Colten presented at the hospital with a report from his mother that he was fussy, crying, screaming, screaming at night and not sleeping through the night 13 days out?

A Yes.

Q Is that consistent?

A That is, yes.

Q Okay. And that within 31 days he presented

again at the hospital and was admitted to the hospital. Do you recall the discussion about the admission?

A Right.

Q Do you also recall the note that the doctor made on his hospital admission, not on his chart note, but on the hospital admission 31 days post MMR, that by that point Colten had undergone a mental status change? Do you recall that note?

A Yes.

Q And then right around that time, the Memorial Day weekend, you recall the testimony of family members and caregivers that he was lethargic, had stopped making eye contact, had stopped interacting, and all of that testimony. Do you recall hearing all of that?

A Right. I mentioned the lethargy but you filled in the other details which you reminded me of.

Q So all of that happened within 31 days. And the presentation of those symptoms within 31 days of the MMR, I'm assuming, is completely consistent with your theory of the excitatory inhibitory process that's triggered by the measles vaccine in the brain.

A Oh, it certainly is.

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Q Great.

A Yeah.

Q Moving on to a couple of other questions, I'm actually going to get more specific to this before I talk about some of the general ones. Early in the cross-examination by Mr. Matanoski, a fair amount of time was spent on a slide that Dr. Bradstreet had presented. You recall that --

A Yes, sir --

Q Now that's a slide that as far as you know was prepared by Dr. Bradstreet to describe the clinical course of care that he provided to Colten Snyder.

A Well, he, he specifically used it to explain why he did what he did as a treating physician, yeah.

Q And at no point were you ever relying on the material that was presented in that slide to reach your opinion on causation, either generally or specifically --

A Oh, indeed not.

Q In fact , you couldn't have because that slide was just presented to everybody as part of a PowerPoint presentation a couple of days ago.

A Correct.

Q So all of your work on developing both the

general causation theory in these cases and the specific case, were independently of whatever Dr. Bradstreet might have been thinking of, either in his course of care or to the extent that he was developing his own nonexpert, nontestimonial opinions on causation, your opinion is developed completely independent of that.

A That is the case.

Q And doesn't rely on that at all.

A At all.

Q You recall a line of questioning that, later in the cross-examination, about whether various levels, what started off as questions about copy numbers, high copy numbers being equated with more severe symptoms and then was refocused to, as I understood the questions, to be saying if he had more virus in the CSF or virus in the brain, would you expect the symptoms to be more severe. Do you remember that line of questioning?

A I do.

Q Okay. Now it's fair to say that in any case of autism spectrum disorder there are possibly a number of factors involved, is that right?

A Of course.

Q And across the range of presentations,

within the population, people with autism have a very wide range of symptoms, correct?

A Yes.

Q A great diversity of the severity of those symptoms, correct?

A Yes.

Q And in the mix of the symptoms and in the onset of the symptoms, correct?

A All those things.

Q So given that presentation of diversity within the autistic population in terms of symptoms, would it be reasonable for you to conclude that even given the exact same viral load across a population of autistic children, you would see a variety of symptoms?

A Well, yes and I did conclude as such in, in our discussion.

Q And I just wanted to make that clear, because you would also see a diversity even in the onset of the symptoms, correct?

A Right.

Q And you would expect to see given the diverse nature of autism, you would expect to see diversity of symptoms even given a group of children with the same, call it viral load or copy number,

correct?

A One would expect that.

Q It's entirely consistent with the model of autism that we know outside of a viral postulated model. There was also a line of questioning about what your opinion, the various permutations that your opinion might go through based on the appearance or nonappearance of measles virus in a variety of samples. I just want to make sure I get to the heart of what you were saying and apply it to this case.

The absence of measles virus whether it's in the gut -- whatever evidence there is, just assume there's no measles virus at all. The absence of measles virus doesn't preclude the existence of a neuroinflammatory model that creates autistic symptoms, does it?

A Oh, no. I never suggested that. It, it's relevant to determining what the, what the cause of the neuroinflammation is. Also, I might say absence of something on a test doesn't mean to say it's not there. And I, it's not that, this is not engineering, you know. It could be there another time, and so it's probabilistic, it's a matter of degree.

Q Yes, and I just wanted to make sure that the mechanism you're describing --

A Yeah.

Q -- neuroinflammation and the dysregulation of the excitatory and inhibitory process, that mechanism can be present absent the measles virus.

A Absolutely. I was describing the mechanism separately and I pointed out that there's more than one cause of neuroinflammation. There could be other causes for autism by this very same mechanism.

Q And as time passes by, even if there is measles virus, it may not be able to be detected directly through spinal fluid, through blood, through gut, anything. There may over time be the development of methodologies and technologies that allow surrogate markers to allow somebody to reliably conclude that there is in fact persisting measles virus. Is that --

A Right.

Q -- something that's fair to expect?

A One would certainly hope so, other than to spinal tap everybody

Q And certainly your opinion on causation where there's a proposition that the measles vaccine, or any vaccine for that matter, that results in persistent infection, you're open to a theory that would include other ways of detecting the virus rather than through tissue samples, spinal taps and that sort

of thing.

A Yes, I agree with that.

MR. POWERS: Okay. That's everything that I had on redirect, Special Master.

THE COURT: Thank you. Mr. Matanoski?

MR. MATANOSKI: Thank you, ma'am.

RECROSS-EXAMINATION

BY MR. MATANOSKI:

Q One last point, Doctor. Do you know of any surrogate tests that are in the process to be developed to identify measles virus?

A No.

Q Paul Dykken, is that a letter that he wrote because we saw something in Cedillo.

A Did I submit it --

Q No. It came up at the very end of the trial, as I recall. I was just wondering if it's the same -- some sort of letter.

A It was an editorial in a journal. Actually, it was an editorial discussion. It wasn't a letter, no. It was, it was an article --

Q Was it speculating about what might be happening based on --

A I don't think he felt he was speculating. I think he thought he was describing a rather important

development in neurology.

Q Based on what was happening in the U.K. litigation, Dr. Wakefield --

A This has nothing to do with Dr. Wakefield.

Q I thought he mentioned it in his --

A Oh, no. Let me be clear about it. If Dr. Wakefield had never existed, I would never have met Dr. Dykken in England. However, he saw children under the umbrella of the, of the British case. He ultimately was not one of the people who gave an opinion. He didn't play an active role. It was helpful to have him there.

But he made his own observations on these children, which he didn't necessarily discuss with Dr. Wakefield or anybody and he wrote this article. And I, as I said to the Court, I do have it and --

Q All right. I'm just wondering if it's the same one because that was an editorial that came out before the expert reports, I believe, before the expert reports were filed in the U.K. litigation and certainly before that litigation was underway.

A I may not have seen it then, though.

Q And since that time, there's nothing more from Dr. Dykken, is there?

A Not that I've heard. I haven't talked

to him since. That's all I'm aware of.

Q Nothing about the hypothesis that he had in that editorial. I think he called it MINE, he said it's something --

A Yes, he --

Q -- I've just come up with, -- I'm going to call it MINE.

A That's the acronym that he used. I don't know whether he's done a followup investigation or published it since then. I haven't come across it.

MR. MATANOSKI: Thank you.

THE COURT: All right. Is there anything else we need to take up on the record today?

MR. POWERS: No, Special Master. For purposes of our case in chief, we would excuse Dr. Kinsbourne and as with all of our witnesses reserved him for rebuttal if needed.

THE COURT: Certainly. All right. Thank you very much, Dr. Kinsbourne. We'll reconvene then at 9:00 a.m. tomorrow morning.

(Whereupon, at 5:12 p.m., the hearing in the above-entitled matter was adjourned until November 7, 2007, at 9:00 a.m.)

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REPORTER'S CERTIFICATE

DOCKET NO.: 01-162V

CASE TITLE: Colten Snyder by and through Katherine Snyder and Joseph Snyder, his natural guardians vs. Secretary of Health and Human Services

HEARING DATE: November 6, 2007

LOCATION: Orlando, Florida

I hereby certify that the proceedings and evidence are contained fully and accurately on the tapes and notes reported by me at the hearing in the above case before the Department of Health and Human Services.

Date: November 6, 2007

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