

UNITED STATES COURT OF FEDERAL CLAIMS

THERESA CEDILLO AND MICHAEL)
CEDILLO, AS PARENTS AND)
NATURAL GUARDIANS OF)
MICHELLE CEDILLO,)
)
Petitioners,)
)
v.) Docket No.: 98-916V
)
SECRETARY OF HEALTH AND)
HUMAN SERVICES,)
)
Respondent.)

REVISED AND CORRECTED COPY

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C O N T E N T S

WITNESSES:	DIRECT	CROSS	REDIRECT	RECROSS	VOIR DIRE
For the Petitioners:					
Vera S. Byers	862	934	1010	1015	--

BYERS - DIRECT

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

2 (9:02 a.m.)

3 SPECIAL MASTER HASTINGS: All right. We're
4 going to call this morning session to order here.

5 I understand that your next witness is going
6 to be Dr. Byers, and she's already on the witness
7 stand so that, Ms. Chin-Caplan, when you're ready go
8 ahead with your direct.

9 Dr. Byers, would you raise your right hand,
10 please?

11 Whereupon,

12 VERA S. BYERS

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

15 SPECIAL MASTER HASTINGS: Please go ahead,
16 Ms. Chin-Caplan.

17 MS. CHIN-CAPLAN: Thank you, Special Master.

18 DIRECT EXAMINATION

19 BY MS. CHIN-CAPLAN:

20 Q Dr. Byers, could you kindly state your name
21 for the record, please?

22 A Yes. Vera S. Byers.

23 Q Dr. Byers, would you kindly give the Court a
24 brief description of your educational background from
25 college?

BYERS - DIRECT

1 A From college?

2 Q From college.

3 A Yes. I graduated from UCLA with a degree in
4 Microbiology, because at that time we didn't have
5 immunology. I then got a Master's degree in Protein
6 Chemistry, I think.

7 I have an M.D. from UCSF with boards in
8 Internal Medicine, a Ph.D. in Basic Immunology, a
9 fellowship in Protein Chemistry, another three-year
10 fellowship in Clinical Immunology again from UCSF. I
11 think that's it.

12 Q And after you finished your M.D. did you
13 have an internship?

14 A Yes. That's why I said boards in Internal
15 Medicine. That requires an internship and then two
16 additional years of internal medicine.

17 Q And are you board certified?

18 A Yes, I am.

19 Q And what is your board certification in?

20 A Internal Medicine.

21 Q Doctor, could you kindly describe your work
22 experience since your graduation?

23 A That's a long time ago. I joined the
24 faculty at UCSF initially in the Department of
25 Medicine and then in the Department of Dermatology.

BYERS - DIRECT

1 I did research in tumor immunology
2 initially. I was one of the founders of the field, at
3 least one of the initial workers in the field, because
4 I was doing clinical trials in osteogenic sarcoma,
5 which is a cancer of young teenagers, using
6 immunotherapy. People were not doing that at the
7 time. We didn't really know about immunotherapy at
8 the time.

9 Then I worked on immunodermatology,
10 particularly poison oak. At one time I was considered
11 the world's expert in poison oak and ivy dermatitis,
12 which my medical student colleagues thought was
13 amusing because they didn't think it was very
14 important.

15 SPECIAL MASTER HASTINGS: Doctor, can I have
16 you maybe pull those microphones a little bit closer
17 to you? The other one too if you can. It's laying on
18 the table there. Great. Thank you.

19 THE WITNESS: Is this better?

20 SPECIAL MASTER HASTINGS: I hope so.

21 THE WITNESS: Okay. Let's see. Where was
22 I?

23 MS. CHIN-CAPLAN: Poison oak.

24 THE WITNESS: Poison oak, yes. So I worked
25 on poison oak and basically immunodermatology

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1 psoriasis for a while, and then when I finished my
2 residency I continued on the faculty at UCSF, but I
3 also joined a company called Xoma Corporation, which
4 was one of the first biotech companies, and then also
5 joined the faculty at the University of Nottingham in
6 England and continued doing work in primarily cancer
7 research, but also monoclonal antibodies.

8 I was the inventor of the first monoclonal
9 antibody to be put into clinical trials initially at
10 the University of Nottingham and then later on at
11 Xoma, and I also was the inventor of the first of the
12 antibodies that ultimately culminated in the ones that
13 are now used for leukemias and lymphomas.

14 The antibody was called H65RTA because it
15 had ricin A chain attached to it. We were using it
16 initially in graft versus host disease, for which I
17 received approval from the FDA Scientific Advisory
18 Board for use in a salvage therapy for GVHD, and then
19 I put it into clinical trials in a wide variety of
20 autoimmune disease ranging from Type 1 diabetes
21 through Crohn's disease through multiple sclerosis,
22 rheumatoid arthritis, et cetera.

23 Then after a time I started a company, an
24 allergy company, again using biologic-based therapies
25 to more rapidly desensitize people for classic

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1 allergies. We were looking at both poison oak, no
2 surprise, and dust mites, which was DRP-1, and then I
3 moved on to being a consultant, and that's what I've
4 been doing for probably the last 15 years.

5 I split my time between working as a medical
6 toxicologist, so I go out. I'm usually contacted by
7 people, usually attorneys, who are looking at large
8 populations of people who have been exposed
9 potentially to environmental chemicals, and they would
10 like me to go out and see whether or not there is a
11 signature.

12 For example, the first one of those I did
13 was there was a case in Woburn, Massachusetts, where
14 the people were exposed to trichloroethylene in the
15 water and they were developing leukemias, and the
16 question was whether or not the trichloroethylene
17 could be attributed to the water.

18 Later they wrote a book about it. Jonathan
19 Harr wrote a book called Civil Action, and they made a
20 movie out of it. I think it's one of the first so-
21 called clusters that has ever actually been confirmed
22 for an etiologic agent because the Massachusetts
23 Department of Public Health or something went in later
24 on, and they did a large study comparing East Woburn
25 with West Woburn, one of which had TCE in the water

BYERS - DIRECT

1 and other did not. They confirmed that in fact I was
2 correct.

3 BY MS. CHIN-CAPLAN:

4 Q Do you consult to drug manufacturers as
5 well?

6 A Oh, sorry. Yes. The other part of my time
7 I spend being a consultant to biotech companies. I
8 specialize in biologics. For example, let's see, I
9 worked with a vaccine for multiple sclerosis with
10 gamma interferon for atopic dermatitis, ran a large
11 study in that.

12 The largest chunk of time I guess I spent
13 was at Immunex in Seattle. I was there for three
14 years on the team that got Enbrel, which is basically
15 a TNF sponge, and it was approved for rheumatoid
16 arthritis, thoriatic arthritis, Still's disease, et
17 cetera.

18 Our competitor, Remicade, you probably know
19 Remicade better because it also had the same profile
20 with the addition of it's also effective in Crohn's
21 disease.

22 Q Doctor, are you currently consulting to a
23 biotech company?

24 A Yes. At the moment I've been primarily
25 working with a company called Hutchison MediPharma,

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BYERS - DIRECT

1 which is based out of Shanghai.

2 Their mandate is about a year and a half ago
3 the FDA finally approved regulations by which we can
4 take herbal mixtures and put them in clinical trials
5 in the United States. We didn't have the release
6 criteria before.

7 Hutchison, one of their main areas of
8 interest is to take classic Chinese herbs and then put
9 them in clinical trials in the United States and so at
10 the moment I'm involved with the clinical trial of one
11 of their herbs in Crohn's disease in the United States
12 and in ulcerative colitis in China.

13 Q Doctor, you indicated that you had an
14 appointment at the University of Nottingham in London?

15 A No, no. In Nottingham, England.

16 Q What was that appointment?

17 A That was as a senior lecturer, which is
18 basically it's probably like an associate professor,
19 maybe a little bit higher than an associate professor,
20 and I held that position from around 1984 until about
21 2000.

22 It was one of the main reasons for the
23 appointment is that that was the main place that I was
24 conducting my research. That's where my lab was.

25 Q You indicated that you had a clinical

BYERS - DIRECT

1 practice as well?

2 A Yes. I practiced allergy and immunology
3 from about 1981 through something like 1998, 2000,
4 something like that, seeing patients with a variety of
5 diseases, both pediatric and adult, with a wide
6 variety of immunologic and allergic conditions.

7 Q And have you operated different types of
8 clinical laboratories to observe certain patient
9 populations?

10 A Yes. I set up and ran the Immunology
11 Division of the LCL from approximately something like
12 1977 through 1979, something like that. I set up
13 their Immunopathology Division and ran it during that
14 time.

15 Q You said LCL. What does LCL stand for?

16 A Levin Clinical Labs.

17 Q And did you run any other clinical labs?

18 A Well, obviously I ran my own clinical labs
19 when I was doing full-time academic research, and then
20 also I was involved in much of the human work that was
21 done at the University of Nottingham.

22 Q Did you have any relationship with the AIDS
23 Clinic at UCSF?

24 A I forgot. Thank you. It wasn't at UCSF.
25 We founded the largest AIDS clinic in San Francisco.

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BYERS - DIRECT

1 If I remember rightly, I think it was called Positive
2 Action. Positive Action.

3 The concept was it was in the very early
4 days of AIDS before the protease inhibitors and so
5 AIDS was a really devastating disease. The people who
6 had HIV disease were going out and taking lots and
7 lots of different drugs on their own and so the
8 promise to them was that we would monitor the drugs
9 that they were taking, as well as suggest those of our
10 own, but they had to tell us what they were taking.

11 We wound up having a very good relationship
12 with the HIV community and were actually responsible,
13 I think we were at least in part responsible, for the
14 fast track drug application that we have now.

15 I do know for sure that we were responsible
16 for taking away the enmity that the gay community had
17 between the governmental agencies and the drug
18 companies because we just kind of involved them in
19 there, and that's really all they wanted.

20 Q Doctor, have you published any articles?

21 A Oh, yes. I've probably got about 200
22 published articles, but I kind of, I'd have to check
23 my bibliography to make sure because I haven't thought
24 about it for a while.

25 Q And, 2nd these, You indicated that you do

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BYERS - DIRECT

1 research. What is

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1 the subject of your research?

2 A When? Now or then or what?

3 Q Currently.

4 A Currently the main research is probably on
5 these populations that I was telling you that are
6 exposed to toxic chemicals, as well as the research on
7 the herbs that I'm running with the Chinese company.

8 Q And in the past did you have other research
9 interests?

10 A Well, primarily tumor immunology and
11 chemical carcinogenesis in general.

12 Q So you were doing cancer research?

13 A Yes. Well, the part of the immune system
14 that is responsible for controlling cancer, yes.

15 Q Do you sit on any national panels at all?

16 A Oh, primarily at the NIH committee called
17 the SBIR, Small Business Innovative Research. I've
18 been on that for a long time, like about 15 years.

19 Q Do you hold any patents, Doctor?

20 A I probably have about 10.

21 Q And do you sit on any editorial review
22 boards?

23 A Yes. Well, I served on Cancer Drugs and
24 then Cancer, Immunology and Immunotherapy until about
25 two years ago.

BYERS - DIRECT

1 Q Doctor, at some point in time were you asked
2 to review the medical records of Michelle Cedillo?

3 A Yes, I was.

4 Q Doctor, when you reviewed the medical
5 records of Michelle Cedillo what were you looking for?

6 A I was asked to give an opinion as to why the
7 measles virus had persisted in her body. I was
8 already given information that it had. My conclusion
9 was that she had and has a dysregulated immune system.

10 I was asked then to list the known causes
11 for immune dysregulation in Michelle, that particular
12 child, and I concluded that it was a combination of
13 genetics and the measles virus vaccination and the
14 thimerosal-containing vaccines that she had received.

15 I was asked to opine as to the results of
16 the persistent measles infection or of the persistent
17 measles virus, and I found that I could attribute her
18 chronic gut inflammation and opine that she would be
19 expected to have CNS pathology as a result of that.

20 Q Now, Doctor, how does one work up a child
21 who has an immune dysfunction?

22 A If I could have the next slide?

23 SPECIAL MASTER HASTINGS: All right. Let's
24 stop for a minute here now. Dr. Byers, like the
25 previous Petitioners' witnesses, has a slide

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1 presentation for us.

2 Let's mark... We have paper copies of it. Let's
3 mark those, Ms. Chin-Caplan, as Petitioners' Trial
4 Exhibit I think we're at No. 9, are we not?

5 Dr. Byers had just been referring to page 1
6 of that group, so now we're going to move to page 2 of
7 that, I understand. Go ahead, Dr. Byers.

8 BY MS. CHIN-CAPLAN:

9 Q So, Doctor, when one evaluates a child for
10 immune dysregulation what would you do as a clinical
11 person?

12 A You would take a family history. You would
13 be particularly interested in a family history of
14 immune disorders. You would take a personal history.

15 You would be particularly interested in a
16 history of frequent or unusual infections, and with
17 children that's especially fairly easy because the CDC
18 has published criteria by which how many infections a
19 child of a given age should expect to have.

20 You're particularly interested in an
21 infection that caused the child to be taken to the
22 doctor, because that means that the family is
23 concerned enough about the child, and about cases when
24 the child has been put on an antibiotic because that
25 means that the physician is concerned enough about the

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1 infection.

2 Other things you would look at would be
3 aberrant reactions to vaccines and chronic
4 inflammatory conditions.

5 Q And when you looked at Michelle's history
6 did you notice any factors which would lead you to
7 believe that she had a dysregulated immune system?

8 A I did.

9 Q And what were those factors?

10 A I noticed clinically that she certainly had
11 an aberrant reaction to the MMR vaccine and that she
12 also had chronic inflammatory at least one, if not
13 more, chronic inflammatory conditions.

14 In her case I did not find that she had a
15 history of frequent or unusual infections, and her
16 only family history was notable for just routine
17 allergies.

18 Q Doctor, once you take that family history
19 and you determine that there might be something there
20 worth evaluating, what would you do next?

21 A The next thing you would do would be
22 laboratory tests.

23 Q What laboratory tests would you run, Doctor?

24 A As shown on Slide 3, this is just a fairly
25 routine set of labs, so it's a CBC, which is a

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1 complete blood count; a differential, which is the
2 number, the percent of monocytes macrophages, T cells,
3 B cells, et cetera, in the lymphocyte population; a
4 chemistry panel, which would include tests of liver
5 function, of renal function, et cetera; and then a
6 urinalysis.

7 Then the B and T cells with the subset
8 analysis; serum immunoglobulin levels, and in that
9 case you're particularly looking for something simple
10 like common variable immunodeficiency disorder because
11 there's a treatment for that.

12 And then response to both ubiquitous
13 antigens -- a ubiquitous antigen is something that
14 like 90 percent of the population has been exposed to,
15 so you know that if you check mitogenesis, for
16 example, you know that those people have been
17 sensitized to that or should have been sensitized, and
18 if you get a negative reaction then you know that
19 there's something abnormal with the immune system --
20 and then also a response to usually the nonspecific
21 mitogens.

22 The nonspecific mitogens are things like
23 pokeweed mitogen, Concanavalin A, et cetera. Those
24 are things that are just nonspecific stimulants of the
25 B cells or the T cells that everybody is going to

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1 react to if they have normal reactions.

2 In other words, when you're looking at your
3 B and T cells you're just looking at the number of
4 cells, but you're not asking whether they can function
5 properly. When you're looking at the response to the
6 antigens, you're asking whether not only are they
7 there, but can they also function properly.

8 Q So, Doctor, the last three, the B and T
9 cells with subset analysis, the serum immunoglobulin
10 levels with subclass analysis and the response to the
11 antigens, vaccines and nonspecific mitogens. Are they
12 are considered part of an immune panel?

13 A Yes, they are.

14 Q Now, to your knowledge was Michelle
15 Cedillo's was her immune system evaluated?

16 A It was, and it was really fortuitous because
17 it's my understanding that the only reason that we
18 have these data so early in the disease process is
19 because her mom wanted to see whether or not she would
20 qualify for intravenous gammaglobulin and so that's
21 the only reason that we got all of these antigens.

22 Later on she had had so many treatments,
23 steroids, et cetera, that you really could not have
24 gotten a good assessment.

25 Q And do you know who she was evaluated by?

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1 A Yes. Dr. Gupta.

2 MS. CHIN-CAPLAN: Okay. For the Court, Dr.
3 Gupta's record is contained at Petitioners' Exhibit 3.

4 BY MS. CHIN-CAPLAN:

5 Q So, Doctor, when you evaluated the medical
6 records and everything, what history did you obtain
7 about Michelle?

8 A I found, as you can see itemized on Slide 4,
9 that she was the product of a normal pregnancy and
10 delivery, that she had had viral syndromes at age
11 three and seven months, which were not unduly
12 frequent. She did have an allergy to amoxicillin.

13 She had received her MMR vaccination at age
14 15 months, and then a very colorful and dramatic set
15 of circumstances occurred, which is that seven days
16 later she developed a high fever, which essentially
17 lasted for two weeks.

18 It waxed and waned a little bit, but, I
19 mean, her mom is describing temperatures of up to 106,
20 and at the end of that two-week period she was
21 documented in the clinic to still have a temperature
22 of 100.6, so that is not only a very unusually long
23 interval, excuse me but the extent of the reaction is
24 very high.

25 It's at the time that would be expected.

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1 It's just that it lasted for a long time, and it was

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1 very dramatically unusual.

2 Q Doctor, just to interrupt you for one
3 minute, you said that it would be expected. Would the
4 fever of 105, almost 106, be expected?

5 A No. The time at which it appeared is not
6 unusual. It's not unusual to have a mild fever
7 following the vaccination at about seven days.

8 Q When you say a mild fever, what is a mild
9 fever?

10 A Under 100.

11 Q Thank you. And what other information did
12 you obtain on Michelle's history from the medical
13 records?

14 A That when the fever resolved it then was
15 noted that she had diarrhea, which ultimately proved
16 to be the beginning of her chronic inflammatory bowel
17 disease, which she continues to suffer from.

18 Q Thank you. Doctor, you indicated previously
19 that she saw Dr. Gupta for an immune workup. Is that
20 true?

21 A That's correct.

22 Q Where is Dr. Gupta located?

23 A He's at UC-Irvine.

24 Q And is Dr. Gupta somebody whose reputation
25 you are familiar with in the community?

BYERS - DIRECT

1 A Yes. He's a well-known clinical
2 immunologist.

3 Q Doctor, did you review that immune panel
4 that was performed on Michelle by Dr. Gupta?

5 A Yes, I did.

6 Q Doctor, when you reviewed the records, what
7 did you see that Dr. Gupta, what tests did Dr. Gupta
8 run?

9 A Dr. Gupta did the tests that I had indicated
10 on the previous slide, which I think was Slide 3 or 4.

11 Q And after reviewing those tests and looking
12 at her clinical history, did you come to some
13 conclusion about whether Michelle suffered from some
14 immune dysfunction?

15 A Yes. I concluded that she suffers from
16 immune dysregulation, and this is in part
17 characterized by the TH1/TH2 skewing, which was
18 described by Dr. Kennedy yesterday.

19 Q Doctor, subsequent to that immune workup did
20 Michelle also demonstrate clinical evidence of immune
21 dysregulation?

22 A Yes, primarily with the chronic inflammatory
23 bowel disease, but also in the inability to clear the
24 measles virus vaccine strain from her body.

25 Q With respect to the immunue workup that was

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1 performed by Dr. Gupta, could you go into the

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1 specifics of what Dr. Gupta found?

2 A Well, the only thing on my slide that I
3 pointed out are the laboratory abnormalities, so
4 therefore she has an unusually low CD8 count, and as a
5 result she has an elevated CD4:CD8 ratio. An elevated
6 CD4:CD8 ratio is compatible with autoimmune disease.

7 Q and are you using that when one has an
8 abnormal, could you kindly describe to the Court the
9 relationship between CD4 and CD8?

10 A Yes. Let me see. The normal CD4:CD8 ratio
11 should be about 1.2, so in other words you have just
12 about as many CD4s as you do CD8s.

13 In this case she has an abnormally low CD8
14 population. In those days I think we really did not
15 understand, and maybe we still don't really
16 understand, why that predisposes you, or at least is
17 characteristics of, autoimmune disease, but that's
18 what she had, so it's compatible with her chronic
19 bowel inflammatory disease.

20 Q And, Doctor, you indicated she had an
21 elevated T cell, oh sorry, CD20?

22 A Yes.

23 Q What is the significance of the elevated
24 CD20?

25 A It just means that you've got abnormally

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BYERS - DIRECT

1 elevated B cell precursors, and it could go along with

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BYERS - DIRECT

1 the abnormally elevated IgG2 and IgG4.

2 Q You indicate here also that she had a low
3 response to specific and nonspecific mitogens?

4 A Yes. As I described before, it's one thing
5 just to figure out how many cells are there, but you'd
6 also like to know whether they're working properly and
7 so if I could see the next slide?

8 SPECIAL MASTER HASTINGS: So we're leaving
9 Slide 5 and going to Slide 6?

10 THE WITNESS: Yes. We may go back to Slide
11 5. However, I've been asked You asked me for the
12 function, so therefore I'm going to have to go through
13 7 or 8. There you go.

14 SPECIAL MASTER HASTINGS: So now we're on
15 Slide 7?

16 MS. CHIN-CAPLAN: That's correct, Special
17 Master.

18 SPECIAL MASTER HASTINGS: If one of you can
19 try to mention the number as we get to it I won't have
20 to interrupt you.

21 MS. CHIN-CAPLAN: Okay.

22 THE WITNESS: I'll do it. So as you can
23 see, and I'm just going to give you numbers, but
24 basically what you're looking at is when you're
25 looking at these mitogen assays you're hitting a

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BYERS - DIRECT

1 population of T cells in a test tube with something

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1 that it should react to.

2 And then you're putting in radioactivity and
3 you're comparing the radioactivity in the stimulated
4 cultures with those of nonstimulated cultures, and
5 then you're looking at your normal range, and you're
6 doing the same thing.

7 In other words, you're taking a group of
8 normal people from wherever you're going to get it,
9 from the population served by your lab, and you are
10 using exactly the same standard operating procedures
11 and exactly the same equipment to run those people and
12 establish what the value should be in a normal
13 population, and then you are using that to compare the
14 numbers that you get from your patients.

15 The main thing you need to look at is just
16 look at the numbers which are outside the normal
17 range. As you can see, the nonspecific mitogens that
18 were abnormal here, that is the ones that everybody
19 should respond to regardless to whether they've been
20 exposed to the antigen or not, is something called
21 ConA and the pokeweed mitogen, which are abnormally
22 low.

23 I'm going to go over this fast because I
24 know everybody is bored with lab tests. Then if you
25 look at the specific antigens, that is which most of

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BYERS - DIRECT

1 the population has been exposed to, you can also see
2 that she is low on mumps, candida and PPD.

3 BY MS. CHIN-CAPLAN:

4 Q So she was low on ConA, pokeweed mitogen,
5 mumps and candida and PPD? Is that it?

6 A That's right.

7 Q Doctor, if you could go back to page 5? Was
8 there one last abnormality noted in her immune workup?

9 A I'm sorry. Do you want 5 or 6?

10 Q Page 5. We didn't discuss the last one.

11 A Oh, sorry. I think I did. The fact that
12 she has abnormally elevated IgG2 and IgG4, which is
13 consistent with TH1/TH2 skewing.

14 I will just remind the Special Masters that
15 Dr. Kennedy described that yesterday. What that does,
16 you've got cross regulation. I'm sorry. You've got
17 the TH1s that are responsible for for other- things
18 clearing virus killing virally infected cells, right,
19 because antibodies can't reach the virus once it's in
20 the cell and so therefore you need a T cell that can
21 eat it up.

22 Your TH2s are also responsible important,
23 but they are responsible for immunoglobulins,
24 specifically IgG2 and IgG4, and they cross regulate so
25 therefore if you have TH1/TH2 skewing the reason that

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BYERS - DIRECT

- 1 is bad is because the TH2s can sit on the TH1s and
- 2 prevent them from working

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BYERS - DIRECT

1 as effectively as they should.

2 Q Doctor, you previously had indicated that
3 they looked at the CD4's and CD8's ratio.

4 A That's right.

5 Q If we could go to page 6? Could you remind
6 the Court what you indicated was the result of this
7 bloodwork?

8 A Yes. You can see here that she has a normal
9 level of CD4's, but she has an abnormally low level of
10 CD8's. Therefore, that gives her an abnormally
11 elevated CD4:CD8 ratio, which then is indicative of an
12 autoimmune process.

13 Of course we know, maybe we didn't know back
14 then because she had just started with this chronic
15 bowel problem, but we now know that she does have a
16 chronic autoimmune process.

17 Q Doctor, again the result of the CD20? What
18 was the significance of that?

19 A The CD20 indicates that you've got an
20 abnormally elevated precursor B cell population, which
21 would be consistent with several things, but including
22 some bone marrow toxicity.

23 Q Thank you.

24 A Maybe I should make a comment here just so
25 that I can explain the colors of the slides.

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BYERS - DIRECT

1 The UCI laboratory normal range is indicated
2 in blue here. The other ranges that have been used by
3 Dr. McCusker?

4 Q Yes.

5 A Thank you. Include Hannet, Shearer and
6 Gasparoni, and what she was trying to do is to give
7 you normal ranges that are age specific.

8 While it's certainly correct that there are
9 different normal ranges at the different ages, the
10 problem is that you cannot compare, you can't compare,
11 a single result from one lab with results from a
12 different lab. You have to compare it with that same
13 laboratory and so that's why I have put in the UCI
14 laboratory range in blue.

15 Q Doctor, what is the reason why you can't
16 compare and apply the normals from one laboratory to
17 another laboratory?

18 A Because the laboratories are using. First of
19 all, even if you're doing it concomitantly the
20 laboratories are using different reagents, different
21 instruments, and so they're going to get different
22 normal ranges.

23 But in this case it's particularly difficult
24 because the initial labs from Cedillo were done in I
25 think 1997. And for example, the range from Shearer

885B

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1 was done in 2003, so to give you an example, if let's
2 see.

886A

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1 Shall we choose Kevin Conway again?

2 So if Mr. Conway had gone in to his doctor in
3 1995 and said I have shortness of breath and they had
4 found a suspicious lesion in the chest and the doctor
5 said well, let's just follow it so come back in a
6 year, and so Mr. Conway doesn't come back until 2000.
7 And once again he has shortness of breath.

8 If the doc tries to do a CT scan again of
9 the chest, unless there's been a really, really
10 dramatic change in that you can't compare those two
11 CTs because the laboratory will have gotten a better
12 CT scanner in that five-year period.

13 So that's the second problem with this,
14 which is that you're trying to compare lab tests that
15 were done in 1997 when our knowledge of immunology was
16 actually pretty poor and our reagents weren't great
17 either, with something like a normal range in the year
18 2003.

19 Q And the ranges that Michelle Cedillo's lab
20 results came from was the one from the UC-Irvine
21 Laboratory?

22 A Yes. It's the same laboratory where her
23 tests were done.

24 Q Okay. And those were the tests that were
25 ordered by Dr. Gupta?

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1 A That's right, and those were the normal
2 ranges that were used by him as well.

3 Q Now, Doctor, if we could go to page 9. You
4 had indicated that she had demonstrated an abnormal
5 IgG2 and IgG4. Was that it?

6 A That's right.

7 Q Doctor, are these numbers the numbers that
8 were reported in Michelle's records?

9 A I think the --

10 Q I'm sorry. Page 8.

11 A Thank you.

12 SPECIAL MASTER HASTINGS: Page 8.

13 THE WITNESS: Yes. These are just the
14 immunoglobulin subclasses, and I think we've already
15 discussed these.

16 These are the abnormally elevated IgG2s and
17 IgG4s producing the skewed TH1/TH2 ratio, which Dr.
18 Kennedy has already described yesterday.

19 BY MS. CHIN-CAPLAN:

20 Q Doctor, if somebody had an immune
21 abnormality what would you expect to see clinically
22 when you evaluated that patient?

23 A If you've got immune dysregulation you can
24 see either one or both. You can see either an
25 increased incidence of immunodeficiency, which would

888A

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1 be manifest by frequent infections. Alternatively you
2 could see an increase in autoimmune diseases, or you
3 could see both.

4 Q And in Michelle Cedillo's case what did you
5 see?

6 A She's got clinical manifestations of
7 increased proinflammatory cytokines, which is
8 primarily manifest by her chronic bowel inflammation,
9 which would be considered an autoimmune reaction.

10 And she also has an overly robust response
11 to the toll-like receptors, and that was primarily
12 seen by her abnormal response to the measles vaccine,
13 as well as by her frequent episodes of just
14 inflammation in general.

15 I'll point out that not only did she fairly
16 rapidly develop chronic bowel disease, but she also
17 had a very unusual inflammation inflammatory, reaction
18 to what the orthopedist thought was probably a small bone
19 broken in the foot, which resulted in a massive
20 inflammatory response, which according to her mom went
21 from the foot and the ankle clear up to the knee and
22 stayed there for a long time before I think it finally
23 cleared on Remicade.

24 SPECIAL MASTER HASTINGS: Just to clarify,
25 we were back on Slide 9 the last several answers.

889A

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1 MS. CHIN-CAPLAN: That's correct, Special
2 Master.

3 BY MS. CHIN-CAPLAN:

4 Q Now, Doctor, if we move to page 11 of you
5 slides? Did you review the medical literature on the
6 immunology of autistic children?

7 A I did, and I would highly recommend the Paul
8 Ashwood summary, which actually was referenced in Dr.
9 Kinsbourne's report, called The Immune Response in
10 Autism: A New Frontier for Autism Research, because
11 he does an extremely good job of summarizing what is
12 known about the immune status of autistic children in
13 general.

14 Q Doctor, in your review of the literature can
15 you describe to the Court the types of immune
16 dysfunction that was reported in the literature?

17 A Yes. It seemed that most of the reports are
18 explaining that there is abnormalities in the response
19 of the innate immune system to various kinds of
20 stimuli and so kind of a central theme here is that
21 these children seem to have an abnormal and overly
22 reactive inflammatory response.

23 For example, Jyonouchi has taken peripheral
24 blood mononuclear cells from children with ASD, and
25 she's found that in response to a nonspecific

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1 stimulation, which is LPS, they have abnormal levels
2 of three of the chief proinflammatory cytokines, which
3 is TNFa, IL1-B and IL6.

4 Vargas was a very informative paper because
5 they looked at the actual histology of different brain
6 sections, and they found that these children actually
7 had, just to make it simple because I've detailed it
8 on this slide, but basically they had abnormal
9 activation of the dendritic cells or the dendritic-
10 like cells that are in the brain resulting in actual
11 inflammation in wide areas of the brain.

12 Q Doctor, can we just stop there for a minute?
13 You indicated elevation of dendritic cells?

14 A They're essentially the microglia and the
15 astroglia, which are the equivalent of the fixed
16 dendritic cells.

17 I'm leaving that to Dr. Kinsbourne to
18 describe further to you tomorrow if he wishes.

19 Q What are dendritic cells?

20 A Oh, sorry. Those are the main cells of the
21 innate immune system, the ones that are first when an
22 antigen comes into the body that's the first thing
23 that it sees, and they are usually compared to
24 defenders of the wall of a castle.

25 Dr. Kennedy described yesterday I thought

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1 very concisely how they react in a very instantaneous
2 fashion to try to block the invaders.

3 Q So this is your immediate response arm of
4 the immune system?

5 A Yes, and that's called the innate immune
6 system.

7 Q Thank you. Were there any other articles
8 that reported the immune abnormalities found in
9 autistic children?

10 A Yes. I had indicated the fourth one, which
11 is that Ashwood, et al., the same fellow who wrote the
12 review, demonstrated that there was elevated CD3
13 counts in the gut.

14 Now, that is part of the adaptive immune
15 system, right, which would be the innate immune system
16 kind of picks up the baton and then passes it on to
17 the adaptive immune system, which takes longer to
18 respond, but is much, much more specific.

19 That indicates that you have not only
20 activation of the innate immune system, but also the
21 adaptive immune system in that inflamed, in the gut,
22 and he was primarily looking at children who have
23 chronic bowel disease. He calls it autistic
24 enterocolitis.

25 Q So, Doctor, if you see elevated CD3s is that

891B

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1 an indication that the innate immune system has

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1 already been activated and was unable to clear an
2 infectious agent?

3 A Yes, it is.

4 Q And that the adaptive immune system was now
5 up-regulated or stimulated?

6 A It's stimulated and attempting to clear the
7 virus, yes, because, as I said before, once you have
8 the virus intracellularly intracellular the antibodies
9 no longer have an ability to go after it. You've got
10 to use the T cells.

11 Q So what you're indicating is that the
12 persistent infection allows the infection to enter a
13 cell, and at that point that first line defense can't
14 kill the infection?

15 A It can't kill it very effectively. It's
16 probably going to continue to be stimulated, but it's
17 now passed the baton onto the adaptive immune system.
18 Both of them are going to continue to be active
19 though.

20 As long as you've got this foreign body or
21 this foreign matter in your body, both of them are
22 going to continue to work.

23 Q Doctor, were there any other articles that
24 you thought significant when you evaluated the immune
25 abnormalities of autistic children?

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1 A There were a lot of other articles, and I
2 again would refer the Special Masters when they are
3 looking at the report to the Ashwood review, but I did
4 mention that the ASD patients have an aberrant other
5 aberrant innate immune responses.

6 Both of those, Both of the articles are by
7 Jyonouchi. One is specifically 2000, and then one was
8 an update in 2006.

9 Q Now, Doctor, when you were evaluating
10 Michelle's case did you determine what potential
11 causes of her immune dysfunction could be?

12 A Yes. I essentially did a differential which
13 is what you do in internal medicine, and that is that
14 you list the problems that you find and then you
15 list -- actually, a classic differential lists the
16 symptoms, and then it lists the possible diseases.

17 However, if you're trying to identify a
18 potential culprit you will list the diseases and then
19 you can list the possible causes.

20 Q And did you do that in Michelle's case?

21 A Yes, I did.

22 Q Did you come up with potential possible
23 causes?

24 A Yes. I found that both the thimerosal that
25 she had received in her prior injections before MMR

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1 and the one or two subsequent to MMR were both
2 responsible in part for her dysregulated immune
3 system.

4 Q And when you made that determination, had
5 you conducted a review of the literature on mercury
6 toxicity?

7 A Yes, I had.

8 Q Just taking one step back, Doctor, is
9 mercury contained in thimerosal?

10 A Yes, it is.

11 Q Do you know approximately how much mercury
12 is contained in thimerosal?

13 A Well, I'm going to defer to Dr. Aposhian for
14 most of the mercury stuff, but I do remember from the
15 Ashwood review they said that something like 47
16 percent of the vaccine was ethyl mercury, but I would
17 rather defer to him for that stuff.

18 Q Doctor, moving on to page 12 of your slides,
19 when you reviewed the immunotoxicity of mercury in
20 humans what did you find?

21 A First of all, I was astonished at the number
22 of papers. I mean, when I started printing out the
23 papers, I was almost papered out -- I was papered
24 out -- of my office because there's an extensive list
25 of the types of toxicities of mercury.

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1 I put some of them on this slide, but I
2 think it would be easier if I just kind of described
3 them. It ranges from these poor sea mammals that have
4 been contaminated with mercury in their water and are
5 found to have frequent infections, particularly as I
6 was describing before.

7 You look for opportunistic infections; that
8 is, we all have bacteria and virus in us, and a large
9 number of those never cause any problem. When you
10 have something wrong with your immune system, all of a
11 sudden you start getting these opportunistic
12 infections, and that's what these poor animals were
13 getting.

14 There's been a lot of in vitro studies, so,
15 for example, it inhibits something called the oxidated
16 burst in the neutrophils. Now, the neutrophils are
17 nonspecific parts of the immune system, but they're
18 very valuable because they carry out a seek and
19 destroy mission, and they gobble up a lot of invaders.

20 The way that they kill their bacteria is by
21 something called an oxidative burst, which kind of
22 blows them up. If that is impaired then you can't
23 eliminate all of these or a lot of these pathogens.

24 It also causes autoimmune diseases, which is
25 acute glomerulonephritis, and a lupus-like syndrome.

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1 It causes autoreactivity of T cells in humans. It
2 lowers your suppressor cells. There are thousands of
3 articles.

4 If I see, Can I see Slide 13 to see if I went on
5 and on about this a bit? I did. I did go on a bit
6 about this.

7 Q Are we now on page 13 of your slides?

8 A We are on 13, and essentially what I'm doing
9 is just trying to list some of the more profound
10 immune dysfunctions that we found here.

11 Can I have the next one, 14?

12 Q Fourteen?

13 A Fourteen. Right. Essentially mercury in
14 whatever its form, and again I'm going to defer to Dr.
15 Aposhian because he will go on and on about the
16 different forms of mercury, but whether it be
17 inorganic mercury, methyl mercury, ethyl mercury, it
18 had multiple roles in disturbing the immune system.

19 The immune system, I should say we always
20 talk about the immune system as warriors or an army,
21 and that's kind of what its function is. I mean, it's
22 not something like the pancreas where if you're a
23 pancreatic cell you kiss the wife and you go into work
24 every day and you kind of pump out the insulin. These
25 components of the immune system are responsible for

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1 defending against invaders on multiple fronts, and
2 that's what mercury does.

3 The difficulty that I had when I was
4 reviewing these things is dose. In many of these
5 studies you don't know what the dose was. I mean, how
6 do you know what the dose that a sea otter was exposed
7 to in the seawater?

8 Although you may know the dose in the in
9 vitro studies, in some cases they were at pretty high
10 doses because if you just want to show that in fact
11 you're getting some kind of a reaction, you know, you
12 chuck in a pretty high dose.

13 That's the reason why I, and I think the
14 whole field, have been particularly helped by two
15 recent publications, which probably are on 15 if I can
16 have that next slide.

17 Q Doctor, before we go to 15, in your review
18 of the literature did you notice that mercury affects
19 or causes the full expression of autoreactive T cells
20 in humans that's on page 14?

21 A It induces the differentiation of
22 autoreactive T cells, and it is also toxic to the
23 regulatory T cells, which we used to call suppressor T
24 cells. We're not allowed to do that anymore. We can
25 only call them T regulatory cells.

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1 The result is the same, which is that once
2 you induce an abnormal autoimmune response that the
3 body would like to stamp on very rapidly, you have
4 lost the important cell population that allows you to
5 do the stamping, or at least you have disabled it.

6 Those are the T suppressor cells.

7 Q So would it be fair to state that mercury in
8 any of the forms, methyl, ethyl, inorganic, has a
9 widespread effect on the immune system?

10 A Yes. As far as actually discussing
11 specifically the type of mercury, I certainly intend
12 to defer to Dr. Aposhian, but, yes, it has wide
13 toxicity to the immune system.

14 Q So, Doctor, just to summarize for the Court,
15 what conclusions can be drawn about how mercury
16 affects the immune system?

17 A Mercury in general produces immune
18 dysregulation. It itself is a Hapten, so in other
19 words it can form an intermediate, which then can bind
20 to self-proteins. Once it binds to self-proteins,
21 those self-proteins become immunogenic when they
22 shouldn't be.

23 It can produce autoantibodies that will
24 react against it. Those autoantibodies can produce
25 all sorts of havoc, including immune complexes and

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1 vasculitis. A vasculitis is an inflammation of the
2 vessels, which is often seen in systemic lupus
3 erythematosus that can be caused by mercury exposure.

4 I've already described the apoptotic. Let
5 me just tell you what apoptotic is.

6 Q Yes, please.

7 A Apoptotic is a programmed cell death, and
8 the deal is that if you have a cell that dies by a
9 necrosis that's an extremely inefficient and a
10 dangerous type of death because it results in
11 scarring, and the insides of the cell are just kind of
12 dumped out in a fairly unregulated fashion, as opposed
13 to apoptosis where it's programmed cell death and the
14 cell is given a death signal and the cell squishes up
15 in a very nice, neat little piece that then can be
16 easily eliminated so it doesn't lead to scarring.

17 However, it's a main way of killing cells,
18 and in this case you're killing cells that you really
19 don't want to kill, and then finally it induces the
20 differentiation of the autoreactive T cells and, as
21 I've already described, that's particularly dangerous
22 when you are also disabling the function of the
23 regulatory cells that are supposed to sit on them and
24 squash them.

25 Q Now, Doctor, you indicated earlier that

BYERS - DIRECT

1 there was an issue of the dosage that could
2 potentially cause harm.

3 When you reviewed the literature, were there
4 articles that indicated the amount of mercury that it
5 could take to affect the immune system?

6 A Finally, yes. There has been at least two
7 articles, and to try to avoid overwhelming the Court
8 I'm trying just to focus on two of them, but there
9 have been more than that. They have concluded
10 dendritic cells are the most sensitive part of the
11 immune system.

12 Q Again, Doctor, what are dendritic cells?

13 A Dendritic cells are part of the innate
14 immune system. They are the first defenders of the
15 castle, and when they're triggered they release
16 proinflammatory cytokines so that they can call in all
17 of the other cells from the immune system to start
18 defending themselves.

19 For example, if you've got your warriors
20 around the outside of the castle they're already
21 armed, but as soon as they find that there is an
22 invader coming in they will not only start to kill the
23 invader, but they'll also send signals out to pull in
24 all of their buddies.

25 That's the reason that, for example, if you

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1 have a skin test you'll often have a bump. That bump
2 is composed of a lot of cells, a lot of lymphocytes,
3 that have come from other parts of the body and are
4 trying to defend against that invader because your
5 body thinks, I guess, that the skin test that you've
6 put on is an active invader.

7 Q So this is the first response system, for
8 want of simple term?

9 A Thank you. I see, yes. It's the first
10 response system, and it's the most sensitive.

11 If you can't get proper dendritic cells it
12 impairs your ability to come up with cells of the
13 adaptive immune system as well, which are very highly
14 specific and the ones that are going to carry you
15 through long term.

16 Q So, Doctor, this first response system is
17 affected by mercury, and when the first response
18 system is affected the signaling to the other portion
19 of the immune system is affected as well?

20 A That's right.

21 SPECIAL MASTER HASTINGS: I would note again
22 we've moved to Slide 16, I believe. Go ahead.

23 BY MS. CHIN-CAPLAN:

24 Q Doctor, you indicated that there were two
25 primary articles that you considered. Could you

BYERS - DIRECT

1 kindly describe to the Court these two articles that
2 you considered?

3 A Yes. Both of them found that the dendritic
4 cells were the most sensitive part of the immune
5 system, and Goth, et al. and Agrawal, et al., and, by
6 the way, Agrawal is actually Gupta because the senior
7 person on that is Gupta.

8 Both of those studies showed that the range
9 of about 25 micrograms, 20 micrograms, of thimerosal
10 in vitro caused an abnormal IL6 secretion. One of
11 them used murine dendritic cells. One of them used
12 human dendritic cells.

13 They postulate and they tested different
14 reasons that occurred, and they come up with different
15 reasons. It's certainly not inconceivable or
16 illogical to think that both of those are active.

17 In other words, you don't have to have just
18 one mechanism by which you're inducing this, but the
19 interesting thing is that both of them are looking at
20 IL6, and both of them are finding that there is
21 abnormal levels of IL6 that is being produced.

22 Both of them point out in their discussion
23 that this is a level that is much, much lower than the
24 thimerosal that had been given prior to vaccination
25 and at a level that is above that that would be

BYERS - DIRECT

1 expected to be given in a single injection.

2 Q Just to be perfectly clear, Doctor, are you
3 saying that these two articles utilized doses that
4 were less than that seen in pediatric immunization?

5 A Yes. They were at least at the same level.

6 Q And at that level they were observing harm
7 to the immune system?

8 A They were.

9 Q The cellular portions of the immune system?

10 A Yes.

11 Q Doctor, when you looked at Michelle's
12 medical records did you evaluate the vaccines that she
13 received?

14 A Yes, I did.

15 Q And on page 17 of your presentation does
16 this indicate the amount of ethyl mercury exposure for
17 Michelle Cedillo?

18 A It does, and it also gives the age at which
19 she was exposed.

20 Q Doctor, this chart indicates thimerosal
21 exposure. Do you mean ethyl mercury exposure?

22 A I think I mean thimerosal, which is of
23 course ethyl mercury.

24 MS. CHIN-CAPLAN: Just one minute, Special
25 Master.

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1 BY MS. CHIN-CAPLAN:

2 Q We'll just move on.

3 A Go ahead.

4 Q Doctor, could you just kindly go through
5 this chart and tell the Court how much mercury
6 Michelle received?

7 A Yes. Let's specifically look at the mercury
8 that she received before the MMR because that very
9 dramatic and very colorful demonstration of an
10 aberrant immune system really was manifest at the time
11 that she received her MMR, so let's look at what
12 happened to her.

13 Let's look at her body burden before. As
14 you can see, she's gotten, let's see, 75, so she's
15 gotten more than 100. I'm going to have to calculate.
16 Let's see.

17 Q So on day one of her life, which is her
18 birth date, she received how much?

19 A 12.5 micrograms.

20 Q And at approximately one month how much did
21 she receive?

22 A Another 12.5, so now you've got 25
23 micrograms.

24 Q Right. And at two months of age?

25 A She got another 25 micrograms, so now we're

BYERS - DIRECT

1 up to 50.

2 Q Okay. And at four months of age?

3 A She's got another 25 micrograms, so we're
4 now up to 75.

5 Q And at seven months of age how much did she
6 receive?

7 A She receives a total of 37.5 micrograms, so
8 now we're over 100.

9 Q And after this date does she receive any
10 other immunizations?

11 A Yes. Three months after her MMR she
12 received at least one shot containing 25 micrograms,
13 and I'm told by you that they were unable to document
14 whether or not she truly received another 25
15 micrograms.

16 Q That's correct. Doctor, before that last
17 thimerosal-containing vaccine, did Michelle receive an
18 MMR immunization?

19 A She did. She received an MMR three mo
20 nths before the last thimerosal-containing vaccine.

21 Q Okay. Doctor, moving on to page 18 of your
22 slides. Could you tell the Court what this
23 represents?

24 A Yes. I am giving the Court the site of a
25 castle, and the reason that I'm doing that is not only

906A

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1 to underlie the importance of the innate immune system
2 and explain what it's doing, but it's also because I
3 think you'll probably see it at a lot of
4 presentations, because I'm seeing it more and more,
5 this symbol, being used at different presentations.

6 And essentially, where do dendritic cells
7 live? Well, they live at the places where you are
8 going to get invasion by pathogens. So therefore,
9 they live in the form of the Langerhans cells of the
10 skin, because you always get cuts and bruises, or ,
11 sorry, cuts

12 with potential invasion. You are going to have them
13 lining your lungs, because you are going to breath in
14 bugs. You are going to have them lining your gut
15 because you are going to be eating bugs. And so,
16 those are the main places that you are going to look
17 for.

18 You are also going to see them in the liver
19 in the form of Kupffer cells. These are all just,
20 they are dendritic cells that ultimately have become
21 fixed and so we name them different things because the
22 old-timey pathologists didn't really know where they
23 came from.

24 And so here you've got your fortress of the
25 castle and you've got all your guys who are standing

906B

BYERS - DIRECT

1 there with their spears ready to, number one, kill the
2 invading organisms, and number two, call in for their

BYERS - DIRECT

1 buddies to help them. And again, that was described,
2 I though, very nicely yesterday by Dr. Kennedy.

3 Q Is this your thinking or this accepted
4 within your field right now?

5 A It's accepted in the field. That's why I
6 mention that I am seeing this analogy more and more at
7 meetings. It seems like everybody comes up with a new
8 castle.

9 Q Now, Doctor, as we move on to page 19 of
10 your slides, what does this represent?

11 A These slides, actually came from a lecture
12 series that's given by Dr. Abbas. There is a meeting
13 called FOCIS, Federation of Clinical Immunology
14 Societies, and he usually gives this lecture right
15 before the society, and he always has nice pictures.

16 So this describes in the first panel, you've
17 got a bug that's adhering to the epithelium. Now, of
18 course, that's not relative in the case of the measles
19 vaccination because it's going to be injected, so
20 let's look to the next panel. It's injected, and this
21 little fellow here who has a lot of tendrils
22 represents the dendritic cells. And the red dots are
23 going to represent the measles vaccine virus entering
24 the cell.

25 It's going to be bound to and phagocytized

908A

BYERS - DIRECT

1 by the dendritic cell. The dendritic cell then is
2 going to come loose and it's going to go into the
3 lymph node. And at the lymph node, it is now going to
4 try to pass the baton on to the adaptive immune
5 system, and I mentioned in the legend for the slide
6 the fact that this is one of the places where
7 thimerosal has been shown to be toxic.

8 Q And does this process continue on, Doctor?

9 A It does, and I've got several more pretty
10 slides.

11 Q So if we go to page 20?

12 A So this shows that the dendritic cell has
13 moved to the lymph node, and then it's presenting the
14 processed antigen to now the adaptive immune system.
15 Now it's trying to pass its baton on to those T cells.
16 Remember I said that they found CD3s in the gut of
17 inflamed bowels of children who have autistic
18 enterocolitis? Well, that's what those things are.
19 And the thimerosal, or actually, in this case, I think
20 it's mercury in one of its forms or another, has been
21 shown to produce apoptosis of T cells.

22 Q And Doctor, on page 21, what do these
23 pictures represent?

24 A I just put in some pretty pictures of
25 dendritic cells, and the one I like the best is on the

BYERS - DIRECT

1 right-hand panel on the middle portion, which is
2 showing you the dendritic cells as they exist with all
3 of their folds. You can imagine that you want to
4 maximize the surface area of a dendritic cell because
5 what it needs to do is capture antigen, and one of the
6 places it's going to capture the antigen is on its
7 surface.

8 Q Thank you. Doctor, I just want to move back
9 to page 17 of your presentation, and I am going to
10 refer you to Respondent's Exhibit No. ii. And I am
11 going to ask you to look at Table C on ii. So Doctor,
12 on Table C of ii, as compared to your chart on page --

13 SPECIAL MASTER HASTINGS: Ms. Chin-Caplan,
14 can you wait just a minute for us to get it? Is that
15 the IOM report?

16 MS. CHIN-CAPLAN: Yes. Appendix C of the
17 IOM report, thimerosal containing vaccines. We are
18 looking at Table C-1. There is a slight correction
19 here. It is my error.

20 SPECIAL MASTER HASTINGS: Just one minute.
21 Is there a page number?

22 MS. CHIN-CAPLAN: It is page 17.

23 SPECIAL MASTER HASTINGS: Okay, I'm sorry.

24 SPECIAL MASTER VOWELL: It's not slide ii?

25 MS. CHIN-CAPLAN: No, it's slide 17, and I

BYERS - DIRECT

1 have pulled out Respondent's Exhibit No. ii.

2 SPECIAL MASTER HASTINGS: Right. I am
3 asking for a page number of Exhibit No. ii.

4 MS. CHIN-CAPLAN: Exhibit No. ii, it's just
5 Table C-1 at the back, and there doesn't seem to be a
6 page number.

7 SPECIAL MASTER HASTINGS: All right. Page
8 127, I'm told.

9 MS. CHIN-CAPLAN: Right, and I just wanted
10 to correct an error that was made by me.

11 BY MS. CHIN-CAPLAN:

12 Q Doctor, when we look at your chart that you
13 provided on Michelle Cedillo's immunizations, it
14 indicates thimerosal exposure for Michelle Cedillo, is
15 that right?

16 A That's right.

17 Q And on the far right-hand column it says,
18 'thimerosal amount.' Is that correct?

19 A Yes, it does.

20 Q And Doctor, when you compare it to Table C-1
21 of Respondent's Exhibit No. ii, would the proper term
22 be 'mercury,' as opposed to 'thimerosal'?

23 A Well, let me see. They are saying 'percent
24 thimerosal concentration' and then they are saying
25 'mercury in micrograms.'

BYERS - DIRECT

1 Q And Doctor, when we referred to the
2 micrograms in your chart on page 17, does that refer
3 to mercury?

4 A I thought that that referred -- I'm sorry.
5 At the break, maybe I will check, because I was given
6 the information that that was thimerosal.

7 Q Correct, but according to the IOM chart?

8 A According to the IOM chart, yes, but you are
9 looking at DPT, which is 25 micrograms, right? Okay,
10 so here is your Hepatitis B, and so it is listing 12.5
11 micrograms, and its title says 'mercury' instead of
12 'thimerosal.'

13 Q Thank you, Doctor. So, moving on, Doctor --

14 SPECIAL MASTER HASTINGS: So let me make
15 sure that I understand what the point of that
16 discussion was. On slide 17, Dr. Byers, you have in
17 your right-hand category, it says 'thimerosal amount.'

18 THE WITNESS: That's right.

19 SPECIAL MASTER HASTINGS: And after looking
20 at the IOM table that you were just talking about, are
21 you saying that actually -- let's take the first
22 entry. On August 31, '94, Michelle got a Hepatitis B
23 vaccination. You are saying that she actually got
24 12.5 micrograms of mercury as part of that
25 vaccination, rather than 12.5 micrograms of

BYERS - DIRECT

1 thimerosal?

2 THE WITNESS: That's apparently what the IOM
3 is saying, and I think what I would like to do is to
4 defer to Dr. Aposhian for the actual chemical
5 structure of the compound, because I have not read
6 this paper for quite a while.

7 SPECIAL MASTER HASTINGS: Okay, fine.

8 Go ahead, Ms. Chin-Caplan.

9 MS. CHIN-CAPLAN: Thank you.

10 BY MS. CHIN-CAPLAN:

11 Q Dr. Byers, moving on with your testimony
12 here, we are now on page 22. Would you tell us what
13 this slide represents?

14 A Yes, this is just a continuation of the
15 little slide presentation I put together, indicating
16 the fact that mercury is involved at multiple places
17 in the immune system. This is showing, again, the
18 innate immune system with a macrophage dendritic cell
19 containing a phagocytosed microbe producing both
20 cytokine production and beginning to impact on the
21 adaptive immune system.

22 Q So this is a depiction of your immediate
23 response system?

24 A Yes, it is.

25 Q And Doctor, will you move on to page 23?

BYERS - DIRECT

1 A This slide was actually also utilized by Dr.
2 Kennedy yesterday. It points out though that the
3 ability to clear invading microbes is impeded by
4 damaged macrophages or dendritic cells, as would have
5 been damaged by mercury.

6 Q And Doctor, what does page 24 represent?

7 A That represents the regulatory cells.
8 Remember, I was saying earlier that mercury actually
9 stimulates autoreactive T cells, but normally those
10 autoreactive T cells would be squashed by the
11 regulatory T cells. However, mercury also damages the
12 regulatory T cells.

13 Q So are you describing damage to all aspects
14 of the immune system?

15 A Yes, and probably by, again, different
16 chemical parts, different chemical presentations of
17 mercury.

18 Q And Doctor, if you had to summarize for the
19 Court the effect that mercury has on the immune
20 system, what would you say?

21 A I would say that the most important thing
22 that we should now be concerned with is the effect of
23 thimerosal on the ability of dendritic cells to behave
24 in a normal fashion so that they can clear viruses.

25 Q And more specifically, on page 25 of your

BYERS - DIRECT

1 presentation, do you detail how it affects certain
2 elements of the immune system?

3 A Yes, it impacts on the secretion of LPS, of
4 the different proinflammatory cytokines, and the
5 reason that is important is it means that it is going
6 to impair the ability of the dendritic cells to
7 stimulate the adaptive immune system, which is, long-
8 term, the way that you are going to have to get rid of
9 and clear the virus. It is also inducing elevated
10 TH2s, which are going then to inhibit the very cells
11 that are supposed to be able to do this in the
12 adaptive immune system.

13 It's going to alter the IL6 secretion. That
14 was shown by the Goth et al. paper. And it's also
15 going to produce apoptosis in T cells. This is not
16 one of the two key papers that I pulled out, but it
17 basically is saying that it is producing apoptosis by
18 oxidative stress and depletion of the glutathione
19 within the cells, which I think Agrawal also showed.

20 Q And Doctor, as a result of this ability for
21 mercury to cause immune dysfunction, what could happen
22 to an individual?

23 A The individual could have the ability to
24 normally clear viruses and bacteria from their system
25 impaired, which would then result in a chronic low-

BYERS - DIRECT

1 grade inflammatory response that was dysregulated.

2 Q And what happens when a chronic low-grade
3 inflammatory response occurs?

4 A It produces autoimmune disease. In fact,
5 the new name for autoimmune disease is, let's see,
6 immune- mediated inflammatory disorder, to underlie
7 the fact that inflammation is a key hallmark of many
8 of these autoimmune diseases, and many of them are
9 initiated by dysregulation of the innate immune
10 system.

11 Q And Doctor, what causes the inflammation?

12 A The inflammation is caused by cytokines that
13 are released. And the cytokines are released from
14 both the innate and the adaptive immune system. They
15 just keep churning around because they can't get rid
16 of the invader.

17 Q Doctor, in your opinion, if there is a
18 dysfunctional immune system when a child is
19 administered an MMR immunization, will that affect the
20 ability of the body to clear the measles virus?

21 A Yes, it can.

22 Q And Doctor, in your opinion, would that be a
23 substantial contributing factor to the persistence of
24 the measles virus?

25 A Yes, it would.

BYERS - DIRECT

1 Q Now, Doctor, if we move on to page 27, what
2 is this?

3 A I think you need to flip back to 26.

4 Q Okay.

5 A So, because I think people throw around the
6 idea of cytokines, and cytokines are just proteins,
7 and they are proteins that are produced both by the
8 innate and by the adaptive immune system, and they can
9 be toxic to multiple organs, and they are released
10 immediately on interaction with the dendritic cells.
11 Now you can go to the next slide.

12 Q Thank you.

13 A Well, it's a pretty slide.

14 Q Very pretty. Could you kindly explain to
15 the Court what this slide represents?

16 A Yes. It represents a dendritic cell. The
17 little 'pDC' at the upper right stands for plasma
18 dendritic cell. And it is mapping out the path by
19 which activation of the pathogen results in secretion
20 of proinflammatory cytokines. And the thing to know
21 about this is that there are only about 10 different
22 specificities when you are kind of entering in, and
23 I've given you the one that binds and is stimulated by
24 single-stranded RNA, which would be the measles virus.
25 And then you have these complicated pathways, and

BYERS - DIRECT

1 there is at least two of them, but the main thing is
2 that they all result in the secretion of pretty much
3 the same thing, which is the proinflammatory
4 cytokines.

5 So you've got a bunch of different things
6 coming at you. The immune system, the innate immune
7 system is segregating them into 10 different broad
8 categories, and then those 10 different broad
9 categories are activating the -- they are called toll-
10 like receptors in the innate immune system, and the
11 end result of it is pretty much similar; it is the
12 secretion of proinflammatory cytokines, which is then
13 ultimately going to recruit other warriors to help you
14 eliminate your virus.

15 Q So Doctor, to be perfectly clear here, if a
16 child has an immune system that was affected by
17 mercury, and then received an immunization with
18 measles-containing virus, would that child have
19 difficulty clearing that virus?

20 A The child could. Now, obviously, everybody
21 doesn't, because lots of people get mercury-containing
22 vaccines and as far as we know, they clear them fine.

23 Q And if that child had difficulty clearing
24 the virus, what would you expect to see in that
25 individual?

BYERS - DIRECT

1 A You would see persistent measles virus which
2 would continue to produce an inflammatory response and
3 ultimately an autoimmune condition, which could be
4 specific, it could be nonspecific, because the body is
5 still trying to get rid of the virus.

6 Q When you have an inflammatory response, are
7 there certain elements of the immune system that
8 respond?

9 A It's both. It's both the innate immune
10 system and the adaptive immune system. They are both
11 secreting proinflammatory cytokines.

12 Q Okay, and Doctor, are those proinflammatory
13 cytokines restricted to a particular spot in the body?

14 A No. To continue your analogy, they are
15 going to be primarily focused in the places where the
16 virus likes to live, and as Dr. Kennedy described
17 yesterday, two of those places are the gut and the
18 brain. So it's not surprising that we have found
19 measles virus in the inflamed gut.

20 Q So Doctor, if there is a localized
21 infection, inflammatory response, would that
22 inflammatory response move systemically?

23 A Yes. The most well-known pathology of that,
24 of a systemic, chronic infection is, not only do you
25 have inflammation and dysfunction of the organ where

BYERS - DIRECT

1 the battle is going on, but you also have systemic
2 release of cytokines, and those very famously go to
3 the brain and cause brain pathology. One of them,
4 TNF α , destroys or affects the blood-brain barrier, and
5 that really allows a lot of the cytokines to move into
6 the brain.

7 So that means a systemic inflammation can
8 affect multiple parts of the body, including the
9 brain.

10 And if it affects the blood-brain barrier,
11 what happens to the blood-brain barrier?

12 A For cytokines particularly, they can more
13 easily cross. Additionally, however, you have
14 activated lymphocytes that have access to the brain,
15 and a neuroimmunologist would tell you that for an
16 activated lymphocyte, there really is no blood-brain
17 barrier.

18 Q So that means that the cytokines are able to
19 freely move across the blood-brain barrier?

20 A Well, they can move more freely than other
21 molecules would. And from slide 29, this can include
22 IL1, IL2, and TNF α . And they can be passively
23 transported or can be actively transported, and I
24 think when I made that slide, when I said actively
25 transported, I meant that they are coming from

BYERS - DIRECT

1 activated lymphocytes, which, as I say, can easily
2 wiggle through the blood-brain barrier.

3 Q And Doctor, what happens when cytokines
4 affect the CNS?

5 A There is a lot of CNS pathology. IL1á
6 induces local inflammation in the brain, and I have
7 given --

8 SPECIAL MASTER HASTINGS: Now you are
9 reading from slide 30?

10 THE WITNESS: Slide 30, yes. IL1á induces
11 local inflammation in the brain, it induces GABA
12 receptor function in the neurons. What I want you to
13 take away from this is that it just, it produces a lot
14 of CNS pathology. One of the probably the most
15 important ones here is nitric oxide, which is produced
16 by macrophages and can actually directly biochemically
17 affect the function of the electrical transmission of
18 the neurons, and that, among other, has been heavily
19 implicated in the flares that you get with multiple
20 sclerosis.

21 Q And Doctor, are cytokines also administered
22 as a drug?

23 A Oh, yes. We learned to produce cytokines in
24 a commercial formulation some years ago, and as a
25 matter of fact, you might be amused to know that one

BYERS - DIRECT

1 of the first ones to be administered was TNF α . TNF α
2 used to be called the old cachectin, which was the
3 reason that people lost weight when they developed
4 various cancers, particularly ovarian cancer, and it
5 also can produce apoptosis.

6 So some bright sparks decided that they
7 would purify TNF α and give it to see if they can cure
8 cancer, and the effects were absolutely disastrous, so
9 therefore, TNF α has never been marketed. However,
10 some of the other cytokines are standardly marketed,
11 and they all have black box warnings.

12 Q What does that mean?

13 SPECIAL MASTER HASTINGS: Now we are slide
14 31, correct?

15 MS. CHIN-CAPLAN: That's correct, Special
16 Master.

17 THE WITNESS: I'm not being very good about
18 giving you the -- sorry about the page number. I'll
19 try to be better.

20 A black box warning is, essentially, one
21 where the FDA is so concerned about it that they black
22 box it so that the first thing you see when you open
23 your PDR is this black box. It's the main thing that
24 the doctors need to worry about. So for example, I am
25 giving you IL2. IL2 is one of the main cytokines

921B

BYERS - DIRECT

1 released by T cells,

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1 and it's a cause of fever. And if I remember rightly,
2 it has been used I think to treat renal cell carcinoma
3 some time ago.

4 And the black box warning says it must be
5 withheld in patients with lethargy or somnolence, in
6 other words, people who are drowsy and not really very
7 with it mentally, because if you don't, it'll result
8 in a coma, which is obviously a very marked CNS
9 effect. Additionally, they say, change in mental
10 status, speech difficulties, cortical blindness, limb
11 or gait ataxia, hallucinations, agitation, obtundation
12 and coma may result, and it may cause seizures.

13 I gave you this slide to demonstrate how a
14 peripheral inflammation or peripheral injection of
15 these cytokines result in CNS dysfunction.

16 Q And are there other cytokines that can be
17 administered?

18 A Yes, I pulled out interferon- α --

19 Q Page 32.

20 A -- which is on page 32, which is also
21 secreted by various members of both the adaptive and
22 the innate immune system. It causes or aggravates
23 fatal or a life-threatening neuropsychiatric
24 autoimmune ischemic and infectious disorders. It
25 produces depression, psychosis, nervousness, anxiety,

BYERS - DIRECT

1 emotional lability and agitation, and 26% of the
2 patients reported mild to moderate depression, and
3 that was the most common reason for stopping the drug.

4 Q And Doctor, is there another cytokine?

5 A There's a bunch of other cytokines. Here's
6 on page 33, IFN- α , which increases depression and
7 suicide, seizures, and the best demonstration that
8 these symptoms are caused by the administration of the
9 cytokine is that the CNS problems resolve when the
10 treatment is stopped.

11 Q So Doctor, would it be fair to state that
12 there is a correlation between cytokines that normally
13 occur in the body and those that are administered
14 peripherally?

15 A Yes.

16 Q Would they have the same effect?

17 A One would expect them to have the same
18 effect, yes.

19 Q Okay, and Doctor, do cytokines have an
20 effect on the neurological system?

21 A Yes, I've already described that they have
22 an effect on the neurologic system, but on slide 34, I
23 wanted to give the reason, and the reason is that
24 there is a very close interaction between the immune
25 system and the neurologic system. The immune system

BYERS - DIRECT

1 produces cytokines, which are active on the neurologic
2 system, and the reverse happens, which is that the
3 neurologic system produces cytokines that in turn
4 interact with the immune system.

5 And I would once again refer you to the Paul
6 Ashwood review, because he has a very nice description
7 of the interaction between those, so that when you
8 guys are getting ready to write your opinion up, you
9 might use that as a reference.

10 Q So they cross-talk? They talk to each
11 other?

12 A Yes, they chit chat. So the neurons have
13 the cytokine receptors from the immune system, and
14 IL1, IL6 and TNF α induce the production of nerve
15 growth factors. TNF α and IFN- interact with the
16 neuronal adhesion molecule responsible for neuronal
17 development, synaptogenesis and regeneration. All of
18 those things I am going to leave to Dr. Kinsbourne to
19 interpret tomorrow, but I felt it was my
20 responsibility to describe what these interactions
21 are.

22 Now I am on 35. IL2, look at the third
23 bullet. Again, we've got IL2 receptors in one of the
24 important cell layers of the hippocampus. We've got
25 IL2 contributing to regulation of neurotransmission in

BYERS - DIRECT

1 that same area. It can provoke schizophrenia-like
2 symptoms in humans as one of its side effects.

3 Q When you say neurotransmission, are you
4 talking about the way in which they talk, is that it?

5 A I'm talking about the way that neurons talk
6 to each other.

7 Q So the signal that they send?

8 A Yes.

9 Q And IL2, which is a cytokine, affects the
10 way the signal is sent from the neurons to the immune
11 system, and vice versa?

12 A Yes, it can do that. Nitric oxide is better
13 known to do that.

14 Q And are there other proinflammatory
15 cytokines that affect the neurotransmitters?

16 A Yes. I've described the disastrous clinical
17 trials that we did with TNF α , so we don't have a black
18 box in the PDR to look for that. However, we do have
19 other data indicating that TNF α will, for example, its
20 chronic release will inactivate catecholamine
21 secretion. It can play an important role in
22 demyelination in multiple sclerosis, and in my review
23 of the literature, it was the main culprit in
24 impairing the blood-brain barrier.

25 Q And Doctor, when we move on to page 37, is

BYERS - DIRECT

1 IL6 a proinflammatory cytokine as well?

2 A It is. IL6 is actually turning out to be
3 the hot topic of the month because we have now just
4 developed a monoclonal antibody against IL6 which is
5 proving to be highly effective against a variety of
6 autoimmune diseases. It is, again, synthesized by
7 mononuclear cells, by endothelial cells of the
8 vessels, and also by fibroblasts, and there are so-
9 called stress receptors for IL6 in the hippocampus,
10 and I put that in because I think Dr. Kinsbourne might
11 have an opinion as to the implications of that,
12 because it's certainly important in cognitive
13 function, and it's abnormal in autistic children.

14 It's also involved in other neuropathology
15 such as Alzheimer's, because one paper said that there
16 was elevated levels of IL6 found in plaques of
17 Alzheimer's patients.

18 Q Now, in bullet number 2, you say 'stress
19 receptors.' What are stress receptors?

20 A Stress receptors are simply receptors that
21 will dysregulate and cause abnormal function of the
22 neurons, and again, I'm going to leave it to Dr.
23 Kinsbourne to decide whether he would like to comment
24 further on that.

25 Q And the hippocampal dentate gyrus, is that a

BYERS - DIRECT

1 portion of the brain that you are referring to?

2 A Yes, it is.

3 Q Doctor, moving on to page 38, you have
4 indicated that cytokines can cause inflammation in the
5 brain. Is there a specific area within the brain that
6 the inflammation occurs?

7 A Yes. This is a quote from the abstract
8 actually of a recent paper called 'Effective
9 Inflammation on the Microglia of the Brain,' and in
10 this case, it was an animal study where they injected
11 LPS. And remember, LPS is one of the main and more
12 powerful stimulants of the toll-like receptors, and so
13 what they are doing is they are administering LPS
14 systemically and then they are seeing if there is an
15 effect on the brain.

16 And they did find that there was a rapid
17 increase in TNF α in the brain, and the interesting
18 thing is that this remained elevated for 10 months
19 after injection, which was a marked change in the
20 pharmacokinetics of the TNF α in the periphery where in
21 serum it was dying down by about nine hours and in the
22 liver, it was dying down by about a week. And the
23 injection of this activated the microglia and it
24 increased the expression of multiple brain
25 proinflammatory factors.

BYERS - DIRECT

1 Again, this is the same theme that I've
2 given you, probably, what you think is too many
3 slides, to basically say that these cytokines, when
4 administered systemically, have an effect on the
5 central nervous system.

6 Q Doctor, the TNF α , is that it?

7 A Yes.

8 Q That's a proinflammatory cytokine?

9 A Yes, that's the proinflammatory cytokine
10 that Enbrel, which I helped develop, blocks, and it's
11 also the one that Remicade, which is the one that
12 Michelle Cedillo responded to, Remicade also blocks
13 TNF α .

14 Q That remained elevated for 10 months in the
15 brain?

16 A That's what they report.

17 Q And at the same time, by the end of nine
18 hours, the level had decreased in the blood?

19 A That's what they reported.

20 Q And the levels had decreased by one week in
21 the liver.

22 A That's right.

23 Q So the message here could be that even
24 though you have normal serum levels of proinflammatory
25 cytokines, you could still have inflammation going on

BYERS - DIRECT

1 in the brain?

2 A That is certainly correct, and it's correct
3 for other parts of the body as well. For example,
4 with rheumatoid arthritis, you can have perfectly
5 normal levels of TNF α in the periphery, and yet have
6 very elevated levels of TNF α in the joints.

7 Q So the peripheral, the blood work that is
8 drawn, is not an accurate reflection of what is going
9 on in the brain necessarily?

10 A It is more accurate to actually take it from
11 the brain, and it's certainly more accurate to take it
12 from the synovial fluid if you have rheumatoid
13 arthritis.

14 Q Doctor, could you kindly summarize for the
15 Court the facts that we have referred to here?

16 A Yes. She suffers from immune dysregulation.
17 This is manifest clinically by the abnormal febrile
18 reaction that she had to her MMR vaccination, followed
19 by the inflammatory gut reaction, which was apparent
20 within two weeks after the immunization. According to
21 her mom, as the fever started to drop, then they were
22 actually able to start looking at the first symptoms
23 of the chronic bowel inflammation, and the reason that
24 the body had difficulty in eliminating the thimerosal,
25 or the mercury, from the body is because the

930A

BYERS - DIRECT

1 thimerosal had damaged the ability of the immune
2 system to clear the virus, allowing viral persistence.
3 And for this, I am relying upon, in part, Dr.
4 Aposhian's report about the abnormal mercury efflux
5 from autistic patients, as well as the fact that he
6 finds that there is a mercury build-up in the immune
7 system.

8 Q Doctor, based on your education, training
9 and experience, and your review of the medical
10 literature regarding both thimerosal and measles, do
11 you have an opinion whether the mercury that was
12 contained in Michelle Cedillo's vaccines substantially
13 affected her immune system?

14 A Yes, I find that the mercury that was given
15 to her in her vaccines leading up to MMR lead to a
16 difficulty in her immune system in eliminating the
17 measles virus from the body.

18 Q And Doctor, what is the basis of your
19 opinion that her immune system was substantially
20 affected by the mercury that was contained in her
21 vaccines?

22 A The fact that there has been substantial
23 literature indicating that mercury in general damages
24 multiple parts of the immune system, and that the
25 doses of mercury which she was given is capable of

930B

BYERS - DIRECT

1 damaging at least the dendritic cells.

BYERS - DIRECT

1 Q And Doctor, do you have an opinion whether
2 the virus that was found in Michelle's gut tissue from
3 Unigenetics was persisting approximately four years
4 after her immunization with MMR?

5 A Yes, I have, and I am relying upon the
6 testimony of the two experts who testified yesterday,
7 that in fact that is correct.

8 Q Doctor, do you have an opinion whether
9 persistent measles virus was the result of her
10 dysregulated immune system?

11 A Yes, I do. I find that the dysregulated
12 immune system would have impaired the ability of her
13 body to clear the measles vaccine in a normal fashion.

14 Q And what is the basis for that opinion?

15 A The basis for that opinion is that it is
16 there, and that we have demonstrated clinically and
17 from laboratory tests that she does and did have a
18 dysregulated immune system.

19 Q And Doctor, do you have an opinion whether
20 persistent measles virus can cause CNS dysfunction?

21 A My opinion is that persistent measles virus
22 which results in inflammation, particularly bowel
23 inflammation, can cause CNS dysfunction, and I will
24 point out that bowel inflammation is absolutely
25 notorious for causing CNS dysfunction ranging from

BYERS - DIRECT

1 Crohn's disease to ulcerative colitis to certainly
2 celiac disease.

3 Q And Doctor, do you believe that more
4 probably than not, that the mercury contained in
5 Michelle's vaccines substantially harmed her immune
6 system?

7 A Yes, I do.

8 Q And do you believe more probably than not
9 that the measles virus in her gut was a persistent
10 virus?

11 A Yes, I do.

12 Q Do you have an opinion whether or not that
13 persistent measles virus was a result of her
14 dysregulated immune system?

15 A Yes, I do.

16 Q And do you have an opinion, more probably
17 than not, whether persistence of that measles virus
18 caused CNS dysfunction?

19 A Yes, it caused inflammation, and
20 inflammation is certainly associated with CNS
21 dysfunction in a wide variety of experimental models
22 as well as humans.

23 MS. CHIN-CAPLAN: Thank you, Doctor.

24 SPECIAL MASTER HASTINGS: Why don't we take
25 our morning break at this point? I have 10:44. We'll

BYERS - DIRECT

1 start back promptly at 11:00 a.m.

2 (Whereupon, a short recess was taken.)

3 SPECIAL MASTER HASTINGS: For those at home,
4 we are ready to go back on the record.

5 Ms. Chin-Caplan, have we lost our witness?
6 While we are searching for the witness, let me remind
7 all counsel, especially those at the counsel tables,
8 anywhere where you have a microphone, on this phone
9 conference system, we start at 8:35 or sometime in the
10 morning, turn it on, and these microphones are live
11 all day. They are live during the breaks, including
12 the ones at your tables, the ones up here on the
13 bench, so that you can act accordingly. I just wanted
14 to make you aware of this. For technical reasons, the
15 phone conference stays on all day until we adjourn for
16 the rest of the day, so be so advised.

17 Are there any matters that we need to talk
18 about today, counsel?

19 MR. MATANOSKI: Not from the government,
20 sir.

21 MS. CHIN-CAPLAN: Special Master, I am still
22 intending to call Dr. Kinsbourne tomorrow, and even if
23 we finished early today, I would like to adjourn early
24 and start first thing in the morning. And I expect to
25 be completed by tomorrow.

BYERS - CROSS

1 SPECIAL MASTER HASTINGS: I understand.

2 All right, I see we have a sighting of Dr.
3 Byers, and she is proceeding towards the witness stand
4 now.

5 Dr. Byers, you are of course still under
6 oath, so with that, Mr. Matanoski, do you have any
7 questions for this witness?

8 MR. MATANOSKI: Yes, sir. Thank you

9 SPECIAL MASTER HASTINGS: Please go ahead.

10 CROSS-EXAMINATION

11 BY MR. MATANOSKI:

12 Q Good morning, Dr. Byers.

13 A Good morning.

14 Q I know we were just looking for you to sit
15 there at the witness stand. I hope that it wasn't
16 because I was about to speak to you that we couldn't
17 find you.

18 A Well, there was certainly a moment of terror
19 there.

20 (Laughter.)

21 BY MR. MATANOSKI:

22 Q Doctor, you were here during testimony
23 yesterday, correct?

24 A Yes, I was.

25 Q And you got to hear Dr. Kennedy speak?

BYERS - CROSS

1 A Yes, I did.

2 Q Anything that he said yesterday that you
3 disagree with?

4 A As I sit here right now, I cannot remember
5 anything that he said that I disagreed with.

6 Q Could you lay out for me step by step what
7 your theory of causation is in this case?

8 A Yes. My opinion as to causation is the
9 child had a -- one has to say that simply because one
10 is autistic, one has a compromised --

11 Q Actually, maybe if you would just go through
12 it step by step, I'm sorry.

13 A I am doing that. One has to say that
14 genetically, an autistic child has an immune system
15 that is innately prone to being damaged, and it
16 appears that the main place that it is going to be
17 damaged is by an aberrant reaction to environmental
18 stimuli. And in the case of Michelle Cedillo, she was
19 partially compromised by the thimerosal that she
20 received, producing a burden of mercury in her body,
21 which resided in the cells of the immune system, or
22 the organs of the immune system, and for all of that,
23 I am relying upon Dr. Aposhian.

24 And however, she escaped unscathed from any
25 symptoms until she received her MMR vaccination. When

BYERS - CROSS

1 she received the MMR, the time at which she developed
2 a fever was not unusual. However, the extent of the
3 fever was very unusual. Mother reports that it went
4 up to 106, and Mom became very concerned about it.
5 From the records, it appears to have waxed and waned
6 slightly over the next two weeks, and at the end of
7 that time, the continued fever was confirmed at a
8 clinic visit, at which time I think it was 100.6. So
9 it's still a significant fever.

10 As it resolved, she then became symptomatic
11 with inflammatory bowel disease. She was, shortly
12 after that, let's see, probably -- I don't have the --
13 I think at age 3, or she was vaccinated at age 1 and a
14 half. It was a pretty short time after that that she
15 actually had the immune evaluation by Dr. Gupta and
16 was found to have laboratory abnormalities, although
17 not the ones he had expected.

18 She then was found to have inflammatory
19 bowel disease, and that has basically continued
20 throughout her life, and she was then later
21 demonstrated to have persistent measles virus in the
22 gut. And so it is my opinion that the clearance of
23 the measles virus was impaired by the body burden of
24 mercury. However, the trigger for the autoimmune
25 reactions which have now plagued her for the rest of

BYERS - CROSS

1 her life were triggered by the MMR, which resided for
2 an unusually long period in her body and could not be
3 cleared.

4 Q So that's your opinion?

5 A Yes.

6 Q Starting with the first premise of that, so
7 genetically, there has to be a genetic component to
8 this, that someone is genetically susceptible to
9 immune dysregulation as part of your theory?

10 A The literature would indicate that. The
11 literature would indicate that not only do you have
12 genetic abnormalities that are found in a substantial
13 number of these children, but there is an awful lot of
14 studies on their immune system indicating that the
15 immune system is abnormal.

16 Q Okay, so it's a genetic abnormality to make
17 the immune system susceptible to being abnormal, or to
18 make the immune system abnormal?

19 A That is at least one of the results of the
20 genetic abnormality, and the only one that I am
21 responsible for.

22 Q And that's part of your theory of causation
23 here?

24 A That's part of my opinion, yes.

25 Q And you also mention that there was receipt

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1 of thimerosal-containing vaccines. Was that a
2 necessary component of your theory?

3 A In Michelle Cedillo, it's got to be. It
4 does not necessarily have to be a component in other
5 autistic children, because I believe each one must be
6 evaluated separately.

7 Q Okay, so you don't need thimerosal-
8 containing vaccines, then, to reach an opinion that an
9 autistic child who received MMR, I suppose, had it
10 because of the MMR vaccine, had their autism because
11 of that?

12 A As just a broad statement, I would not
13 refuse to evaluate an autistic child who had received
14 MMR but had not received thimerosal-containing
15 vaccines, if you could find them.

16 Q I'm not talking about whether you would
17 refuse to treat them.

18 A No, I wasn't either.

19 Q I'm trying to figure out -- well, that's how
20 you framed your answer. I'm trying to figure out what
21 your theory is and how it will apply in a broad
22 variety of situations so I can know when you would
23 conclude that the case before you was a case of autism
24 prompted by vaccination. Now, we got to the second
25 step, thimerosal-containing vaccines, and though

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1 that's true in this case that the child received
2 thimerosal-containing vaccines, that's not necessary
3 for your opinion. Is that right?

4 A No, that is incorrect. My opinion is case-
5 specific, and my opinion is based on the fact that the
6 evaluation of Michelle Cedillo includes the fact that
7 she received substantial doses of thimerosal and then
8 received measles virus which was found to be retained
9 in her gut.

10 Q So if I were to give you a case and I took
11 out the thimerosal, would your opinion be the same?
12 Every single fact of that case is the same as in this
13 case, except there is no receipt of thimerosal-
14 containing vaccines proven.

15 A I'm sorry, I cannot give you that broad an
16 answer. The best answer I can tell you is that if
17 there was an autistic child who had demonstrated
18 persistent measles and had not received thimerosal, I
19 would certainly think that it is worthwhile evaluating
20 that child clinically again. People are just not
21 cookie cutters.

22 Q I need to find out whether your opinion, a
23 sine qua non for your opinion is receipt of
24 thimerosal-containing vaccines. So you assume the
25 facts are exactly the same as this case, and you take

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1 out, the only fact that's different is that you do not
2 have evidence of receipt of thimerosal-containing
3 vaccines. Is your opinion the same?

4 A I'm sorry, I can't say that. I would have
5 to evaluate each individual child separately.

6 Q I'm giving you the facts. This is a case
7 for you to evaluate. The facts are exactly the ones
8 you are familiar with in this case, except you can
9 take out the page of your slide presentation with
10 thimerosal-containing vaccines in it, and assume
11 that's the fact pattern before you. Now you are asked
12 to evaluate that case. What is your opinion?

13 A I would say I have to evaluate the case
14 individually. I would not refuse to consider the
15 contribution of MMR in the absence of thimerosal.

16 Q Do you have an opinion in that case as to
17 whether or not the child's MMR vaccination would cause
18 their subsequent ASD?

19 A I would be willing to evaluate the child to
20 see if the MMR vaccination, what the manifestations of
21 the MMR vaccination might be.

22 Q Doctor, I am giving you the exact fact
23 pattern. I am asking you to evaluate it. You said
24 you are willing to do that. Please do it.

25 A I'm sorry. I think you just, you can't do

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1 that. There is going to be differences. There is
2 going to be differences --

3 Q There is no differences, Doctor. It is this
4 fact pattern, except there is no thimerosal-containing
5 vaccines. Can you render an opinion or not?

6 A I could not render an opinion without
7 individually looking at the report.

8 Q I am telling you what the facts are, Doctor.
9 You have already been through, you have a clinical
10 history in your slide presentation.

11 A I'm not willing to -- go ahead.

12 MS. CHIN-CAPLAN: Is Dr. Byers to assume
13 that the child has a dysregulated immune system?

14 MR. MATANOSKI: It's every fact of this
15 case, except the receipt of thimerosal-containing
16 vaccine.

17 THE WITNESS: The child --

18 BY MR. MATANOSKI:

19 Q These judges are going to have to decide
20 cases, and this is supposed to be a general causation
21 as well as a specific causation. Now, you have before
22 you a fact pattern that you can use to render some
23 opinions. I am asking you to change one fact, and
24 that is receipt of the thimerosal-containing vaccines.
25 The purpose of that question is to find out whether or

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1 not receipt of thimerosal-containing vaccines is
2 critical to your opinion.

3 A It is not.

4 Q Next part of your theory --

5 SPECIAL MASTER HASTINGS: The answer was it
6 is not?

7 THE WITNESS: That's correct. I would not
8 refuse to evaluate a child who is autistic and who had
9 not received thimerosal but had shown that she had
10 persistent measles virus. I think the Special Master
11 wants to say --

12 SPECIAL MASTER VOWELL: I don't understand
13 how you are using the word 'evaluate,' Dr. Byers. We
14 are talking about making a causation determination
15 here, and 'evaluate' to me says, I'm going to look at
16 the child, I am going to look at her records, and then
17 I am going to make some decision based on that, but it
18 doesn't tell me what you think about causation. I
19 don't want us to play semantics, I want to understand
20 how you are using that word. So what does 'evaluate'
21 mean to you?

22 THE WITNESS: It means that, in this case,
23 thimerosal and MMR are contributors to her condition,
24 but it means that I, myself, would not be willing to
25 do a cookie cutter. I gather if you have somebody who

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1 is named Michelle Cedillo, who had received all of the
2 vaccinations but did not have thimerosal in it, but
3 that then was vaccinated with the MMR and was found to
4 have only autoimmune disease and chronic bowel
5 inflammation, then I would say that it is certainly
6 very possible that the autism and that the dysfunction
7 was a result of the measles virus, but I still would
8 be very uncomfortable giving you guys an opinion that
9 would allow you to cookie cutter people because there
10 are so many variations in this.

11 There is variations in the types of autism.
12 Certainly there is variations in the types of the
13 immune dysregulations.

14 SPECIAL MASTER HASTINGS: I appreciate your
15 discomfort with hypotheticals, although I do want you
16 to understand, we've got 5000 cases. We are hoping to
17 not have 5000 three-week trials. I don't think you
18 want to come here for 5000 three-week trials.

19 THE WITNESS: I sure don't.

20 SPECIAL MASTER HASTINGS: So what we are
21 hoping to get here and the whole point of using the
22 test case was to get from the experts some kind of
23 general opinions that could help us evaluate
24 additional cases. Now, if you can't answer it, you
25 can't. I'm just saying that's what we are hoping to

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1 get. Your opinion may be helpful to Michelle Cedillo.
2 If you can't go beyond her case, it won't be helpful
3 to any of the other 5000.

4 So to the extent you can give us your
5 general thoughts, it would be helpful. I'll leave it
6 at that.

7 THE WITNESS: Thank you, Special Master. If
8 I need to do what you have just asked me to do, then
9 you might as well let me go home. What I can do is to
10 tell you that one of the cut points that you can use,
11 one of your screenings that you can use is to look at
12 children who have, one of the groups that you can use,
13 is to look at the children that have had thimerosal in
14 the same dose as Michelle Cedillo, because that's
15 about the same dose that kids get, or at least kids
16 got in her day, and look at somebody who has an
17 aberrant reaction to the measles vaccine, clinically,
18 and look at somebody, if that same person then has
19 persistent measles virus in the gut, then you can make
20 a pot and you can put that person in the pot and say,
21 all right, I'm going to send that out for medical
22 evaluation.

23 Now, I mean, I guess that's not going to
24 give you exactly the clean answer that you want, but
25 you and I are trying to interface between legal,

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1 scientific and medical, and I think we have to come to
2 a match point, a meeting of the minds, and I can at
3 least give you what I just gave you, and I think that
4 should help. I don't know what those 5000 cases look
5 like.

6 SPECIAL MASTER HASTINGS: All right. Go
7 ahead, Mr. Matanoski.

8 BY MR. MATANOSKI:

9 Q So Doctor, do I understand your testimony to
10 be that in the absence of thimerosal-containing
11 vaccines, and the same fact situation are present, you
12 have no opinion?

13 A That's true. But further, I've given you a
14 more general outline of someone who should be
15 medically evaluated. It's a little more general than
16 you want, but I think it's better than you've got now.

17 Q So the receipt of thimerosal-containing
18 vaccines, in your view, may or may not be important?

19 A In this case of Cedillo, it certainly is
20 important.

21 Q My question is, in your opinion, the receipt
22 of thimerosal-containing vaccines may or may not be
23 important. Is that correct?

24 A Yes, depending upon other factors of the
25 case, and I've laid down what those are in somebody

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1 who received MMR and thimerosal.

2 Q Okay. Let's turn to the next factor.

3 Actually, turn to another fact-specific factor. How

4 long after receipt in your view of thimerosal-

5 containing vaccines is it necessary -- what's the

6 range in terms of the difference in time between

7 receipt of the thimerosal-containing vaccines and

8 receipt of MMR vaccines?

9 A I'm going to rely upon Dr. Aposhian for

10 that. In this case, he tells me that the, I think it

11 was, 5 months, 8 months, something like that, after

12 the last receipt of thimerosal, still produces a

13 significant body burden. I would turn to him for the

14 extension of that range.

15 Q So you are unable to render an opinion on

16 what the range should be in terms of the time limit

17 between thimerosal-containing vaccines and receipt of

18 MMR, as far as its clinical significance in the

19 development of autistic spectrum disorders?

20 A I think that's a fair thing to say, yes.

21 Q You mentioned receipt of thimerosal-

22 containing vaccines and fever thereafter. The fever

23 in this case was seven days, approximately seven days.

24 Is the fever a necessary element after MMR for you to

25 reach a conclusion that autistic spectrum disorder was

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1 caused by that MMR?

2 A Well, now my opinion is not that autistic
3 spectrum disorder is caused by the MMR.

4 Q So we don't need the fever as a clinical
5 manifestation after the MMR for you to reach your
6 opinion?

7 A That is not what I said. May I clarify
8 this?

9 Q Absolutely.

10 A The part of your statement that I did not
11 agree with is when you said that MMR causes autistic
12 spectrum disorder.

13 I do not have the qualifications to be able
14 to say that. That needs a pediatric neurologist.
15 That is the reason that Dr. O'Leary could not say it.
16 That's the reason that Dr. Kennedy could not say it.
17 That's the reason I can't say it.

18 What I can say is that MMR was associated
19 with an abnormal inflammatory reaction to the virus
20 which then was in part responsible for the chronic
21 bowel disease.

22 Q Give me a moment. I thought I had
23 understood you to say this morning that it was your
24 opinion that Michelle Cedillo's autistic spectrum
25 disorder was caused by the receipt of her MMR vaccine.

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1 Do I understand your last answer to be that
2 you can't render such an opinion; you need to rely on
3 some other expert?

4 A Yes, that is correct.

5 Q Now turning back to the fever, as far as for
6 your part of this opinion is development of fever a
7 necessary clinical symptom after receipt of MMR for
8 you to reach your conclusions about the role of MMR
9 and the subsequent development of autistic spectrum
10 disorders?

11 A No. The subsequent development of bowel
12 inflammation.

13 Q Is fever a necessary element, in your
14 opinion, about the subsequent development of bowel
15 disorder?

16 A I have taken the position, and I've been
17 working in the Vaccine Court for some time, that if
18 there is not some sort of an evidence of inflammation
19 following a temporally reasonable time after a
20 vaccination then my suspicion of the vaccination is
21 significantly decreased, and as a rule of thumb I have
22 used fever.

23 I can't tell you that another expert might
24 not use something else because basically any evidence
25 of abnormal or unusual cytokine release is indication

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1 of abnormal activation of the innate immune system,
2 which then can trigger an autoimmune disease, but as
3 you sit here looking at this expert in front of you I
4 can tell you that fever in my opinion is generally
5 necessary for me to assume that there is activation of
6 the innate immune system.

7 Q Okay. So it is important to your opinion
8 about the formation of the cytokine release?

9 A Yes, it is.

10 Q In the absence of fever, would you render
11 the same opinion?

12 A I don't know. Let me give you a
13 hypothetical. Suppose that somebody had gotten a
14 vaccination, and for some reason or another they had
15 not gotten fever, but you had drawn blood and you had
16 demonstrated that there was a very abnormal release of
17 the other proinflammatory cytokines.

18 Then I think a reasonable expert would have
19 to say I don't know why there's a lack of fever, but
20 look, I've got these other things, and I'm going to
21 include them. As a rule of thumb though, I have said
22 I want to see fever.

23 Q So for your opinion, fever is a critical
24 element?

25 A It has been in the past. I may change it

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1 and a different expert may not follow in my footsteps.

2 Q To reach your opinion, is it necessary, the
3 opinion you've reached in this case, and I understand
4 you aren't going to the ultimate opinion.

5 I'm sorry. Are you having trouble hearing
6 me, Doctor?

7 A You have a very low voice.

8 Q I'm actually having a little trouble keeping
9 my voice. I apologize.

10 In your opinion, is the development of
11 inflammatory bowel disease necessary for you to reach
12 the conclusion that you have?

13 I understand that you haven't reached the
14 ultimate conclusion of whether the autism was caused
15 by MMR, but to the extent as far as you're going with
16 your opinion, is development of inflammatory bowel
17 disease necessary to bring MMR into a causative role?

18 A Yes. In the case of Michelle Cedillo, I am
19 strongly influenced by the fact that she had
20 inflammatory bowel disease with all of its impact on
21 the CNS and that the measles virus was found in the
22 inflamed gut.

23 Q Okay. Strongly influenced. Is it a
24 necessary element, Doctor?

25 A If she had no other evidence of

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1 inflammation, including no fever and no reason for an
2 abnormal lack of a fever, then I would have to rethink
3 my opinion as to whether or not any CNS pathology was
4 caused by the measles.

5 Now, assuming that I can't find any measles
6 any place else in the body and I have no evidence that
7 the measles was abnormally retained.

8 Q Now I'm going to actually ask you a
9 different question. It is assume the same facts in
10 this case except there's no bowel inflammation noted
11 at all. There's no bowel symptoms. Is your opinion
12 the same?

13 A What other symptoms are there?

14 Q It's the same clinical presentation as this
15 case.

16 A Once again I can't answer that, and I'll
17 explain why. The clinical presentation and the
18 records on which I relied are so heavily influenced by
19 the bowel inflammation that I really can't tell if
20 something else was happening.

21 If I did not have the bowel inflammation
22 there might have been something else. For example,
23 there might have been immunodysfunction because of
24 recurrent infections, for example, and a recurrent
25 infection obviously is a chronic inflammation.

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1 So for what I can say, this is it. You
2 probably have looked at the medical records and seen
3 how stormy this course was.

4 Q So the bowel inflammation is critical to
5 your opinion?

6 A No. In the case of Michelle Cedillo, the
7 bowel inflammation, it fixes it so that I don't have
8 to move any further, so it's easy for me.

9 Q So any absence of any other bowel
10 inflammation alone is enough?

11 A If there were no other bowel inflammation --

12 Q No other symptoms here other than bowel
13 inflammation and MMR. I just heard you say that it's
14 so striking to you in this case and important to you.

15 A Yes.

16 Q Would you need any of the other symptoms
17 that you see? Is it the constellation of all these
18 symptoms?

19 A It's mostly the bowel inflammation.

20 Q You also mentioned that there was recovery
21 of persistent measles virus in your view.

22 A Yes.

23 Q Is that critical to your opinion here?

24 A It is critical that the measles virus caused
25 an exaggeration inflammatory response, and it is

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1 helpful in this case that she has been shown to have
2 persistent measles virus.

3 If she did not have measles virus,
4 persistent measles virus, and had no evidence that she
5 ever had an abnormal response to measles then I think
6 that we would have to rethink the case.

7 Q So do I take it then that the recovery of
8 measles virus is not critical to your opinion?

9 A The recovery of measles virus is important
10 in the case of Michelle Cedillo. However, if in fact
11 she had had measles virus and was demonstrated to have
12 had it, demonstrated in however you wanted to do it to
13 say that it induced and started the inflammation, that
14 would work as well.

15 Q I'm not sure I understand your answer. Is
16 the recovery of persistent measles virus critical to
17 your opinion or not?

18 A It is certainly critical in the case of
19 Michelle Cedillo.

20 Q In the next case if you did not have that,
21 the same facts, would you reach the same opinion?

22 A I think you would have to look at it.
23 However, I'm trying to give you as cookie cutter as I
24 can.

25 Q Maybe I could give you a different question.

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1 A Okay.

2 Q If the next case came forward and there was
3 not recovery of measles virus, can you tell us today
4 that you would offer an opinion that it was caused by
5 MMR vaccine?

6 A Right. Well, you know that there is going
7 to be recovery of the measles virus at some point in
8 time, right?

9 Q If it was recovered at I guess this would be
10 seven years after the fact. If that was not there,
11 would your opinion be the same?

12 A With Michelle Cedillo, yes. I'm sorry.
13 Look, let me give you another scenario. Let me give
14 you another hypothetical.

15 Q No. That's quite all right. I'm just
16 trying to find out what the critical factors are, what
17 your opinion is resting on. That's all I'm trying to
18 find out.

19 I'm taking it that recovery of persistent
20 measles virus is not critical to you. You would still
21 reach the same opinion in another case even if that
22 wasn't recovered.

23 A I cannot say that. However, I will say that
24 if you want to come up with a box to put people in,
25 one of the boxes that you can use is someone who has

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1 persistent measles virus for the simple reason that
2 that indicates an aberrant response to the measles
3 virus.

4 Q So outside of this case, regardless of
5 whether there's recovery of measles virus, you're not
6 willing to render an opinion?

7 A I would certainly want to look at the case.

8 Q And you aren't reaching an ultimate
9 conclusion about whether the MMR is causing autism?

10 A No, I'm not.

11 Q If you don't have the evidence of immune
12 dysregulation, if there's an immune test and there's
13 no evidence of immune dysregulation, is your opinion
14 the same?

15 A Can I have a clinical evidence?

16 Q The same clinical picture as in this case,
17 but there's no test done by Dr. Gupta.

18 A Okay. No lab tests. None by Dr. Gupta.
19 There's no clinical evidence of any kind of immune --

20 Q No. The same facts other than there's no
21 lab tests done by Dr. Gupta.

22 A I think we do not have to use those lab
23 tests. We can use the exaggerated response to the
24 measles virus in the form of the high fever and also
25 in the form of the persistent measles virus in the

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1 gut.

2 Q What if there were immune tests, but they
3 were normal? Same fact situation.

4 A I would say the same thing. The laboratory
5 tests help bolster my opinion in the case of Michelle
6 Cedillo. However, in clinical medicine the clinical
7 is always given precedence over laboratory tests.
8 Laboratory tests are used to bolster that.

9 Q So in your view the results from Dr. Gupta
10 would bolster your opinion, but if they were normal
11 your opinion would be the same?

12 A Yes.

13 Q You talked a little bit about your
14 qualifications, and I'm going to skip to those right
15 now after we've gone through your theory.

16 A My opinion.

17 Q I'm sorry. Your opinion.

18 A Thank you.

19 Q You're not certified in allergy and
20 immunology, are you?

21 A I'm board eligible. I have not taken the
22 test. Instead, I did the three-year fellowship in
23 clinical immunology and practiced allergy for 25
24 years.

25 Q Why didn't you take the test?

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1 A Because at that time it was a very long time
2 ago. At that time it only really qualified you to
3 treat allergy, and at that time I thought the practice
4 of allergy was extremely boring and I would never plan
5 to do it, so then I went on to do it for the next 25
6 years.

7 Q So you practiced without being certified?

8 A I practice, yes. I'm boarded in internal
9 medicine.

10 Q But you called yourself board eligible?

11 A Board eligible in allergy immunology, yes.

12 Q Is board eligible a phrase that's recognized
13 by the organization that certifies allergists and
14 immunologists?

15 A Yes, it is, so therefore if you are filling
16 out an application, for example, like I'm a fellow in
17 the American Academy of Allergy and Immunology. If
18 you're filling out an application for that they will
19 ask you whether you are boarded in allergy immunology
20 or whether you're board eligible in allergy
21 immunology.

22 Q You'll see on your screen a letter from the
23 American Board of Allergy and Immunology referencing
24 your status with that organization. They note that
25 the board neither recognizes, uses nor defines the

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1 term board eligible.

2 A Okay.

3 Q So you've been essentially representing that
4 that is a qualification that you have in terms of
5 rendering an opinion about immunology?

6 A Yes, I have.

7 Q You also mentioned, and you have this in
8 your CV as well, you've been testifying about it, that
9 you were on the team that developed Enbrel.

10 A Yes.

11 Q You mention in your resume that you're the
12 medical director of the four doctor team responsible
13 for filing the Biologics License Application for
14 Enbrel?

15 A I'm sorry. Would you say that again?

16 Q You indicate in your resume that you were
17 the medical director of the four doctor team
18 responsible for filing the Biologics License
19 Application for Enbrel?

20 A That is not exactly correct. I was a
21 consultant medical director. There were I think
22 either four or five physician members of the team.

23 It was run by a physician that the head of
24 the team was a woman named Dr. Leslie Garrison, and
25 she was the person who spearheaded the entire Enbrel

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1 approval and was then made a vice president of Immunex
2 as a result of that.

3 Q So that part is perhaps a misstatement on
4 your curriculum vitae?

5 A My title was consulting medical director.

6 Q If we were to check the files at FDA to see
7 whether your name appears at all on any of the
8 documents submitted by Immunex for Enbrel, would your
9 name appear?

10 A I'm sorry. I don't know. I don't know the
11 requirements to submit members of the team.

12 Q So you don't know whether it appears or not?

13 A No, I'm sorry. I don't.

14 Q Was your role in it major or minor?

15 A I was one of five doctors. Would you like
16 me to tell you what I did?

17 Q I'm trying to find out. You've represented
18 that you were the medical director on the --

19 A No. I said consulting medical director.

20 Q I'm sorry. I meant on your CV. All right.
21 You're the consulting medical director then on the
22 BLA. That's the Biologics License Application.

23 We checked at FDA. Your name doesn't appear
24 on any of the documents submitted by Immunex on the
25 Biologics License Application.

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1 A Okay. That's information. It doesn't make
2 any difference because what I did is -- I told you
3 what I did.

4 Q You talked this morning about Nottingham
5 University.

6 A Yes.

7 Q On your CV you say that you're still a
8 member of the faculty there. Is that true?

9 A No. I think I dropped off. The main
10 purpose for me being at University of Nottingham is
11 because my research was done there, and it was
12 actually performed and supervised on a day-to-day
13 basis by a physician named Dr. Mike Price.

14 Sadly, Dr. Price died of cancer in like
15 about 2002, 2004, something like that, so when he died
16 there was no longer a reason for me to be at
17 Nottingham University.

18 Q So your CV is inaccurate? You are not still
19 on the faculty of Nottingham University?

20 A That's correct. It sounds like it's an old
21 CV.

22 Q Your CV also lists you as a faculty member
23 at University of California-San Francisco. Are you
24 still a member of that faculty?

25 A To my knowledge I am, unless this hearing

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1 has kicked me off.

2 Q We checked with University of California-San
3 Francisco. What was your faculty role at University
4 of California?

5 A I'm on the adjunct series.

6 Q What did you do there?

7 A I did research in poison oak and ivy
8 dermatitis, went on rounds with the docs.

9 Q How long ago was that?

10 A I'm sorry?

11 Q How long ago was that?

12 A Let me see. Through from about 1974 through
13 about 1981, and then I went back again in 1984 and was
14 there episodically probably through about two years
15 ago.

16 The main reason I would use that is because
17 when I would have different projects in different
18 areas of medicine I would use that position then to go
19 and do rounds or go in the clinic with the different
20 docs.

21 So for example, when I was asked to evaluate the
22 children in the U.K. for immunodeficiency disorders I
23 spent three, four months in the immunodeficiency
24 clinic just to find out what was new.

25 The same thing for when I was doing atopic

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1 dermatitis, connective therapeutics. I then started
2 doing rounds in the atopic dermatitis clinic just to
3 find out what was going on, what was new.

4 Q So you would do some rounds sporadically to
5 aid your litigation consultation?

6 A Neither of those were litigation. Those
7 were all biotech.

8 Q In the U.K., that was not litigation?

9 A Oh, in the U.K.? Sorry. In the U.K. it was
10 litigation. The atopic dermatitis, psoriasis, et
11 cetera, was for research for biotech companies.

12 Q How long ago was the research for biotech
13 companies being done?

14 A I'm not absolutely sure. I think I did some
15 multiple sclerosis clinics. I'm trying to remember
16 the consultants.

17 Probably the atopic dermatitis was in about
18 1998, and subsequently I have not -- no. Then I went
19 back to some of the immunodeficiency clinics, so I
20 can't remember. You know, I go back and forth.

21 Q Okay. About a decade ago for the
22 dermatitis? About a decade ago for the dermatitis?

23 A About, yes.

24 Q Any other involvement at UCSF, at University
25 of California-San Francisco?

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1 A Well, I use their library and I go to their
2 parties, and also -- I'm sorry. I forgot. I took a
3 regular -- let's see. It was a four month course in
4 advanced biostatistics, clinical epidemiology and one
5 other thing last year, so I was there like four days a
6 week for probably the duration of the semester, which
7 was about four months.

8 Q They in their response indicated that your
9 participation was I believe at best gave very
10 occasional lectures.

11 A Oh, no. That's not true. I don't know why
12 they said that. Maybe they just don't know. Who did
13 it come from? Oh, Bruce Wintroub?

14 See, Bruce Wintroub is the head of
15 dermatology, right? This was in biostatistics.

16 Q You worked there in biostatistics?

17 A No. I took the courses in biostatistics.

18 Q You took courses?

19 A Yes.

20 Q Okay. So this is not as a faculty member.
21 This is as a student?

22 A Well, I mean, I was allowed in because one
23 of the requirements is -- one of the pops that you're
24 in is that you need to be a faculty member and so
25 that's the reason I was allowed in the class. It's a

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1 special graduate class.

2 Q So this wasn't lecturing by you? This was
3 not lecturing by you? This wasn't teaching by you,
4 was it?

5 A No. I was on the receiving end of it. I
6 was taking the classes and taking the tests.

7 Q Now, in the last decade, for about the last
8 decade, you've only seen patients in consultation for
9 litigation purposes, correct?

10 A They're not specifically for litigation
11 purposes, but they're to decide whether or not
12 litigation is going to be warranted.

13 I'm asked to see them in my capacity as a
14 medical toxicologist so, for example, I go out in the
15 field and see a whole bunch of patients at a time
16 doing histories and physicals and lab tests and then
17 evaluate whether or not -- you don't want me to
18 finish?

19 Q No.

20 A Whether or not they have any symptoms that
21 are consistent with an environmental exposure.

22 Q You don't clinically treat these patients,
23 correct?

24 A I usually will liaison with their treating
25 docs. If I find something that concerns me I will

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1 either call up the treating docs or send them letters
2 because they're generally in different states.

3 Q Do you recall testifying in a case in
4 February of this year, a vaccine case?

5 A Probably. Was that you?

6 Q Yes, it was.

7 A Hello.

8 Q Welcome back. Now, do you recall what your
9 answer was about whether you treated patients or
10 whether you saw them in consultation for litigation
11 purposes at that time?

12 A I'm sorry. I don't.

13 Q Would it refresh your recollection then to
14 know that you testified at that time that for
15 approximately the last 10 years you had only seen
16 patients for litigation consultation purposes?

17 Do you recall that? Do you recall
18 testifying to that?

19 A No, I don't remember that, but I'm trying to
20 remember if that's correct.

21 I don't think that's exactly correct because
22 we sold our medical practice in -- I don't know --
23 1996, 1997, something like that, and I continued to
24 see patients in that same clinic, which is at 500
25 Sutter, for probably say through the year 2000, and

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1 then I stopped. I would say that I would need to
2 change that answer to something like seven years.

3 Q I don't think the decision has come out, so
4 there's still time.

5 A I can't hear you. What?

6 Q I don't think the decision has come out yet,
7 so there's still time.

8 A Are we going to win?

9 Q In your report you talk at length about
10 immune suppression. Do I understand that your
11 testimony really or what your opinion really hinges on
12 is immune dysregulation? Is that right?

13 A You're absolutely correct, yes.

14 Q So it's not immune suppression that's
15 important to you; it's immune dysregulation?

16 A It is immune dysregulation, and I'm sorry,
17 but I don't find any at least major header in a quick
18 look of my report where I talked about immune
19 suppression, particularly in relationship to Michelle
20 Cedillo. Would you like to point me to a page?

21 Q I'm just asking you. I took it from your
22 testimony that from your report that immune
23 dysregulation and not immune suppression is the
24 critical factor for you.

25 A It is immune dysregulation because immune

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1 dysregulation encompasses both immune suppression and
2 an autoimmune disease.

3 And as you will remember I believe you and I
4 agreed, or at least Dr. Kennedy testified, that the
5 persistent measles virus is a manifestation of a type
6 of immune suppression, which would fall under the
7 umbrella of immune dysregulation.

8 Q So within that umbrella of immune
9 dysregulation is it immune suppression that's
10 important to you, or is it a skewing of the TH1/TH2
11 response that's important to you?

12 A It's all of it.

13 Q Neither makes a difference? It doesn't make
14 a difference for your opinion?

15 If the person is immune suppressed and
16 that's what the finding is, as opposed to immune
17 skewing, your opinion stays the same?

18 A Both of them would be responsible for
19 persistent measles virus, which is what she had.

20 Q Immune suppression would and the skewing?

21 A Either one, yes.

22 Q So we don't need to then talk about it. We
23 have immune suppression. We don't need to talk about
24 immune skewing, TH1/TH2 skewing? It's enough for you
25 if there's immune suppression?

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1 A I think so. Just a moment. I've just been
2 handed my report, which appears to be the same
3 document as I have in front of me.

4 Either TH1/TH2 skewing, that would suppress
5 the ability of the body to clear the virus.
6 Alternatively, immune suppression would affect the
7 ability of the body to clear the virus. Both of them
8 could result in prolonged measles virus present in the
9 gut, which would then trigger off the chronic bowel
10 disease.

11 Q What level of immune suppression do we need
12 to see for you to opine that there is sufficient
13 immune dysregulation for the measles virus to persist?

14 A I'm sorry. I can't answer that because the
15 immune suppression and abnormal handling of virus has
16 ranged from at least in animal studies, if I remember
17 rightly, mild or moderate immune suppression through
18 to the immune suppression that you see with HIV
19 disease.

20 Q So sometimes immune suppression won't make a
21 difference? You can have immune suppression, and
22 you'll still clear the virus? Is that right?

23 A It depends on which arm of the immune system
24 is suppressed, but that is certainly possible.

25 Q Let's be clear then. Immune suppression

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1 overall, general immune suppression, both in the TH1
2 arm and the TH2 arm versus the skewing theory, which
3 I'm not talking about right now.

4 I'm talking about your opinion that any
5 immune suppression, just talking about lowering the
6 body's level, the immune system's level to respond.
7 My question to you was how far down does that have to
8 be lowered for there to be persistence of measles
9 virus?

10 A I don't know, and I believe no one knows.

11 Q If there is some lowering of the immune
12 response, the immune suppression, do you expect there
13 still to be clearance of the virus in cases?

14 A That's a question that I can't answer.

15 Q You're an immunologist. Do you expect that
16 in some cases there will be clearing of the virus?

17 SPECIAL MASTER HASTINGS: Mr. Matanoski, can
18 you keep your voice up as best you can?

19 MR. MATANOSKI: I'm sorry.

20 SPECIAL MASTER HASTINGS: I'm having a
21 little trouble.

22 Did you understand the question?

23 THE WITNESS: I think so. He's asking
24 whether or not if I only have TH1/TH2 skewing, but I
25 have no other indication of other abnormalities of the

970A

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1 immune system, if it could result in persistent
2 measles virus, and that answer is yes.

3 MR. MATANOSKI: No. That wasn't my
4 question.

5 BY MR. MATANOSKI:

6 Q My question is immunosuppression distinct
7 from TH1/TH2 skewing. This is a systemic
8 immunosuppression?

9 A Yes.

10 Q Do you agree that in that instance there
11 could be systemic immunosuppression and the body will
12 still clear measles virus?

13 A It's possible, particularly if the --

14 Q Isn't there proof of it?

15 A Just a second. It's possible, particularly
16 if the arm of the immune system that is suppressed is
17 the antibody arm, but there is still an intact T cell
18 arm so that you can still clear the measles infected
19 cells.

20 Q And isn't there proof that you can clear
21 measles virus cells in the presence of immune
22 suppression?

23 A I'm sorry. As I sit here right now I don't
24 know what you're talking about. Do you want to give
25 me a paper?

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1 Q I believe you may have discussed either in
2 your report -- I think it was in your report -- about
3 HIV patients.

4 A Yes.

5 Q They clear the virus, don't they?

6 A No, they don't.

7 Q They don't. They continue to persist? It
8 persists lifelong in HIV patients?

9 A Well, I don't know if it's lifelong, but,
10 you know, one of your own experts has published a
11 paper saying that in HIV disease you have persistent
12 virus.

13 Q And it clears. Isn't that right?

14 A I can't remember. I remember that she
15 carried it out for like six months.

16 Q It's not important to you whether that would
17 be true or not in the case of an immune suppressed
18 individual?

19 A It's not important that we --

20 Q It's not important what the result of that
21 study was?

22 A The result of the study was that there was
23 persistent measles virus in the HIV infected children.

24 Q And if it were shown that it was cleared
25 would that be important to your opinion?

972A

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1 A It depends on when it was cleared. It was
2 my memory that it was cleared in about six months.

3 Q And that's not good enough?

4 A That would be good enough. Certainly. If
5 in fact the persistent measles virus then produced a
6 chronic bowel inflammation, then yes.

7 Q Okay. So if there's chronic bowel
8 inflammation regardless of whether the persistent
9 measles virus is clear?

10 A I don't know. You're twisting it all
11 around. It's possible certainly.

12 Q Isn't your opinion that chronic bowel
13 inflammation is caused by persistent measles virus?

14 A Yes. Triggered by it.

15 Q Oh,so it continues on its own?

16 A Yes.

17 Q So you don't need recovery of measles virus?

18 A Yes. That's the point I was making.

19 Q I see.

20 A You're going to get recovery of measles
21 virus for at least --

22 Q And are you a gastroenterologist?

23 A Stop, stop, stop.

24 SPECIAL MASTER HASTINGS: Let her finish.

25 Let her finish.

973A

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1 THE WITNESS: Thank you. For at least two
2 weeks to four weeks after you have the vaccination in
3 a normal person.

4 If that person then develops an autoimmune
5 disease in an organ like the bowel where the virus is
6 shown to be, then it obviously indicates that you've
7 got viral persistence and that it strengthens your
8 opinion that the trigger is the measles virus.

9 BY MR. MATANOSKI:

10 Q So you don't need the Uhlmann study. You
11 don't need recovery of measles virus. You don't need
12 anything but inflamed bowels?

13 A I need inflamed bowels in somebody who had
14 an abnormal reaction to measles virus.

15 Q And the abnormal reaction is fever?

16 A It could have been the high fever, or it
17 could have been the presence of a persistent virus.

18 Q So you're going farther than any of the
19 other researchers who have published papers?

20 A I certainly hope I'm not.

21 Q They've published papers, the researchers
22 that we've been looking at and as have been cited by
23 you, that indicate that it's persistent measles virus
24 in the bowel that's causing the problem.

25 A It is persistent measles virus in the bowel

974A

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1 that triggered the problem. I do not know -- wait a
2 minute. Stop it.

3 I do not know if they said that the virus
4 had to persist for four years. I can't remember if
5 they said that.

6 Q These researchers are undergoing great
7 lengths to try to recover measles virus from a bowel.
8 Some of your experts came in here and -- I'm sorry.
9 Not yours.

10 Some of the Petitioners' experts came in and
11 talked about ongoing studies to do this, but in your
12 view the recovery of measles virus is not necessary
13 because it doesn't even matter if the measles virus is
14 still there?

15 A It matters if there was an abnormal response
16 to the measles virus particularly directed to the
17 bowel, but in their case the abnormal reaction was the
18 persistent measles virus in the gut.

19 I'm saying that there could be another
20 scenario where you have an abnormal reaction to the
21 measles virus that is manifest some other way, and you
22 can't do a cookie cutter for this.

23 Q You've never worked with measles virus, have
24 you?

25 A Just as a clinician.

975A

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1 Q So in other words you have treated some kids
2 with measles virus?

3 A That's correct.

4 Q You never published on measles virus?

5 A The only publication I have is that one that
6 Dr. Kennedy and Dr. Marchalonis and I did together
7 with measles virus.

8 Q So other than that there's been no
9 publication on measles virus?

10 A To my knowledge, from me that's correct.
11 There's been obviously a lot of publications on
12 measles virus.

13 Q And that's your only publication on measles
14 vaccine or MMR vaccine?

15 A Yes.

16 Q And you and Dr. Kennedy and Dr. Marchalonis
17 worked together on that publication?

18 A Yes.

19 Q And all three of you were consultants in the
20 U.K. MMR litigation, correct?

21 A Yes.

22 Q And that's how you met each other?

23 A Oh, no.

24 Q You knew Dr. Kennedy beforehand?

25 A I knew Dr. Marchalonis since about, let's

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1 see, 1976, and I had known of Dr. Kennedy. However,
2 Dr. Marchulonis was the one that asked Dr. Kennedy to
3 be involved when we found we needed a viral
4 immunologist.

5 Q Did Dr. Marchalonis bring you into the U.K.
6 MMR litigation?

7 A No. Actually, it was Ms. Sylvia Chin-Caplan
8 that did.

9 Q She brought you into the U.K. MMR
10 litigation?

11 A She suggested to the attorneys in the MMR
12 litigation, who said that they needed a clinical
13 immunologist to evaluate the relief criteria, that
14 they might call me.

15 Q Do you recall how much money you received
16 for your participation in the litigation there?

17 A I'm sorry. I don't. I will tell you that I
18 spent a lot of time on it.

19 Q This is represented in pounds sterling.
20 Does 115,107 pounds sterling sound about right?

21 A I'm sorry. I can't tell you that. I can
22 tell you that I worked on it from about 1999 through
23 like around 2003, and I spent a lot of time on it.

24 Q We've been talking a lot about the vaccine.
25 Do you know how the attenuated measles vaccine is

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1 made?

2 A I have known, and I don't remember right
3 now, but I do know that the relief criteria is simply
4 that the measles vaccine should produce a plaque that
5 is equal to or less than the size of the plaque that
6 is produced by an equivalent number of wild-type
7 viruses.

8 I also have looked at genetic mapping of the
9 different measles vaccine strains, and to my eye it
10 seems that they have not actually been able to
11 identify the part of the DNA which is mutated which is
12 responsible for its attenuation, and that's about the
13 limit of it.

14 Q Do you know how they make it?

15 A Yes. They made it a long time ago by
16 passing it multiple times through whatever cells they
17 grew it in.

18 Q Do you know what kind of cells they grew it
19 in?

20 A Let me see. I seem to remember that they
21 were chicken cells. At least they were chicken cells
22 when they were making the thing.

23 Q When you introduce attenuated measles
24 vaccine in the body, do you know what the properties
25 are?

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1 A Yes.

2 Q What it does? What does it do?

3 A Roughly from a clinical standpoint it
4 induces immunity, which is not as long lived as the
5 wild-type measles, and the only immunity that they
6 measure are antibodies. I have not really seen any
7 studies on large vaccinated populations where they're
8 looking at the T cells.

9 It produces disease which is less in nature
10 than that of the wild-type. In other words, the
11 symptoms are attenuated.

12 Q Does it replicate as readily as the wild
13 virus?

14 A I do not think it does.

15 Q So part of the attenuation process has
16 limited its ability to replicate. Is that right?

17 A That's my understanding. I would prefer to
18 defer to Dr. Kennedy because that's the reason we
19 brought him in as an expert for you.

20 Q Because he had some familiarity with measles
21 virus?

22 A What?

23 Q Because he had familiarity with measles
24 vaccine virus?

25 A Because he has familiarity with vaccines in

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1 general. Yes.

2 Q With the immune suppression you were talking
3 about after wild measles virus or with the vaccine
4 virus does the level of immune suppression depend to
5 any extent on how severe the infection is?

6 A I do not know that.

7 Q You mentioned in your report that you've
8 published extensively on environmental toxins.

9 A I did? I have certainly worked extensively
10 on environmental toxins. My publications have been
11 limited to a couple of papers involving the affect of
12 trichlorethylene on the immune system, and then also I
13 worked on HIV, which you could certainly consider an
14 environmental agent. HIV, tricosanthin, those papers
15 which were clinical trials.

16 Q In your report you indicated that the
17 environmental toxins that you published on were poison
18 oak and poison ivy.

19 A I did, didn't I? I told you I was one of
20 the world's experts.

21 Q Now, are you sure you published on TCE?

22 A Yes.

23 Q Have you ever published on hexavalent
24 chromium?

25 A I have never published on it. I have done

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1 litigation research on it.

2 Q You did testify about it, correct?

3 A I can't remember if I actually testified in
4 that case or not.

5 Q You offered litigation support then or
6 consultation, at least offered that on hexavalent
7 chromium?

8 A Yes, I did.

9 Q You never published on dioxin, did you?

10 A I have not published on dioxin. I'm in the
11 process. There's a manuscript in preparation on
12 dioxin.

13 Q You testified in a case involving dioxin,
14 didn't you?

15 A I can't hear you.

16 Q I'm sorry. You testified in a case
17 involving dioxin, didn't you?

18 A I don't think that ever went to Court. I
19 believe that was one of the ones that was settled.

20 Q That was another instance where you were a
21 litigation consultant?

22 A Yes. Well, I was a testifying expert, but
23 they never went to trial.

24 Q Now, you mentioned a moment ago you think
25 you might be having a publication coming out soon on

980B

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1 dioxin?

981A

BYERS - CROSS

1 A Well, I'm in the process of writing the
2 report.

3 Q It hasn't been submitted to any journals?

4 A That's correct.

5 Q Any other co-authors on it?

6 A Well, yes. My colleague, Bob Baldwin.

7 Q I've been through your CV a little bit this
8 morning. Any publications that you have that aren't
9 on that CV?

10 A I don't think so. I think the most recent
11 one is the one that Kennedy, Marchalonis and I did,
12 and if in fact that's on the CV then you probably have
13 an up to date one as far as publications go.

14 Q So that's the extent of your publications?

15 A I felt it was enough.

16 Q Now, you've described yourself as a medical
17 toxicologist?

18 A Yes.

19 Q What training have you had in toxicology
20 that's not reflected on your CV?

21 A The formal training has been when I was a
22 medical student. Subsequent to that, though, I have
23 done medical toxicology in two different aspects. The
24 first is of course I've worked for my whole
25 professional life for pharmaceutical companies and

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1 biotech companies, and nowadays a medical consultant
2 to the medical director actually works in large part
3 as a toxicologist because of course the efficacy is
4 the remit of the statisticians.

5 So, you know, you spend the day trying to
6 decide whether or not the adverse events that you're
7 witnessing are part of the normal disease process or
8 other drugs are associated with your drugs. Then the
9 other aspect of that is that I started looking at
10 environmental toxicology in 1984. Well, no. I had
11 done that before.

12 I actually started in the field in about
13 1976 when I submitted a grant supported by a small
14 study looking at the immune system of the farm workers
15 in the Central Valley because they were being exposed
16 to pesticides, and essentially I've been doing
17 environmental toxicology off and on ever since then.

18 Q And you said your training primarily came as
19 a medical student?

20 A The formal training came as a medical
21 student, but the on the job training has continued
22 from about 1984.

23 Q The name of your consulting company is
24 Immunology Incorporated? Is that right?

25 A Yes.

BYERS - CROSS

1 Q You offered a great deal of testimony this
2 morning on mercury. Have you ever published on
3 mercury?

4 A I have not published on mercury.

5 Q Turning to your slides you start off with
6 the first slide Immunotoxicology of Mercury in Humans.
7 What kind of mercury are you referring to when you
8 talk about that? What are the species of mercury?

9 A I'm sorry?

10 Q What are the species of mercury?

11 A The species of mercury that I am referring
12 to I'm getting primarily from Dr. Aposhian because I
13 have no particular expertise in the differences, for
14 example, pharmacokinetics, et cetera, in the species
15 of mercury. I'm told by Dr. Aposhian that there are
16 differences, so I have to be careful. The mercury
17 species that I'm aware of are ethyl mercury, methyl
18 mercury, inorganic mercury, iron and then mercuric
19 vapors.

20 Q So you said that you don't have any
21 particular expertise in the pharmacokinetics of the
22 various species of mercury?

23 A I do not. I turned to Dr. Aposhian for
24 that.

25 Q Okay. So you're relying on him for the

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1 pharmacokinetics of mercury?

2 A Yes, I am.

3 Q Would immune suppression be a
4 pharmacokinetic of mercury?

5 A No.

6 Q It is not a pharmacokinetic property?

7 A No.

8 Q You mentioned that you were I believe you
9 put it papered out of your office when you were
10 downloading I take it articles on mercury?

11 A No, not when I was downloading them, when I
12 was printing them.

13 Q Sorry. When you were printing them. That
14 makes sense. Yes. Do you know what types of mercury,
15 what the species of mercury were in those articles
16 that you were reading?

17 A In most cases the species were described,
18 and it was the whole range.

19 Q It was all the different species?

20 A It was.

21 Q You would agree from your training in
22 toxicology that there's a difference in how the
23 different species of mercury affect the body, correct?

24 A Yes, and not just on my training, but also,
25 I have been educated by Dr. Aposhian.

984B

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1 Q Educated by Dr. Aposhian?

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1 A Aposhian. Yes.

2 Q For this trial?

3 A Well, not specifically for this trial, but
4 for this, but for the investigation of mercury in the
5 human body.

6 Q For litigation purposes?

7 A For litigation purposes. Yes. We've had
8 several meetings.

9 Q So there's more than this trial that you're
10 preparing your opinion for and studying under Dr.
11 Aposhian for?

12 A Yes.

13 Q How much of thimerosal is ethyl mercury?

14 A Let me see. I'm told that there is about 50
15 percent of mercury in thimerosal, and I know that
16 thimerosal is composed both of ethyl mercury coupled
17 to salicylic acid, so I can't tell you how much is
18 ethyl and how much is the salicylic acid. I think I
19 actually said that in the testimony this morning
20 because I got that from either the Goth or the Agrawal
21 paper.

22 Q What's the periodic chart symbol for
23 mercury?

24 A Hg.

25 Q What's the molecular weight?

985B

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1 A I can't remember.

986A

BYERS - CROSS

1 Q Can't remember? Do you know?

2 A I'm sorry?

3 Q Do you know?

4 A I would look it up.

5 Q What's the chemical composition of
6 thimerosal expressed as elements on the periodic
7 chart?

8 A You know, I don't really understand that
9 question.

10 Q You told me what the element was, mercury,
11 what it was described as on the periodic chart, Hg.

12 A Yes.

13 Q What are the other chemical elements, the
14 otehr elements on the periodic chart that describe
15 thimerosal that compose it?

16 A Hydrogen, oxygen, sulfur, carbon.

17 Q Do you know how they're aligned?

18 A I can't hear you.

19 Q Do you know how they are aligned?

20 A What do you mean aligned?

21 Q Bonding?

22 A The bonding.

23 Q What's double bonded? What's single bonded?

24 A I do, I mean, I think I do, but I'm not
25 positive, and so I don't want to speculate.

986B

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1 Q What's the chemical composition of ethyl

987A

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1 mercury expressed the same way?

2 A Let me see. Ethyl mercury is CH- let me
3 see-CH- I can't remember- C₂H₄ I think.

4 Q Do you know how they are bonded?

5 A No, I don't.

6 Q From a toxicological significance standpoint
7 what's the clinical significance of the difference
8 between methylated mercury and ethylated mercury?

9 A I'm told that there's many differences.

10 Q Who told you this?

11 A Dr. Aposhian.

12 Q Okay. So this again was in preparation for
13 this litigation?

14 A Not necessarily this litigation.

15 Q For litigation on mercury?

16 A Thimerosal. Yes.

17 Q So what is the difference?

18 A There is a difference in the half life,
19 there's a difference in the association forming the
20 inorganic mercury or the Hapten whatever. I mean,
21 what I would do is if you actually ask me to answer
22 these questions I would go to him or I would look up
23 in an article and I would make lists.

24 Q You've just offered I don't know maybe a
25 half hour of opinion on the toxicological affects of

987B

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1 mercury. You've offered 14 pages of slides on the

988A

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1 toxicological effect of mercury. So you're telling me
2 that you need to actually ask someone else and answer
3 about the differences between methylated and ethylated
4 mercury, how they affect the body?

5 A I would ask for somebody else's opinion on
6 how they affect other organs apart from the immune
7 system. My responsibility was to look at the
8 immunotoxicity of mercury, and that's the reason that
9 I gave you the entire broad range. Most of the 14
10 slides I was careful to tell you involved either
11 methyl mercury, ethyl mercury, mercury vapor,
12 inorganic mercury, whatever.

13 Q Let's go to the first slide. Mercury and
14 the immunotoxicology of mercury is the --

15 SPECIAL MASTER HASTINGS: Which slide are we
16 turning?

17 MR. MATANOSKI: This is Slide 12.

18 SPECIAL MASTER HASTINGS: No. 12. Okay.

19 BY MR. MATANOSKI:

20 Q You mentioned in that it inhibits oxidative
21 burst and neutrophils causing neutrophil dysfunction.
22 Of the species of mercury, which one were you relying
23 on?

24 A I can't remember what the paper was. You
25 would have to put the paper in front of me.

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1 Q You didn't cite any reference. What is your
2 best reference for that?

3 A I'm sorry. As I sit here right now I do not
4 know the references, and I'm sorry that they weren't
5 on the slide. However, I'm told that I can have an
6 opportunity to do rebuttal testimony or something. If
7 you specifically ask for all of those references you
8 will get them.

9 Q Doctor, you were supposed to put together an
10 expert report in this case by February 20, 2007, that
11 laid out in detail your theory of the case.

12 A Who told you that?

13 Q So you didn't think that you had to lay out
14 in detail your theory of the case when you filed an
15 expert report in this case?

16 A I was told that I should file an expert
17 report. I do not remember the date at which I did so,
18 and it's my opinion that I laid out an expert report.
19 I gave you the limitations of the statement on the
20 slide, and I have also told you that there is a report
21 that I have put together which gives you all of the
22 references including all of the references that they
23 refer to. I simply did not include it in this report
24 because I didn't think it was important. It exists,
25 and you may have it.

BYERS - CROSS

1 Q That's not rebuttal, doctor, that's supposed
2 to be your opinion. That was supposed to be laid out
3 four months ago so that our case could be presented in
4 response to your opinion.

5 A I have no information as to your legal
6 schedule.

7 SPECIAL MASTER HASTINGS: Do you have a
8 question?

9 MR. MATANOSKI: I do, sir.

10 BY MR. MATANOSKI:

11 Q You filed a seven page, single spaced
12 report. In that report you have one paragraph that
13 discusses the affect of mercury on the body, and in
14 that you cite two articles, Goth and Agrawal. What
15 other support do you have for your opinion here today?
16 You've given us 14 pages of slides discussing mercury.

17 A The reason you have those 14 pages is
18 because I had thought that Dr. Aposhian was going to
19 opine on the immunotoxicity of mercury, and I was
20 listening to his testimony on Monday and found that he
21 was not going to do that, so therefore I felt it was
22 important for me to add stuff so that the Court could
23 have access to it.

24 Q Okay. So you're adding stuff about
25 toxicology?

BYERS - CROSS

1 A About immunotoxicology of mercury. Yes.

2 Q Why did you think Dr. Aposhian was going to
3 talk about immunotoxicology?

4 A Because I was told that he was going to be
5 discussing toxicology of mercury in general, and to me
6 that included immunotoxicology.

7 Q So you thought he was qualified to talk
8 about immunotoxicology?

9 A I'm sorry, I didn't know. I've not seen his
10 CV, and of course we weren't allowed to talk before
11 the trial.

12 Q You weren't allowed to talk before the
13 trial?

14 A I'm sorry?

15 Q I thought you did talk with him. He talked
16 to you about mercury.

17 A Yes. I talked to him maybe months ago.
18 We've had several meetings where he has presented the
19 toxicology of mercury, so I was surprised when he did
20 not include the immunotoxicology, and I decided that
21 it was necessary for me to give the Special Masters a
22 complete overview of it.

23 Q So Dr. Aposhian's testimony was incomplete?

24 A I can't hear you.

25 Q So Dr. Aposhian's testimony was incomplete?

BYERS - CROSS

1 A Dr. Aposhian did not include the
2 immunotoxicity of mercury.

3 Q Who informed you you weren't supposed to
4 talk to the other testifying experts?

5 A I was told by the attorneys.

6 Q The attorneys told you you shouldn't talk to
7 one another?

8 MS. CHIN-CAPLAN: Special Master, we're
9 getting to the area of attorney/client communications
10 here.

11 SPECIAL MASTER HASTINGS: Is there any
12 relevance to the question, Mr. Matanoski?

13 MR. MATANOSKI: I'll move on.

14 SPECIAL MASTER HASTINGS: Go ahead.

15 MS. CHIN-CAPLAN: Can Petitioners take a
16 five minute break?

17 MR. MATANOSKI: I'm sorry, sir. I can
18 probably finish up before our lunch break.

19 SPECIAL MASTER HASTINGS: All right. Let's
20 take a five minute break, and then we'll finish up.

21 (Whereupon, a short recess was taken.)

22 SPECIAL MASTER HASTINGS: All right. We'll
23 go back on the record here. We'll be continuing with
24 cross-examination.

25 MR. MATANOSKI: Thank you, Your Honor.

BYERS - CROSS

1 BY MR. MATANOSKI:

2 Q Doctor, do you have cites for each of the
3 statements that you have in your slides regarding
4 toxicology?

5 A Regarding the toxicology of mercury? Is
6 that what you want to say?

7 Q Yes.

8 A Yes, I do have that.

9 Q Can you provide those in the next 24 hours?

10 A I'm sorry. I can't do it in the next 24
11 hours because my travel schedule will not allow it.
12 However, I will do it in a very timely fashion.

13 Q Can we go through them now, and we'll find
14 out the ones that you can remember right now? Your
15 best ones that you can remember?

16 A No. The two that are most relevant for the
17 specific mercury that I feel is applicable to this
18 case, I have given you those references.

19 MS. CHIN-CAPLAN: Special Master, if there's
20 any question about the literature that Dr. Byers has
21 provided us we will get it, and we will file it as
22 soon as possible. We'll talk to her today about this.

23 SPECIAL MASTER HASTINGS: I understand.

24 MR. MATANOSKI: It just makes it very
25 difficult to cross-examine a witness if you don't know

BYERS - CROSS

1 what they're relying on.

2 SPECIAL MASTER HASTINGS: Well, I mean,

3 you --

4 MR. MATANOSKI: I understand.

5 BY MR. MATANOSKI:

6 Q Doctor, do the normal immune parameters vary
7 with age?

8 A Yes, they do.

9 Q Is it standard practice to use adult values
10 to assess a child's immune system?

11 A It is standard practice.

12 Q You mentioned the PCR testing that was done
13 in this case?

14 A I did not.

15 Q I thought you mentioned the recovery of
16 measles virus genomic material through PCR or the
17 detection?

18 A I was told by one of the PCR experts that in
19 fact the measles virus had been recovered, and that's
20 what I'm relying upon. I know that there is several
21 different types of PCR, and so I don't know and I
22 can't answer the specific test.

23 Q The PCR test, though, you would accept in
24 this case, the diagnostic values from that test? Are
25 they important to your opinion?

BYERS - CROSS

1 A It's important to my opinion to know that
2 measles virus was retained in the gut.

3 Q Okay. And that was detected by PCR?

4 A And that was detected by a test that the
5 experts upon whom I'm relying feel is sufficient.

6 Q Your own opinion on PCR? Do you have an
7 opinion on the value of PCR?

8 A I do not.

9 Q Did you offer an opinion previously to this
10 Court on the value of PCR?

11 A No. I offered an opinion on my reliance of
12 the other experts.

13 Q I'm sorry. Previously in testimony before
14 this Court in another case?

15 A I'm sorry. I can't remember.

16 Q Do you recall testifying that PCR was not
17 reliable unless it was an FDA-approved lab?

18 A I'm sorry. I can't remember doing that at
19 all.

20 Q You don't hold that opinion now?

21 A I haven't thought about it.

22 Q Would it be important to you that it be an
23 FDA-approved lab?

24 A Well, first of all you know that labs are
25 not directly accredited by the FDA.

BYERS - CROSS

1 Q I was going over your testimony, doctor.

2 A I'm sorry?

3 Q I was going on what was important to you
4 based on your testimony.

5 A The laboratories are accredited by the
6 American College of Pathology. Certainly, if it was a
7 routine test you would prefer to have it done by an
8 accredited laboratory. In some cases that's not
9 possible. The reason is that if it's ACP accredited
10 you don't have to worry about looking at the controls.
11 You don't have to do that yourself because somebody
12 else has already done it for you, namely the American
13 College of Pathologists.

14 If, though, you're looking at a test that's
15 done by a different laboratory that is not certified
16 by the ACP then either you have to do it yourself or
17 you have to find somebody else upon whom to rely, and
18 that's what we've done here.

19 Q I'm sorry. I'm not sure I understand whom
20 you're relying. As far as testing for controls?

21 A Talk a little louder, please.

22 Q I'm sorry. For testing for controls?

23 A Not just testing for controls. You're
24 making faces at me. You are.

25 SPECIAL MASTER HASTINGS: Look at the

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BYERS - CROSS

1 Special Masters. You won't make the case today.

2 THE WITNESS: She's much more attractive.

3 Thank you. If you have a test or a lab that is
4 accredited by the ACP, American College of
5 Pathologists, then they have already looked to make
6 sure everything is kosher. They have made sure that
7 the controls are kosher, and probably as important
8 like about five times a year they send out unknown
9 samples to make sure that you get the right results,
10 so somebody has already done all that work for you.

11 If you however are using a laboratory, for
12 example, an academic research laboratory or even a
13 clinical laboratory where that has not been done then
14 you either have to go in yourself and convince
15 yourself that all of their controls and their normal
16 ranges are proper or alternatively you have to ask an
17 expert upon whom you can rely to do it. So it just
18 makes it a little more complicated.

19 BY MR. MATANOSKI:

20 Q And you don't recall testifying that you
21 would not credit PCR results from a non-FDA-approved
22 lab?

23 A I'm sorry. I cannot remember doing that.

24 MR. MATANOSKI: Thank you. I have no
25 further questions.

BYERS - CROSS

1 SPECIAL MASTER HASTINGS: Do you have some
2 questions for this witness?

3 SPECIAL MASTER VOWELL: I have some
4 questions, but do we want to take a lunch break first
5 or do we want to just continue on? I mean, I'm just
6 asking.

7 SPECIAL MASTER HASTINGS: Well, let me ask
8 you, Ms. Chin-Caplan. Are you expecting to do a lot
9 of redirect?

10 MS. CHIN-CAPLAN: No, Special Master, I'm
11 not.

12 SPECIAL MASTER HASTINGS: Well, maybe we
13 could go on and see if we conclude without a lunch
14 break. We'll see what happens.

15 Go ahead, Special Master Vowell.

16 SPECIAL MASTER VOWELL: Bear with me, Dr.
17 Byers, because I may have to flip back and forth a
18 bit, and if my questions are not properly phrased,
19 help me out. I'm trying to understand what you had
20 testified about. As I understand it dendritic cells
21 secrete cytokines.

22 THE WITNESS: Yes, they do.

23 SPECIAL MASTER VOWELL: And those cytokines
24 can either be proinflammatory or antiinflammatory?

25 THE WITNESS: I didn't say that, but you're

BYERS - CROSS

1 correct. They can be.

2 SPECIAL MASTER VOWELL: Okay. Would you
3 give me some examples that would be found in the
4 literature of proinflammatory cytokines?

5 THE WITNESS: Yes.

6 SPECIAL MASTER VOWELL: Okay.

7 THE WITNESS: The ones that most come to
8 mind are TNF-alpha, IL6 and IL1-beta.

9 SPECIAL MASTER VOWELL: Okay. So TNF, and
10 that's alpha.

11 THE WITNESS: TNF-alpha.

12 SPECIAL MASTER VOWELL: Okay. Tumor
13 necrosis factor alpha.

14 THE WITNESS: That's right. That's the one
15 that Enbrel and Remicade are directed against. IL6,
16 which is the one that the new monoclonal antibody I
17 was telling you about is directed against, and IL1-
18 beta, which is new. You're probably not going to be
19 seeing a lot of references to that unless you look at
20 maybe the literature this year, and the reason for
21 that is we just elucidated a new path which results in
22 the secretion of IL1-beta instead of TNF-alpha.

23 So from your question it's obvious that you
24 are becoming very well-read in the subject. So if you
25 want to find IL1-beta look, for example, for the CIAS1

1000A

BYERS - CROSS

1 gene mutations because that's the literature where
2 it's going to come from.

3 SPECIAL MASTER VOWELL: And IL1 is then
4 divided into alpha and IL1-beta? Are there two sets?
5 Were they originally thought to be part of the same?

6 THE WITNESS: (Nonverbal response.)

7 SPECIAL MASTER VOWELL: Okay. You're
8 shaking your head, so obviously I've got something
9 wrong. So go ahead.

10 THE WITNESS: IL just stands for
11 interleukin, and so therefore all of the classes of
12 interleukin are going to have IL as the beginning.
13 Yes.

14 SPECIAL MASTER VOWELL: Right, but I'm
15 talking about IL1-alpha, IL1-beta. Are they part of
16 the same family of interleukins? I don't know how
17 interleukins came to be numbered, so I'm assuming that
18 originally we had something that was called IL1 and
19 now its IL1-alpha and IL1-beta. If that assumption is
20 incorrect please correct me.

21 THE WITNESS: I think you're right, but let
22 me also just correct you on one thing. The cytokines
23 by and large have been numbered in the order in which
24 they were discovered, but sometimes they were numbered
25 in different ways.

BYERS - CROSS

1 SPECIAL MASTER VOWELL: And I understand
2 that people may have found the same one and called it
3 something else, and then eventually the scientific
4 community came to a consensus on what it ought to be
5 called.

6 THE WITNESS: Sometimes they do, and
7 sometimes they don't. I mean, what happens is that
8 the gene jockeys sit around and they find something
9 abnormal, and then they say well, let's call this fox
10 pro three or let's call this toll-like receptors.
11 Then at a later date the biologists come in and they
12 say that's what that's doing.

13 Sometimes at a later date you have a big
14 convention and you say, all right, we're going to
15 change the name, and sometimes you never do.

16 SPECIAL MASTER VOWELL: Okay. And
17 antiinflammatory cytokines, can you give me some
18 examples of those?

19 THE WITNESS: No. As I sit here right now I
20 can't because I just haven't thought about it, but I
21 certainly will be willing to send you all the reprints
22 that you want.

23 SPECIAL MASTER VOWELL: I think there are
24 enough articles here for us to read, Dr. Byers.

25 THE WITNESS: Oh, dear.

1002A

BYERS - CROSS

1 SPECIAL MASTER VOWELL: Identifying which
2 ones may be more helpful than any new ones. All
3 right. You talked about helper inducer cells on one
4 of your slides. Can you explain to me what they are?

5 THE WITNESS: Well, yes. The helper cells
6 are T cells. The name is very old-fashioned, but
7 basically they're called helper inducers because they
8 will induce B cells to produce antibodies.

9 SPECIAL MASTER VOWELL: Okay. So the helper
10 inducer cells are another name for T cells, and the T
11 cells induce the B cells to produce antibodies and
12 then you get an antibody response.

13 THE WITNESS: That's right.

14 SPECIAL MASTER VOWELL: That would be -- I'm
15 losing my words here -- not the innate immune system,
16 but the adaptive immune system?

17 THE WITNESS: Yes.

18 SPECIAL MASTER VOWELL: Okay. As I
19 understand your testimony about the affects of mercury
20 in general, and we won't try to speciate it right now,
21 that mercury in general has a toxic affect on the
22 immune system.

23 THE WITNESS: Yes.

24 SPECIAL MASTER VOWELL: And you testified
25 that it lowers suppressor cell numbers on Slide 12,

1003A

BYERS - CROSS

1 but you don't have a citation for that. You just
2 don't recall that citation at all?

3 THE WITNESS: No, I don't. I'm sorry. I
4 have prepared an entire brief with all the citations.

5 SPECIAL MASTER VOWELL: You referred us to
6 the Agrawal and the Goth studies.

7 THE WITNESS: I did.

8 SPECIAL MASTER VOWELL: Maybe I
9 misunderstood your testimony, doctor. You testified I
10 think that the presence of mercury induces apoptosis
11 in T cells.

12 THE WITNESS: It can. Yes.

13 SPECIAL MASTER VOWELL: Okay. How about
14 dendritic cells?

15 THE WITNESS: No. I've never seen evidence
16 that mercury induces apoptosis of dendritic cells. As
17 I sit here right now I cannot remember it.

18 SPECIAL MASTER VOWELL: As I understood your
19 testimony about Michelle you indicated that one of the
20 things you would look for in clinically evaluating
21 immune dysregulation -- I'm referring to page 2 of
22 your slide -- would be a history of frequent and/or
23 unusual infections.

24 THE WITNESS: Yes.

25 SPECIAL MASTER VOWELL: But you said that

1004A

BYERS - CROSS

1 was not present in Michelle.

2 THE WITNESS: You're correct.

3 SPECIAL MASTER VOWELL: And so there is no
4 evidence from the number of infections prior her to
5 MMR vaccine that the thimerosal containing vaccines
6 had any clinical impact on her presentation.

7 THE WITNESS: You're correct. She did have
8 a varicella vaccination at age 12 months, and when we
9 talked to her mom she could have had an abnormal
10 reaction to it, but I don't have any records of it and
11 so therefore I'm not saying anything about it.

12 SPECIAL MASTER VOWELL: Okay. You talk in
13 general about the effects, and I'm referring to your
14 Slide 31 here, of cytokines on the central nervous
15 system, specifically interleukin-2 blackbox form.

16 THE WITNESS: Yes.

17 SPECIAL MASTER VOWELL: Did you testify in
18 any way about the effects of thimerosal containing
19 vaccines on interleukin-2 levels?

20 THE WITNESS: I did not testify.

21 SPECIAL MASTER VOWELL: Or thimerosal in
22 general?

23 THE WITNESS: Yes. One can postulate what
24 might be the affect, but I do not know of any
25 experimental data as I sit here right now.

BYERS - CROSS

1 SPECIAL MASTER VOWELL: Okay. So when
2 you're talking about what interleukin-2 can do, change
3 the hemostatus, speech difficulties, ataxia, you
4 didn't cite me to anything that said there's a problem
5 with interleukin-2 based on mercury exposure.

6 THE WITNESS: Indirectly, because the
7 mercury exposure impairs the ability of the immune
8 system to clear the measles virus. The measles virus
9 then stimulates the adaptive and the innate immune
10 systems. The adaptive immune system of course is one
11 of the primary pushers of IL2, and so therefore one
12 indirectly is asking the thimerosal to exaggerate the
13 affect of IL2.

14 SPECIAL MASTER VOWELL: But you are not
15 aware of any research that shows an affect on IL2 by
16 thimerosal, or ethyl mercury, or methyl mercury?

17 THE WITNESS: I have not seen any papers
18 where they have taken thimerosal and put them in T
19 cells in a test tube and demonstrated that it
20 decreased it.

21 SPECIAL MASTER VOWELL: How about
22 interferon-alpha? That's Slide 32.

23 THE WITNESS: My answer is the same.

24 SPECIAL MASTER VOWELL: Okay. I'm just
25 trying to track down that I haven't missed anything in

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1 terms of the reading because I have spent a lot of
2 time with Agrawal and Goth. And you indicated
3 interferon-beta has the effect of depression, suicide,
4 seizures, at least they've been reported, but you
5 don't have any citations for an effect of the measles
6 virus, or thimerosal, or any mercury effect on the
7 production of interferon-beta.

8 THE WITNESS: I do not.

9 SPECIAL MASTER VOWELL: Okay. I'm just
10 tracking this down. All right. You referred in one
11 of your slides I believe to LPS. What is LPS?

12 THE WITNESS: Lipopolysaccharide.

13 SPECIAL MASTER VOWELL: And that is?
14 Translate that for me.

15 THE WITNESS: Lipopolysaccharide is the
16 component of several cell walls of bacteria. You'll
17 remember I said that there's essentially 10 major
18 specificities of the toll-like receptors. One of
19 those is LPS, and I think LPS is probably the most
20 potent of the stimulants of that pathway, and so
21 therefore, it's a favorite of people who would like to
22 simply use something to stimulate that pathway.

23 Unknown: For the record that reference was
24 on page 25 of Petitioner's Trial Exhibit No. 9. Thank
25 you.

1006B

BYERS - CROSS

1 SPECIAL MASTER VOWELL: As understand your
2 testimony, Dr. Byers, you said

1007A

BYERS - CROSS

1 that because the thimerosal containing vaccineS in
2 Michelle that that contributed to her inability to
3 clear the measles virus from her system. Was that
4 your testimony?

5 THE WITNESS: Yes, I did.

6 SPECIAL MASTER VOWELL: Okay. And the
7 presence of the persistent measles virus and/or the
8 presence of the residual thimerosal in whatever form
9 it's left in the body has an effect on cytokine
10 production?

11 THE WITNESS: Yes, it does.

12 SPECIAL MASTER VOWELL: And it is the
13 proinflammatory cytokines that you think responsible
14 for the gut symptoms and the CNS symptoms?

15 THE WITNESS: Yes.

16 SPECIAL MASTER VOWELL: And intestinal
17 symptoms and CNS symptoms are linked?

18 THE WITNESS: Are?

19 SPECIAL MASTER VOWELL: Are linked? In
20 other words, those people who have intestinal symptoms
21 are more likely to have CNS symptoms. Is that what
22 you're saying?

23 THE WITNESS: Than those people that do not
24 have gut symptoms, and actually, probably than those
25 people who have inflammation in other areas of the

BYERS - CROSS

1 body.

2 SPECIAL MASTER VOWELL: You also referred us
3 to the Ashwood article. Is that correct?

4 THE WITNESS: I did.

5 SPECIAL MASTER VOWELL: And you talked about
6 the significance of Michelle's CD4 levels. The CD4,
7 CD8. In other words, she had a normal CD4, but the
8 CD4, CD8 ratio was skewed?

9 THE WITNESS: Yes.

10 SPECIAL MASTER VOWELL: Doesn't Ashwood talk
11 about decreased CD4 levels in autistic individuals?

12 THE WITNESS: I can't remember.

13 SPECIAL MASTER VOWELL: So you couldn't tell
14 me why Michelle's would be normal but Ashwood would
15 find a decreased level?

16 THE WITNESS: I'm sorry. I can't.

17 SPECIAL MASTER VOWELL: That's okay. I'm
18 just trying to answer questions that occurred in the
19 course of the testimony and in the course of my
20 reading of the articles. Do you recall from your
21 reading of the mercury articles, Agrawal and Goth
22 whether IL6 is increased or decreased as the result of
23 thimerosal or some form of mercury?

24 THE WITNESS: In the Goth article, as I
25 remember it was biphasic.

1009A

BYERS - CROSS

1 SPECIAL MASTER VOWELL: And what would the
2 significance of any of it being biphasic be?

3 THE WITNESS: I think there's not very much
4 significance because the biphasic nature of this is
5 really not known. In other words, I mean, if you ask
6 me, for example, there's a circadian rhythm of the
7 immune system in general which we now know is
8 responsible for the classic old-timey afternoon fevers
9 in TB, but we knew about the afternoon fevers and then
10 40 years later we figured out about the significance
11 of the circadian rhythm.

12 My guess is that this biphasic business is
13 going to be under investigation for say the next 10.

14 SPECIAL MASTER VOWELL: Are IL6 and
15 IFN-beta --

16 THE WITNESS: Are they linked?

17 SPECIAL MASTER VOWELL: How are they linked?

18 THE WITNESS: IL6 and IL1-beta?

19 SPECIAL MASTER VOWELL: IFN-beta.

20 THE WITNESS: Interferon-beta.

21 SPECIAL MASTER VOWELL: Yes. Are they
22 linked at all?

23 THE WITNESS: They're linked in that they
24 are -- let me see. I'm sorry. I can't remember how
25 they're linked. I can give you TNF-alpha and IL1-

1010A

BYERS - REDIRECT

1 beta.

2 SPECIAL MASTER VOWELL: Okay. I think those
3 are my questions. Thank you very much, Dr. Byers

4 THE WITNESS: Thank you.

5 SPECIAL MASTER HASTINGS: Ms. Chin-Caplan,
6 did you want to do some redirect?

7 MS. CHIN-CAPLAN: Yes, Special Master.

8 REDIRECT EXAMINATION

9 BY MS. CHIN-CAPLAN:

10 Q Dr. Byers, you submitted a report in this
11 case, didn't you?

12 A I did.

13 Q And, Dr. Byers, on page 4 of your report,
14 which is Petitioner's Exhibit 57, at the very bottom
15 have you included a section on thimerosal and how it
16 relates to the problems that Michelle Cedillo suffers?

17 A Yes, I did.

18 Q Okay. And, doctor, just read along with me.

19 SPECIAL MASTER HASTINGS: Which page did you
20 say?

21 MS. CHIN-CAPLAN: Page 4.

22 SPECIAL MASTER HASTINGS: Page 4. Thank
23 you.

24 MS. CHIN-CAPLAN: Thank you.

25 BY MS. CHIN-CAPLAN:

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1011A

BYERS - REDIRECT

1 Q The other known immunosuppressive factor to
2 which Michelle Cedillo was exposed was thimerosal in
3 the vaccine she received before and shortly after the
4 MMR injection. Mercury has been shown to be
5 immunosuppressive in multiple systems both in animals'
6 in vivo systems and human in vitro systems. One of
7 the most consistent findings is a demonstration of
8 abnormal increase in the TH2 population of helper T
9 cells resulting in a skewing of the TH1 TH2 ratio.

10 Recent data indicates the root cause of this
11 abnormal immune function is the dendritic cells.
12 These cells of all the immune cells appear to be the
13 most sensitive to the effect of mercury, specifically
14 thimerosal. In murine dendritic cells thimerosal was
15 shown to interfere with calcium channels thereby
16 adversely affecting its cytokine production necessary
17 for proper antigen presentation.

18 This occurred at relatively small amounts
19 such as 50 nanomoles, about 11 micrograms per liter.
20 Goth, et al., 2006. A more recent paper used human
21 dendritic cells to establish that thimerosal treatment
22 altered the ability of the cells to produce a TH1
23 response instead promoting a TH2 response. Agrawal,
24 et al., 2007.

25 Again, at a dose of 50 nanomoles. Since

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1012A

BYERS - REDIRECT

1 measles virus itself also produces the skewed response
2 the thimerosal containing vaccines received both
3 before and shortly after the MMR vaccination together
4 with the immunosuppressive ability of the measles
5 virus itself may have resulted in a prolongation of
6 the measles virus in the body, and this should be
7 included in the differential diagnosis of the abnormal
8 immune system. Have I read that correctly?

9 A Yes, you have.

10 Q Has your opinion changed at all since you
11 wrote that report?

12 A No. No.

13 Q So the testimony that you gave today is
14 entirely consistent with what's contained in your
15 report?

16 A I think so. I would have to go back and
17 double check the doses because this is 50 and it might
18 have been 25 nanomoles. But, yes, it's nanomolar or
19 amount. It's small.

20 Q So your testimony today is the same as what
21 you let the government know back in February that you
22 were going to be testifying about?

23 A Yes.

24 Q Doctor, there were some questions about page
25 12 of your slide, and it was titled Immunotoxicology

BYERS - REDIRECT

1 of Mercury in Humans. Mr. Matanoski was asking you
2 some questions about why you didn't include any
3 citations. Do you recall that?

4 A Yes, I do.

5 Q Now, doctor, you don't have an office here
6 in Washington, D.C., do you?

7 A No, I don't.

8 Q You're functioning out of a hotel room.
9 Isn't that true?

10 A Yes.

11 Q And you don't have any staff to help you, do
12 you?

13 A No.

14 Q Other than me. Doctor, I'm going to show
15 you page 12 on your computer screen. Do you have some
16 articles cited to the right of this page on your
17 computer?

18 A What's the right of the page mean? Excuse
19 me. The right of this?

20 Q Yes. The page.

21 A Yes, I do.

22 Q Doctor, could you just tell the Court what
23 those citations are?

24 A Yes. One is al-Hashimi, Inhibition of
25 Luminol Dependent Chemiluminescence of Human Granula

BYERS - REDIRECT

1 Sites by Low Doses of Inorganic Mercury.

2 SPECIAL MASTER HASTINGS: Is there a whole
3 lot of these? Okay. There's four? Okay. Go ahead.

4 THE WITNESS: Okay. So al-Hashimi.

5 SPECIAL MASTER HASTINGS: You're trying to
6 make the point, Ms. Chin-Caplan, that there are
7 citations here.

8 MS. CHIN-CAPLAN: Yes.

9 SPECIAL MASTER HASTINGS: And maybe we could
10 make a copy of these and let the government have them
11 rather than reading the whole thing into the record
12 here?

13 MS. CHIN-CAPLAN: That's fine.

14 SPECIAL MASTER HASTINGS: Okay.

15 BY MS. CHIN-CAPLAN:

16 Q So, Dr. Byers, you relied on the medical
17 literature that you printed up when you formulated
18 these slides, didn't you?

19 A Yes, I did.

20 Q And there are citations available for this
21 information contained on this page?

22 A Yes. I'm glad you said. But I also have a
23 regular report that is available that will support the
24 slides.

25 MS. CHIN-CAPLAN: Thank you. I have no

BYERS - RECROSS

1 further questions.

2 SPECIAL MASTER HASTINGS: Any re-cross?

3 MR. MATANOSKI: Briefly, Judge.

4 SPECIAL MASTER HASTINGS: Okay. Go ahead.

5 RECROSS-EXAMINATION

6 BY MR. MATANOSKI:

7 Q You said you have a regular report. Is that
8 the report you submitted in this case? The regular
9 report that supports these slides?

10 A There is a regular report, and I did not
11 include it in that presentation, but I have it.

12 Q You don't plan to be filing that now in this
13 case, do you?

14 A It depends on whether you want to. I
15 thought you had just asked for it. In fact, you asked
16 for it within the next 24 hours.

17 Q No. I asked for the cites, ma'am, and I
18 understand we'll be getting those. You stated that
19 was inorganic mercury as to the cite on the first part
20 of Immunotoxicology of Mercury in Humans? Is that
21 right?

22 A I'm sorry. I don't know what you're talking
23 about.

24 SPECIAL MASTER HASTINGS: I'm not sure what
25 the question is.

1016A

BYERS - RECROSS

1 BY MR. MATANOSKI:

2 Q I'm sorry. On page 12 you were asked to
3 read one of the citations. I take it it was for the
4 inhibits oxidative burst in neutrophils causing
5 neutrophil dysfunction. Did I understand that to be
6 al-Hashimi? Is that right?

7 A I remember that, yes. I just read it.

8 Q On inorganic mercury?

9 A I can't remember. Does it say inorganic
10 mercury?

11 Q I thought I heard Ms. Chin-Caplan read that
12 out of the title.

13 SPECIAL MASTER HASTINGS: I thought they're
14 going to print it out and give it to you within a few
15 minutes.

16 MR. MATANOSKI: Okay. Thank you, sir.

17 BY MR. MATANOSKI:

18 Q You've mentioned your conclusion remains the
19 same in this case?

20 A Yes. It's the conclusion that I testified
21 to.

22 Q In 2004 when you published your article with
23 Drs. Kennedy and Marchalonis didn't you state at that
24 time that in our assessment if measles virus is
25 detected in the gut, CSF and CNS at a time when host

1016B

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1 immune response should have removed the infection and

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1 if the measles virus is of the vaccine strain then the
2 potential for a persistent infection cannot be ruled
3 out? I'll put the D in there.

4 A That's a typo.

5 Q Yes.

6 A You read it correctly.

7 Q Still hold that to be your opinion?

8 A Yes.

9 MR. MATANOSKI: Thank you. I have no
10 further questions.

11 SPECIAL MASTER HASTINGS: Any redirect?

12 MS. CHIN-CAPLAN: No redirect.

13 SPECIAL MASTER HASTINGS: Go ahead.

14 SPECIAL MASTER VOWELL: Dr. Byers, you
15 talked about the Goth article and the Agrawal article.
16 The Goth article deals with murine dendritic cells,
17 correct?

18 THE WITNESS: Yes.

19 SPECIAL MASTER VOWELL: And the Agrawal
20 article deals with human dendritic cells?

21 THE WITNESS: That's correct.

22 SPECIAL MASTER VOWELL: So for purposes of
23 opining on the affect of thimerosal on the human
24 immune system would one study be better than the
25 other?

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1 THE WITNESS: Not necessarily. May I
2 amplify a little bit?

3 SPECIAL MASTER VOWELL: Sure.

4 THE WITNESS: I think your question is
5 whether or not there is something that is
6 biochemically or biologically different between human
7 and murine cells, and I do not know of any information
8 on that. As I mentioned to you, I sit on the SBIR
9 panel and since it's a cancer panel we get lots of
10 cancer vaccines. It's pretty normal to be evaluating
11 a vaccine where you treat murine dendritic cells in
12 vitro and then inject them into the mouse.

13 You have to use murine because you want
14 syngeneic, right? In the 15 years that I've been on
15 that panel there has never been any suggestion that
16 one cannot use the results from that experiment in
17 order to move forward into human clinical trials.

18 SPECIAL MASTER VOWELL: Okay. Well, let me
19 ask the question this way because you talked about the
20 biphasic effect that was found on dendritic cells
21 in --

22 THE WITNESS: Goth.

23 SPECIAL MASTER VOWELL: -- Goth, but didn't
24 Agrawal find that thimerosal suppressed the secretion
25 of IL6?

1019A

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1 THE WITNESS: He said he did. If I look at
2 one of his figures it looks to me like he enhanced it,
3 and he is mostly focusing on I think IL5 and IL13, but
4 these are early days. I think the main thing you
5 should take away is the fact that there is abnormal
6 secretion of some of these cytokines.

7 SPECIAL MASTER VOWELL: It doesn't matter
8 which one?

9 THE WITNESS: Basically. We're going to
10 work this out, we're going to shake it out. The thing
11 that I took away from the two papers is that you can
12 have abnormalities in these key dendritic cells from
13 nanomolar amounts of mercury specifically in the form
14 of thimerosal, and I had not gotten that before in all
15 of these articles that I cited.

16 SPECIAL MASTER VOWELL: And my question is
17 not arguing with you about which is more level. I'm
18 trying to understand why you would have a biphasic
19 affect in one study and why in another, and obviously
20 one answer is one is our human cells and one are
21 murine cells. But you don't think that makes any
22 difference?

23 THE WITNESS: I really don't. I think it
24 might just be that maybe they are measuring
25 differently or something like that.

1020A

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1 SPECIAL MASTER VOWELL: Okay. Thank you
2 very much, Dr. Byers. I apologize for not asking that
3 one earlier.

4 SPECIAL MASTER HASTINGS: Anything further?
5 (No response.)

6 SPECIAL MASTER HASTINGS: So from the
7 Petitioner's standpoint we should just end for the day
8 and start again at 9:00 a.m. with Dr. Kinsbourne. Is
9 that correct?

10 MS. CHIN-CAPLAN: That's correct.

11 SPECIAL MASTER HASTINGS: Any housekeeping
12 matters and anything we ought to do before we break
13 for the day?

14 MS. CHIN-CAPLAN: Yes, Special Master. I
15 thought that we had agreed that anything produced in
16 the UK would be given to the Petitioners.

17 SPECIAL MASTER HASTINGS: There aere four
18 articles- You're talking about the expert report they
19 got from the UK litigation?

20 MS. CHIN-CAPLAN: Well, apparently there was
21 it looked like a spreadsheet that Mr. Matanoski was
22 referring to.

23 SPECIAL MASTER HASTINGS: Well, I was going
24 to ask about that myself. Our practice has been this
25 first week of trial when people were questioning from

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1 documents we were filing them as trial exhibits.
2 There were three such references today that I wrote
3 up, the letter from the Board of Allergy and
4 Immunology, and the letter from the University of
5 California at San Francisco and finally, some kind of
6 document from the UK litigation.

7 Any problem with filing them as trial
8 exhibits?

9 MR. MATANOSKI: No, sir.

10 SPECIAL MASTER HASTINGS: And that's what
11 you're referring to?

12 MS. CHIN-CAPLAN: Right.

13 SPECIAL MASTER HASTINGS: All right. Well,
14 why don't you do that. File it, and put them in
15 sequence to the ones you filed. I think you filed the
16 other ones already.

17 MR. MATANOSKI: Yes, sir. We'll do that.

18 SPECIAL MASTER HASTINGS: Okay. That would
19 be good. Anything else we should discuss?

20 MR. MATANOSKI: Just a point of
21 clarification. That last document was not from the UK
22 litigation. It involves it, but it's from publicly
23 available sources. I believe it was actually obtained
24 by the Freedom of Information Act that the British
25 have to obtain through those websites.

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1 SPECIAL MASTER HASTINGS: All right. In
2 fact, while we're on the topic -- well, we don't
3 really need to discuss this now. Okay. Anything else
4 we ought to discuss now?

5 (No response.)

6 SPECIAL MASTER HASTINGS: If not, we're
7 adjourned until 9:00 a.m. tomorrow morning. Thank
8 you, all.

9 (Whereupon, at 1:15 p.m., the hearing in the
10 above-entitled matter was adjourned, to reconvene
11 Friday, June 15, 2007, at 9:00 a.m.)

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REPORTER'S CERTIFICATE

DOCKET NO.: 98-916V
CASE TITLE: Cedillo v. Sec., HHS
HEARING DATE: June 14, 2007
LOCATION: Washington, D.C.

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 United States Court of Federal Claims.

Date: June 14, 2007

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