SUPERIOR COURT OF CALIFORNIA

COUNTY OF ALAMEDA

BEFORE THE HONORABLE WINIFRED Y. SMITH, JUDGE PRESIDING

DEPARTMENT NUMBER 21

---oOo---

COORDINATION PROCEEDING SPECIAL TITLE (RULE 3.550) ROUNDUP PRODUCTS CASE	**JCCP No. 4953**
THIS TRANSCRIPT RELATES TO: Pilliod, et al. vs. Monsanto Company, et al.	**Case No. RG17862702** **Pages 2663 - 2940** **Volume 17**

Reporters' Transcript of Proceedings

Tuesday, April 9, 2019

Reported by: Kelly L. Shainline, CSR No. 13476, RPR, CRR
Lori Stokes, CSR No. 12732, RPR
Stenographic Court Reporters

BAY AREA REPORTING
SOLUTIONS

888.526.8243
www.BayAreaReportingSolutions.com

APPEARANCES OF COUNSEL:

For Plaintiffs:

THE MILLER FIRM, LLC
108 Railroad Avenue
Orange, Virgina 22960
(540)672-4224
BY: MICHAEL J. MILLER, ATTORNEY AT LAW
mmiller@millerfirmllc.com

BAUM HEDLUND ARISTEI & GOLDMAN PC
10940 Wilshire Boulevard, 17th Floor
Los Angeles, California 90024
(310) 207-3233
BY: R. BRENT WISNER, ATTORNEY AT LAW
rbwisner@baumhedlundlaw.com
PEDRAM ESFANDIARY, ATTORNEY AT LAW
pesfandiary@baumhedlundlaw.com

(APPEARANCES CONTINUED ON FOLLOWING PAGE)

APPEARANCES: (CONTINUED)

For Defendants:

EVANS FEARS & SCHUTTERT LLP
2300 W. Sahara Ave, Suite 950
Las Vegas, Nevada 89102
(702) 805-0290
BY: KELLY A. EVANS, ATTORNEY AT LAW
kevans@efstriallaw.com

HINSHAW
One California Street, 18th Floor
San Francisco, California 94111
(415) 362-6000
BY: EUGENE BROWN JR., ATTORNEY AT LAW
ebrown@hinshawlaw.com

GOLDMAN ISMAIL TOMASELLI BRENNAN & BAUM LLP
564 West Randolph Street, Suite 400
Chicago, Illinois 60661
(312) 681-6000
BY: TAREK ISMAIL, ATTORNEY AT LAW
tismail@goldmanismail.com

HOLLINGSWORTH LLP
1350 I Street, N.W.
Washington, DC 20005
(202)898-5800
BY: KIRBY GRIFFIS, ATTORNEY AT LAW
kgriffis@hollingsworthllp.com

(Multiple other counsel present as reflected in the minutes.)

I N D E X

Tuesday, April 9, 2019

Tuesday, April 9, 2019 9:05 a.m.

(The following proceedings were heard in the presence of the jury:)

THE COURT: Good morning, everyone.

Ready to continue this morning with Plaintiffs' next witness.

MR. MILLER: Good morning, Your Honor. I'll be doing the witness today. And the witness is Dennis Weisenburger, M.D.

Good morning, folks.

Dr. Weisenburger, if you will take the stand.

If I could approach the witness, we have a binder of exhibits for the doctor.

Here is a copy for counsel and a copy for the Court.

DENNIS WEISENBURGER,

called as a witness for the Plaintiffs, having been duly sworn, testified as follows:

THE CLERK: Would you please state and spell your name for the record.

THE WITNESS: Dennis Weisenburger. D-E-N-N-I-S, W-E-I-S-E-N-B-U-R-G-E-R.

DIRECT EXAMINATION

BY MR. MILLER:

Q. Good morning, Doctor.

A. Good morning.

Q. It sounds like you have a little bit of a cold.

A. Yeah, I'm struggling. If I could a little bit, don't be offended.

Q. Did you visit the grandkids this weekend? That's what does it, right?

A. Yep.

Q. All right. Well, let's get started, okay? This jury has heard your name a few times, but we need to hear it from you.

Who are you?

A. Well, I'm a hematopathologist who has spent years studying non-Hodgkin's lymphoma, diagnosing it, working with oncologists to treat it, doing research on it.

I was at the University of Nebraska for 28 years, where we did a lot of work on epidemiology of non-Hodgkin's lymphoma. And then most recently, I've been at the City of Hope, where I was chairman of the Department of Pathology.

Q. I'm going to break down some of that, all right?

A. Okay.

Q. So you're a pathologist, right?

A. Right.

Q. Which is a form of medical doctor, of course?

A. Right. It's a medical doctor with special training.

Q. Yes, sir.

And so in addition to being a medical doctor and a pathologist, you're a hemo-pathologist, right?

A. Right. Well, a hematopathologist. That means I have special training in the diagnosis of diseases of the blood and bone marrow.

So things like leukemia, lymphoma, Hodgkin's, and non-Hodgkin's lymphoma, myeloma and other diseases of the blood and bone marrow, including benign diseases like anemia and low white count. Those kinds of things.

I had two years of additional training in pathology just in that specific field.

Q. Hematopathology?

A. Right.

Q. Pathology is the study of what?

A. Pathology is just the study of disease. So pathologists are the ones who look at the tissue that's been taken out of the patient. They make slides of the tissue. Sometimes it's a tumor, sometimes it's benign or inflammatory. And then they look at the slides, and they make a diagnosis.

So in the case of cancer, we usually try to make diagnosis of the cancer, and then try to tell where the cancer came from and whether it's a highly malignant form of cancer or a slow-growing cancer. So we work very closely with our clinicians, oncologists, and hematologists to help guide them into what kind of cancer the patient has and how they should treat that cancer.

Q. So the clinician is the doctor at the bedside with the patient, the oncologist or --

A. Right.

Q. And that's part of the team for treating a patient, pathology, oncology?

A. Yes.

Q. You mentioned that your work has focused in non-Hodgkin's lymphoma.

How long have you been doing that, Doctor?

A. I've been doing it for over 40 years. Even when I was a young trainee in pathology, I was interested in lymphoma and wrote some papers on it. A long time.

Q. How important is a hematopathologist in diagnosing a non-Hodgkin's lymphoma?

A. Well, it's important because the classifications of these hematologic malignancies are

really complex. Most clinicians, hematologists, or oncologists want a hematopathologist to look at it and make sure the precise diagnosis is correct. Often, it may not be correct. And so most academic places, most big hospitals have a hematopathologist.

Q. In addition to studying the pathology, have you studied the genetics of lymphoma?

A. Yes. So when I was at University of Nebraska, and also at City of Hope, where I am now, we've done a lot of research on the genetics of non-Hodgkin's lymphoma. What genetic lesions are important, what are the initiating lesions, what are the later lesions.

So, yeah, we've written quite a bit about that. We've been interested in the genetics, the epidemiology, as well as the biology, and the clinical features and how to treat the patient. So I've done the whole gamut of that type of research.

Q. We've looked at a couple of your epidemiological papers on pesticides and non-Hodgkin's lymphoma.

How long have you been studying pesticides and non-Hodgkin's lymphoma?

A. Yeah. So actually I started studying pesticides and non-Hodgkin's lymphoma shortly after I went to Nebraska. I did my training in hematopathology

in City of Hope in Los Angeles, but I'm from the Midwest.

So we ended up moving back to Omaha, Nebraska because I was interested in lymphoma, and I was told there was a lot of lymphoma there. So I thought, well, gosh, why do they have a lot of lymphoma in Nebraska? So when I went there, that was one of my main areas of research for the first 10 or 15 years.

And you'll hear more about something called the Nebraska Study today. But that was a study that I basically managed and performed at the University of Nebraska, looking primarily at non-Hodgkin's lymphoma and what causes there are.

Q. And you started that way back when?

A. It would have been the mid-1980s.

Q. I've jumped ahead of myself.

You got your medical degree where, sir?

A. University of Minnesota, Minneapolis.

Q. Okay. Sounds cold.

That was in 1974?

A. I believe so.

Q. All right. A long time ago.

And you did an internship at Ohio State?

A. Yes. One year of internal medicine at Ohio State.

Q. Then a residency.

First, explain what a residency is.

A. So a residency is where you get your specialized training.

So if you want to become a pediatrician, you do a residency in pediatrics. Or if you want to become a pathologist, you do a residency in pathology.

So I went to the University of Iowa, and spent two and a half years there doing my special training in pathology, both anatomic pathology and clinical pathology.

Q. So four years of college, four years of medical school, internship for one year, residency for three years in anatomic and clinical pathology.

Then you did a fellowship?

A. Yes.

Q. What's that?

A. A fellowship is where you get trained in a subspecialty in pathology. Pathology is a broad field. We have pathologists who do breast pathology, lung pathology, and I was interested in the pathology of the immune system or blood and bone marrow; so I focused on diseases of that system, which is called hematopathology. And "hemato" means blood; "hem" means blood.

Q. And you did that at City of Hope in Los Angeles?

A. Yes.

Q. 1979, 1980?

A. Correct.

Q. And you're licensed to practice medicine in Iowa, Nebraska, and California?

A. Yes, that's correct.

Q. And board certification, what does that mean?

A. Well, to practice, you have to pass an exam to show that you learned the things you're supposed to learn. So I had to pass an exam in anatomic and clinical pathology in order to practice. So it's called your board exam. You do that after your training.

Q. You're board-certified in anatomic pathology?

A. Yes.

Q. And board-certified in clinical pathology?

A. Yes.

Q. And where do you currently work?

A. Currently, I work at the City of Hope National Medical Center in Duarte, California. It's a suburb of Los Angeles.

Q. How long have you been there?

A. Over six years.

Q. And is City of Hope an NCI-designated

comprehensive cancer center?

A. Yes, it is.

Q. What does that mean?

A. Well, our National Cancer Institute designates certain cancer centers as -- they award this designation to certain cancer centers that are premiere cancer centers, that do patient care and research in cancer.

And so in the Los Angeles area, UCLA has this designation, University of Southern California, and City of Hope have this designation.

Q. Very good.

So you do clinical work?

A. Yeah. So, you know, I was a chairman for six years.

Q. Six years as a chairman?

A. I stepped down last year. So I was doing a lot of administration for the six years -- first six years I was at City of Hope. But I decided to step down last year because I turned 70, and I thought, I don't need all this stress of administration.

So I got back to doing more clinical work, which means work looking at biopsies of patients, working with clinicians to make the correct diagnosis, and making sure the patients got the proper treatment.

The other thing pathologists do is they

oversee all the clinical laboratories. So all the laboratories that do testing on your blood, on your bone marrow, on your urine, any kind of tissue fluid, pathologists oversee all of that. I oversaw a big department at City of Hope, about 300 people.

Q. You've been doing research in non-Hodgkin's lymphoma in that context in your whole career?

A. Yes. For the last 40 years.

Q. And prior to that, you were at the University of Nebraska?

A. Yes.

Q. In pathology and research in non-Hodgkin's lymphoma?

A. Yes. So that was my first, I would say, first real academic job. And I was at the University of Nebraska for 28 years and did most of my important work -- research work there, including the epidemiology work we did on non-Hodgkin's lymphoma.

Q. And pesticides?

A. And pesticides, yes.

Q. What is the organization called InterLymph?

A. So InterLymph is an organization of mainly epidemiologists who are interested in studying non-Hodgkin's lymphoma. But in that group, there are also some researchers, biologists, and pathologists to

sort of advise about how they should do their research.

And this group came into being when there was a dramatic increase in non-Hodgkin's lymphoma back in the 1970s and '80s. And people were kind of -- they were wondering why this was happening so suddenly.

So they convened a meeting at the National Cancer Institute, and I was invited. And we tried to figure out why is the increase -- why is there this increase all of a sudden?

And out of that then grew this organization call InterLymph, which was a group of people who wanted to do research together on trying to find the causes of non-Hodgkin's lymphoma. And the group continues to work today.

Q. You're one of the founding members?

A. Yes, I am.

Q. What is the UNMC Eppley Institute for Research in Cancer and Allied Diseases?

A. That's the cancer research institute at the University of Nebraska. It's part of the University of Nebraska Medical Center. But that's basically where the basic researchers do their work.

And that was also a National Cancer Institute designated cancer center at the University of Nebraska.

Q. I've heard the phrase "wet bench research."

Have you heard that phrase?

A. Yeah, sure.

Q. What does that mean?

A. It's people whose job is to work in the lab and do research on cells or animals or chemicals to try to understand better how a disease evolves or what causes the disease.

Q. You've done wet bench research?

A. I've done some, not a lot. Most of my research has been more clinical and practical.

Q. And epidemiological?

A. Yeah. But I've worked with these researchers for many years, in collaboration.

Q. So at the Eppley Institute, it was a focus on non-Hodgkin's lymphoma?

A. That was my focus. They focused on all kinds of cancers at the institute. But we had a big lymphoma program -- clinical lymphoma program at Nebraska, and that's what I focused on.

Q. You also worked for the Center for Environmental Health and Toxicology from '98 to 2012?

A. That was a center at Nebraska that was focused on diseases occurring in the Midwest, in the farming communities. So we were trying to understand what causes disease in farmers. And I tried to strategize

for what kind of research we should do.

So since I was doing a lot of work on causes of non-Hodgkin's lymphoma and other related diseases, these diseases in Nebraska probably occur primarily in farmers, so I was a part of that group.

Q. Okay. And at the Center for Environmental Health and Toxicology, did they work on the basic science of non-Hodgkin's lymphoma?

A. Yes. It spanned all the work from basic science to epidemiology.

Q. And did they work on environmental health? Did you work on environmental health?

A. Yes.

Q. What does environmental health include?

A. Well, environmental health includes all kinds of things. It includes cancer, obviously, but it includes things like lung disease, chronic COPD, things that -- environmental health means, what are the things in the environment that could affect your health?

So we were focusing on the things in the Midwest, in the farming country, what would affect the health of those people. That's what we focused on. It was primarily cancer, primarily lung disease.

Q. Is that what generated your interest in pesticides and environmental health?

A. No. I -- when I first came to Nebraska, I had this question, why do they have more cases of lymphoma in Nebraska than other places? So when I got there, I started to do some research on that.

And then kind of a landmark paper was published by people at the National Cancer Institute. It was a study of non-Hodgkin's lymphoma in Kansas. And they found that certain pesticides increased the risk for non-Hodgkin's lymphoma. And that really got my attention.

And I said, well, gosh, if we have the same thing going on in Nebraska, that's what really piqued my interest on pesticides and what led me to perform the epidemiology study in Nebraska.

Q. And I do want to talk about that a little more when we start talking about the epidemiology. But let me finish up on your credentials, if I could. And I know you're modest, and you don't want me to go over them, but I'm going to a little bit.

So you're a member of the American Association of Cancer Research?

A. Yes.

Q. Please tell us what that is.

A. Well, that's an association of scientists and physicians who are primarily focused on doing research

in cancer.

And it's the major -- I would say it's the major cancer organization that oversees research in cancer.

Q. You have a 118-page curriculum vitae?

A. I don't know. I haven't counted them.

Q. I just did. I won't go through every page.

But suffice it to say, you have hundreds of peer-reviewed articles in here?

A. Yes.

Q. And many of them deal with the issues of pesticides?

A. Yes.

Q. And their implication on public health?

A. Yes.

Q. Including the specific issues we're here to talk about today?

A. Yes.

Q. The jury already knows what an editorial board is.

Have you sat on the editorial board for peer-reviewed journals?

A. Yes. I currently sit on a number of editorial boards related to hematologic malignancies, yes.

Q. I'm going to point out a few examples.

You were on the editorial board of the European Journal for Clinical and Medical Oncology?

A. Yes.

Q. You were on the World Journal of Clinical Oncology?

A. Yes.

Q. Journal of Epidemiology in Public Health?

A. Yes.

Q. And you're on the board for Clinics in Oncology?

A. Yes.

Q. And you've performed journal reviews for the New England Journal of Medicine and the International Journal of Cancer?

A. Yes, among many others.

Q. Yes, sir. I did not mean to limit it.

And in the course of your career, you've focused over 400 articles on non-Hodgkin's lymphoma?

A. Probably. I've published over 400 articles, most of them are on non-Hodgkin's lymphoma, yes.

Q. And approximately 50 articles in the peer-reviewed literature with epidemiology and causes of non-Hodgkin's lymphoma, including studies of pesticides?

A. Yes.

MR. MILLER: Well, Your Honor, at this point

in time, I would like to qualify Dr. Dennis Weisenburger as an expert in causes of non-Hodgkin's lymphoma and pesticide, and its implications to the public health.

MR. ISMAIL: Subject to prior briefing, reserve for cross, Your Honor.

THE COURT: You may proceed.

BY MR. MILLER:

Q. I'm interested. Where is the Platte River?

A. The Platte River runs right through the length of Nebraska.

Q. Well, let's cut back to, I believe you said, the late '80s?

A. Yes.

Q. And you were a young researcher where?

A. Well, I was in private practice in Sacramento for a short time, and then I went to the University of Nebraska in 1983.

Q. What happened along the Platte River that got you to thinking about these issues?

A. Well, when I got to Nebraska, you know, I wasn't really sure how to begin to investigate this issue.

So I began by a simple kind of crude method. I made some maps, and I mapped out the 66 counties in eastern Nebraska. And from the Nebraska Department of

Health, they had data on the number of different kinds of cancers: Hodgkin's, non-Hodgkin's lymphoma, leukemia. So I made maps of the counties that had a high incidence of those different hematologic cancers.

And then I made some other maps, where I looked at counties with high production of corn or high use of insecticides or herbicides or high use of fertilizers, and I tried to see whether there was a correlation between the counties with intensive agriculture and these hematologic malignancies.

And there was a correlation, which sort of fit with the findings. And I mentioned to you the Kansas study, where certain pesticides were associated with non-Hodgkin's lymphoma. So I began drawing these crude maps, and I wrote a couple of papers.

And then I eventually contacted Aaron Blair at the National Cancer Institute, and he was the one -- his group was the one that did the cancer study. And I said, come to Nebraska. I'm sure we're going to find things here.

And he said, well, we don't have any money to come to Nebraska. And I said, you know, it's a great opportunity. He said, if you can get some money, I'll come. I said, I'll try.

So I wrote some grants to the Nebraska

Department of Health, and I got some money for three years. And the National Cancer Institute contributed their time and energy and expertise for free. And that's how the Nebraska Study was done.

Q. And the Nebraska Study comes in and plays a part of the De Roos/Weisenburger/Blair study that was published in the peer-reviewed literature in 2003?

A. Yes. The Nebraska Study was one that was included in that pooled analysis by De Roos.

Q. One person can make a difference.

A. I continue to believe that.

Q. We're going to cut away later to the NAPP study, in which you used some of the Nebraska data, which then grew into the De Roos/Weisenburger paper, which grew to the NAPP study later.

Is that right?

A. Yes.

Q. You've been studying pesticides and non-Hodgkin's lymphoma ever since?

A. Yeah. Since the mid-1980s, yes.

Q. And have you concluded whether pesticides -- I'm talking about one of them -- can cause non-Hodgkin's lymphoma?

A. There are certain pesticides that are known to cause non-Hodgkin's lymphoma, yes.

Q. All right. And 35 years later, we called you and said, hey, Dr. Weisenburger, we read your stuff, would you talk to us, right?

A. Right.

Q. And we sent you Al and Alberta Pilliod's medical records, right?

A. Yes.

Q. And we asked you to review them?

A. Yes.

Q. And we asked you to review the deposition of every treating physician that Monsanto wanted to take a deposition of, right?

A. Yes.

Q. And you reviewed all the medical records?

A. I did.

Q. And you read all the depositions?

A. Yes.

Q. And you talked to Al and Alberta on the phone?

A. I did, yes.

Q. And you applied your 35, 40 years of research in this field to reach your opinions that I asked you to look at and comment on, right?

A. That's correct.

Q. And you're going to give me those opinions if you hold them to a reasonable degree of medical

certainty?

A. Yes.

Q. All right. Let's cut to the chase.

Does Roundup cause non-Hodgkin's lymphoma in people who are exposed to Roundup?

A. Yes, it can.

Q. Was repeated Roundup use, and I'm going to put this on the overhead, if I could, 0297.

Was repeated Roundup exposure a substantial factor in causing Alberta Pilliod's non-Hodgkin's lymphoma?

A. Yes.

Q. And that's to a reasonable scientific certainty?

A. Yes.

Q. Was repeated Roundup exposure a substantial factor in causing Al Pilliod's non-Hodgkin's lymphoma?

A. Yes.

Q. And you feel comfortable with these opinions after reviewing all the medical records and all the other things that have happened to them in their life that we'll talk about in more specificity in a bit?

A. Yes, I do.

Q. And I've asked this question to other experts, and this has already been published, 0114.

We'll republish that. 0114, please.

You've been studying this since a lot of these folks weren't in high school yet, and I want to ask you these questions after a lifetime spent studying this.

Does Roundup cause tumor in mammals?

A. Yes, it does.

Q. And after 35, 40 years of studying this, can you tell us whether malignant lymphoma in mice can be caused by Roundup?

A. Yes, it is.

Q. Can Roundup cause genetic damage in human lymphocytes?

A. Yes. There's been many studies that have shown that.

Q. Remind us all, what are human lymphocytes?

A. Well, lymphocytes are one of the white blood cells that we all have circulating in our blood, that protect us from infection and cancer and other things.

And so these are the cells, the normal cells, that will become malignant as non-Hodgkin's lymphoma.

So the importance of this is: There have been a number of studies that have shown now that, even at low doses, Roundup-based herbicides can cause genetic damage in these lymphocytes that are the same cells that are the parent cells or the precursor cells for the

lymphoma.

Q. And we'll talk about those summaries in a little bit. I want to get your summary opinions.

That's what a lymphocyte is?

A. Yes.

Q. Does Roundup cause oxidative stress in human cells?

A. Yes.

Q. What is oxidative stress and can that lead to cancer?

A. Oxidative stress is the stress that cells come under for a variety of reasons. And it's one of the effects of pesticides on human cells.

The cells, when they are in contact with pesticides, become stressed. And they -- there's a stress reaction that occurs in the cells. And the cells produce something called oxygen free radicals. And normally the body can handle these oxygen free radicals and prevent them from causing lasting damage.

But these free radicals are not good for the cell. They can damage the DNA of the cell and can eventually lead to cancer.

And so oxidative stress is something that we deal with every day in our bodies, but usually our bodies can handle it and take care of it. But when you

come under a more overwhelming kind of stress, the body can't always fix all the damage, and then you get genetic damage that can lead to cancer.

Q. And you told us, but I'll ask again: Does Roundup cause non-Hodgkin's lymphoma in humans in real world exposure?

A. I believe it does, yes.

Q. And we have a two-minute animation that you reviewed?

A. Yes.

Q. And does it assist you in explaining these concepts?

A. Yes.

MR. MILLER: With the Court's permission?

THE COURT: Any objection?

MR. ISMAIL: No, Your Honor.

THE COURT: Okay.

MR. MILLER: We'd like you to sort of narrate this and explain to us how this works, okay. If we could roll that.

BY MR. MILLER:

Q. We're talking about the two mechanisms of cancer.

What are they?

A. Here you have Roundup coming in through the

skin and getting into the body and contacting the cells and causing this oxidative stress, stressing the cells.

And then as a result of that, they produce these oxygen free radicals, which you see kind of moving around in the cell, in and out of the nucleus, which is the central orange piece, and causing DNA damage. It's a form of -- it's a mechanism for genotoxicity.

Q. That's the first mechanism, right?

A. Right.

Q. What is genotoxicity?

A. Genotoxicity means that the chemical can damage the DNA and produce mutations or deletions or other kinds of genetic abnormalities.

So it can be done sort of indirectly via the oxidative stress pathway, or it could be done directly. That is the chemical itself could damage the DNA.

Q. Have we seen that with Roundup?

A. Yes.

Q. What is that process we're looking at?

A. Now you see some genetic damage in the cell in the middle where there is the small micronuclei, which is sort of broken off from the nucleus.

This is an indication of genetic damage. There's a test called the binucleated micronuclei test, which we'll talk about later because this test has been

used in --

Q. In Roundup?

A. In Roundup, yeah.

Q. And documented micronuclei damage?

A. Yes.

Q. What is that?

A. What it's showing now is these cells are dividing and multiplying. And they become autonomous so that they can grow on their own and have, then, the features of a cancer cell.

So they begin to take over the body is what you can see here. They multiply and begin to take over the body.

Q. That is the definition of cancer?

A. Yes.

Q. What's going on there?

A. Well, it just a group of cells causing a tumor, which is -- non-Hodgkin's lymphoma is a form of cancer.

So, you know, this can be any cancer, but in this setting, it would be non-Hodgkin's lymphoma.

Q. And non-Hodgkin's lymphoma is a blood-borne cancer?

A. Yes.

Q. There are also cancers that are what we call

solid tumor cancers?

A. Yes. So tumors like breast cancer and lung cancer are what we call solid tumors. The tumors that derive from the blood and the bone marrow are the ones that -- what I've been interested in.

Q. And normally with experts, we ask them if they're relying on articles they've read and reviewed, and I suppose you are, as well, but you're actually relying on articles that you have developed, prepared and authored, right?

A. Well, some of the articles that I've been involved in, yes, are relevant to this case, yes.

Q. And specifically the De Roos Weisenburger Blair article from 2003?

A. Yes.

Q. And then the North American Pooled Project, right?

A. Yes.

Q. And you relied on other epidemiology in forming your opinions, as well, over the years, haven't you?

A. Yes. I've been very interested in epidemiology over the years.

Q. And you, as part of your studies, constantly reviewed the mechanistic studies of Roundup, as well?

A. I did, yes.

Q. What do we mean by mechanistic study, Dr. Weisenburger?

A. What we mean by mechanistic study is we try to understand how could a chemical like Roundup cause a cancer like non-Hodgkin's lymphoma. How does that work? How does that happen?

And as we showed you in the video, there are at least two ways that Roundup can cause cancer, can cause non-Hodgkin's lymphoma, either by directly damaging the DNA in the cells and causing chromosome mal abnormalities and genetic lesions or by increasing the oxidative stress, and then the oxygen free radicals will damage the DNA and cause genetic damage.

Q. And you reviewed the literature about not just mechanistic studies but the genotox studies on Roundup?

A. Yes.

Q. What does that mean?

A. Genetic damage. So things like mutations in DNA, translocations, deletions, insertions, additions, all kinds of abnormalities that can occur in the DNA as a result of a chemical like Roundup and the kind -- those kind of abnormalities that you see in cancer cells.

Q. We've heard before in this courtroom that

those are the three pillars of science when you're trying to determine causality, epidemiology, mechanistic studies and genotox studies -- animal studies, cell studies and epidemiology?

A. Yes.

Q. And you reviewed all three of them?

A. I did.

Q. Would a responsible scientist review all three before reaching an opinion on causality?

A. Yes. Because to reach such an opinion, you really want to know everything, right? You want to know all the information. And you want to weigh the information in order to make an informed decision.

Q. Let's go to just a few seconds of generally what non-Hodgkin's lymphoma is.

There's about 60 subtypes?

A. Yes.

Q. And who plays a key role in determining what subtype an individual has?

A. That's what the hematopathologist does.

Q. That would be you?

A. Yes.

Q. Okay.

A. A biopsy of the tumor is done, and we take the tissue, and we process it. And we put a thin slice of

the tissue on a glass slide and stain it with some stains.

And then we look at the slides under the microscope and see what kind of cells are there, what is the pattern of growth. And then we can do different tests on the tissue looking for different markers of different kinds of cancer.

And so this is what we do every day in our practice. So we try to say, well, this is non-Hodgkin's lymphoma. And it's specifically this type of non-Hodgkin's lymphoma.

Q. And just to sort of give us a primer on this, there's B-cells and T-cells, right?

A. Right.

Q. What's a B-cell, what's a T-cell, and how do they relate to the story?

A. Well, the B-cells and T-cells are lymphocytes, like we talked about, okay. They're the white blood cells -- one group of white blood cells that circulates in the body.

And the B-cells are the cells that produce the antibodies. So antibodies are proteins that are produced by these cells that will go out and react with things that shouldn't be in your body, like a virus or a bacteria or sometimes the cancer cell.

So these B-cells monitor your system and try to keep it from being infected with infectious organisms, try to protect you from cancer and other bad things.

So the B-cells produce these antibodies or proteins that protect you. And then the T-cells are sort of direct attack cells. They will attack the infected cells or the cancer cells and kill them. They have certain proteins that they use to kill the infected cells or the bad cells.

So these are the cells of the immune system that protect you from infections, protect you from cancer and other things.

Q. So a person could get non-Hodgkin's lymphoma in a B-cell or a T-cell?

A. Yes.

Q. So you can have non-Hodgkin's lymphoma T-cell, right?

A. Yes.

Q. And you can have non-Hodgkin's lymphoma B-cell?

A. Yes.

Q. Now, Al Pilliod got non-Hodgkin's lymphoma B-cell in 2011, right?

A. Yes.

Q. And then four years later, his wife got non-Hodgkin's lymphoma, and she got B-cell?

A. Yes.

Q. So they're both from the same branch, if you will, of non-Hodgkin's lymphoma -- they both got non-Hodgkin's lymphoma, they both got the same subtype?

A. Yes.

Q. Al got his systematically. What does that mean?

A. That's the usual way. So non-Hodgkin's lymphoma is a cancer that involves usually the normal organs of the immune system, the lymph nodes, the spleen and things like the tonsils, wherever you have this lymphoid tissue. And sometimes in the GI tract, gastrointestinal tract.

And non-Hodgkin's lymphoma often spreads to multiple sites. It starts in the lymph nodes, or it could start in the bone marrow, and then it spreads to other sites. So it's often present throughout the body in the organs of the immune system.

Q. What's the lymphatic system within the human body?

A. It's the system that drains fluid from your tissues back into the blood.

So, you know, if you're like me, and you sit

all day, a long time, your legs will swell, right.

That's basically edema fluid that accumulates in your ankles and your legs. And how does that get back into the regular system? Well, it drains through the lymph system, which is a circulatory system, just like the blood system, that that goes back into the blood.

So in that lymph system are all the lymph nodes that have the ability to -- that are the organs of the immune system where the T-cells and B-cells live and do their work.

Q. So with the video that we saw, once the cancer develops in one spot of the blood system, can it then travel and repopulate in other spots?

A. Yes, it often does.

Q. And is that what happened to Al Pilliod?

A. Yeah. He had Stage 4 disseminated non-Hodgkin's lymphoma. He had it in almost all his lymph nodes and his bones. So he had -- he had advanced disease.

Q. There are four stages --

A. Yes.

Q. -- of B-cell lymphoma?

1 is the mildest?

A. Yeah. So there's Stage 1, which means the

lymphoma is localized to one site or one region.

Stage 2, it's located in two regions above the diaphragm or below the diaphragm.

Stage 3, it's in regions both above and below the diaphragm.

And in Stage 4, it's in multiple organs, like Al had. So he had Stage 4, which is the most advanced stage of non-Hodgkin's lymphoma.

Q. Once the doctors find non-Hodgkin's lymphoma, they're going to send the slides to a hematopathologist like you, right?

A. Yes.

Q. And you're going to let them know what kind, is it T-cell? Is it B-cell? And then there are subtypes from there, right?

A. Correct.

Q. Once the clinician knows the specific type of cancer, can he then treat it?

A. He waits for our diagnosis to know what to use to treat because the treatments are very different for different types of lymphoma. Some have to be treated very aggressively, with a lot of chemotherapy and other things, radio therapy. Some lymphomas are kind of low-grade and very indolent. Sometimes they don't treat the lymphoma initially because the patient is fine.

So they really need to know what kind of lymphoma is it so they know what treatment to use.

Q. And with a Stage 4 B-cell that's gone all over the entire lymphatic system and lodged in bone, how quickly do you need to treat that?

A. You would need to treat that quickly with very aggressive therapy.

Q. And that's what happened with Al?

A. Yes.

Q. And so the doctor who is treating, he's more concerned about getting the right chemotherapy in that patient right away?

A. Yes.

Q. Does the environmental exposure matter to him at that point in terms of how he's going to treat that patient?

A. No, it doesn't.

Q. So he or she is going to know that it's a B-cell, Stage 4, I know what I need to give, I'm just going to give the patient that treatment, and I'm not going to go back and study cause?

MR. ISMAIL: Objection. Leading, Your Honor.

THE WITNESS: Yeah, that's the usual scenario.

MR. MILLER: I'll rephrase.

MR. ISMAIL: He answered. That's fine.

MR. MILLER: Yes, I apologize.

THE COURT: That's fine.

BY MR. MILLER:

Q. So what is the process and the interrelationship between -- would a doctor who is treating or would he not -- she not -- look for environmental causes or just go treat the patient? How does that process work?

A. Well, I would say, as you mentioned, for most cancers, once the patient has the cancer, the doctors are primarily concentrating on getting the right diagnosis and then getting the right treatment.

So they aren't so concerned about what caused the cancer. Now, sometimes -- sometimes it will be obvious from talking to the patient what the cause of the cancer is.

For example, if the patient has a lung cancer, and he's been smoking two packs of cigarettes every day for 40 years, that's the most likely cause of his lung cancer.

Q. Are you able to see the tobacco in the histopathology slide?

A. No. If we look at a slide of lung cancer, we say it's lung cancer and classify it or subtype it like you would with lymphoma. But we can't say it's due to

smoking. You would have to get that information from the patient.

Sometimes we can tell from looking at the slides and doing the stains what the cause of the cancer is. But more often than not, we can't.

Q. Right. So in the case of Roundup and non-Hodgkin's lymphoma, no one is claiming you can look in the slide and see Roundup, right?

A. Right. Those lymphomas look like any other lymphoma.

Q. It takes an expert who's been in the field to look back and tell us whether or not the environmental exposure was a factor or not?

A. Well, yeah. It takes what I did in this case. It takes looking at the medical records, talking to the patients, doing a lot of research, doing a differential ideology analysis to come to that conclusion.

And, you know, that's something that pathologists don't normally do in their practice. And it's something that oncologists don't normally do in their practice. Because by the time you get the cancer, the water is already under the bridge, so we have to deal with it.

Q. Okay. So in Al's case, he has got Stage 4 cancer in his bone marrow, you need to get him into

therapy right way.

Now, what is R-CHOP?

A. R-CHOP is the standard chemotherapy now used for large B-cell lymphoma and other aggressive lymphomas. It's a combination of four chemotherapeutic agents, four chemicals and one antibody.

So it's a -- it's actually a very good treatment.

Q. Great. So Al had -- or what is DLBCL?

A. So DLBCL is an abbreviation for the kind of lymphoma that both Al and Alberta had. It stands for diffuse large B-cell lymphoma.

So what that means is the cells were large, which is usually bad. And they were B-cells. And they were growing in a very diffuse and infiltrative pattern. So that's what it means. Diffuse large B-cell lymphoma.

THE COURT: We'll take a ten-minute break.

(Recess taken at 9:52 a.m.)

(Proceedings resumed at 10:05 a.m.)

(The following proceedings were heard in the presence of the jury:)

THE COURT: Mr. Miller, you may proceed.

MR. MILLER: Thank you, Your Honor.

BY MR. MILLER:

Q. Back to work, Doctor.

You mentioned that you're currently at the City of Hope, and you were chairman of the pathology department for five, six years. Still there.

Does City of Hope, like every other medical university in the country, have a website?

A. Yes.

Q. And it's a website that's someplace where patients, prospective patients can go and learn about you and your colleagues, right?

A. Yes.

Q. And I think your picture is actually on the website, last time I checked?

A. I guess so.

Q. Yes, yes.

And on your website, where people ask about causes of non-Hodgkin's lymphoma, does it mention pesticides?

A. Yes.

MR. ISMAIL: Objection, Your Honor. Hearsay.

THE COURT: Overruled.

BY MR. MILLER:

Q. You can answer.

A. On the City of Hope website, we try to be patient-friendly and help educate our patients as best we can.

So on our website, we tell the story about what is this kind of cancer, what causes this kind of cancer, and what are the approaches to treating this kind of cancer.

So it's meant to educate patients, yes.

Q. One of the things it educates them about is that one of the potential causes of non-Hodgkin's lymphoma is exposure to pesticides?

A. Yes. It's one of the things listed on the website.

Q. Sure. Let's talk about your general causation opinions. We've heard a lot of general causation, and I know everyone will be anxious to get to the case-specific with Al and Alberta.

But I want to go through your general causation opinions, okay?

A. Okay.

Q. Tell us, what is Roundup? We sort of know, but what is your perspective on that?

A. Well, Roundup is a herbicide. It's used to kill weeds, basically. And it will kill all kinds of plants, not just weeds. It's an organophosphate type of pesticide. And the main component of it is called glyphosate.

Glyphosate is the chemical that is thought to

kill the weeds. And then Roundup is usually -- the glyphosate is usually put into a formulation. So there are other things in the formulation. There's probably water in there, and then there are other chemicals which potentiate the effectiveness of the glyphosate. Things which are called surfactants, which allow a fluid to stay on a surface and penetrate into the cell.

So they use these things called surfactants in this pesticide as well.

Q. And that does what?

A. It helps to layer itself onto the leaves of the plant, and then to penetrate through the cell walls of the plant into the cells of the plant.

Q. What is POEA?

A. So that's one of their surfactants that's commonly used in Roundup. In fact, it's part of Roundup. Some companies use other surfactants, but that's the surfactant that is used in Roundup.

Q. Have there been independent scientists that have studied this combination of glyphosate and POEA, the surfactant, and seen whether it's more toxic than just glyphosate alone?

A. Yes, it is. So the glyphosate -- there have been different kinds of studies done. I think we're going to show you some examples of the genotoxicity.

But in general, the Roundup -- that is, the glyphosate-based formulation with the other chemicals in it -- is much more toxic and genotoxic than the glyphosate alone.

Q. And has that been shown in peer-reviewed, independent studies in scientific and medical literature?

A. Yes.

Q. Let's talk for a second about how one is exposed to Roundup. We'll talk in a bit about how Al and Alberta were exposed and their routines.

But generally speaking, what are the ways that the human body is exposed to Roundup?

A. Well, Roundup is usually sprayed from a canister or plastic bottle. And so there's a mist in the air. And when you're spraying it, if it's windy, or if you're not careful, you can get it on your hands, you can get it on your arms and other parts of your body, on your clothes.

And so just like with the weeds, once it gets on your hands, it will penetrate through the surface of your skin into your cells, and eventually it will get into the rest of your body via the bloodstream. So, yeah, it's mainly from skin exposure.

But there are other ways it could be exposed,

too. Sometimes if you inhale it, you can be exposed by inhaling it. But I think the main mechanism is by skin exposure, getting it on your skin.

Q. Is that often referred to as dermal absorption?

A. Yes.

Q. And there are studies out there on the amount of dermal absorption Roundup can seep into your skin?

A. Yes.

Q. And we have an expert on Thursday for that.

What happens when you're initiated or exposed to Roundup repeatedly because, perhaps, you use it weekly or bi-weekly or monthly?

A. So, I mean, the way we believe Roundup causes non-Hodgkin's lymphoma is that when it gets into the body -- through the skin and into the body -- it comes into contact with other cells, like the lymphocytes, either in the blood or in the lymphatic organs like the lymph nodes, and it causes genetic damage.

And, of course, the more frequently you use it, the larger amounts that you use, would increase your exposure and increase your likelihood of getting genetic damage that could lead to cancer.

Q. And some of the studies talk about if you're exposed more than twice a year.

Are you familiar with that?

A. Yes.

Q. Some say more than ten days a year, right?

A. Yes. So those are some parameters that epidemiologists have used to try to look at whether more exposure causes more cancer.

Which is logical, right? If you get more exposure, you would expect to get more cancer. So those are some parameters that epidemiologists have used.

Q. Let's go through some of the studies. We spent all day looking at studies yesterday.

But particularly, let's focus on the De Roos/Weisenburger/Blair study, of 1993.

It's been published before, 1588. Let's look at the title again to get ourselves oriented.

This is in 2003, right, Doctor?

A. Yep.

Q. And it's peer-reviewed, of course?

A. Yes.

Q. And in the published literature, right?

A. Yes.

Q. And Dr. De Roos, we know you, Dr. Weisenburger, and Dr. Blair are three of the authors on this paper, right?

A. Yes.

Q. And is this one of the papers that controlled for age, controlled for sex, but controlled for other pesticides?

A. Yes. This is a paper that looked at the risk of NHL, and it looked at about 40 different pesticides to see whether any of those actually increased the risk for non-Hodgkin's lymphoma.

Q. And 16 years ago, when this paper came out in a peer-reviewed public literature, did anyone from Monsanto call you and ask you that?

A. No.

Q. To this day, has anyone from Monsanto called you and asked you that?

A. No.

Q. Have you ever seen that Monsanto went out and did their own study like this in 2003 or 2004?

A. No.

Q. So this data was collected from 1979 to 1986?

A. Yes.

Q. Just to back up, if someone from Monsanto would have called you, would you have talked to them about your scientific findings?

A. Sure.

Q. So let's look at some of the findings here. If we could turn to the table we looked at yesterday.

In a nutshell, tell us what the table there is explaining to us.

A. It's showing you the odds ratios or risk ratios for each of the different pesticides that was looked at in this study. So if you look -- you see to the left, it says "Pesticides." That's the list of all the pesticides.

And these are case-control studies, so it's a pooled analysis of four case-control studies. So you have the cases, those are the people who had non-Hodgkin's lymphoma. And then you have the controls, those are the people who didn't have non-Hodgkin's lymphoma.

And then they did a sophisticated statistical analysis of each of these pesticides and came up with an odds ratio, which is the word "OR" there, and the 95 percentile confidence intervals using two different methods. Logistic regression, which is the common method used; and the hierarchal regression, which is another method sometimes used.

Q. And there are some criticisms that some of the studies weren't controlled for 2,4-D.

Do you see 2,4-D on there?

A. Yes.

Q. And by your study in 2003, the culmination of

all your research, 2,4-D did not increase the risk of non-Hodgkin's lymphoma.

Or am I reading that wrong?

A. In this study, it didn't. That's true. This is forever and ever, yes.

Q. So forever and ever use of 2,4-D, no increased risk of non-Hodgkin's lymphoma, would one have to then control for 2,4-D if it doesn't cause non-Hodgkin's lymphoma?

A. Well, usually you wouldn't do -- you wouldn't control for it if you didn't find it. But there had been other studies that showed an increased risk for 2,4-D. So sometimes epidemiologists are very conservative, and they'll control for things anyway.

Q. There were about 47 herbicides, pesticides studied in this article, right?

A. Yes.

Q. How many of them had a statistically significant odds ratio of doubling the risk for non-Hodgkin's lymphoma?

A. I don't know. I haven't looked at that. Maybe you need to tell me.

Q. Well, do you have the full table in front of you?

A. I do.

Q. Why don't you take a second and look at it. I think it's pretty easy.

A. Atrazine is one. Glyphosate.

Q. When you say "glyphosate," you're studying the formulated product there, right?

A. Yes.

Q. Right.

A. Sodium chlorate.

Q. That's three.

A. I must have missed one.

Q. There may only be -- I don't know, three or four. I'm just asking you, Doc.

A. And diazinon.

Q. Okay. So out of 47 or so pesticides, only four showed a doubling statistically significant risk of non-Hodgkin's lymphoma?

A. Yes.

Q. And one of them was Roundup?

A. Yes.

Q. What conclusions do you reach from this data as one of the authors of this scientific paper?

A. Well, at the time -- at the time, there wasn't a lot of data on individual pesticides. So the whole purpose of this paper and the studies we were doing was to see what the specific pesticides are that increased

risk. And so that's why we looked at all these different types.

And the conclusion was that some of these pesticides, the four that I named, do have statistically significant increased odds ratios for NHL. And those are the ones that one should really worry about and probably study in more detail, both with additional epidemiology studies, as well as with other kinds of mechanistic studies and animal studies.

Q. So the data was collected from 1979 -- which is, I believe, four years after Roundup came on the market -- and collected through 1986; is that right?

A. Yes.

Q. And this article involved data from where?

A. So it was four Midwestern states. The Kansas study, which I told you about earlier, was pooled into this. And then there was a large study done of two states, Iowa and Minnesota, together. And then the last study was the Nebraska study.

So the case-control studies for those four states were pooled together into one big analysis.

Q. Okay. And did this add to your strength of your opinion that Roundup causes non-Hodgkin's lymphoma?

A. Well, yeah. It was a piece of the puzzle. It was. I mean, at the time, there wasn't much information

there. So all we could do was say, gee, this is an interesting finding. We need to do more research.

But since this time, there's been a lot more research done. But this was an important piece of the puzzle.

Q. Let's look at the concept of latency.

A. Okay.

Q. What is latency?

A. Latency is just the time from when you're first exposed to the chemical until you get the cancer.

It's usually measured in years, because for most chemicals, it takes years to develop a cancer. So for an individual person, for a single person, there would be a latency of so many years.

I think for Al, it was 29 years; and for Alberta, it was over 30 years.

Q. Twenty-nine years from the start of his exposure?

A. To Roundup.

Q. Until he -- okay.

A. Got his lymphoma, yeah. So both of them had a long exposure of about 30 years or more to Roundup.

So you can have a latency for an individual person and then a median latency. Which means, what is the latency -- if you take a whole group of people who

got cancer due to Roundup, how long, on average, would it take, okay?

And we don't really know the answer to that in Roundup. We believe it's long. It's probably 20 years or longer; 20, 25 years just to the median.

So that means half of the people would get their cancer earlier than 20 years, and half would get it later than 20 years.

Q. Let's look at an article that you published on the issue, if we could, Exhibit 1458.

MR. MILLER: Permission to publish?

MR. ISMAIL: No objection.

THE COURT: Granted.

BY MR. MILLER:

Q. Let's look at the title of this: "Pathological Classification of Non-Hodgkin's Lymphoma for Epidemiology Studies."

That's you, Dennis Weisenburger?

A. Yes.

Q. And you published this in 1982?

A. Yes.

Q. It's a peer-reviewed journal?

A. Yes.

Q. Okay. And what was the purpose of this publication, Dr. Weisenburger?

A. This publication came out as a group of publications from this InterLymph group that met. Remember, I told you we met for the first time when we were concerned about the rising incidence of non-Hodgkin's lymphoma.

So after that meeting where we had this discussion for almost a week, there was a series of papers that were written to try to document the conclusions we came to, and to sort of provide a guide for what future research needed to be done.

So since I'm a pathologist, my role was, well, how can pathology be important in this? Because one of the things that epidemiologists had done for many years was study non-Hodgkin's lymphoma as a group, a group of diseases, 50, 60 diseases.

And we came to realize that there are certain subtypes of non-Hodgkin's lymphoma that were very different from other subtypes. We have B versus T, for example. And so we -- so one of the reasons I wrote this paper was to say, maybe we should study the lymphomas by the subtypes rather than putting them into one big group.

So that was one of the messages of this study, how could epidemiologists do that? So I tried to provide a plan for how they could do it.

Q. A way forward?

A. Yeah. And the other thing was just to discuss some issues like latency.

And so, you know, I drew some latency curves to illustrate how I thought the latency would work for non-Hodgkin's lymphoma in different scenarios.

Q. Let's take a look at it, if we could, page 6 of Exhibit 1458. And blow up Figure 4 there, please.

Is this the concept that you were just articulating?

A. Yeah. So what I did was, I drew two bell-shaped curves here to illustrate some different points. So --

Q. If it would help you, you can stand up and point it out.

MR. MILLER: I don't think the Court would mind.

THE COURT: No, it's fine.

THE WITNESS: Sure. Can you hear me? It's okay?

BY MR. MILLER:

Q. Yeah, nice and loud so everybody on the far end can hear you.

A. Yeah. So here you see the -- this is not going to work. It's not going to work.

Q. You can point with your finger.

A. Here, you see the number of cases of non-Hodgkin's lymphoma that occur over a time period, okay?

And there are two different curves, one that goes up very quickly in the beginning and comes down quicker, and one that goes up slowly and goes down over a long period of time.

I think that for glyphosate and Roundup, it's more believed to be the second curve, or curve B, where the cases would accrue over time fairly slowly and then pick up so that the median of latency, for example, would be maybe 20 or 25 years.

So about half of the cases would occur prior to the median latency, and the other half would occur afterwards. And that's a typical curve for, kind of, low-dose recurrent exposure to a chemical.

And the same kind of curve you see with exposure to solvents like benzine and turpentine and paint thinners. You see the same kind of curve with the same kind of latency, more or less.

So this is the kind of curve you would see with repeated exposures over a long period of time that were not real high-dose exposures. So --

Q. So -- sorry to interrupt you. Go ahead.

A. So the second curve is a different curve. And it shows what the curve would look like if you got intense exposures over a short period of time, like if you were using something every day for five years.

And in that case, you would get a much higher dose, right? So you would expect a much higher incidence rate, and you would expect the cancers to come sooner, right? That's exactly what you see here. So the cancers begin coming sooner, they peak very early, and then they go down at a lower rate.

So this is the type of curve you would see in a high-dose exposure to very potent genotoxic agents. And you would see this in a lower-dose exposure to the same kind of agents.

Q. And we'll talk more about Al and Alberta Pilliod after we go through general causation.

But they fit within your latency pattern B?

A. Yeah. So in the De Roos article -- Roundup was brought into the market in 1974 or 1975. And the De Roos article, the first cases that were accrued came from 1979, okay? So they would have been kind of early on this curve. They would have only used Roundup for a small number of years.

But some of the other studies, the Iowa/Minnesota study came later and the Nebraska study

came later. So the exposure of the Kansas cases would have had four or five years of exposure, whereas the cases from Nebraska would have had up to 12 years of exposure.

So we believe the data in the De Roos study because the people who got non-Hodgkin's lymphoma in that study would have been on this early phase of the curve.

Q. Let's go back and look at that study for one second; the De Roos/Weisenburger study, Exhibit 1588. I just wanted to point out a couple of things.

The top right side: During the '80s, the National Cancer Institute conducted three population-based case-control studies of non-Hodgkin's lymphoma; Nebraska, Iowa/Minnesota, and Kansas.

That's what you were referring to?

A. Yes. Three studies in four states.

Q. And so in Al and Alberta's case, they started spraying Roundup in what year?

A. I would have to look at my notes.

Q. Sure.

A. It was the 1980s, I think. 1983.

Q. Okay. And what do your notes tell you about how long they continued to use Roundup?

A. Well, they used Roundup right up until the

time they got their non-Hodgkin's lymphoma. So Al used it for 28 years, and Alberta used it for 32 years before they got their non-Hodgkin's lymphoma.

And Al continued to use it afterwards because it worked, I guess. But they used it for a long period of years. And they had a lot of exposure.

Q. So the idea of latency and continuous exposure, do they fit within both of these concepts?

A. Yes. If we assume the latency is about 20 to 25 years, they are very close to that, or a little bit further out. So the latency fits very well with chemical exposure.

Q. And we're curious, if someone stops using Roundup and doesn't get non-Hodgkin's lymphoma for five or ten years, can it still be related to what they were exposed to five or ten years earlier?

A. It could, yes.

Q. Not in this case, but that's also what we see in science?

A. Yes.

Q. I want to ask one more question about the De Roos/Weisenburger article. I want to go to page 9. I want to look at the references.

As a good scientist, you reference other articles that have come before you, right?

A. Yes.

Q. If we can look at Article 50.

That's an article by Gary Williams and others?

A. Yes.

Q. Okay. And that was in the peer-reviewed literature at the time?

A. Yes.

Q. And written by Dr. Gary Williams?

A. Yes. And others.

Q. Okay. We want to just bear that in mind.

And that was one of the things that was out in the literature at the time?

A. Yes.

Q. Okay. And scientists rely upon authors to tell the world what they know and what potential conflicts that they might have?

A. Yes.

Q. Just one more point, and then we can leave Exhibit 1588.

Bottom left paragraph on page 7. It starts with, "Adjustment for multiple pesticides."

I just want to ask you about this. So what you confirmed or what you concluded in 2003 was:

"Adjustment for multiple pesticides suggested that there were few instances of substantial

confounding of pesticide effects by other pesticides."

Right?

A. Right.

Q. All right. And one other sentence I want to ask you about. Top left, second full sentence.

You write then, long before this case: "Environmental factors, such as pesticides, could play a role in this persistent increase."

Is that a -- persistent increase in what?

A. In non-Hodgkin's lymphoma.

Q. And in fairness, you also mention that AIDS has increased the risk in non-Hodgkin's lymphoma, as well?

A. Yes.

Q. Sure.

So during this period of time, you write about environmental factors, such as pesticides, can play a role; and AIDS can play a role?

A. Yes.

Q. Something was causing non-Hodgkin's lymphoma to go up?

A. Yes.

Q. Okay. I think you prepared a summary chart of

the epidemiology.

Is that right, sir?

A. Yes. In my report for general causation, I did a summary chart of the epidemiology studies.

MR. MILLER: With the Court's permission, we would like to publish Exhibit 293.

MR. ISMAIL: No objection, Your Honor.

THE COURT: Granted.

MR. MILLER: If you can put that up.

BY MR. MILLER:

Q. Now, did you prepare this, Doctor?

A. Yes, I did.

Q. Okay. And it's entitled "Case-control Epidemiologic Studies"?

A. Right. At the time I was doing my research for this Roundup litigation, these were the six case-control studies -- epidemiology studies that had been published. So I tried to summarize them on a table.

Q. And this jury has already heard -- there's others that have come out this year, we'll talk about those, as well, right?

A. Yes.

Q. But this -- you made this chart in 2016?

A. Yes.

Q. Walk us through and tell us the significance of these findings.

A. Well, here you see the different places where the studies were done: Canada, Midwest U.S., Sweden, France, and six countries in Europe. So studies done in different areas by different researchers.

And you see the number of cases of non-Hodgkin's lymphoma, and the number of controls. Usually you have two to three controls for every case.

And then there's the exposure category. Number of exposed cases, risk estimates or odds ratios, and then some other comments.

And I know Dr. Ritz went through this with you at length yesterday. So I'm just going to try to summarize this without going into too much detail.

But from these six case-control studies, actually five of the six studies show an increased odds ratio of greater than 2. And I bolded those here under "Risk Estimates."

The only study that didn't show an increased odds ratio was this one study from France, okay?

Q. Is that a hospital-based study?

A. Yes. And in four out of the five studies, the odds ratios were statistically significantly increased. So the likelihood of this being due to chance is very

low, okay?

And then there were three studies adjusted for the use of other pesticides. So this is to get around the issue of confounding, where you think one thing might be causing it when it's actually something else that's being used at the same time.

So in Hardell and in De Roos and in Eriksson, they did these statistical adjustments to try to rule out the effects of other pesticides on this for glyphosate.

And in De Roos, we did this right up front. And the odds ratio was still 2.1 with -- this is a confidence interval.

In the two other studies that looked at this, they also saw an increased risk, but it went down after they adjusted for the use of other pesticides. Which would make sense, right? If two pesticides are causing it, and you adjust for one, you really want to see what is the effect of the one, not the two together.

So when they did this adjustment, the odds ratio went down from 3 to about -- close to 2. And here, the odds ratio went down from 2 to about 1.5. So they didn't go down to 1; they didn't go down to no risk. The risk just decreased.

And because of the small numbers of cases --

you can see there are small numbers of exposed cases here -- the odds ratio was no longer statistically significant. Because when you have small numbers, the statistics don't work very well.

So three of the five studies were adjusted for use of other pesticides and continued to be positive.

The other important thing on here is that two of the studies looked at dose response. This is what we talked about. If you're exposed to more chemical, you would expect the risk to be higher, right?

Q. And the two studies that looked at it, what did they find, and which studies?

A. The two studies were McDuffie, the Canadian study. And they used two days per year as sort of their way to split the cases up into two groups.

So there were 23 cases that had exposure more than two days a year, and 28 that had it less than or equal to two days per year.

And I think they just assigned a -- well, so when they looked at the risk, the risk for those who had used it less than two days a year was 1, so it wasn't increased at all. But if they used it more than two days a year, it was more than 2-fold, and it was statistically significant.

And one of the Swedish studies by Eriksson did

sort of the same thing. They looked at the total number of days that they used this glyphosate or Roundup. And if they used it less than ten days over a lifetime, there was an increased risk of about 70 percent, but it wasn't statistically significant, okay?

But if they used it more than ten days over their lifetime, the risk was increased over 2-fold, 2.36, and it was statistically significant.

So both of these studies show that if you use the -- if you use the pesticide frequently, in days per year or number of days total, your risk is increased, which is what we call a dose response kind of scenario, right? More dose, more cancer; less dose, less cancer.

So those are the important features of the studies. I think there's consistency here. Five of the six studies are positive. And the one study that is negative is a study with very weak power to detect anything.

Q. I want to go back to the exposure response.

You saw in McDuffie, people with less than two days a year, no risk, right?

A. Yes.

Q. People who were greater than two days had a doubling of the risk?

A. Yes.

Q. Do you assume as a scientist, then, that if people used it four or eight or ten days a year, the risk would go up?

A. Well, it would probably go up more than 2-fold, yes. Because you assume that the more they used, the higher the risk. So the curve would be something like that.

Q. Going up?

A. Yeah.

Q. With Al and Alberta we know they used it significantly more than two days. We'll talk more about specifics in a bit.

But that would apply, in real world terms, to them and their use of Roundup?

A. Yes, it would.

Q. Likewise, Eriksson. Eriksson tells us that if you use it less than or equal to ten days in a lifetime, you don't really have a statistically significant risk, right?

A. There's probably some risk, but it's not significant.

Q. Right.

A. According to the statistics we use, you can see there probably is a risk there of about 70 percent, even though it's not statistically significant.

Q. People that used more than ten days in a lifetime would be at a significantly increased risk?

A. Yes.

Q. And if the Pilliods used it, say, 20 or 40 or 700 days in a lifetime, they would have risks that would go up in proportion to the exposure?

A. Very likely.

Q. Okay. So this is your summary of the case-control studies that were done before 2016?

A. Yes.

Q. And now there have been -- we've talked about them -- two studies that have come out since, Zhang and Leon?

A. Right.

Q. Did either one of them reaffirm your knowledge and belief that Roundup causes non-Hodgkin's lymphoma?

A. Yes. Both studies were positive. The Zhang study did a meta-analysis of these studies, plus the Agricultural Health Study.

They pooled all the data together and tried to get an overall risk ratio from all of the data in all of the studies. And they did some interesting things. They tried to look just at the people, if they could, where there was data on high exposure.

If you're going to see an effect, it should be

there with the high exposure. So they said, we're going to focus on the high exposure. And they found a statistically significant increase of about 1.4 for non-Hodgkin's lymphoma.

Q. Forever and ever use?

A. Yes.

Q. And confirming what you found in 2003, that there was a relationship between Roundup and non-Hodgkin's lymphoma?

A. Yes.

Q. Make you feel validated?

MR. ISMAIL: Objection, Your Honor.

THE COURT: Sustained.

MR. MILLER: I'll withdraw.

BY MR. MILLER:

Q. Well, you didn't quit studying it with the De Roos/Weisenburger article in 2003, did you?

A. No. We did another pooling study, which is the NAPP study.

Q. North American Pooled Project?

A. Yes.

Q. Tell us about that, please.

A. It's a project just like the De Roos paper, where we pooled the studies from four different states, the data from four different states to get more data and

have more power to detect increased risk.

And so what we did was, we took the four studies -- the data from the four states in the U.S., and we pooled it with a Canadian study, the McDuffie study, which had data on many of the provinces in Canada, so it's a bigger pooled study like De Roos.

And what we could do there was, look at NHL not only as a group, but look at some of the major subtypes of non-Hodgkin's lymphoma, like diffuse large B-c.

Q. Diffuse large B-cell?

A. Yeah. So it gave us more power to find risks, and it allowed us to look at specific subtypes of non-Hodgkin's lymphoma.

Q. And you're one of the scientists that were involved in this, all the way down the line?

A. Yes.

Q. Now, it's been presented at three different medical conferences, your finding from the North American Pooled Project?

A. Yes.

Q. And in order to be presented at a scientific conference, you have to be peer-reviewed to the extent that they allow it in the conference, right?

A. Yes. Right. You submit a summary of your

research. It's reviewed by some experts, and they decide whether to allow you to present your research at that meeting or not. So it is peer-reviewed, yes.

Q. And it's been presented by your group of scientists at three different conferences?

A. Yes.

Q. And we have three different PowerPoints used at three different conferences, right?

A. Yes.

Q. And we'll be happy to talk about any and all of them.

Which one do you think gives us the most relevant data to look at and walk through first with the jury?

A. Well, the data that I used in my -- in my analysis would be the data from the first presentation. Because the data is presented in the same kind of format that I've shown you already, with odds ratios and confidence intervals.

And more importantly, it was adjusted for the use of other pesticides. So that was the data that I used in my other reports.

MR. MILLER: And that's Exhibit 3049.

Court's permission?

MR. WISNER: It's already been published.

MR. MILLER: Oh, sorry.

BY MR. MILLER:

Q. 2082, all right. Excuse me.

Is this the presentation?

A. Yes, I believe it is, uh-huh.

Q. Occupational Cancer Research Center.

What is that?

A. That's a center in Canada that is focused on occupational research. And the Canadian group was a group that sort of led this work. And so I think that's -- it's a center in -- I'm not sure where it is, I think it's in Edmonton.

Q. So here we are. The second page, real quick.

Same thing I think you told us earlier, cancer starts in the lymphocytes, right?

A. Right.

Q. Same thing you told us earlier, glyphosate is a broad-spectrum herbicide known as Roundup, the most frequently used herbicide in the world, right?

A. Yes.

Q. And you gave us some estimates on page 3.

Explain that for us, please, about estimated agriculture use of glyphosate in 2012.

A. Right. So this is just a map that shows where the glyphosate is used in the U.S. This was data from

2012.

And you can see, if you look here, it's used right in the middle of the country in North Dakota, South Dakota, Minnesota, Iowa, the eastern part of Nebraska, and Kansas.

So that's the reason -- that's one of the reasons why they decided to study those states, because those are states that were using a lot of pesticides. And glyphosate is more recently one of those.

Q. Not sure I could find -- where is the Platte River on there?

A. The Platte River? It kind of comes down like this and then goes through the center of Nebraska.

Q. That's the eastern part of Nebraska that you were making maps about back in the '80s?

A. Yeah. This is the Missouri River.

Q. Pretty country?

A. Yes.

Q. A lot of farm?

A. Yes.

Q. Let's look at page 5.

Do these -- what's the significance here, Dr. Weisenburger?

A. It just shows you the states and provinces that the research was done in, okay?

Q. Okay.

A. So there were four states and six provinces.

Q. Looks like a lot of territory?

A. Yep.

Q. All right. Go, if we could, to page 7.

What does this tell us, Doctor?

A. This shows us that the way the data was collected was a little bit different in the different studies. This is the studies in the U.S. and Canada.

So in Kansas, we only had ever/never use of glyphosate, okay? We didn't have data on number of years they used it or number of days per year, so we couldn't calculate lifetime days.

In Iowa and Minnesota, we had the duration of years, but we didn't have the frequency, number of days per year. So we don't calculate the lifetime days.

So it was only in Nebraska and the Canadian provinces, which were the studies done later, where we had data on the number of years they used it, number of days per year. And then we could calculate the lifetime number of days per year.

Much of the data I'm going to show you is based on Nebraska and Canada. The Kansas data only contributed to ever/never.

Q. Page 8, if you could.

What is this about, "Conceptual Framework for Analysis of this Issue"?

A. Well, this just shows you the parameters we used for glyphosate. So we used ever/never.

What that means is, if they ever used it, they were called users, ever users. So people who never used it versus people who ever used it, could have been once or twice.

Then the duration, number of days, frequency, number of days per year. And then we get to the lifetime days; how many days over their lifetime did they use the glyphosate?

And over here, we have the overall risk for non-Hodgkin's lymphoma, all the different types. And then we look at the three most common types, follicular lymphoma, diffuse large B-cell lymphoma -- which is the disease that the Pilliods have -- small lymphocytic lymphoma, and then we grouped all the others together.

So we looked at the three main subtypes, and then what was left.

Q. And you controlled for what?

A. Yes. And so then -- and so then in the analysis, we controlled for other things to make sure that we were comparing apples to apples and oranges to oranges.

So we controlled for age and sex and the state or province, whether there was a history of lymphatic cancer in first-degree relatives. Because we know if you have a first-degree relative with lymphoma, you have an increased risk.

Q. How come you only controlled for hemopoietic or blood cancers?

A. Because we believe that's the history that really poses the real risk. It's not history of any cancer. It's history of this kind of group of cancers, leukemia, lymphoma, myeloma, the hematologic cancers.

We control for use of proxy respondents. I don't know if Dr. Ritz talked about this.

Q. Not really. Let's go over it.

A. Sometimes people think proxy respondents aren't quite as reliable, so we controlled for that.

Q. Does that mean talking to the wife or the husband?

A. Or the son, someone who was there.

Q. Okay.

A. And then use of personal protective equipment. Because if you use personal protective equipment, your risk goes down; if you don't use it, it goes up.

And then we control for the three pesticides that were highly correlated with the use of glyphosate

and are known to cause non-Hodgkin's lymphoma: 2,4-D, dicamba, and malathion.

So epidemiologists very carefully adjust for all these things. So they're really trying to make this as clean an analysis as possible, that isn't complicated by other factors that could be important.

Q. All right. Let's move on and we'll go to page 13.

Explain to us what you and the other scientists in the North American Pooled Project found.

A. When we looked at the number of years of glyphosate use, and we just look at overall risk, nonuse is 0. So the people who never used it, these are never, their risk ratio is, by definition, 1.

So those who used it less than or equal to 3.5 years had a slight increase in risk, but it wasn't statistically significant. And those who used it more than 3.5 years really didn't have an increased risk at all, and it wasn't statistically significant.

So you don't see anything here that makes very much sense, okay? And the bottom line is that it doesn't look like the number of years you used the chemical is a very good predictor of risk, okay?

Now, that might be sort of counterintuitive, but, in fact, if you used it for ten years, and you only

used it one time each year, you would be counted as ten years. But it wouldn't be very intensive exposure.

And we had the same finding in our Nebraska study, when we looked at 2,4-D. The number of years didn't increase whether your risk was increased or not.

Q. So let's go to page 14 and look at what does.

A. Right.

Q. What is this about?

A. This is the data on the number of days per year. Like the McDuffie study, less than two days or greater than or equal to two days.

And here, you see the risk for non-Hodgkin's lymphoma. If you didn't use it, your risk is 1, no risk. If you used it two or -- two days or less, your risk is .8, so it's really close to 1. There's no risk using it less than -- two days or less per year.

But if you used it more than two days per year, the risk goes up almost 2-fold, and it's statistically significant.

Q. Is that or is that not a dose exposure response?

A. Right. So what it shows you is that your risk is increased 2-fold for non-Hodgkin's lymphoma if you used it more than two days per year. So this is kind of a nice dose response. The more you used it, the more

your risk is increased. Being exposed a little bit didn't increase your risk, but being exposed more increased your risk.

And we see the same thing for diffuse large B-cell lymphoma. So the risk was not increased with two days or less per year, but it's over 2-fold risk increase and statistically significant more than two days per year, okay?

And both of these, there was a positive trend analysis telling you this number is significantly higher than this number, and this number is significantly higher than that number.

Q. Since we know that Al and Alberta both have diffuse large B-cell lymphoma, would that be the most relevant data here?

A. The most relevant data would be this data here, yes.

Q. And that shows a dose response for more days per year handling glyphosate and then getting non-Hodgkin's lymphoma, diffuse large B-cell?

A. Yes.

Q. So that dose response -- for you, as a scientist -- does that mean we can assume that the two-and-a-half risk or the over-doubling of the risk would get worse with more exposure than more than two

days a year?

A. That's what you would think. The more you used it, the higher the risk.

Q. Now, this was presented to medical providers or toxicologists, groups of scientists, right?

A. Yeah. I think it was mainly presented to groups of epidemiologists or groups of researchers -- cancer researchers, yes.

Q. But if somebody said you weren't sharing your opinions about Roundup and non-Hodgkin's lymphoma with the larger scientific community, would that be true or not?

A. We presented it three times over a period of three or four years. We presented it in Canada at an epidemiology meeting, we presented it in Brazil at a cancer research meeting, and we presented it in Lyon, France at the meeting of the International Agency for Cancer Research.

The other point is, what this study shows is that it's the intensity of the exposure that's more important than the number of years. High exposures over short periods of time have more of an effect than small exposures over long periods of time.

And I think that's what you're seeing here. The intensity of exposure with pesticides is the most

important parameter.

Q. What else do we need to talk about with your NAPP study?

A. You can show the next -- is there another slide or not?

Q. Yeah. Move to the next slide. Thank you.

A. This is the one that just takes the number of years and multiplies it by the number of days per year.

Again, you don't see anything that really pops out here. I think the reason for that is that the number of years, really, is what's driving this -- the statistics in this rather than the number of days per year. So we don't see the effect when we look at total number of days -- total number of lifetime days, okay?

So -- and again, this is the same thing we saw in our Nebraska study when we were looking at 2,4-D. The main finding was the number of days per year or the intensity of the exposure. That's what predicted for risk.

Q. More than two days, more risk per year?

A. For glyphosate, yes.

Q. For glyphosate, okay.

And if four days, six days, the risk would increase in some fashion?

A. Yes.

Q. Okay. Now, does your NAPP data, then, does it support or not support the belief that you and others have that Roundup causes non-Hodgkin's lymphoma?

What's the sum of the NAPP data?

A. It supports the contention that Roundup caused his non-Hodgkin's lymphoma because of the findings overall for NHL and for diffuse large B.

Q. And have you and your fellow scientists in the NAPP study prepared a manuscript to be published in the peer-reviewed journals in this regard?

A. Yes. And it's currently under review by the journal. And hopefully will be accepted in the next month or two, and even published this year yet.

Q. We've heard a little about meta-analysis, but tell us what they are.

A. So meta-analysis, it's a little bit like pooled analysis. It's an analysis of all the available studies that are in the literature that could be combined into one big database that you could analyze.

And epidemiologists often do these meta-analyses. They'll take 6 or 10 or 20 studies, combine all the data together, and see, well, what is the truth?

And so that was done multiple times with regard to glyphosate. There was a meta-analysis

published a few years ago, which showed an increased risk of 1.5; so 50 percent increased risk for ever/never that was statistically significant.

And then there were a couple other analyses that were done, one by the IARC and one by an industry-sponsored group. And they did a little bit more adjustments. And the odds ratio went down a little bit to 1.3, but it was still statistically significant. So the two meta-analyses that have been done have been positive.

And they also did an analysis for just B-cell non-Hodgkin's lymphoma, and that was also positive.

Q. So let's look at Exhibit 2107, that's the Chang meta-analysis.

And that was funded by Monsanto?

A. Yes.

MR. MILLER: Permission to publish?

MR. ISMAIL: No objection.

THE COURT: Okay.

MR. MILLER: 2107.

BY MR. MILLER:

Q. This is the meta-analysis that was funded by Monsanto in 2016.

A. Yes.

Q. Did that show a statistically significant

increased risk for non-Hodgkin's lymphoma with exposure to Roundup?

A. Well, it's kind of borderline. The confidence intervals include 1, so it's kind of borderline.

I think when it was done by the IARC, it was statistically significant. Here, it's kind of borderline, but it's the same numbers.

Q. It shows a 30 percent risk with a borderline statistical significance?

A. Yes.

Q. And that's the study funded by Monsanto?

MR. ISMAIL: Objection.

Leading, Your Honor. Repetitious.

THE COURT: This is direct.

MR. MILLER: Yes, Your Honor.

BY MR. MILLER:

Q. Who funded this study?

A. Monsanto funded this study.

Q. All right, very good.

Let's move on, then, to the next meta-analysis. I think you mentioned one by IARC.

And if we can look at Exhibit 1019.

MR. MILLER: Permission to publish?

MR. ISMAIL: It's already been published.

MR. MILLER: That's right. Thank you.

BY MR. MILLER:

Q. Have you seen this document before?

A. Yes.

Q. Ninety-page report -- well, you tell me what it is. Is this a report?

A. Well, this is a report from an organization called the International Agency for Cancer Research.

Does that sound right? International Agency --

Q. For Research on Cancer.

A. For Research on Cancer, yeah. IARC.

Q. And this is -- part of this document is this meta-analysis to which you referred?

A. Yes. It's one small piece of this.

Q. How would you describe how comprehensive IARC's --

A. So IARC -- have you talked about who IARC is?

Q. We have. We --

MR. ISMAIL: Objection, your Honor. This is cumulative. We had a great deal of testimony last week on this topic.

THE COURT: Why don't you just summarize very briefly. It's moving to 352 territory.

Summarize very quickly and move on to the heart.

MR. MILLER: Fair enough.

THE WITNESS: IARC is an international body that commissions groups of researchers and scientists to come and analyze different chemicals or different agents and determine whether they can cause cancer or not. That's what they do.

So it's recognized internationally as an authoritative body, okay? And in this analysis, they looked at glyphosate and some other pesticides.

BY MR. MILLER:

Q. Did they find a statistically significant increased risk of non-Hodgkin's lymphoma with exposure to Roundup?

A. In their meta-analysis, they did, yes.

Q. And they also looked at all three pillars of science.

Is that fair?

A. Yes, they did.

Q. Let's take a look at some of the things we haven't looked at before, if we could.

Page 45. Bottom left there. They talk about the mechanism.

And it says:

"Glyphosate has been studied for genotoxic potential in a wide variety of assays."

What is an assay?

MR. ISMAIL: Objection, Your Honor. We've been through literally every page of this document with Mr. Wisner's exam last week.

THE COURT: Well, I think he can review it quickly with Dr. Weisenburger.

Just be mindful of what we've already done.

MR. MILLER: Five minutes.

THE WITNESS: So an assay is just a test. They use different kinds of tests to determine whether a chemical can damage DNA.

So assays are just different kinds of tests.

BY MR. MILLER:

Q. And they had a table. If we can turn to Table 4.1, page 47.

We looked at this before, but it's "Genetic and Related Effects of Glyphosate in Exposed Humans."

You've reviewed this, haven't you?

A. Yeah. There are lots of tables here. And what they found is that the majority of the studies that were done, the majority of the tests that were done show that there is genotoxicity associated with either glyphosate or with Roundup.

Q. And does the genotoxicity effect of glyphosate, what happens to it when it's mixed with

Roundup? Does it stay the same? Go away? Get worse?

A. Well, it becomes more genotoxic.

Q. And that's been shown in these peer-reviewed, published studies?

A. Yes.

Q. They talk about the Paz-y-Mino study, that it causes DNA strand breaks on a comet assay.

Have you reviewed that?

A. Yes.

Q. Do you concur with that finding?

A. I believe it.

Q. Also in the Paz-y-Mino, it shows chromosome malignant damage.

Has that been your observation in studying this for all these years?

A. Yes.

Q. We looked on our video about micronucleus formation; that's the Bolognesi study. And they show that Roundup causes micronucleus formation.

Have you reviewed the study?

A. Yes.

Q. Do you agree with that finding?

A. Yes.

Q. Okay. At the time, IARC said, we know it's probably carcinogenic in humans.

That was back in March of 2015?

A. Correct.

Q. Has the evidence strengthened, weakened, or stayed the same since then, Dr. Weisenburger?

A. Well, I think it's strengthened. There's been some mixed results that have been published. But I think it's been strengthened, because there's been a new meta-analysis done by Zhang that looks at people that had high exposures, and that was positive. The odds ratio was 1.4.

And then there was a recent study just published a few weeks ago from -- combining or pooling three cohorts of people together, which showed a significant -- showed an increase for diffuse large B-cell lymphoma.

Q. Now, it's the Zhang study from 2019 and the Leon study from 2019?

A. Yes.

Q. But before that, we want to talk about the Agricultural Health Study.

Do you accept the findings of the Agricultural Health Study that there is no increased -- no significant increased risk of exposure of Roundup for non-Hodgkin's lymphoma?

A. Well, you know, I think there are some -- I'm

sure you heard about this from Dr. Ritz -- I think there's some significant issues and problems with the Agricultural Health Study.

And so I considered it as part of my analysis, but I didn't give any undue weight to it, unlike some of the other agencies that have done the analysis, because of the significant issues and problems.

And I think the biggest issue is the issue of misclassification of exposure. I'm sure Dr. Ritz talked to you about that yesterday. But if you have misclassification of exposure, that is, you classify some individuals with the disease as unexposed when they were actually exposed, or you classify them as exposed when they were actually unexposed or exposed less, you get this -- you get this problem with the data being kind of muddy and murky. And it decreases the ability of the study to detect a real increase in the risk.

And so you can have a study that looks like a powerful study. But if it's not done properly, it can give you the wrong answer.

Q. Yesterday we talked about Farmer Tom, and he goes in and takes the licensed pesticide application exam, where they get the information.

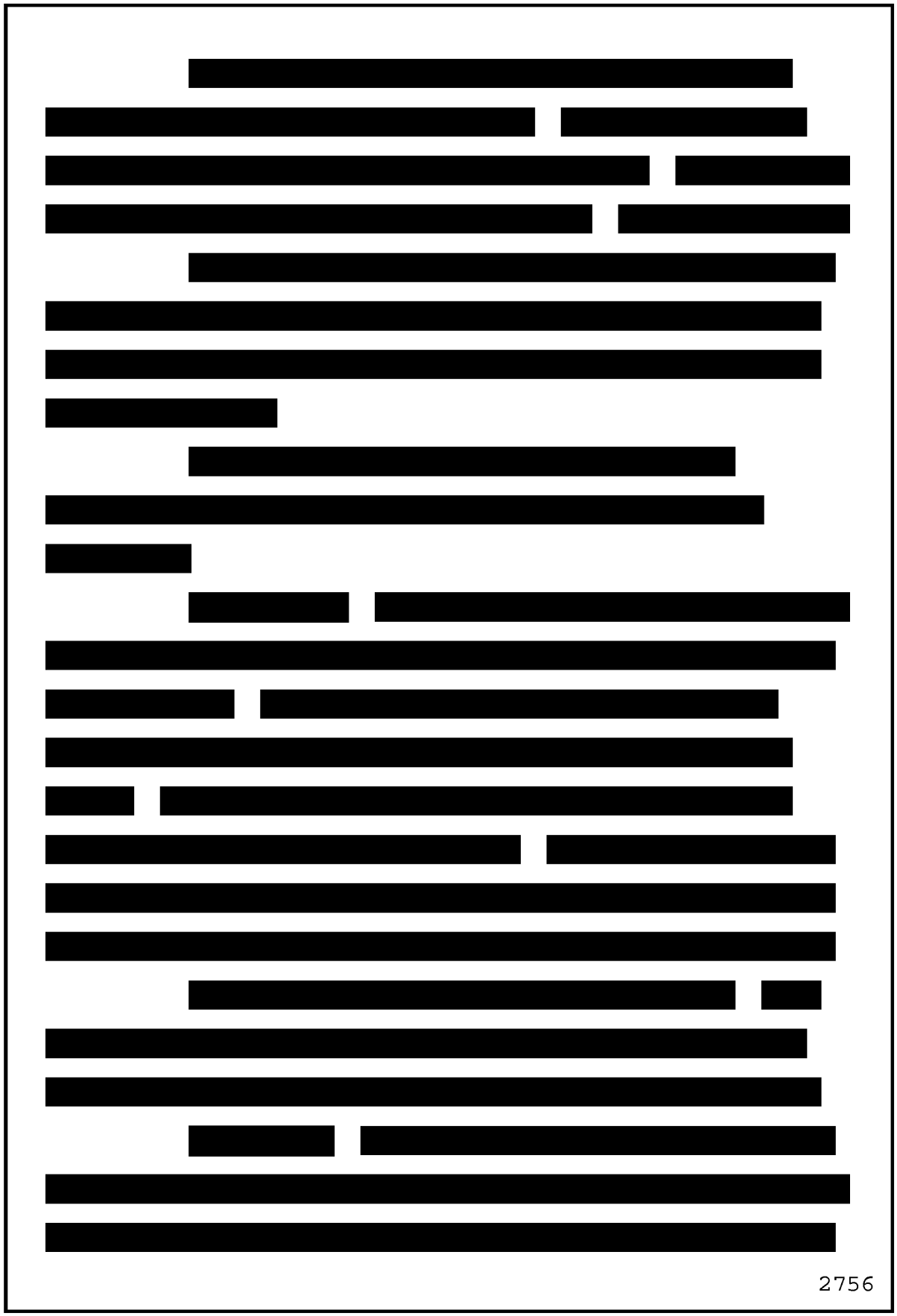
MR. ISMAIL: Your Honor, can we be heard just briefly at sidebar.

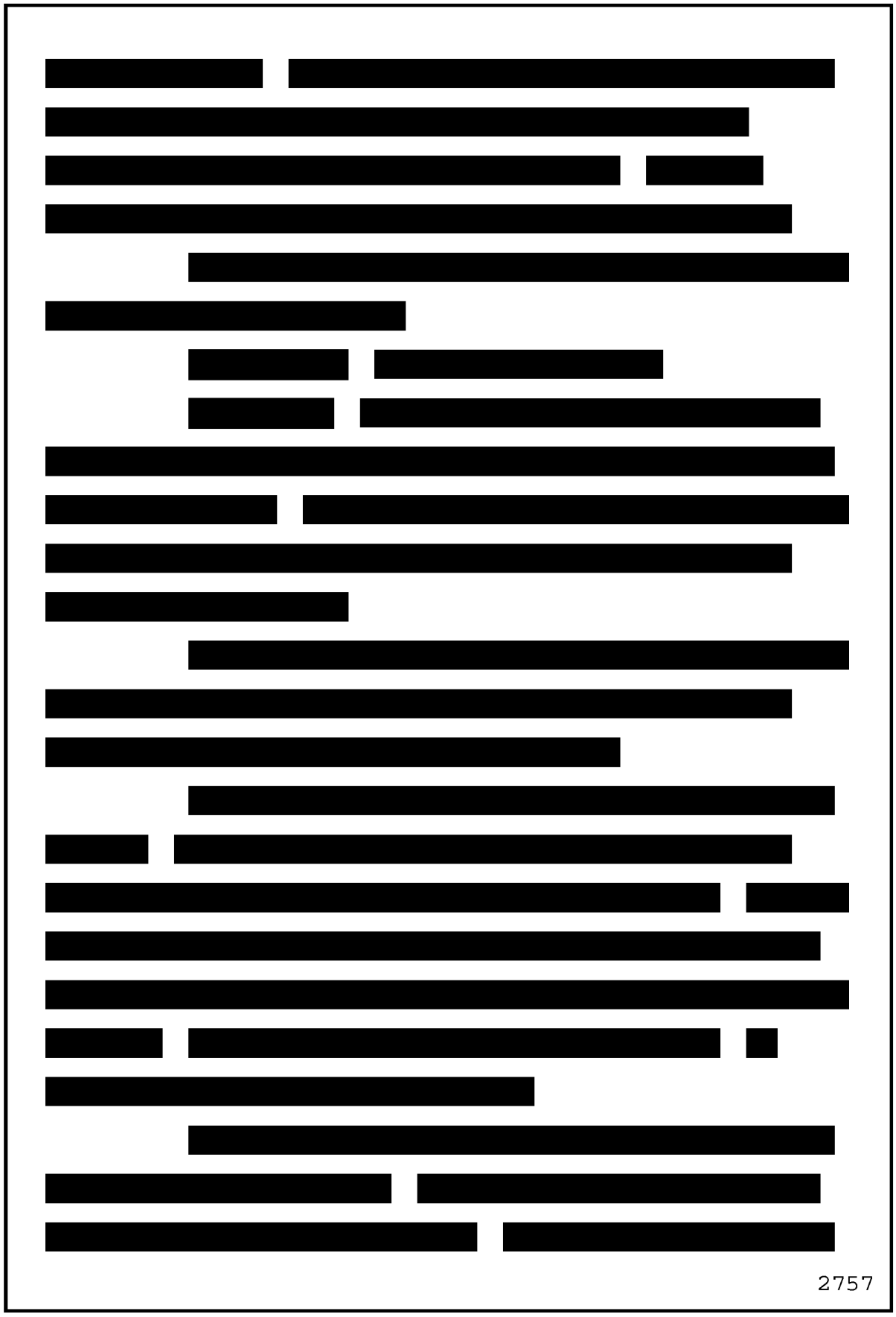
THE COURT: We're going to take a ten-minute break anyway.

Ladies and gentlemen, we are going to come back in ten minutes. We're going to take our lunch from 12:30 to 1:30 today.

(The following proceedings were heard out of the presence of the jury:)

[redacted]


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
2756


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
2757

[redacted]

(Recess taken at 11:18 a.m.)

(Proceedings resumed at 11:30 a.m.)

(The following proceedings were heard in the presence of the jury:)

THE COURT: Resume.

MR. MILLER: Thank you, Your Honor.

BY MR. MILLER:

Q. All right. Before our break, Doctor, we were talking about your concern about exposure misclassification in the Agricultural Health Study.

Remember that discussion?

A. Right.

Q. And I was asking you whether this comports with your analysis or not. Correct me if I'm wrong.

But we had a farmer, we'll call him Tom; call him anything you want. He goes in in '93, he fills out the pesticide application. He's not using Roundup. He

says no use. '94, '95, '96, he uses Roundup. He's one of the 37 percent lost to follow-up. He develops non-Hodgkin's lymphoma.

Does he go down as a nonuser, even though he used Roundup for three years?

A. Well, there's no way to really know, but it's likely, based on what was published, that he was still considered not exposed. Because prior use was one of the factors that went into their algorithm.

Q. Okay. Is that -- what do you call that in science, when they're mixing like that?

A. Well, it's called exposure misclassification. In other words, somebody is misclassified. Somebody who used the chemical is classified as having not used it, or vice versa.

Q. Okay. Now, you mentioned to us before we took our last break that the science had gotten stronger in 2019.

Do you generally remember that line of questioning?

A. Yes.

Q. We heard about the Zhang study. We're not going to go through the entire article, but just briefly, what is the importance of it?

What was it and how does it relate under your

opinions?

A. Well, I think the Zhang article is important because it was written by an independent group of scientists, epidemiologists, who did a meta-analysis including these case-control studies we've talked about, plus the updated Agricultural Health Study.

And so they used the most updated data that was available. And they tried to look at the people who were exposed the highest. So that's where you're most likely to see an effect, a risk effect.

And then they did a whole bunch of different analyses, but the bottom line is that they found an increased odds ratio of 1.4, that was statistically significant; 40 percent increase for NHL as a group.

And then they did something else, something similar to what I did and something similar to what the IARC did. They looked at the other data on animal studies and mechanistic studies, and they incorporated that into their analysis. And their conclusion was that the evidence was compelling, that glyphosate can cause non-Hodgkin's lymphoma. So that was their conclusion.

Q. And these three scientists that did the Zhang article, one of them here in Berkeley, they were -- they disclosed whether they were involved in the Scientific Advisory Panel for the Environmental Protection Agency?

A. I think some were on that panel, yes.

Q. Did that help inform, or not, your opinion that you've held for so many years that Roundup exposure can cause non-Hodgkin's lymphoma?

A. Well, it confirmed my opinion.

Q. We've also heard about this study that came out while we were starting trial, the Leon study.

Briefly tell us about that and how it affects your opinion.

A. Well, the Leon study is a different kind of study. It's a pooled analysis of cohort studies. And in the Leon study, what they found was that -- and they were pretty much looking at ever/never use of glyphosate.

What they found was that it didn't increase the risk overall for NHL, but for diffuse large B-cell lymphoma, it did increase the risk. And in one of the three studies -- the Agricultural Health Study was one of the three studies, but one of the other studies showed a statistically significant increased risk in diffuse large B-cell lymphoma with glyphosate.

So, you know, it also was confirmatory of my opinion that Roundup does cause non-Hodgkin's lymphoma; and, in this case, diffuse large B-cell lymphoma.

Q. Which is the precise type of lymphoma that Al

and Alberta Pilliod have?

A. Yes.

Q. We've talked about the genotox, and I'm not going to spend a lot of time on it.

But anything else you want to say about the Suàrez-Larios study?

A. Just a couple of points I want to make about genotoxicity. First of all, there have been multiple studies of human lymphocytes, where they take blood from normal people, they separate out the lymphocytes, then they look at genotoxicity in the lymphocytes.

And there have been 11 studies that have been positive for genotoxicity in human lymphocytes. And in six of those, it was toxic even at very low doses. So I think that's a really important finding, because these are the same cells that become malignant.

And then there have been a number of other studies, like this Suàrez-Larios study, which looked at specific kinds of genetic abnormalities. And what he found was that the pesticide increased the risk of what are called double-strand breaks, where both strands of the DNA break at the same place.

And then what you get is a change of DNA, translocations. And he showed those were statistically increased with Roundup.

And, in fact, those are the same kinds of DNA abnormalities that occur in lymphoma. You get these translocations of genes from their normal spot to another spot, where the gene then becomes turned on or turned off and can cause the cancer.

So he showed that the specific type of genetic abnormality that we see in non-Hodgkin's lymphoma is the same abnormality that's induced by Roundup in human lymphocytes.

Q. And that was a peer-reviewed study, of course?

A. I'm sorry?

Q. Suàrez-Larios --

A. Yes.

Q. And quickly, then, let's move to the Bolognesi study.

What's the quick takeaway there?

A. Well, the Bolognesi study is a similar type of study. They used a different assay, where they looked for these binucleated micronuclei, and they found that glyphosate by itself was genotoxic, but you had to use very high doses of it. But if you used Roundup, it was like ten times more genotoxic than the glyphosate itself.

So the Roundup, by putting all the other things in there, like the surfactants and other things,

it made it ten times more genotoxic.

Q. And the Wozniak study?

A. Again, a very similar study using a different assay. And they did the same thing as Bolognesi. And they showed that the Roundup was much more genotoxic than the glyphosate itself. In that study, it was, I think, 200 times more genotoxic.

So the bottom line is that glyphosate is genotoxic, but when you mix it together with the POEA and other things, it becomes much more genotoxic.

Q. So in 2016, a lawyer calls and says, hey, Dr. Weisenburger, would you look at lots of medical records?

Takes a lot of time, doesn't it?

A. Yes.

Q. And I sent you over a thousand pages of records for Alberta Pilliod?

A. Yes.

Q. Read them all?

A. I did.

Q. And I sent you probably more than that for Al Pilliod.

Did you read them all?

A. Yes.

Q. Okay. And then I sent you every deposition

taken by Monsanto of the plaintiffs, of every treating physician we could locate for Al and Alberta.

Did you read them?

A. Yes, I did.

Q. I sent you the pathology slides for the non-Hodgkin's lymphoma, right?

A. Yes. For both, yeah.

Q. And you looked at them?

A. Yes.

Q. And let's cut to the chase.

Was Roundup a substantial contributing -- well, you also looked at the exposure testimony, how much exposure these two folks have had, right?

A. I looked at their pesticide data sheets, their depositions. And then I spent about an hour, maybe a little over an hour on the phone with them asking them specific questions about their exposure, to sort of understand that. So I got a good idea of what their exposure was, yes.

Q. Why don't you relay for us what their exposure was.

A. So both of them had substantial exposure to Roundup. Al had more exposure because he did the mixing when they were mixing stuff. And he did most of the spraying. So they estimated that he sprayed about

75 percent of the time, and she sprayed about 25 percent of the time.

And they had different properties, and sometimes they had two or three properties at one time that they were spraying.

So when I sat down and sort of did my calculations, it was amazing. It looked like Al was using Roundup somewhere between 13 and 67 times a year, okay? And his total number of times that I calculated was 729 times that he used Roundup. Of course, this is an estimate, but it's based on data that he -- that they provided to me.

And for Alberta, she used it probably around 8 to 27 times a year, okay? Depending on which properties they were spraying. And her total -- she used it probably around 270 or -80 times in her lifetime.

Q. Did you ask them whether they wore a mask?

A. Yeah. I asked them a lot about protective equipment. They didn't wear any.

Q. No gloves?

A. Al wore gloves once in a while, cloth gloves. But most of the time, he was spraying without gloves. So they were wearing clothes. Alberta was spraying in tank tops and shorts and flip-flops. So she was getting it on her legs, her feet, her hands, and arms. So they

both had high exposure. They got it on their skin.

Q. And this is higher by multipliers than any of the studies we've looked at, isn't it?

A. Well, it's hard to know because the studies didn't look at it in such detail. But certainly the number of days they were exposed is more than two per year or more than ten in a lifetime. So that would give them an increased risk.

And we know from the fact that they didn't take any precautions and they sometimes sprayed for hours, they wore their clothes for the whole rest of the day, they didn't take their clothes off and change, they didn't shower or maybe wash their hands after they were done, they probably had exposure during the whole day after they were exposed.

Q. Neither one of them -- did you learn whether they set for their license pesticide applicator exam?

A. I didn't ask that question. I don't know.

Q. They weren't commercial operators?

A. No.

Q. Well, let's cut to the chase.

Was Roundup, this exposure you've told us about, a substantial contributing factor in causing Al Pilliod's non-Hodgkin's lymphoma?

A. Yes.

Q. Hard call?

A. It's not a hard call.

Q. Was constant exposure year after year, week after week, from Alberta Pilliod a substantial factor in causing her non-Hodgkin's lymphoma?

A. Yes.

Q. Hard call?

A. It was not a hard call.

Q. Do you know if the label for Roundup warned of wearing protective gear?

MR. ISMAIL: Objection, Your Honor. Lack of foundation.

THE COURT: If he knows.

THE WITNESS: I think it doesn't warn about wearing protective gear. But I'm not an expert on that.

MR. MILLER: I understand. We'll move on from that, then.

BY MR. MILLER:

Q. So what is differential diagnosis or differential ideology? What does that concept mean?

A. Well, for differential ideology, what one needs to do is to say, okay, this is the diagnosis, non-Hodgkin's lymphoma. What are all the known accepted causes of non-Hodgkin's lymphoma? Because we have some known accepted causes of non-Hodgkin's lymphoma.

And then what risk factors for non-Hodgkin's lymphoma did Al have and did Alberta have?

And so that's, sort of, the methodology that I went through when I was trying to determine whether glyphosate or some other factor was a substantial contributing factor in these two cases.

Q. Did you prepare a board to sort of go through the risk factors and analyze them for each plaintiff?

A. Yes. So there's a list on a board that has the major risk factors.

MR. MILLER: Exhibit 0299, permission to publish, Your Honor?

MR. ISMAIL: No objection.

THE COURT: You can go ahead, Mr. Miller.

MR. MILLER: Thank you, Your Honor.

Your Honor, with the Court's permission, if the doctor could come down and walk through the board.

THE COURT: Sure. That's fine.

MR. MILLER: If Counsel wants to come over and stand here.

BY MR. MILLER:

Q. Doctor, be careful, come down here, and we're going to walk through this board, okay?

THE COURT: Let me ask you whether or not --

MR. MILLER: I was going to have him write on

it.

BY MR. MILLER:

Q. Let's walk through this and make sure all the jurors can see. I'll pull it up some more. Here you go.

What are we looking at here, Doc?

A. When we do this differential ideology, we look at all the known risk factors for non-Hodgkin's lymphoma. And then we ask, which ones did Alberta have? And then, were they real risk factors? Were they substantial risk factors or not?

So we know that age is a risk factor for non-Hodgkin's lymphoma. That is, the older we get, the higher our risk for non-Hodgkin's lymphoma. That's true of many cancers, okay?

And why is that? Well, because we have more time to develop genetic abnormalities, we have more exposures to our environment. And so that's, I think, one of the reasons why the risk goes up with age.

But age is not a cause of non-Hodgkin's lymphoma, right? It tells you that there's increased risk, but the fact that you're old doesn't make you get non-Hodgkin's lymphoma. So I don't think age is what I would call a causative risk factor. It doesn't cause the lymphoma.

The same is true for sex and race. Males have a slightly higher risk than women, and Caucasians have a slightly higher risk of non-Hodgkin's lymphoma than African Americans or Asians or Hispanics.

So I don't think any of these are what I would call causative risk factors. They tell you that you have an increased risk, but they don't cause the cancer.

A family history of hematologic malignancies, particularly in first-degree relatives -- so your mother, your father, your sister, your brother, or one of the kids -- if you have a family history of hematologic malignancies of non-Hodgkin's lymphoma, that means that the other -- if you have that in your history, then you have about a twofold of increased risk, okay?

But neither -- Alberta didn't have a family history of hematologic malignancies.

Q. We're talking just about Alberta?

A. We're talking about Alberta, yeah.

So pesticide use. We know that pesticide use increases risk, and there are 15 or 20 pesticides of various types that we know increase the risk for non-Hodgkin's lymphoma. So pesticide use is definitely an increased risk. So we're going to move that one over here. We're going to put Roundup.

The reason I'm putting Roundup is because one of the things I did when I talked with them is, I asked them, did you use any other pesticides? And by and large, the only pesticide they used in that 30 or so years was Roundup.

Q. Did you see pictures of the bottle, where it was Roundup manufactured by Monsanto?

A. Yes.

Q. Okay.

A. It was the only herbicide they used in any significant amount during that 30 years or so.

Q. Let me go back now. Family history of hematologic malignancies.

Alberta didn't have anyone in her family who had any of the blood-borne cancers?

A. She didn't.

Obesity is also known to be a risk factor for non-Hodgkin's lymphoma. And I calculated Alberta's body mass index, a way that we measure obesity --

Q. Don't tell me if I'm obese or not.

A. And if it's greater than 30 kilograms per meter squared, then you're considered obese. So she falls into this category of being obese. So that would give her an increased risk, as well, okay?

Q. Yes. That's a yes?

A. Yeah, that's a yes.

Q. You write like a doctor.

A. Is that a yes? Sorry.

Q. You said age, sex, and race don't cause non-Hodgkin's lymphoma so you're not going to carry them over.

Can you put an X through them, if that's appropriate? Or what?

A. Yes, I can.

Q. No family history. We have a positive for pesticide and a positive for obesity.

Let's talk about viral infections.

A. There are some viral infections that increase the risk for non-Hodgkin's lymphoma. The AIDS virus, for example. If you get AIDS, you have increased risk for non-Hodgkin's lymphoma.

There are other viruses. There's a virus in Japan that causes lymphomas in Japanese people. There's a virus that's very common called Epstein-Barr virus, which causes infectious mononucleosis. It also causes lymphomas in people later in life. So there are some viruses we know can cause lymphoma. But she didn't have any of those viruses, okay, as far as we can tell.

So I'm going to cross that out.

And then there are certain bacterial

infections. The most well-accepted one is a bacteria, a microorganism that sometimes lives in the stomach, called Heliobacter. And it causes lymphomas in the stomach, okay, because it lives there and causes lymphomas in the stomach. So that's one example.

But she didn't have any history of these bacteria infections that would cause lymphoma.

And then we know that immunodeficiency, either inherited immunodeficiency, that you're born with as a child, you have an increased risk of non-Hodgkin's lymphoma. Or if you have an acquired immunodeficiency like HIV, you have an increased risk of non-Hodgkin's lymphoma, like AIDS.

But she didn't have any history of any of that. She didn't have any evidence of immunodeficiency. She was healthy, pretty much her entire life. She didn't have any susceptibility to any kinds of infection; that was out of the ordinary, so I don't believe she had any immunodeficiency.

And immunosuppression -- that is, taking drugs that could decrease the immunity of the person -- is another way to get immunodeficiency. And she wasn't treated with any drugs, except the chemotherapy she got for her lymphoma. That would have given her some immunodeficiency, but she didn't have that prior to

getting her lymphoma. There's no evidence that she had immunodeficiency or any other things that were causing her immunosuppression.

Now, one other thing is autoimmune diseases. So there are certain diseases where the body reacts against itself. Like rheumatoid arthritis is a common one, where the body makes antibodies against its own tissues and causes arthritis. And there's a whole family of diseases where the body makes -- attacks itself, basically. And so the question -- most of these, many of these increase the risk for non-Hodgkin's lymphoma.

So when we asked about that, she did have a history of hyperthyroidism some years before, okay? And what happened is she was hyperthyroid, and then they treated her for that, and then she became hypothyroid. So then she had to go on thyroid medication.

And probably what she had was an autoimmune disease called Hashimoto's thyroiditis. That's an inflammation in the thyroid gland, and it destroys the gland. And it first caused her to be hyperthyroid, when it was destroying the gland; and then hypothyroid when it had pretty much destroyed the gland. So she did have this Hashimoto's thyroiditis, okay?

Q. Lupus would be one?

A. There are a whole family of them. Lupus.

Q. Sjogren's syndrome?

A. Sjogren's syndrome, scleroderma.

Q. She had none of them?

A. She had none of those other autoimmune diseases. So this is one I think she had, and so we have to put that in our consideration.

Chronic inflammation. I didn't find any evidence that she had chronic inflammation that might lead to her lymphoma.

And then solvent use is the last one. I mentioned to you earlier that benzine and turpentine and paint thinners and some of the solvents like that can increase non-Hodgkin's lymphoma. But she didn't have any exposure to those kinds of things, any significant exposure.

Q. You interviewed her, you read her deposition, you looked at her medical records.

A. Right.

So then we come to the three that are left. And we have to say, now, what do we really think was the major cause or the substantial cause for her non-Hodgkin's lymphoma, okay?

Well, I don't think it was the autoimmune disease. Let me tell you why. When you get Hashimoto's

thyroiditis, okay, the autoimmune disease is in the thyroid gland. The inflammation that comes from that is in the thyroid gland. So that's where the damage is done.

And, in fact, the lymphomas you get if you have Hashimoto's thyroiditis are in the thyroid gland. They don't get lymphomas outside the thyroid gland at any increased incidence. She had lymphoma of the brain, not the thyroid gland. So I think we can cross that one out.

So that leaves us with Roundup and obesity. And obesity is what I would call a minor risk factor for non-Hodgkin's lymphoma. The odds ratio for those people who are obese is about 1.3. And we don't really understand for sure how that happens. Probably the metabolism of the individual is disturbed, and that can influence the lymphocytes. But the risk is pretty small, okay? Obesity, the risk is about 30 percent.

And so I would call obesity -- I would call it a minor risk factor. It may have contributed to her lymphoma, but it wasn't a substantial contributing cause. On the other hand, Roundup causes an odds ratio greater than 2 in people who are highly exposed like she was.

And so I think that it's logical that Roundup

would be the substantial contributing cause. Because we know it causes lymphoma, and we know the people exposed have a higher increased risk for non-Hodgkin's lymphoma.

So what I came up with was that Roundup was the substantial contributing cause, major cause; and that perhaps obesity could have contributed, but probably wasn't the major cause.

Q. The defendants are going to ask you, she had a history of bladder cancer, didn't she?

A. Yes. She had a history of bladder cancer. Bladder cancer itself does not increase the risk for non-Hodgkin's lymphoma. She didn't get any chemotherapy for her bladder cancer, so that wasn't in play.

Q. Prior chemotherapy could increase your risks?

A. Yes.

Q. But Alberta had no prior chemotherapy before getting non-Hodgkin's lymphoma?

A. Right. In the end, I think that Roundup is, more likely than not, the substantial contributing factor to her developing her non-Hodgkin's lymphoma.

And so do you want to bring up the issue of idiopathic?

Q. Yes, I do.

A. One of the things we think about is, well, in some cases, we don't know what caused the non-Hodgkin's

lymphoma, right? So the doctor goes through the list, crosses off everything on the list, and says, I don't know what caused your non-Hodgkin's lymphoma.

So in that situation, we say, well, it's idiopathic. It means I don't know. You got it, but I don't know what caused it, okay? And that's actually the case in the majority of the people with lymphoma.

But if you know what the cause is, if there's an obvious cause like Roundup, you don't call it idiopathic. You say, it must have been the Roundup, more likely than not.

It's just like the analogy of cigarette smoking. In a lady that gets lung cancer, and she smoked two packs a day for 30 years, you don't say, well, Mrs. Smith, we don't know what caused your lung cancer. We say that it was probably the smoking for 30 years.

So it's the same analogy. It's very likely that it was the Roundup that caused the non-Hodgkin's lymphoma, rather than some unknown cause that we don't know.

Q. All right. That's Alberta.

Let's take a look at her husband, who has the same type of non-Hodgkin's lymphoma.

A. Okay.

MR. MILLER: Exhibit 0298, I assume it's okay to publish? Same thing?

MR. ISMAIL: Yes.

BY MR. MILLER:

Q. We're taking an analysis of what, sir?

This is for Al. Explain this.

A. We're going to do the same thing, but go through it a little more quickly with Al.

But again, Al was 69, he was older; male, has a slightly increased risk; and he's Caucasian. So these would have put him at a slightly increased risk. But none of these are causative risk factors. His race or sex didn't cause his cancer. So we can just eliminate those.

Al had no history of hematologic malignancies. He did have a history of skin cancers in his father and mother and sister, which I think we're going to talk about later. I don't know. But he had no history of hematologic malignancies.

Q. So no one in the family before him, even his family members that had skin cancer, none of them had non-Hodgkin's lymphoma?

A. No. They had no -- none of this family of diseases.

Again, for Al, we have to put up Roundup for

the reasons I've already explained to you. Al really did not use much more in the way of other pesticides. Occasionally, once a year, twice a year, he would spray for spiders in the house with a can of spray like you would use in your house. And once a year, he would treat his fruit trees with a dormant agent, which I think was a fungicide to keep mold off of the trees.

But that was, as far as I could tell, the only other pesticide he ever used. And probably neither of those are very important risk factors. So there wasn't any other significant pesticide use.

Al is not obese, but he's a little bit overweight. So we're going to put that here. When I calculated his body mass, it was less than 30, 29-point something. And I used the weight and height to calculate that based on their usual weight as an adult, not before or after the cancer -- not long before the cancer.

Al did have a history of viral infections, okay? He had probably repeated infections with herpes simplex virus, which, in most people, causes cold sores.

Some of you have probably had it. About a quarter of the population has this virus. Most of us are infected and it lives quietly and doesn't cause any problems. But a quarter of the people have cold sores

that come back every year or every other year.

But that virus doesn't cause lymphoma. It causes cold sores and can occasionally cause encephalitis. He had encephalitis, and a seizure disorder from his encephalitis, and meningitis; all probably to do with this virus. But that has nothing to do with his lymphoma. He's just one of these people who has this infection, and it seems to recur every so often and cause him problems.

So I would say we can cross that out. He didn't have any other viruses that are known to cause lymphoma. He didn't have any bacterial infections that are known to cause lymphoma.

So one of the questions is: Did he have immunodeficiency? I know one of the hypotheses of the defense is that he had some kind of immunodeficiency that resulted in him getting his lymphoma, okay?

And it's also why he had so many skin cancers, and it's also why he had this chronic viral infection, and it's also why he had some other kinds of infections.

So -- but, in fact, when I look carefully at his record, and I did my research on these different things, I don't believe that his skin cancer had anything to do with his lymphoma.

Q. What's the number one cause of skin cancer?

A. Sunlight, ultraviolet radiation.

Q. Is Al a surfer?

A. Al spent a lot of time in the sun. He was a surfer, had a sailboat. And early in life, he didn't use sunblock. And he's light-complected with red hair and blue eyes, so he has the body characteristics of someone who shouldn't spend a lot of time in the sun. And if they do, should be wearing sunblocks and all kinds of things.

So it's the same skin type that his parents had and his sister had. That whole family is light-complected with red hair and is at high risk for sunburn and sun damage and skin cancers.

So I don't believe that Al has any immunodeficiency. He wasn't immunosuppressed. There was some talk about him --

Q. Before we get any further, immunosuppression, people who have immunosuppression are often put on immunosuppression drugs, aren't they?

A. Right. So these are drugs that we use to treat cancer or to treat autoimmune diseases or other kinds of diseases. Drugs that sort of knock our immunity down.

Q. And Al wasn't on any of those?

A. He wasn't on any of those.

Autoimmune disease. Al had a history of ulcerative colitis, many years ago, which is an autoimmune disease.

But when we asked him more carefully about it, for a period of one to two months, he had diarrhea and cramping, and he went to the doctor and was given some anti-inflammatory medications. And after about two months, this resolved and he never had it afterwards. So that's not ulcerative colitis. Ulcerative colitis is a chronic disease that's very debilitating. It doesn't just go away spontaneously after one or two months.

So whatever he had, whether it was food poisoning or some kind of infection, we don't know. But I don't think he ever had ulcerative colitis or an autoimmune disease.

No evidence of product infection, and really no significant evidence of solvent use. The paints they used were water-based paints. They didn't use any solvents. Early on in his career, he was exposed to solvents for a short period of time when he worked in a garage -- he actually worked in the office, he didn't work in the garage. So he had very minimal exposure to solvents over his lifetime.

In the end, just like Alberta, it comes down to Roundup and overweight.

And then, it's the same story, you get a risk ratio from him of about 1.3, a little less; here is greater than 2.

So this one comes over here as the major substantial risk factor. And being slightly overweight puts him maybe at a slightly increased risk, but not a substantial increased risk for non-Hodgkin's lymphoma.

So that's the rationale I went through in my determination of what could have caused his non-Hodgkin's lymphoma, okay?

Q. Doctor, even if you didn't have both the husband and wife exposed and contracting the same cancer and subtype together, you just had one case -- you just had Al's exposure to Roundup and him getting non-Hodgkin's lymphoma -- would you be able to say with a reasonable degree of medical certainty that Roundup was a substantial contributing factor in just one of them?

A. Yes. I didn't let that information bias me when I analyzed these. I looked at each case separately. And each case, based on what I've shown you, points the finger to Roundup.

Q. All right. Anything else we want to talk about on this chart?

A. I don't think so.

Q. All right. Why don't you have a seat.

We had enormous patience from everybody all day, and it's just about lunchtime, so I'm about ready to wrap up.

So you looked at all the medical records, all the depositions, took all these years of study.

Did Mr. Pilliod tell you that he was mixing Roundup sometimes and buying concentrate?

What's the history of that?

A. Usually, they were using the stuff off the shelf, the ready-to-use Roundup. But he also bought the more concentrated Roundup and mixed his own Roundup, I think, 10 to 15 percent of the time. So he did do some mixing.

Q. Dr. Weisenburger, in reviewing all of this, Roundup is a substantial contributing factor in causing Al's non-Hodgkin's lymphoma?

A. Yes. I think for both of them, yes.

Q. Looking at all the medical history and all the other things they've had in their lives?

A. Yes.

Q. And same for Al and Alberta?

A. Yes.

Q. Answer the questions, if you would, sir, of Monsanto's lawyers. And I thank you for your time.

THE COURT: We're going to come back at 1:25. I have something I have to do, and a couple of attorneys have to do something. But as soon as we're all done, we're going to reconvene.

So if everybody could be back in the building at 1:15, we'll see thereafter how quickly we get back on track.

A break. Please, no discussion of anything that occurred amongst each other or anyone else. Enjoy your lunch.

(Luncheon recess was taken at 12:12 p.m.)

AFTERNOON SESSION 1:32 p.m.

(Proceedings resumed in open court in the presence of the jury.)

THE COURT: Mr. Ismail, cross-examination. You may proceed.

MR. ISMAIL: Thank you.

CROSS-EXAMINATION

BY MR. ISMAIL:

Q. Good afternoon, Dr. Weisenburger.

A. Good afternoon.

Q. Sir, I'd like to just start by reminding you this is cross-examination, and most of my questions to you this afternoon are going to be "yes" or "no," and I ask you to do your best to limit your answers to what

I'm asking. Will you do that?

A. I'll do the best I can.

Q. Terrific.

Now, Doctor, I want to start with some things that I think you and I can agree on.

Now, you agree that Mr. and Mrs. Pilliod could have developed their exact same lymphoma at exactly the same time with exactly the same features even if they never used Roundup; true?

A. It's true. They would have the same risk as you or I.

Q. Now, lymphoma is an umbrella term that describes dozens of different cancers; correct?

A. Yes.

Q. And non-Hodgkin's lymphoma, among cancers, is a common form of cancer?

A. It's relatively common, yes.

Q. All lymphomas combined and their subtypes are, what, the seventh -- sixth or seventh most common form of cancer in the United States?

A. Yes.

Q. And you're familiar with statistics, sir, that 75,000 people in the United States will be newly diagnosed with NHL just this year alone; correct?

A. Yes.

Q. Now, DLBCL, that's the subtype of NHL that you've been talking about today; right?

A. Yes.

Q. And that form, that subtype of NHL is the most common type of non-Hodgkin's lymphoma; true?

A. Yes.

Q. Now, cancer is a genetic disease; true?

A. Yes.

Q. It's caused by changes in genes that control the way the cells function?

A. Yes.

Q. Non-Hodgkin's lymphoma, that disease was diagnosed for decades prior to, say, 1970; correct?

A. Yes.

Q. Tens of thousands, if not hundreds of thousands of people, millions of people were diagnosed with NHL before the 19 -- say, 1970; correct?

A. Probably.

Q. And I didn't pick 1970 by random, as you told the jury that Roundup and glyphosate formulations were introduced in the mid 1970s; correct?

A. Yes.

Q. And so those tens of thousands or hundreds of thousands or even millions of people who developed NHL prior to 1970, Roundup or glyphosate obviously had

nothing to do with those cancers being developed; correct?

A. Yes.

Q. Now people who have never been exposed to Roundup get non-Hodgkin's lymphoma all the time; correct?

A. I'm not sure I'd say all the time, but they do.

Q. Yes.

A. People are at risk for non-Hodgkin's lymphoma, right.

Q. Thank you. And that is because there are many causes of non-Hodgkin's lymphoma; true?

A. It's true.

Q. To the best of your knowledge, sir, the vast majority of people who develop NHL have never been exposed to Roundup; correct?

A. To the best of my knowledge, yes.

Q. And that would apply also to diffuse large B-cell lymphoma and all the NHL subtypes; correct?

A. Yes.

Q. Now, the vast majority of people who use Roundup don't develop NHL; correct?

A. That's probably correct also, yes.

Q. Now, you talked to the jury this afternoon a

little bit about this concept of idiopathic NHL. Do you recall talking about that briefly?

A. Yes.

Q. And when you defined the term "idiopathic" as meaning where the physicians caring for the patient can't determine the cause of, in this case, cancer; correct?

A. Right.

Q. I think you told the jury that most cases of NHL that are diagnosed in this country fit that definition of idiopathic meaning there's no known cause; true?

A. There's no known environmental cause or obvious cause.

Q. And in fact, sir, you have previously stated that up to 70 percent of all cases of non-Hodgkin's lymphoma, there is no known cause for that individual patient developing the disease; true?

A. Yeah, that's a guesstimate, but it's probably accurate.

Q. And indeed you've seen in the literature statistics that would suggest that the amount of idiopathic, that is, unknown causes of NHL, is even higher than 70 percent? You've seen that in the literature, haven't you?

A. Not that I remember, no.

Q. All right. Now, in those 70 percent or whatever the exact number is of cases for which there is no known cause of the NHL, there still has to be genetic mutations that occur to allow the cancer to develop; correct?

A. Yes.

Q. It's just in those 70 percent of the cases, we don't know what is causing those mutations in an individual patient; true?

A. Yes.

Q. And the reason -- and even with people who have been exposed to Roundup could have those unexplained genetic mutations that have nothing to do with the herbicide; true?

A. It's possible.

Q. Now, you would certainly agree that there are causes for non-Hodgkin's lymphoma that haven't been identified by scientists yet; right?

A. Yes.

Q. So -- and even of those cases, those 70 percent of cases for which there is no known cause, those patients often have risk factors for developing the disease, the likes of which you testified to briefly this afternoon; true?

A. They may have some of the risk factors, the non-causative ones.

Q. Let me be more specific. So you identified age and body weight and gender as -- as factors that can increase a patient's risk of getting the disease; correct?

A. Right.

Q. And so even in those situations where there is no known cause of individual patients' NHL, often those patients have those characteristics that put them at a greater risk. Would you agree with that, sir?

A. Yes.

Q. Now turning to your work in this case specific to Mr. Pilliod and Mrs. Pilliod, am I correct that you did not perform a physical examination of either plaintiff?

A. I did not.

Q. And you believe still that you can render an opinion as to the cause of Mr. Pilliod and Mrs. Pilliod's NHL even though you did not physically examine either of them; true?

A. It's true.

Q. It's obviously true because here you are today giving that opinion; right?

A. Yes.

Q. So you don't believe a physical exam is -- would allow a physician to determine the cause of NHL, at least in this case; right?

A. Correct.

Q. And you would actually think that there's no situation in which a physical exam would allow you to determine that Roundup was the cause of an individual patient's non-Hodgkin's lymphoma; true?

A. Yes.

Q. Now, you are being compensated for your work on behalf of plaintiffs' counsel in this case; true?

A. Yes.

Q. And what is your hourly rate, sir?

A. $500 an hour.

Q. And at the time of your deposition for Mr. Pilliod and Mrs. Pilliod's case, I believe you estimated for us that in their particular case you had spent about 75 hours as of that point on this case. Does that sound about right?

A. I don't remember.

Q. Would you like to see your deposition to refresh your recollection?

A. Sure.

Q. Well, let me ask it this way. And maybe we can short-circuit some of this.

As you sit here today, you've obviously done more work on Mr. Pilliod and Mrs. Pilliod's case since your deposition; right?

A. Yes.

Q. So just focusing on their specific case, how much have you either invoiced or intend to invoice for your work on behalf of plaintiffs' counsel in the Pilliod's case?

A. It will total probably close to $90,000.

Q. All right. Now, you told us about the various subtypes of non-Hodgkin's lymphoma of which DLBCL is the most common type; right?

A. Yes.

Q. And for you as a pathologist you've told us that Mr. Pilliod and Mrs. Pilliod both had a form of DLBCL; correct?

A. Yes.

Q. Now those two types -- but their two cancers are actually further differentiated; correct?

A. I don't understand your question.

Q. Sure. In Mr. Pilliod's case, he's had -- he had what you would describe as a systemic DLBCL; correct?

A. Yes.

Q. And in Mrs. Pilliod's case, she had a primary

central nervous system lymphoma; correct?

A. Yes.

Q. And from a perspective of pathologists, you can characterize both as a DLBCL, but for the oncologist, the actual treating physician taking care of the patients, those are two very different forms of cancer; correct?

A. Well, they're different because they require a different treatment approach.

Q. Exactly where I was going. So for the oncologist, rather than the pathologist, it's important to know exactly what type of -- subtype of cancer the patient has so you can guide your treatment and your counseling of the patient; correct?

A. Yes.

Q. Now, I think you told us this morning that if you look under a microscope you cannot determine whether a particular tumor was caused by Roundup or not.

Did I understand that was part of your testimony this morning?

A. That's true.

Q. Now you told us that for NHL to develop there has to be some genetic mutation to progress to the form of a tumor; correct?

A. Some genetic damage.

Q. Some genetic damage. You showed us a video that maybe we'll get back to which shows one hypothesis by which -- or two hypotheses by which that occurs; correct?

A. Yes.

Q. Now, you have actually published that some specific genetic mutations have been associated with herbicides; correct?

A. Yes. We published some literature on the translocation -- (14;18) translocation was associated with herbicides.

Q. Okay. Well, that's exactly the paper that I wanted to talk about. So --

MR. ISMAIL: May I approach, Your Honor?

THE COURT: Yes.

MR. ISMAIL: Thank you.

Your Honor, I actually don't know what the exhibit number is on this, and we'll get one after -- at the break.

Q. But, Doctor, the article I put in front of you, can you confirm you are the senior author on this paper?

A. Yes, I am.

Q. And this is a paper published in the peer-review literature in 2006?

A. Yes.

Q. And this is a paper on that specific translocation issue that you just referred to in your prior answer?

A. Yes.

MR. ISMAIL: May I publish, Your Honor?

THE COURT: Any objection?

MR. MILLER: No objection, Your Honor.

THE COURT: Granted.

MR. ISMAIL: Thank you.

THE COURT: Hold on a second. Is it covering -- if you could move the demonstrative from in front of the screen.

In fact do you need that just to be moved out altogether? Thank you, Mr. Ismail.

BY MR. ISMAIL:

Q. Okay. Dr. Weisenburger, we were looking here at this paper and t(14;18), without getting too far along in depth here, that's the specific chromosome translocation that you were just describing; correct?

A. Yes.

Q. And you here are an author on this paper; correct?

A. Yes.

Q. Now, this paper actually was an analysis of

what you've described as the Nebraska study; correct?

A. Yes.

Q. So when you were telling the ladies and gentlemen of the jury that when you became interested in this issue of pesticides, which is a broad category of compounds, one of the things you did was secure funding and do a study in Nebraska where you were then practicing; correct?

A. Yes.

Q. And what you did was you did a case-control study with some of your colleagues, looking at the potential risk of non-Hodgkin's lymphoma with various herbicides and pesticides; correct?

A. Yes.

Q. And one of the things you did as part of that research was to look at whether there's a specific translocation -- chromosome translocation that is associated with a herbicide exposure; correct?

A. Yes.

Q. And that's the paper we're looking at here?

A. Yes.

Q. Now, what you found was -- I'm going to direct your attention to the abstract. And I think the jury is familiar with this now.

But the abstract in a article is where the

authors summarize their important findings; correct?

A. Yes.

Q. And what you found, and we'll look at the data in a minute, is that we conclude that insecticides, herbicides, and is that fumigants?

A. Yes.

Q. -- were associated with the risk of t(14;18) positive NHL but not t(14;18) negative NHL; correct?

A. Correct.

Q. And what you did in the study was you had individuals who were exposed to various pesticides, and you looked to see for this specific chromosome translocation, was it positive or negative and compared that to people who were not exposed; right?

A. Correct.

Q. And what you did was, well, gee, is this particular genetic mutation one that predicts whether someone is at an increased risk from a pesticide exposure or not; correct?

A. Well, we didn't look at it from that perspective. We correlated the presence of that translocation with exposure to pesticides. I don't think it's predictive because lots of people get the same translocation who are not exposed to pesticides.

Q. What you did when summarizing your findings

was to say that if an individual's -- that the insecticides, herbicides, and fumigants that you were studying in the Nebraska study -- which included glyphosate; right?

A. Yes.

Q. That if the -- if this particular test was positive, there was an association with an increased risk, but not if it was negative; true?

A. Yes.

Q. Now if you turn to page 1366, you actually have the data here, right, in Table 2?

Tell me when you're there.

A. Okay.

Q. Just to orient everyone, the table is entitled "The Association of Non-Hodgkin's Lymphoma with Agricultural Pesticides and Farming Activities According to t(14;18) Status"; correct?

A. Yes.

Q. And you have broken it down by individuals in your study who were positive for this particular genetic mutation comparing it to the control, the unexposed group, and then you have folks who were negative; right?

A. Yes.

Q. And then we can go down here to herbicides. That would include glyphosate; right?

A. Yes.

Q. And then you have by duration of exposure; correct?

A. I believe so, yes.

Q. And I think you told us earlier that Mr. and Mrs. Pilliod would fall in this 17 year or more row; correct?

A. Yes.

Q. And then if your t(14;18) test was negative, you report a relative risk; correct?

A. Right.

Q. And the relative risk you report is less than 1; correct?

A. Right. Right.

Q. And in fairness, that confidence interval crosses 1 so that would be a statistically insignificant finding; true?

A. Right.

Q. But since we know the point estimate is below 1, the way you would read this data is that in this study individuals who were exposed to herbicides for 17 years or more and had this particular genetic mutation, there was no increased risk of NHL; true?

A. I'm sorry. Repeat that question.

Q. Yes, sir.

In this study, individuals who were exposed to herbicides for more than 17 years who had this particular form of -- who were negative for this particular form of genetic mutation, there was no increased risk of NHL; true?

A. That's true.

Q. Now, you told Mr. Miller that one of the things you did in this case was look at the pathology reports for Mr. Pilliod and Mrs. Pilliod; correct?

A. Yes.

Q. Can you tell the members of the jury whether Mr. Pilliod or Mrs. Pilliod's t(14;18) was negative?

A. For Mrs. Pilliod, it was negative. But for Mr. Pilliod, I don't think it was examined.

Q. So let's show everyone what we're talking about.

MR. ISMAIL: May I approach, Your Honor?

THE COURT: Yes.

BY MR. ISMAIL:

Q. Dr. Weisenburger, you said to Mr. Miller that you looked at all the thousands of pages of medical records that he provided you to give an opinion in this case; correct?

A. Yes.

Q. And in your hand, as marked as

Exhibit 6270.737, is a set of records for Mrs. Pilliod; correct?

A. Yes.

Q. And these are records, as we'll see in a minute, relate to the pathology review of her NHL tumor; correct?

A. Yes.

MR. ISMAIL: Permission to publish, Your Honor?

MR. MILLER: No objection.

THE COURT: Yes.

(Exhibit published.)

BY MR. ISMAIL:

Q. And that's what we have here on the screen.

MR. ISMAIL: Your Honor, would it be appropriate if either the Court or I tell the jury that we have some things that are redacted here at your request, it's personal identifying information, so that that's why it's being displayed in this manner?

THE COURT: And you did it as well as I could do it.

MR. ISMAIL: Thank you.

THE COURT: When you see things blocked out, generally it's because it's personal identifying information or other kinds of information that's private

and violates confidentiality if it's disclosed. But that's the only meaning it has in the case or for the evidence.

MR. ISMAIL: Thank you, Your Honor.

Q. And you're familiar, Doctor, as you look through this, this relates actually to the pathology report that was done by the folks at Stanford relating to Mrs. Pilliod's tumor; correct?

A. Yes.

Q. And if you turn with me, sir, to -- if you look at the page numbering at the bottom, there's like five different page numbers, but if you look at the very last one, it's 743.

A. Okay.

Q. Okay. So here we are. This is for Mrs. Pilliod. And the pathologist was at Stanford Health Care; correct?

A. Yes.

Q. And this is the date. And you recognize that as when she was diagnosed with her NHL; correct?

A. Correct.

Q. And then you looked down here because you wanted to know if her tumor was assessed by the pathologist at Stanford for this question of t(14;18) genetic mutation; correct?

A. Yes, translocation.

Q. Translocation, thank you.

And as you told us a moment ago, in her case it was negative.

A. Right.

Q. Now, your study that you did in Nebraska that you talked about with the jury this morning found that patients who had a negative t(14;18) translocation like Mrs. Pilliod had no increased risk of NHL; true?

A. Repeat that again.

Q. Yes, sir.

Your study, the Nebraska study, when you analyzed this issue, found that individuals who had a negative t(14;18) translocation like Mrs. Pilliod did not have an increased risk of NHL for herbicide exposure; true?

A. That's what the study shows, but it doesn't mean that people who are exposed to herbicides always get the (14;18) translocation. It's just a correlation.

Q. Just a correlation. Right. So you talked to the jury about lots of correlations this morning; right?

A. Yes.

Q. You talked about lots of relative risks this morning?

A. Yes.

Q. And you knew sitting there all morning that Mrs. Pilliod had a negative t(14;18) translocation; right?

A. Yes.

Q. And you knew that you published a paper from your study that said patients like Mrs. Pilliod did not have a correlation with non-Hodgkin's lymphoma for long-term exposure to herbicide; isn't that right, Dr. Weisenburger?

A. No. What this paper says is that if you're exposed to pesticides or herbicides, you're more likely to get a (14;18) positive lymphoma, but it doesn't mean that you could -- you couldn't get a (14;18) negative lymphoma.

Q. That's not even close to the question I asked you, Doctor.

MR. MILLER: I object, Your Honor. I believe it was.

THE COURT: Actually, it was. I'll let him answer.

BY MR. ISMAIL:

Q. I didn't ask you whether it was possible or impossible whether someone had a negative t(14;18) whether they could get NHL. That's not what I asked.

My question was whether -- and we can put up

your study one more time. This is the column that Mrs. Pilliod falls, what I have on the screen here; right? t(14;18) negative; right?

A. Right.

Q. And she would fall in this row 17 years or more; right?

A. Right.

Q. And you compared folks like Mrs. Pilliod who had this exposure to herbicide to the controls; right?

A. Right.

Q. People who were not exposed; correct?

A. Right.

Q. And you found no correlation with non-Hodgkin's lymphoma; isn't that right, Doctor?

A. Well, what we found is that people who -- again, it's a correlation. So what we found is that the people who were exposed to herbicides were more likely, threefold more likely, to get (14;18) positive translocation than the controls, but the other people were not more likely to get that.

Q. So that's a yes; right?

A. That's my answer.

Q. Can you answer my question "yes" or "no," Doctor?

A. No.

Q. Okay. Moving forward.

Now, you told us that because this was an area of interest of yours, you looked to see whether Mr. Pilliod's tumor was assessed for this particular genetic mutation; correct?

A. That's correct, I don't believe it was.

Q. And I agree with you. So when you look to Mr. Pilliod's pathology report, in his case we don't know one way or another whether he's a positive translocation or a negative translocation; correct?

A. That's correct.

Q. So you've actually done further research on this question of what factors are associated with patients who have t(14;18) negative NHL; correct?

A. Yes.

Q. And you know what paper I'm referring to; right?

A. I'm sure you'll show me.

Q. Yes.

Doctor, I've handed you a paper that upon which again you are the senior author; correct?

A. Yes.

Q. And this is published I think a year after the last paper we looked at?

A. Yes.

Q. And what this paper did was -- this is also out of the Nebraska cohort study?

A. Yes.

Q. Case-control study, sorry.

So the same data set that you were pointing to this morning as giving the jury information about the risk or not with glyphosate-based products; right?

A. Right.

Q. And what you did here was since you had this data on t(14;18) individuals, you wanted to see what factors were associated with having an increased risk; correct?

A. Yes.

MR. ISMAIL: May I publish, Your Honor?

MR. MILLER: No objection.

(Exhibit published.)

BY MR. ISMAIL:

Q. So we have here one of the things you looked at was cigarette smoking; correct?

A. Yes.

Q. And while I'm here, we'll highlight your name and in -- by scientific custom, the last author is usually the senior author on the paper; correct?

A. Yes.

Q. And that's you here. And these have a lot of

the same folks that we were looking at in the prior paper who were collaborating with you on this effort; right?

A. Yes.

Q. We see Dr. Blair whose name has come up a couple of times. He was on this paper as well?

A. Yes.

Q. So in the abstract where you summarize your important findings, you said among women who have ever smoked cigarettes, there was an association with t(14;18) negative NHL; right?

A. Yes.

Q. And what you found was about a doubling of the risk; correct?

A. Yes.

Q. So whereas in the last paper you found no correlation with herbicide use for t(14;18) negatives, when you looked at smoking you saw a doubling of the risk; correct?

A. Yes.

Q. But you didn't see that with t(14;18) positive tumors; correct?

A. Right.

Q. Now, if you turn with me, sir, to page 656 of the article and it's Table 2. Here is where you break

out your data on smoking; right?

A. Okay.

Q. And the first cut of the data here is this phrase the jury has heard, sort of the ever/never question; right?

A. Right.

Q. And so in epidemiology you ask the study participants "Have you ever done," blank. Or -- and if it's yes or no, that's ever or never; right?

A. Right.

Q. And you ask that question for smoking; correct?

A. Right.

Q. Ever smoking.

And this is where you report your important findings about a doubling of the risk; correct?

A. Yep.

Q. Now former smoker, there's still an elevated risk, but in this particular cut, the statistical significance goes away; correct?

A. Yes, it's not significant.

Q. But since you told us all morning when you see a relative risk of one-point-something, you would say that's a 70 percent increased risk if you were following the same logic you used this morning; right?

A. Well, you would certainly consider it, yes.

Q. But then down here you actually have more data that might apply in this case.

So we're talking about Mrs. Pilliod here. We're looking at women. And the question is women who age at initiation. And that question is asking the study participants "When did you start smoking?"; correct?

A. Yes.

Q. And part of this is getting at this question of latency that you talked about with the jury this morning; correct?

A. Yes.

Q. And so when you looked at this question of when did you start smoking -- so this is the odds ratio. Here we have a statistically significant doubling of the risk; correct?

A. Correct.

Q. Now let's talk about Mrs. Pilliod. So she's t(14;18) negative; right?

A. Right.

Q. Mrs. Pilliod is a former smoker; correct?

A. Yes.

Q. You know from your review in this case Mrs. Pilliod started smoking around age 17; correct?

A. Okay.

Q. Do you recall that, sir? It's in your notes.

A. I don't know the exact age when she started.

Q. At a young age; correct?

A. I don't know. I don't know what age she started. She smoked for about 20 years. And it was when she was young, but I don't know what date she started.

Q. Okay. Let me show you your deposition, sir.

Okay, Dr. Weisenburger, this is just to refresh your recollection. You can turn to page 203 of your deposition, line 20.

Do you see in your sworn testimony, sir, there?

A. What line?

Q. Line 20.

A. On 203?

Q. 203.

A. Line 20 on 203 is a question.

Q. Yes. And just read the question and the answer, sir, and you'll see you're agreeing that Mrs. Pilliod started smoking at age 17; correct?

A. I guess I did, yeah. Maybe -- I don't remember what age she started, but it was young.

Q. It was young. And you have no reason now to

think you got it wrong in your deposition; correct?

A. No.

Q. And it was part of the history that you were interested in this case was Mrs. Pilliod's smoking history; correct?

A. Yes.

Q. And you told us that she had about a 20-year history of smoking; correct?

A. Yes.

Q. And now looking at putting the two data points together, a t(14;18) negative tumor like Mrs. Pilliod for someone who had initiated -- started smoking before the age of 20, your study found a statistically significant doubling of the risk for non-Hodgkin's lymphoma; isn't that right, Dr. Weisenburger?

A. Yes, for t(14;18) negative lymphoma, yes.

Q. Like hers, like Mrs. Pilliod's?

A. Yes.

Q. Now, Mr. Pilliod also has a history of smoking; correct?

A. Yes.

Q. And he also started at a relatively young age?

A. Yes.

Q. And also had about a 20-year pack-a-day history of smoking like Mrs. Pilliod?

A. Yes.

Q. But as you and I have already discussed, we can't do the same comparison for Mr. Pilliod because we don't know whether his tumor was t(14;18) positive or negative; correct?

A. That's right.

Q. Now, there's nothing in the pathology report for Mr. Pilliod that indicates he used Roundup at any time; true?

A. Correct.

Q. And there's certainly nothing in the pathology reports for Mrs. Pilliod that indicates she used Roundup at any time; true?

A. Yes.

Q. There's no distinctive feature in either Mr. Pilliod or Mrs. Pilliod's pathology that you can point to for this jury and say that's proof that Roundup was a cause of either of their cancers; correct?

A. Yes.

Q. You did not see any medical record in this case that indicated or suggested for Mr. Pilliod that Roundup played any role in his development of non-Hodgkin's lymphoma; true?

A. That's correct.

Q. Same question for Mrs. Pilliod. You did not

see a single medical record in this case that at all suggested that Roundup played a role in her NHL; true?

A. That's true, but I don't think it was investigated.

Q. There is -- there's no biomarker for glyphosate or Roundup that you can point to; correct?

A. Correct.

Q. You cannot say the amount of glyphosate surfactant or any other ingredient that was present in Mr. Pilliod or Mrs. Pilliod at any particular time; true?

A. Repeat the question.

Q. Yes, sir. I'll break it down so it's shorter.

You cannot say any particular amount of glyphosate that was present in Mr. Pilliod at any particular point in time; true?

A. Correct.

Q. Same question for Mrs. Pilliod. You can't do that for her either; correct?

A. Yes.

Q. You cannot say any particular amount of surfactant was present in Mr. Pilliod or Mrs. Pilliod at any particular point in time; correct?

A. That's correct. It was never measured.

Q. So you don't have any data that you can point

the jury to in their case; correct?

A. There's no data. It was never done.

Q. And you can't say any particular amount of Roundup that was absorbed or present in either Mr. Pilliod or Mrs. Pilliod at any particular time over the last 35 years; true?

A. That's correct.

Q. There's no medical test that you can point to in either Mr. Pilliod or Mrs. Pilliod's case that you can point this jury to, to tell them that Roundup specifically was a cause of either of their cancers; correct?

A. That's correct.

Q. There's no particular specific DNA damage that you can point this jury to, to indicate that Roundup was a cause of either Mr. Pilliod or Mrs. Pilliod's cancer; correct?

A. That's true, but it's not been studied.

Q. You can't point this jury to any particular chromosome or gene alterations that you think specifically rule in Roundup for either Mr. Pilliod or Mrs. Pilliod's cancer; true?

A. Yes.

MR. ISMAIL: Your Honor, I want to show a demonstrative and ask Mr. Miller's permission.

MR. MILLER: No objection, Your Honor.

THE COURT: Okay.

(Demonstrative published.)

BY MR. ISMAIL:

Q. Okay. Dr. Weisenburger, we just went over a series of questions. I want to make sure we captured them correctly.

We talked about there's nothing in the pathology reports or the tissue samples themselves that rule in Roundup for either Mr. Pilliod or Mrs. Pilliod; correct?

A. Correct.

Q. And we talked about how there's no biomarker that could show Roundup in either of their cases; correct?

A. Correct.

Q. No genetic marker you can point to in either of their cases; correct?

A. Correct.

Q. No medical test that you can point to in either Mr. Pilliod or Mrs. Pilliod's case; correct?

A. That's correct.

Q. And lastly there's not a single medical record in the thousands of pages that you looked at that indicate or suggest that Roundup contributed to either

Mr. Pilliod or Mrs. Pilliod's non-Hodgkin's lymphoma; true?

A. That's correct.

Q. Now, I want to talk about your work at City of Hope. Okay?

A. Okay.

Q. Now, you've told us you're a pathologist; correct?

A. Yes.

Q. And what a pathologist does is look at tissue under a microscope and diagnose the disease if a pathologist can do so; correct?

A. Yes.

Q. Among other things. I didn't mean to be so limited.

And in a particular case where you are assessing a patient's tissue sample to see if it's -- there's evidence of cancer or not, you would write up a pathology report; correct?

A. Yes.

Q. And what you would do is provide that pathology report to the treating physician who's caring for that patient; correct?

A. Yes.

Q. You've never written a note in a pathology

report for a patient that suggested Roundup caused the patient's non-Hodgkin's lymphoma; true?

A. That's true.

Q. You've never told any of the pathologists that you were -- that you work with and at one time were in charge of that you believe glyphosate or Roundup is a cause of NHL; true?

A. No, but there was no reason to do that.

Q. Is the answer "yes"?

A. It's true, but there was no reason to do it.

Q. There's nothing that prohibited you from doing it; right?

A. No.

Q. Okay. You also work with oncologists at City of Hope; correct?

A. Yes.

Q. And every single day there are patients at City of Hope who are diagnosed and treated for non-Hodgkin's lymphoma; correct?

A. Yes.

Q. And oncologists are an important part of diagnosing and treating patients; right?

A. Yes.

Q. Oncologists would want to know what caused their patients' cancer if they could figure it out;

true?

A. I'm sorry. Repeat the question.

Q. Oncologists, cancer doctors, would want to know what caused their patients' cancer if they could figure it out; true?

A. Yes.

Q. Particularly if it were true, oncologists would want to know that glyphosate or Roundup caused one of their patients' cancers; correct?

A. If they could find it out, yes.

Q. You have never gone to one of the oncologists at your hospital and told them that you believe that glyphosate or Roundup causes cancer; true?

A. It's true, but I had no reason to do that.

Q. You've never gone to any of the doctors who care for patients at your hospital and told them that you think glyphosate or Roundup causes NHL; true?

A. That's true.

Q. You mentioned the InterLymph meetings?

A. Yes.

Q. That was a group that you told Mr. Miller you were a founding member of; correct?

A. Yes.

Q. And it was looking at this issue of non-Hodgkin's lymphoma in part; correct?

A. Yes.

Q. You've never presented at an InterLymph meeting that glyphosate or Roundup causes non-Hodgkin's lymphoma; correct?

A. That's correct.

Q. Now, the truth of the matter is, Doctor, I think you were suggesting a moment ago, determining the cause of an individual person's cancer is not something that you do in your job at City of Hope; correct?

A. Not routinely. When we're looking at a biopsy, there are occasionally tests that we can do to try to determine the cause. But for the most part, we're just making the diagnosis.

Q. Right. So just to make sure we're on the same page, take the last part of that first, you are for the most part confirming that the patient has a malignant tumor, and in the case of NHL you will type it, what subtype of NHL; correct?

A. Right. Right.

Q. And there are some rare circumstances in which a pathologist can identify something in the tumor that will suggest the cause of that NHL; correct?

A. Yes.

Q. One of the things that you talked about with Mr. Miller is this virus, Epstein-Barr?

A. Yes.

Q. And a pathologist can actually see the Epstein-Barr virus in the tumor if it is present; correct?

A. You can do a stain for the RNA of the virus, yes.

Q. Yes. There's some special steps you do as a pathologist, but you can identify that virus if present?

A. Yes.

Q. But that's really the exception; correct?

A. It's the exception. There are some other -- there are some other etiologies, but they're generally the exception, yes.

Q. So generally speaking, when you're at your job at City of Hope, you are not the person who is diagnosing the cause of why an individual patient developed non-Hodgkin's lymphoma; correct?

A. That's correct.

Q. And in fact, you rarely interact with a patient in your job; correct?

A. That's correct.

Q. You rarely get much of a clinical picture, if at all, about the patient; correct?

A. Well, we get a clinical history that comes with the specimen and sometimes we go into the medical

record and try to find answers to questions, but we don't generally interact with the patients or ask them questions in person.

Q. Okay. So you might get a clinical summary as part of the pathology sample, but you certainly aren't developing the medical history yourself; correct?

A. Right.

Q. And one thing you definitely do not do outside of a courtroom is what you did with this jury briefly this afternoon; correct?

A. No, I don't do this in the routine part of my practice, that's correct.

Q. Okay. So the "this" that we're talking about is identify clinical risk factors to why a patient developed NHL and cross ones off that you don't think apply and circle the ones that you think do apply. Outside of a courtroom, that is not what you do; true?

A. That's correct.

Q. So -- and in fact, you have been a pathologist for 40 years.

A. Yes.

Q. Over the last 40 years, you have not done outside of a courtroom what you did with the jury today in doing a differential etiology for non-Hodgkin's lymphoma; true?

A. It's true because it's not part of my practice. It's not what pathologists are expected to do.

Q. Okay. There are oncologists at City of Hope who do consider the cause of an individual patient's non-Hodgkin's lymphoma; correct?

A. Well, sometimes they do. But often what happens is they're more concerned with diagnosing the patient and treating the patient and less concerned with doing a detailed clinical history to try to figure out what caused the lymphoma.

So if it's kind of obvious to them from the exam of the patient or from the clinical history of the patient, they may pursue it with additional questions, but they're much more concerned with taking care of the patient today rather than what happened 5, 10, or 20 years ago.

Q. Certainly the oncologists are interacting with the patients directly and getting a medical history; correct?

A. Yes.

Q. And the oncologists often are gathering information about potential risk factors; correct?

A. More or less. They often don't do a lot of questioning about occupation, about exposures. They

usually don't do much of a question -- an investigation into that. They usually don't.

Q. There are certainly oncologists and researchers at City of Hope who are focused on identifying causes for individual patient's cancers; you would agree with that?

A. As I said before, if it's obvious or straightforward, they would do it. But in most cases, it's not obvious or straightforward and they don't do it.

Q. And in most cases, doctors can't determine the cause of an individual patient's non-Hodgkin's lymphoma; true?

A. That's true. In most cases, they can't.

Q. Now, one of the doctors you work with at City of Hope is Dr. Alexandra Levine; correct?

A. Yes.

Q. Dr. Levine is a very well-respected oncologist; correct?

A. Yes, she is.

Q. She, in fact, hired you at City of Hope; did she not?

A. She did.

Q. And she was until recently the chief medical officer of the entire hospital?

A. Yes.

Q. So in many respects, she supervised all the oncologists and all the pathologists at your hospital; correct?

A. We reported to her, yes.

Q. You know Dr. Levine will be testifying later in this trial?

A. Yes, I heard that.

Q. And you know that Dr. Levine will be testifying that in her opinion Mr. Pilliod's non-Hodgkin's lymphoma was not caused by Roundup? You know that; right, Doctor?

A. Yes, I read her report.

Q. Now, I know you disagree with Dr. Levine, but you certainly respect her as an oncologist; true?

A. Yes.

Q. Okay.

MR. ISMAIL: Any objection?

MR. MILLER: None.

(Demonstrative published.)

BY MR. ISMAIL:

Q. Okay. Dr. Weisenburger, you are the first witness we've had here in this trial to talk about Mr. Pilliod and Mrs. Pilliod specifically. So I'm going to spend a little more time than you did this afternoon

talking about their background. Okay?

A. All right.

Q. Now, have up here on this slide some of the things that you talked about this morning and a couple of things you didn't mention. So we're going to go through how each of these relates or not to their non-Hodgkin's lymphoma.

But first of all, looking at Mr. Pilliod and Mrs. Pilliod, both of them have a family history of cancer, as you've told the jury today already; correct?

A. Yes.

Q. And both of them, Mr. Pilliod and Mrs. Pilliod, have personal history of cancer; correct?

A. Yes.

Q. Both Mr. Pilliod and Mrs. Pilliod have been diagnosed with an autoimmune disease; correct?

A. I don't -- well, they've been diagnosed, but I'm not sure it's correct.

Q. And in particular, you're disputing Mr. Pilliod's ulcerative colitis diagnosis?

A. Yes. I don't think he ever had ulcerative colitis.

Q. We'll get back to that.

You told the jury -- I added it here because you talked with the jury today about BMI being an

important factor that you looked at in this case; correct?

A. Yes.

Q. Now, Mr. Pilliod had recurrent brain infections; correct?

A. Yes.

Q. And we'll talk about the frequency and rarity of those this afternoon.

And Mr. Pilliod had recurrent genital warts from the HPV virus; correct?

A. I'm not sure they were recurrent. He had genital warts, yes. I'm not sure they were recurrent, but he had them.

Q. Okay. Now, Mr. Pilliod was diagnosed in 2011; correct?

A. I believe that's correct.

Q. And he was treated and has been in remission, to the best of your understanding, since 2011 right up to including today; correct?

A. Yes.

Q. And Mrs. Pilliod was diagnosed in 2015. And Mrs. Pilliod has been in remission since January of 2017 up to and including today; correct?

A. Yes.

Q. And you're not offering any opinion to this

case about the prognosis for either Mr. Pilliod or Mrs. Pilliod chances of recurrence, you're not giving any opinions on that; correct?

A. That's correct.

Q. Now, when we talk about risk factors, a risk factor is something that statistically increases a person's likelihood of developing a disease; true?

A. Yes.

Q. And I think we can think about risk factors as those things that increase your chances of getting the disease at issue; right?

A. Yes.

Q. In this case NHL; correct?

A. Yes.

Q. Now, a risk factor -- having risk factors doesn't mean it's automatically the cause of your disease; right? You would agree with that?

A. Yes.

Q. It just statistically predicts you have a greater likelihood of getting it?

A. Yes.

Q. Now people with no risk factors develop non-Hodgkin's lymphoma; correct?

A. They do.

Q. And in most cases, people diagnosed with NHL

do not have any obvious risk factors besides age and maybe body weight; true?

A. I would say it's probably true. Most people don't have obvious risk factors other than age and body weight.

Q. Now you've told us you believe that not all risk factors are a cause of NHL; correct?

A. Yes.

Q. But certainly just because you've been exposed to what you've called a causative risk factor doesn't mean that that factor caused the individual person's NHL; true?

A. That's true.

Q. Now, what you did in this case was -- and you had those boards earlier -- you identified what you said are the known risk factors for developing NHL; correct?

A. Known accepted risk factors, yes.

Q. Known accepted risk factors.

And then you crossed out a bunch and were left with, in your case, your analysis, Roundup; right?

A. Yes.

Q. And I think you've already agreed you've never done that in your professional career outside of a courtroom; correct?

A. That's correct.

Q. Now, you put Roundup on the list -- let me rephrase.

You wouldn't put Roundup on the list for anyone who used the product once or twice; right?

A. Probably not.

Q. Probably not.

You, I think, pointed us to the McDuffie article, the Eriksson article, and your North American Pooled Project as what you are pointing to for saying that there's an increased risk with higher exposures to Roundup; correct?

A. That's what the data shows.

Q. Now, can you confirm, sir, that there is not any published peer-reviewed article that controlled for other pesticides that supports your opinion that greater than two days of use a year or greater than 10 days lifetime put someone at a high risk for non-Hodgkin's lymphoma?

A. Well, I guess I don't get the crux of the question.

Q. Sure. You identified three article -- three reliance data sets.

A. Right.

Q. McDuffie, Eriksson, and N-A-P-P, NAPP; right?

A. Yes.

Q. NAPP hasn't been published. You told us that this morning; correct?

A. Yes.

"Q. Eriksson and McDuffie, the data that you pointed the jury to on two days a year or 10 lifetime days, that analysis did not control for other pesticide use; true?

A. That's true. The dose-response analysis did not control for other pesticides.

Q. So as you sit here in court today, you cannot point to any published peer-reviewed article that suggests that after controlling for pesticide use, using Roundup for more than two days a year or a certain number of lifetime days put someone at an increased risk of NHL; true?

A. Well, the NAPP study will be published. It's been presented at multiple meetings. So everybody knows the information, and it will be published in the next few months.

And also the Zhang article actually in the meta-analysis looked at people who were highly exposed and also found an increased risk.

So there is some other data out there.

Q. Zhang mixes controlled adjusted and unadjusted data; right?

A. They use -- they try to use the adjusted data where it's available. And there wasn't --

Q. And the answer to my question is, yes, they mixed adjusted and unadjusted data. True?

A. Yes.

Q. Okay. So you told me that NAPP eventually is going to get published. But my question in fairness, Doctor, wasn't that.

My question was: As you sit here today -- and we'll talk about NAPP. I promise. As you sit here today, there's not a single published peer-reviewed article that supports the opinion that -- that looks at adjusted data that supports the opinion that using Roundup for more than two days per year or 10 lifetime days is an increased risk; true?

A. It's true.

Q. Now, you testified to the amount of Roundup you believe Mr. Pilliod and Mrs. Pilliod used over the years; correct?

A. Yes.

Q. Now that's nothing you had firsthand knowledge of; right?

A. No. I had to ask them questions about what they used, how often they used it.

Q. And in terms of determining how much Roundup

Mr. Pilliod and Mrs. Pilliod used, you weren't given any contemporaneous documentation of the amount of Roundup they used; correct?

A. No. I asked them questions over the phone.

Q. So you haven't seen any contemporaneous documentation about the amount of Roundup they used; true?

A. Well, there was some information in their depositions, but I felt that I needed to ask them the questions myself to get the data that I could rely on to do some calculations.

Q. I'm being unclear. Let me try to clarify my question.

Mr. Pilliod and Mrs. Pilliod gave depositions a few months ago; right?

A. Yes.

Q. End of 2018.

You called them and spoke to them in January of this year; right?

A. Yes.

Q. And both what they testified to a few months ago and what you asked them on the phone was to think back 30 years ago how much Roundup were you using; right?

A. Yes.

Q. And you would agree, sir, even with the best of intentions and complete good faith, trying to remember how much of a lawn care product you used in a given week 30 years ago is not an exact process; right?

A. That's correct.

Q. And so you even saw, in your preparation for this case, that Mr. Pilliod and Mrs. Pilliod gave differing estimates of when they started and how much Roundup that they used; right?

A. That's correct.

Q. And to be clear, that's -- I'm not saying that as a criticism. It's just awfully hard to remember 30 years ago, 25 years ago how much Roundup was I using in June, for example.

A. Right.

Q. Now, in fact -- but when you were testifying this afternoon, you gave a very specific amount of Roundup exposure that you assumed in this case; correct?

A. I just gave the calculations of what I came up with. It's a guesstimate.

Q. Guesstimate. Okay. You didn't call it a guesstimate earlier, but let's make sure we're clear on this.

You gave us, I think to the day, how many days of exposure you think Mr. Pilliod and Mrs. Pilliod had;

right?

A. I could have used the term "approximately." You know, it's a ballpark number.

Q. Ballpark number?

A. Based on the data they gave me.

Q. Okay. But in fairness, the data has not always been the same; right?

A. Right. Exactly. So some of the estimates changed over time from their deposition. So that's why I did it myself. Okay. I wanted to at least find out what they told me, and that was the data I was going to use.

MR. ISMAIL: Okay. May I approach, Your Honor?

THE COURT: Yes.

BY MR. ISMAIL:

Q. Doctor, you may be pulling out the exact same thing I'm about to give you. These are notes you brought to your deposition --

A. Okay.

Q. -- in this case marked 6604?

A. Yeah.

Q. Is that what you brought with you today?

A. I did, yes.

Q. Okay.

MR. ISMAIL: And may I publish, Your Honor?

MR. MILLER: No objection, Your Honor.

THE COURT: Yes.

(Demonstrative published.)

BY MR. ISMAIL:

Q. And we're not going to go through this in great detail. I'm not sure I could read it anyway. But what we -- is reflected here is sort of your running sort of summary of what you understand their exposure to be at various points in time; correct?

Bad question. Let me withdraw that and ask a better one.

This is actually a collection of notes that you created at different points of time; correct?

A. Yes. So the top part is notes I took from the fact sheet that they filled out. And the lower part where it says "Depo" are notes that I took from their depositions.

Q. Right. So, for example, fact sheet, the jury hasn't seen that yet, but that's a -- that's a set of written questions that we asked the plaintiffs to fill out, and then they had an opportunity to fill out some answers and give us that information as part of the discovery in this case; correct?

A. Right. Right.

Q. And one of the questions was how much Roundup exposure do you claim; right? Correct?

A. I don't remember the exact question.

Q. Yes, that's a paraphrase, but it gives some exposure information; right?

A. There was some exposure information there, not a lot.

Q. And then you also -- so you recorded what you saw. And then you also -- you've got this thing here, "Depo," and what you did was you read the plaintiffs' depositions and you took notes as you went through; right?

A. Yes.

Q. And one thing you were trying to determine was how -- when they started spraying -- and this, by the way, is for Mrs. Pilliod; correct? I think it says Alberta at the top of those notes.

A. Yes.

Q. Okay. And then when you read the deposition for Mrs. Pilliod, you noted that she listed her Roundup exposure as being 1982 to 2012; correct?

A. Yes.

Q. And then later in this document you interviewed Mrs. Pilliod on the phone and you took notes; right?

A. Right.

Q. And you asked her about Roundup exposure, and what you wrote that she told you was 1975 to 2011; right?

A. Where are you finding that?

Q. I'm at the top, sir.

So let me highlight it for you.

A. Yeah, that comes from a nurse's review of the medical records.

Q. Nurse's review. Can you be more specific as what you're referring to?

A. So the Miller firm had the medical records reviewed by one of their nurses --

Q. Actually, I'm not entitled to what his firm told you or whatnot.

A. I'm just telling --

Q. -- so I don't mean to cut you off, but to the extent there's a privilege there, I don't want you to reveal anything.

MR. ISMAIL: Is it okay to continue, Mike, or do you want him to stop there?

MR. MILLER: We don't care. I have no objection.

THE WITNESS: That could well be a copying error on my part or typographical error on the part of

the nurse.

This is data that comes from the nurse's summary of the medical record.

BY MR. ISMAIL:

Q. Well, there's no summary of Roundup use in the medical record, is there, sir?

A. Well, there must have been something. I wouldn't have written it down.

Q. You looked at the medical record yourself; right? There's not a single reference to Roundup in any of the medical records; is there, Doctor?

MR. MILLER: We'll stipulate that there's no mention of Roundup in the medical records. It's fine.

BY MR. ISMAIL:

Q. Okay. How about this? Wherever you got the information, in your notes in this case you wrote down 1975 to 2011; correct?

A. Right.

Q. And, again, not offering as a criticism, but just in your notes alone, we saw three different date ranges for Mrs. Pilliod's exposure; correct?

A. It's not surprising.

Q. And some -- no, it isn't.

And some of the estimates had her stopping Roundup exposure four years before she was diagnosed;

correct?

A. I don't remember that.

Q. We're looking at them right now. 2011.

A. Yeah, but I don't know where this came from. This was something written in the nurse's summary of the medical record. It was the first thing that I got when I started working on the case, and I took notes from it. I didn't rely on it. Okay. Because it didn't agree with the data that I got firsthand from the Pilliods.

Q. Right. So the data you got firsthand from the Pilliods was a little bit different than the deposition which is a little bit different from the fact sheet which is a little bit different than what The Miller Firm provided you; correct?

A. Which, as you said, is not surprising over 30 years to remember such precise detail.

Q. Exactly. And in terms of the data you told the jury about, you estimated for Mr. Pilliod 760 days, right? And Mrs. Pilliod 240 thereabouts?

A. For him, I estimated 729 times. That would be days. And her 200 -- no, 729 times for him. And 279 times for her.

So those are guesstimates. You know, is it a lot, is it a little?

Q. Sure. So you estimated combined about a

thousand times they went out and sprayed residentially; correct, combined?

A. Yes.

Q. But in no circumstance did you get any information in this case that Mr. Pilliod and Mrs. Pilliod sprayed 1,500 gallons of Roundup; right?

A. Well, I calculated the gallons also from the -- from the information they gave me.

Q. You did?

A. Yeah.

Q. Where's that in your notes, sir?

A. I don't know. It's on the next page. I don't know whether I had done it before I did my deposition or after.

Q. Okay. Can you direct me where in your notes that is?

A. Well, there were three sets of notes that I gave at the time of deposition. One was for Alberta, one was for Al, and one was sort of the results of my phone conversation. So you should have three sets of documents.

Q. Okay. And can I just take your copy here in the interest of time?

MR. ISMAIL: May I approach, Your Honor?

THE COURT: Yes.

BY MR. ISMAIL:

Q. So the one that you say you calculated the gallons on, is it this one?

A. Yes.

Q. And can you just show me where that is?

A. It's the next page.

Q. Perfect. Thank you.

A. Do you not have that?

Q. Well, let's do it this way, sir. I'll look at this over the break. If you don't mind if I hold on it till the afternoon break.

A. It's my original so I want it back.

Q. I promise I'll give it back.

Okay. So in terms of the risk factor discussion, Doctor, you do not claim that glyphosate or Roundup causes any other type of cancer other than non-Hodgkin's lymphoma; correct?

A. That's correct.

Q. Now, Mr. Pilliod, as we've discussed, had a personal history of cancer; true?

A. Yes.

Q. In his case, it was recurrent skin cancers; right?

A. Yes.

Q. You're not giving the opinion that glyphosate

or Roundup had anything to do with -- contributed to Mr. Pilliod's skin cancer; true?

A. That's true.

Q. Mrs. Pilliod had bladder cancer twice; correct?

A. Yes.

Q. And similarly you're not offering any opinion that Roundup or glyphosate caused or contributed to Mrs. Pilliod's bladder cancer; correct?

A. Yes.

Q. Now, you are aware, sir, that there is published peer-reviewed literature showing a personal history of cancer, of any cancer, that's associated with an increased risk for developing NHL; true?

A. Well, there is some literature out there, but it's not really -- it's not something you generally consider as a risk factor.

Q. Okay. So the first part of that I think you were agreeing there is literature out there?

A. Well, there's data like that in the McDuffie paper.

Q. The McDuffie paper. That's a name the jury recognizes because that's one of the studies you talked about this morning; right?

A. Yes.

Q. And I'm handing you what we've marked as Exhibit 5502.

A. Yes.

Q. And this is indeed the McDuffie paper; is it not, sir?

A. Yes, it is.

THE COURT: So, counsel, I think before we start talking about this paper, we might want to take our afternoon break.

MR. ISMAIL: Thank you, Your Honor.

THE COURT: So it's 10 of, and we'll start up again at 3:05. Thank you.

(Recess taken at 2:50 p.m.)

(Proceedings resumed in open court in the presence of the jury at 3:08 p.m.)

THE COURT: Mr. Ismail, proceed.

MR. ISMAIL: Thank you, Your Honor.

Q. Dr. Weisenburger, just to wrap up the question about the number of gallons you calculated, I'm going to put up on the ELMO your notes here.

Can you just tell us the number of gallons you estimated for your opinions in this case?

A. So for Al, it was about 790 gallons total. And for Alberta about 263 gallons total.

Q. So is this meant to be part of it too?

A. Oh, yeah. So because she actually applied for four additional years until she got her lymphoma, I had to add that in. So it was actually 271 gallons.

Q. So you added the -- you said Alberta had four additional years?

A. Yeah. She -- her latency was longer. So she was exposed more years. And so I had to add those last I think four years, yeah.

Q. So just so we're clear, what you did is you took like the number of days and then you said they sprayed 2 gallons of Roundup on that day?

A. I tried to take an average of what they told me.

Q. Right. So that -- so this is the days for that property, and that times there, that is meant to be the gallons they sprayed on that day?

A. It would be the number of times they sprayed that place times the number of gallons each time. I would total the number of gallons.

Q. So was this information you got from the Pilliods?

A. Yes.

Q. With all the uncertainty --

A. Yes.

Q. -- that's attendant to trying to remember how

much Roundup you sprayed 25 years ago --

A. Yes.

"Q. -- on a particular day? Yes?

A. Yes. I mean, they gave me sort of general figures about what they sprayed each time at this place and that place, and that's the data I used. So it's a guesstimate.

Q. And 500 of the gallons come from using an estimate of 2 gallons of Roundup on a particular day of residential use?

A. Is that what it -- if that's what it says, yes.

Q. Okay. Now, you have the McDuffie paper still there in front of you, sir --

A. I do.

Q. -- right before the break?

Okay. So the jury has seen part of this paper, but this is one of the papers you pointed to as informing your opinion about the risk of glyphosate-based formulations and NHL; correct?

A. Yes.

Q. So you think this is a good study?

A. Yes.

Q. Reliable study?

A. Yes.

Q. Now, there's more data in this paper about risk factors for NHL than you talked about this morning; correct?

A. Yes.

Q. And in fact, there's a discussion here about whether having a prior cancer increases your risk and having a family history of cancer increases your risk; correct?

A. Yes.

Q. And if you turn with me, sir, to page 1157, Table 1. So over here is the odds ratio; correct?

A. Correct.

Q. And previous cancer, yes. That's what I've highlighted on the screen.

A. Yes.

Q. And when these researchers did this, they were talking any prior cancer, not specifically a blood-borne cancer; true?

A. Yes.

Q. And what these researchers noted was a statistically significant increased risk of 2.43; true?

A. Yes.

Q. Mr. Pilliod and Mrs. Pilliod, if you apply the McDuffie paper, which you think is reliable, to them would fall in this risk of 2.43; true?

A. That's true.

Q. They also have a line item here for having a prior -- I'm sorry, having a first-degree relative with any form of cancer; correct?

A. Yes.

Q. And this is not limited to blood-borne cancers like you did -- when you were talking with Mr. Miller; true?

A. Yes.

Q. And what these researchers found was a statistically significant increased risk of 1.31; correct?

A. Yes. But these are not parameters which are commonly looked at or accepted, and so I really -- most oncologists and hematologists really look at the hematologic cancers, they don't look at any cancer.

Q. Thank you, sir.

A. Because it becomes very complicated when you do that.

Q. Thank you, sir. It wasn't really my question.

A. Well, I had to clarify my yes/no answer. I hope you'll let me do that.

Q. Yes, thank you for doing so.

My question was: The McDuffie paper that you found reliable for your opinions in this case report a

statistically significant increased risk if you have a first-degree relative with any form of cancer; true?

A. That's true.

Q. And Mr. Pilliod and Mrs. Pilliod both have first-degree relatives that have cancer; true?

A. Yes.

Q. And so if you applied the McDuffie paper faithfully to Mr. Pilliod and Mrs. Pilliod, they would fall in this increased relative risk of 1.31 for having a family history of cancer; true?

A. Yes.

Q. Now, you also indicated, and I think you had on your board, that autoimmune diseases are recognized as a potential cause of NHL?

A. Yes, they're a risk factor for NHL.

Q. Okay. And you identify in Mrs. Pilliod's -- in Mrs. Pilliod's case that she was -- had a history of Hashimoto's; correct?

A. Yes.

Q. And I think you even wrote it up on your board as one of the risk factors that you identified for her; correct?

A. Yes.

Q. Now, what -- there is published peer-reviewed literature on the degree of increased risk associated

with Hashimoto's; correct?

A. Risk for what? Non-Hodgkin's lymphoma?

Q. Yes. Thank you.

A. Yes.

Q. And you've looked at that as part of your work in this case?

A. Yes, I have.

MR. ISMAIL: May I approach, Your Honor?

THE COURT: Yes.

BY MR. ISMAIL:

Q. And, Doctor, as promised, I'm going to give back your original notes right now so I don't forget.

A. Thank you.

Q. And I'm also going to hand you what we've marked as Exhibit 6613.

MR. ISMAIL: Thank you, Your Honor.

Q. Dr. Weisenburger, is this one of the papers that looks at the increased risk for NHL from Hashimoto's?

A. Yes, it is.

MR. ISMAIL: Permission to publish, Your Honor.

MR. MILLER: No objection, Your Honor.

THE COURT: Yes.

(Exhibit published.)

BY MR. ISMAIL:

Q. So it's entitled "Autoimmunity and Lymphogenesis"?

A. Lymphomagenesis.

Q. Lymphomagenesis, thank you. And it's from researchers at the National Cancer Institute; is that right?

A. Yes.

Q. Now, these researchers report from based on their review what the increased risk is for Hashimoto's; right?

A. Yes.

Q. And that's on Table 2.

So they looked at several different forms of cancer. And this is the odds ratio again. So if you look at NHL, what was the relative risk for Hashimoto's thyroiditis as reported in this National Cancer Institute paper?

A. That was a threefold increased risk for non-Hodgkin's lymphoma.

Q. And was it statistically significant?

A. Yes.

Q. You're aware that there are additional papers that also confirm that having Hashimoto's autoimmune disease increases your risk of NHL?

A. Yes.

Q. We don't have to go through them this afternoon? You acknowledge for the jury there is other data that supports what this paper published; true?

A. Yes. But this data is for all non-Hodgkin's lymphoma.

Q. Right. All non-Hodgkin's lymphoma.

A. And what I testified earlier was that the risk is really increased dramatically for thyroid non-Hodgkin's lymphoma and not for all the other types of non-Hodgkin's lymphoma.

Q. This paper did not differentiate; correct?

A. No, it didn't. They should have, but they didn't.

Q. So overall relative risk in this National Cancer Institute study for NHL is 3.0, statistically significant; true?

A. Yes.

Q. Now you talked a little bit on direct examination about ulcerative colitis.

A. Yes.

Q. That is also autoimmune disease?

A. Yes, it is.

Q. It falls in the umbrella category of inflammatory bowel disease; correct, IBD?

A. Yes.

Q. And I think you told us this afternoon or morning, whatever it was, that you dispute whether Mr. Pilliod actually had ulcerative colitis; correct?

A. Yes. I don't believe he had it.

Q. Now, you recognize that even at the time that he was diagnosed with NHL, he was carrying a diagnosis of ulcerative colitis in his medical records; correct?

A. Yeah, that's the problem with our medical records. They carry these diagnoses that may or may not be correct.

Q. How -- and to affirmatively diagnose ulcerative colitis, typically you would get a biopsy and have it read by a pathologist; correct?

A. Yeah, along with other tests, that would be one way, sure.

Q. Sure. You would have a colonoscopy, the physician can require a biopsy, have it read by a pathologist who can do what pathologists do and diagnose if the disease is present or not; right?

A. Yes.

Q. Now, did you look in this case whether Mr. Pilliod had a biopsy-confirmed ulcerative colitis?

A. I don't believe he did.

Q. And was it on that basis that you disputed --

withdrawn.

I'm handing you, sir, portions of Mr. Pilliod's medical records that carry the Exhibit Number 6376.6.

MR. ISMAIL: Permission to publish?

MR. MILLER: What's the date on that, counsel?

MR. ISMAIL: September 2006.

MR. MILLER: Thank you.

No objection, Your Honor.

THE COURT: Okay. Granted.

(Exhibit published.)

BY MR. ISMAIL:

Q. Now, ulcerative colitis, sir, is incurable disease; right?

A. Yes.

Q. Now, what we have here is a medical record for Mr. Pilliod; right?

A. Yes.

Q. And this shows you the date of his colonoscopy; right?

A. Yes.

Q. And he had a -- this is the doctor who did the procedure; right?

A. Yes.

Q. And what they did down here, and we're going

to track this in a minute, is they note in their findings to the colonoscopy "biopsies were obtained from the terminal ileum, colon, and left colon; correct?

A. Right.

Q. And that's part of the GI tract; correct?

A. Yes.

Q. And that's where ulcerative colitis attacks the body; correct?

A. Yes.

Q. So if you turn the page in the exhibit, this is the surgical pathology report; correct?

A. Correct.

Q. And this is the same date as the colonoscopy that we just looked at. And this tracks exactly what you and I just went over, which was that a portion of the biopsy was taken from the left colon; right?

A. Right.

Q. And if you turn the page, you see the findings of the pathologist; correct?

A. Yes.

Q. So this again is Mr. Pilliod. This is again the exact same colonoscopy we were looking at. And do you remember when we started, we were looking at that first page that there was a biopsy taken from the left colon; right?

A. Right.

Q. And does this pathology report for Mr. Pilliod say: Contains benign mucosa with marked chronic inflammation.

Did I read it correctly so far?

A. Yes.

Q. And chronic inflammation is one of the things you had up on your board for potential causes of NHL; right?

A. Yes.

Q. And then there is a finding of glandular dropout cryptitus; did I read that correctly?

A. Cryptitus.

Q. Cryptitus, and crypt abscesses?

A. Yes.

Q. And then does this pathologist for Mr. Pilliod note: The findings are those of inflammatory bowel most consistent with ulcerative colitis?

A. That's what he says.

Q. Now, did you dismiss this record in your review, sir?

A. I must have.

Q. And then on the next page, this is sort of a counseling note for Mr. Pilliod. It says: You have an inflamed colon, colitis. Please take hydrocortisone

enemas and -- can't read that -- as needed. Correct?

A. Right.

Q. And hydrocortisone enemas, that's like a corticosteroid?

A. Yes.

Q. And so based on the pathology report we just went over, you would revise and correct your comments earlier today that Mr. Pilliod was not appropriately diagnosed with ulcerative colitis?

A. I stand by my statement that the findings in this report are not specific. The fact that he was treated and cured in two months is totally inconsistent with the diagnosis of ulcerative colitis. So I stand by my statement.

Q. He was not cured of ulcerative colitis, sir. Ulcerative colitis is a disease that can wax and wane; correct?

A. Well, he had it only once many years and it never came back.

Q. Is the answer "yes"?

A. I'm answering your question.

Q. So colitis is a disease that can wax and wane; correct?

A. Yes, it does.

Q. And he received treatment for his colitis when

he was diagnosed by a pathologist for having ulcerative colitis; true?

A. Well, the pathologist is hedging a bit here when he says "consistent with ulcerative colitis." What he's saying is that the findings are consistent with ulcerative colitis, but he's not saying -- what he's saying is it could be something else. Okay --

Q. So --

A. -- so that's terminology that we use sometimes when we're not sure, but we want to give the best -- our best estimate of the findings.

Q. Okay, Doctor.

So you never reviewed this pathology sample yourself; right?

A. I did not.

Q. And until 30 seconds ago, you didn't even know this record existed; right?

A. I did not.

Q. And you are disputing the diagnosis of the pathologist who was actually there at the time looking at the tissue; true?

A. Based on the clinical history, it's highly unlikely he had ulcerative colitis. Because it's a chronic, relapsing, recurring disease not cured by corticosteriod enemas.

Q. So the answer to my question is "yes," upon 30 seconds of review of a document you've never seen before, never seen the tissue, you're disputing the pathologist's diagnosis; correct?

A. I'm not disputing his diagnosis. He's not making a specific diagnosis. He's saying it's "consistent with."

Q. Okay.

A. It could be consistent with a lot of different diagnoses.

Q. Which he doesn't include in his pathology report for the left colon; right?

A. No, but, you know, he may have talked to the endoscopist. I don't know --

Q. Right. You don't know.

A. -- where he got his information. I don't know.

Q. Okay. So the jury has seen the record. And we can move on to the next topic, which is ulcerative colitis is a risk factor for NHL; right?

A. Well, it's complicated. Ulcerative colitis itself is not a risk factor for NHL, but the treatment for ulcerative colitis is a risk factor for NHL.

So often they're treated with drugs that either can cause genetic damage or can alter the immune

system. And so people with ulcerative colitis who get lymphomas, it's related to the drugs they're treated with and not the ulcerative colitis itself.

Q. Okay. You've seen literature on this question; have you not?

A. I've reviewed the literature on this question, yes.

MR. ISMAIL: May I approach, Your Honor?

THE COURT: You may.

BY MR. ISMAIL:

Q. This is Exhibit 4972, an article that speaks to this question about whether ulcerative colitis is a risk factor for non-Hodgkin's lymphoma.

A. Yes.

MR. ISMAIL: May I publish?

MR. MILLER: No objection.

THE COURT: Yes.

(Exhibit published.)

BY MR. ISMAIL:

Q. You're familiar with this paper; correct, sir?

A. Yes, I am.

Q. And it is a study of various autoimmune diseases to see whether that's associated with non-Hodgkin's lymphoma; correct?

A. Yes.

Q. And it's done in a -- in Sweden where other witnesses have told us they have a good cancer registry in those countries; right?

A. Yes.

Q. And if you turn to page 2027, it's Table 1.

A. Yes.

Q. Do they list several autoimmune diseases and whether -- and whether there is an increased risk?

A. Yes.

Q. And so for men, in ulcerative colitis, is the overall risk in this paper statistically significant, 1.5?

A. Yes.

Q. And indeed in this paper, sir, they don't say what you did, which is that this is a risk factor only because of the treatment for ulcerative colitis; correct?

A. No, but it's an article that is talking about all kinds of different autoimmune diseases so they're not going to discuss each one individually.

I can tell you that I looked at this literature, and if you look at the literature on ulcerative colitis prior to the use of these therapies, there's no increased risk. And if you look at the literature after the introduction of these therapies,

there is an increased risk.

So most people think that this increased risk is due to the treatment and not the actual disease itself.

Q. Are you through?

A. Yes.

Q. Great.

Let's turn now to talking about age.

Age is a risk factor for non-Hodgkin's lymphoma; right?

A. Yes.

Q. Mr. Pilliod and Mrs. Pilliod are both about 70 years old when they were diagnosed; correct?

A. Yes.

Q. And that is in the typical range for both men and women to be diagnosed in developing the disease?

A. Yes.

Q. That age range, about 70 years old, put both Mr. Pilliod and Mrs. Pilliod at a greatly increased risk of NHL; true?

A. Compared to younger people, that's true, but not compared to people the same age.

Q. Okay. We're talking about -- so the increased risk for people over the age of 65 compared to people under the age of 65 is, what, a factor of seven or

eight?

A. I don't know. I haven't looked at it that way.

Q. Now --

A. It's higher.

Q. It's higher.

Now, it has been known since the 1960s that age is a risk factor for non-Hodgkin's lymphoma; correct?

A. Yes.

Q. And the magnitude of the increased risk for people over 65 developing NHL has been known well before Roundup ever came on the market; correct?

A. Yes.

Q. So this phenomenon of individuals over the age of 65 developing NHL existed before Roundup ever was available; correct?

A. Yes.

Q. So you indicated that there's something about aging, the process of aging, would put someone at an increased risk; true?

A. Yes.

Q. And what you're -- I think if I understood your testimony earlier, scientists haven't figured out yet what is it about aging that puts people at such an

increased risk relative to younger individuals; true?

A. Well, they have some ideas, but there's no real consensus, I think, on that.

Q. Okay.

A. It's true for almost all cancers, not just non-Hodgkin's lymphoma.

Q. Right. So in the case of non-Hodgkin's lymphoma, the necessary genetic mutations that you need to have to develop that disease, there's something about aging which increases the chances or likelihood of that happening and turning into NHL; true?

A. Yes.

Q. Now, do autoimmune diseases typically get better or worse as people age? Or if you don't know, you can tell us that as well.

A. I think it would depend on the autoimmune disease. I don't know the answer to that.

Q. Does the immune system get weaker or stronger as people age?

A. Tends to get weaker.

Q. Okay. Now, another factor that you put down on your board for both was body weight; correct?

A. Yes.

Q. And like a lot of adverse health conditions, it's associated -- non-Hodgkin's lymphoma is associated

with increase in weight; correct?

A. Yes.

Q. And both Mr. Pilliod and Mrs. Pilliod, you calculated because you were interested in this question, their BMI; correct?

A. Yes.

Q. And you determined that they were both in the higher risk category compared to people with a lower BMI; true?

A. Yes.

Q. And indeed I think you told us that a body weight can be considered a cause of NHL; right?

A. Well, it's associated with NHL. I think some of the -- we don't really know exactly how -- how they're associated and how an increased weight results in an increased risk, but it's thought to be due to sort of an inflammatory state that occurs, a proinflammatory state that occurs in people who are overweight. But it's pretty much hypothetical.

Q. See if you agree with this statement.

Obesity can be considered not only a risk factor but probably a cause as well.

A. That's true. I think it's true. Don't always understand the cause very well.

Q. Okay. So it's causal, but the mechanism is

unknown; is that fair?

A. Yes.

Q. Now, an additional factor that you agreed was a potential cause of NHL was having a weakened immune system; true?

A. Yes. I mean, people who have increased risk for non-Hodgkin's lymphoma usually have a markedly weakened immune system. So we don't really know for elderly people, as their immune system begins to weaken a bit, whether that increases their risk or not. Some people think it does, but we don't really know that.

So we only know that fact for people who have a congenital immunodeficiency or people who are markedly immunodeficient because of AIDS or organ transplant or therapy for that or chemotherapy. Marked immunosuppression.

Q. All right. So you had an immune deficiency up on your board this afternoon; right?

A. Right.

Q. And you included in that category "acquired immune deficiency"; correct?

A. Yes.

Q. So one of the things you sought to examine in this case was whether there's any evidence -- let's talk about Mr. Pilliod specifically -- about whether

Mr. Pilliod has any evidence of having a weakened immune system.

A. Yes, I don't believe he did -- he does.

Q. So that was your opinion in this case?

A. Yes.

Q. So let me ask you this: As part of your work at City of Hope, would it be fair to say, sir, that you are not a doctor who will be called upon to assess whether a patient has a weakened immune system by their clinical factors?

A. It's not something I'm usually asked to do, no.

Q. Right. Because you haven't treated a patient individually since your internship 40 years ago; right?

A. That's correct.

Q. So in terms of looking at a patient, looking at their -- taking their medical history, looking at their clinical factors, and forming an opinion whether they have an immunodeficiency, that's not something you do outside of a courtroom; true?

A. No, but it's something that I can do, that I've been trained to do.

Q. So if I understand your testimony, you're saying that you saw no evidence that Mr. Pilliod had a weakened immune system; right?

A. That's correct.

Q. Okay. So let's look at some of the things that are part of Mr. Pilliod's medical history.

Mr. Pilliod has a history of skin cancer; right?

A. Yes.

Q. Will you acknowledge for the jury that he, Mr. Pilliod, has a rather remarkable history of skin cancer?

A. He does have a remarkable history of skin cancer, yes.

Q. Did you go back through the records and count up how many individual skin cancers Mr. Pilliod has developed over the years?

A. I did not.

Q. Would it surprise you to learn it's more than 20?

A. No.

Q. Mr. Pilliod developed skin cancer for the first time in 1970; correct?

A. I think that's correct, yes.

Q. He was still in his 20s then; correct?

A. Okay.

Q. Am I doing the math correctly?

A. I hope so.

Q. Me too.

So Mr. Pilliod developed skin cancer for the first time in his 20s, and in his adult life developed skin cancer more than 20 times thereafter; right?

A. That's correct.

Q. Now, you have certainly seen peer-reviewed medical literature that indicates that having recurrent skin cancer is a risk factor for developing non-Hodgkin's lymphoma; correct?

A. Yes, as well as a whole variety of other cancers.

MR. ISMAIL: May I approach?

THE COURT: Yes.

BY MR. ISMAIL:

Q. This is Exhibit 64481 of the papers that you considered in this case on the very question we were just discussing with the jury.

A. Yes.

MR. ISMAIL: May I publish, Your Honor?

MR. MILLER: No objection.

THE COURT: Yes.

(Exhibit published.)

BY MR. ISMAIL:

Q. So this is a paper that was published by researchers at Stanford; correct?

A. Yep.

Q. And it's entitled "Frequent Basal Cell Cancer Development is a Clinical Marker for Inherited Cancer Susceptibility"; right?

A. It's a bold statement based on their paper, but that's what they say.

Q. What is cancer susceptibility?

A. It means that they have an increased risk of cancer.

Q. So what these researchers did was they looked to see patients who have recurrent basal cell carcinoma, and they looked at a variety of cancers to see which of those are associated with having a lot of skin cancer; right?

A. Right.

Q. And if you turn to page 4 of the paper.

Are you there?

A. Yeah.

Q. So Table 4. So BCC, that's basal cell carcinoma; right?

A. Correct.

Q. And what they did was they have the columns by how frequently the person has had recurrent skin cancer; right?

A. Yes.

Q. Do you recall approximately how often Mr. Pilliod has had basal cell carcinoma?

A. I don't know exactly. A dozen times maybe.

Q. Okay, well, I'll just take a conservative one and pick this middle column. More than six.

I think you and I can agree Mr. Pilliod's had more than six --

A. Yes.

Q. -- basal cell carcinoma?

A. Yes.

Q. So this research out of Stanford would say that an individual like Mr. Pilliod has a more than doubling of the risk of developing non-Hodgkin's lymphoma; correct?

A. That's what it says.

Q. And --

A. Along with almost all the other cancers on the list.

Q. Yes, because skin cancer is a marker for inherited cancer susceptibility as according to the title of the paper; right?

A. Yeah, but it's the only paper that's been written on this. It's not been confirmed so we don't really know if it's true, okay.

Q. So you think this is the only paper that's

looked at whether skin cancer is a risk factor for basal cell -- or for non-Hodgkin's lymphoma?

A. No. It's the only paper that's done this genetic analysis that sort of allows them to say that.

Q. Okay.

A. There are other papers, and we can talk about those, but I think the title is a very bold title. When I talked to some of my dermatologists at the City of Hope, they kind of looked at me like I was crazy when I asked them about it.

MR. ISMAIL: Move to strike, Your Honor. Nonresponsive.

THE COURT: Overruled.

BY MR. ISMAIL:

Q. Doctor, do your best to restrict your answers to my questions, please.

A. Yes.

Q. So we have this one paper that we just looked at showed more than doubling of the risk of NHL with recurrent basal cell carcinoma; right?

A. Yes.

Q. Now, I think as you were indicating, there are additional papers on this issue; right?

A. Yes.

Q. Is Exhibit 6483 another article that you

considered in this case?

A. Yes.

Q. And this paper, one of the things they were looking at was not only did the individual have a history of skin cancer, but how close in time that was to the development of NHL; right?

A. Yes.

Q. And I think -- I'm not sure if I asked this yet, but in addition to basal cell carcinoma, Mr. Pilliod has had recurrent squamous cell carcinoma; right?

A. Yes.

Q. He's also had melanoma; right?

A. Yes.

Q. He's had all three forms of skin cancer; correct?

A. Yes, he has.

MR. ISMAIL: May I publish, Your Honor?

MR. MILLER: No objection.

THE COURT: Yes.

(Exhibit published.)

BY MR. ISMAIL:

Q. So when you look here in the abstract, there's a sentence here that says the objective of the study was to estimate the risk of second -- of a second primary

cancer in people with a history of basal cell carcinoma or squamous cell carcinoma including any mortality associated with those cancers; right?

A. Yes.

Q. And so if you turn to 2586 in Table 2.

So we have cancer site. And we have non-Hodgkin's lymphoma down here. And this is basal cell carcinoma and squamous cell carcinoma; right?

A. Yes.

Q. You can confirm that Mr. Pilliod developed both those forms of skin cancer within one year of his non-Hodgkin's lymphoma diagnosis; true?

A. I don't know the timing. It's possible. I don't know the timing.

Q. Okay. Well, let's just look to see what this paper shows for individuals such as that.

If you look at someone who develops basal cell carcinoma within that year, you have a doubling of the risk; correct?

A. Yeah, within the first year.

Q. And if you have squamous cell, your risk is 2.60; correct?

A. Correct.

Q. Now, we can keep going, Doctor. There's multiple papers that have looked at this; right?

A. Yep.

Q. And you would acknowledge there's papers that look at melanoma and show that that has an increased risk of developing NHL; correct?

A. Yes.

Q. There's additional papers beyond which we've just looked at for basal cell and squamous cell carcinoma that show an increased risk with NHL; right?

A. Yes. The way to interpret this data is kind of important --

Q. Doctor?

A. -- which you haven't.

I want to clarify my answer, my yes answer. Can I do that?

THE COURT: No. It was a "yes" or "no." And Mr. Wisner or Mr. Miller may ask these questions. But it's a "yes" or "no."

THE WITNESS: All right.

BY MR. ISMAIL:

Q. Now, there's actually even been meta-analyses that looked at this question; right?

A. Yes.

Q. There's been pooled analyses that look at this question; right?

A. Yes.

Q. All of which confirm an increased risk of NHL in patients with recurrent skin cancer; correct?

A. Yes.

Q. Now, Mr. Pilliod also has a history of recurrent brain infections; correct?

A. Yes.

Q. He's had encephalitis; correct?

A. Yes.

Q. And encephalitis is an infection of the brain tissue itself; correct?

A. Yes.

Q. He's had meningitis, and that's an infection of the lining of the brain; correct?

A. Yes.

Q. He's actually had meningoencephalitis which is both at the same time; right?

A. Yes.

Q. Now, you don't claim that Mr. Pilliod's use of Roundup had anything to do with his development of encephalitis; true?

A. Yes, it's true.

Q. Now, Mr. Pilliod's medical records established that he has suffered from resulting seizure disorders and epilepsy as a result of his encephalitis episodes; correct?

A. Yes.

Q. You're not opining that Roundup or glyphosate has anything to do with his seizure disorder or epilepsy; right?

A. Yes.

Q. Mr. Pilliod's medical history shows that he's had ministrokes in his brain, infarcts, in the medical records, actually in the notes that we were just looking at, as a result of his seizure episodes; right?

A. Yes.

Q. And that's even before he developed NHL, before he had chemotherapy; correct?

A. Yes.

Q. And so in that case completely independent of his NHL; right?

A. Yes.

Q. Now, Mr. Pilliod first developed meningoencephalitis in the 1970s; right?

A. Yes.

Q. Do you recall the medical records that described how serious that event was for him?

A. Yes.

Q. He was in a coma for a month; right?

A. Yes.

Q. And over the years when Mr. Pilliod has

developed meningitis or meningoencephalitis, it has unfortunately put him back in the intensive care unit for up to a week at a time; right?

A. Yes.

Q. It's quite a serious condition; right?

A. Yes.

Q. Now, did I understand earlier today that you were -- you indicated that you believe Mr. Pilliod developed his episodes of meningitis because of the herpes simplex virus?

A. That's the most likely.

Q. Now, I think you told Mr. Miller that we -- can we call it the HSV virus?

A. Yes.

Q. Or I'll just call it herpes virus. It's a relatively common virus that people carry; right?

A. Right.

Q. And commonly people have no clinical problems whatsoever; right?

A. Yes. That's correct.

Q. And sometimes if you have a clinical problem from herpes, you might get a cold sore in your mouth?

A. Yes.

Q. But in Mr. Pilliod's case, he gets meningitis; right?

A. Well, yes. He had meningitis probably at least four times over a period of about 30 years.

Q. If the record show five times, you wouldn't dispute that; right?

A. No.

Q. So you have this virus which in most people don't cause anything or maybe a cold sore and, in Mr. Pilliod, has caused him to develop encephalitis five times; right?

A. Yes. But there's a well-known syndrome that has been described that describes his medical situation very well, and that's in people with the herpes infections, they have a chronic infection of their nerves, and for whatever reason, we don't know, sometimes that infection reactivates.

And so there's a nice literature on this recurrent, what they call benign aseptic meningitis in people with a history of herpes, and I believe that's what he had.

Q. Do you know how rare it is to have herpes encephalitis?

A. Well, it's the most common cause of encephalitis. It is rare. It's about two to four per 100,000. It is rare, but it's actually the most common cause of encephalitis.

Q. Two to four in a million; right, sir?

A. You may be right. Two to four in a million. I'd have to look at my notes. I don't know if I have them here.

Q. Would you like to see the paper that talks about this?

A. Sure.

It's not common, but for encephalitis it's the most common type.

Q. And, Doctor, we don't have to put it up on the screen. If you'll just turn to the third page of the exhibit, top left column, you'll see the incidence of herpes simplex virus encephalitis, two to four in a million. Top left paragraph.

A. Yes.

Q. So --

A. That's what I meant, actually, two to four. I didn't get it right.

Q. All right. So you would agree that is an incredibly rare phenomenon, two to four in a million?

A. It's a rare disease, yes.

Q. And he's gotten it five times.

A. Well, it was recurrent. So once he had it, he was likely to get it again.

Q. So he --

A. Just like the cold sores.

Q. So the incidence is two to four in a million for this condition that he's gotten five times; correct?

A. Right.

Q. Now, Mr. Pilliod also -- and I take it, sir, that Mr. Pilliod also had recurrent genital warts as we discussed earlier; right?

A. Yes.

Q. And you have seen literature that described Mr. Pilliod -- that described genital warts as having an increased risk of non-Hodgkin's lymphoma; correct?

A. Yes, there's one paper.

Q. One paper?

A. One that I found.

Q. All right.

(Pause in the proceedings.)

BY MR. ISMAIL:

"Q. Is Exhibit 6443 the paper that you found or the one you didn't find?

A. I found this one.

Q. Okay.

MR. ISMAIL: May I publish?

MR. MILLER: No objection.

THE COURT: Yes.

(Exhibit published.)

BY MR. ISMAIL:

Q. So this is genital warts and risk of cancer, a Danish study of nearly 50,000 patients with genital warts; correct?

A. Yes.

Q. And what this paper does is it looks to see what types of cancers this condition is associated with; right?

A. Yes.

Q. Now if you turn to page 5, you'll see the data laid out.

A. Okay.

Q. And there's a risk for non-Hodgkin's lymphoma in men with genital warts of 3.0. That's statistically significant; correct?

A. Yes.

Q. Now, are you familiar with the Nordenvall paper?

A. Yes. But you notice there's no increased risk for women. Did you notice that?

Q. We're talking about Mr. Pilliod here; right?

A. Yes, but since we have the data up there, I just wanted to comment on that.

Q. Okay. So thank you for pointing that out.

So Mr. Pilliod is the one who has had the

recurrent genital warts; right?

A. Yes.

Q. And looking at his column, that's a relative risk of 3; correct?

A. Yes.

Q. Do you recall -- you said you are familiar with the Nordenvall paper; right?

A. Yes.

Q. So that's the second paper that looked at this issue of genital warts and increased risk?

A. It is.

Q. And it confirms that there is an increased risk of NHL?

A. Why don't we look at it?

Q. Okay. Is that a "yes" or a "no"?

A. I would like to look at the paper.

(Pause in the proceedings.)

BY MR. ISMAIL:

Q. Is this the paper you were wanting to look at, sir?

A. Yes.

MR. ISMAIL: May I publish?

MR. MILLER: No objection, Your Honor.

THE COURT: Yes.

(Document published.)

BY MR. ISMAIL:

Q. Cancer risk among patients with condylomata acuminata. How did I do?

A. Condylomata acuminata.

Q. And that's genital warts; right?

A. Yes.

Q. And this paper looked at whether there's any increased risk of certain forms of cancer with patients with that condition; right?

A. Yes.

Q. And that's reported in Table 3?

A. Yes, it is. Table 2.

Q. Do you see Table 3 on page 88?

A. Yes, Table 3 too, but --

Q. Okay.

A. It's for men and women on Table 2. We should look at Table 2.

Q. And it also looks at it within the years relative to NHL; right? And that's what Table 3 does.

Are you with me?

A. Yes.

Q. And if you look at the development of non-Hodgkin's lymphoma with patients who had recent genital warts within the last one to nine years, it's an elevated risk of 3.1; correct?

A. That's what it says, yes.

Q. Statistically significant; right?

A. Yes. But if you look at Table 2 -- why don't we look at Table 2?

Q. Sure, Doctor.

Different look at the data; right?

A. Table 2 corresponds to the same type of data that you showed me in the other paper, and in this paper the odds ratio for men is not statistically increased and the one for women is. So exactly the opposite findings of what the other paper showed.

Q. So this is what you're looking at here; right?

A. Yes.

Q. Okay. So there's an elevated risk that's not statistically significant for non-Hodgkin's lymphoma with patients -- men with genital warts; correct?

A. Right.

Q. Right.

Now, one of the other things you talked about was the Epstein-Barr virus; right?

A. Yes.

Q. Now, Mr. Pilliod's tumor was looked at by the pathologist to determine presence or not of Epstein-Barr; right?

A. Yes.

Q. And do you recall that the Stanford pathologist read it as equivocal; correct?

A. Yes. Yes.

Q. And you don't take issue with that characterization; true?

A. I don't think he used the right terminology. I wouldn't call it equivocal. I would call it indeterminate.

Q. All right. So equivocal -- indeterminate meaning we don't know?

A. Yes. The test didn't work so we can't decide whether it's positive or negative.

Q. Could be positive, could be negative, you don't know?

A. We don't know.

Q. Epstein-Barr would be a known cause of non-Hodgkin's lymphoma; true?

A. Yes.

Q. So, Doctor, you agree that Mr. Pilliod could have developed the exact same cancer without any exposure to Roundup; right?

A. It's possible, but unlikely. His risk would have been no higher than yours or mine.

Q. Okay. Let's talk about Mr. Pilliod.

So let's take the exact same person,

Mr. Pilliod's age at diagnosis about 70, same BMI. We won't even include ulcerative colitis since you dispute the pathology report. 22 skin cancers, 5 bouts of meningitis, 3 recurrent genital warts. One of them had -- we'll take two people like that. One of them was exposed to Roundup and the other one wasn't; okay?

A. Yes.

Q. For the patient who develops non-Hodgkin's lymphoma who hasn't been exposed to Roundup, you would say you have no idea why that person developed NHL?

A. That's probably true.

Q. And in Mr. Pilliod's case, you'd say it's got to be the Roundup; right?

A. More likely than not, yes.

Q. And take two people like Mrs. Pilliod. People like Mrs. Pilliod develop NHL without ever being exposed to Roundup; right?

A. They can.

Q. So you take two people. One, they got the exact same age at diagnosis, 70, same BMI, Hashimoto's disease, former smoker, history of bladder cancer, cancer in their family. One was exposed to Roundup, one wasn't. Okay? But the person who wasn't exposed to Roundup you'd say you have no idea why that person developed NHL; right?

A. That's true.

Q. And in Mrs. Pilliod's case, you'd say it's got to be the Roundup; right?

A. Right, because it's a known risk factor.

Q. Now I want to talk with you, sir, about some of the other information you shared about -- first of all, before we get there, as to this question of -- there was some talk earlier about the other substances inside the formulated Roundup. Do you recall talking about that with Mr. Miller?

A. Yes.

Q. Now, you don't know the particular type or amount of surfactant in the Roundup Mr. and Mrs. Pilliod used; true?

A. I do not.

Q. You don't know the other ingredients that are part of the formulated product of the Roundup that they used; true?

A. I do not.

Q. You're not relying on any particular amount of surfactant in the Roundup that the Pilliods used for your opinions in this case; true?

A. That's true.

Q. You're not relying on any particular component of those other ingredients, those surfactants or other

ingredients, in your opinions in this case; true?

A. True.

Q. So with respect to some of the topics you discussed this morning, you told the jury you're relying on three different categories of evidence; right?

A. Yes.

Q. You said the animal data, the mechanism data, and the epidemiology; right?

A. Yes.

Q. Now, in fairness, you did not do an independent review of the animal data on glyphosate; true?

A. I reviewed all of the published literature.

Q. You reviewed all of the published literature?

A. To the best of my knowledge, yes.

Q. Okay. So did you go through and you attempted to determine how many positive tumor findings you, Dr. Weisenburger, found in that review?

A. I didn't.

Q. Okay. So truthfully you did not do a comprehensive review to determine the extent to which there are tumor findings in the rodent studies with glyphosate; right?

A. Well, I didn't have access to a lot of the industry-sponsored studies so I reviewed what was in the

IARC, I reviewed what was in the EPA, I reviewed what was in the European review, I reviewed the Greim paper.

Q. Right.

A. And so that is the published literature, okay.

Q. So my question was different, though.

I think you've already agreed you don't come to this courtroom with an opinion as to the number or which type of positive tumor findings there are in the rodent studies; right?

A. I didn't sit down and calculate.

Q. That's all I'm asking.

Now, with respect to the mechanism data, do you claim, sir, to have done a comprehensive review of all of the mechanism data associated with glyphosate and Roundup?

A. No. Again, I reviewed the IARC, the EPA, some of the other studies, the literature reviews from industry, and a lot of the different papers, particularly ones associated with mammalian cells and lymphocyte cultures.

So I didn't review a comprehensive of every paper that was ever published, but I reviewed enough to convince me that Roundup is genotoxic and that it induces oxidative stress. Okay.

Q. We'll talk about that, Doctor. My question

was a little different.

Let me ask it this way: You know that in several of the reviews you just mentioned, the findings of the reviewers was that glyphosate in Roundup is not genotoxic?

A. Yes.

Q. And you know in some of the reviews you made of the animal studies, that the reviewers themselves determined that glyphosate does not cause tumors in rodents?

A. Yes.

Q. Now, with respect to oxidative stress. Now, oxidative stress by itself does not cause cancer; right?

A. Well, oxidative stress by itself can cause cancer. Of course it can.

Q. By itself does not cause -- does not mean you're going to develop cancer. How's that?

A. Right. We all have oxidative stress going on in our bodies every day.

Q. We all have genetic damage going on every day. We all have oxidative stress happening every day. Right?

A. Yes.

Q. Now let's talk about oxidative stress and non-Hodgkin's lymphoma specifically; okay?

A. All right.

Q. Now, you had said previously there is no association between free radical oxygen exposure and NHL; right?

A. I don't remember ever saying that.

Q. I'm handing you, sir, the testimony you gave in an unrelated proceeding.

A. Okay.

Q. I'm going to ask you to turn to page 380 of your testimony.

A. What page?

Q. 380.

A. Mine doesn't go that far.

Q. If you look on the left side.

MR. ISMAIL: May I?

MR. WISNER: It resets.

BY MR. ISMAIL:

Q. All right. I'll let you look at my copy, Doctor.

MR. ISMAIL: I'm going to show -- Mike?

MR. WISNER: Do we have a year?

MR. ISMAIL: Yeah. It's on the front page.

Q. Here we go, page 380. The pages are on the column.

Are you there, sir? Are you there, sir?

A. Yes.

Q. Now, if you look at the prior page, you'll see you were being asked some questions about free radical oxygen and whether or not that causes NHL; right?

A. Yes. But I have no recollection of this testimony. I'd have to read it to really understand what I said and what the context was that I said it in.

Q. Okay. Well, if you look back at the first page, you'll see it's a case in which it has nothing to do with Roundup.

But let me ask this. You've been a retained witness in other litigation, sir; right?

A. Yes.

Q. And you've given sworn testimony under oath in other litigation?

A. Yes.

Q. On the topic of non-Hodgkin's lymphoma?

A. Yes, I have.

Q. And if you look to see this is sworn testimony you gave?

A. Yes.

Q. And so if you look on page 380, line 4, you see there's testimony you gave under oath?

A. Yes.

Q. And do you say under oath:

Free radicals are sort of a normal part of --

MR. WISNER: Your Honor, I can't tell what the question was to this.

THE COURT: Why don't you just take a second and just take a look at it.

MR. WISNER: Well, I mean, first of all, where's the question?

MR. ISMAIL: Mr. Miller's witness.

MR. WISNER: Sorry. I'm just confused.

MR. MILLER: It's the right objection. I was going to clear it up on redirect, but either way.

MR. WISNER: Are you sure that's the question? I don't think it is.

BY MR. ISMAIL:

Q. If you look at the prior page, sir, on 379.

"Q. Would you agree with me there's no way to rule out cancers that might be caused by free radical oxygen if you're trying to determine the cause of a particular cancer?"

And then there's some lawyer colloquy back and forth --

MR. WISNER: There's an answer right here on page 8.

MR. ISMAIL: Yeah. You went backwards.

MR. WISNER: I'm sorry, Your Honor.

THE COURT: Wait. Who's on first? Mr. Miller or Mr. Wisner, who's on first? Who's managing this?

MR. MILLER: I am, Your Honor.

THE COURT: Okay. Then manage that.

MR. WISNER: I'm sorry, Your Honor. I'm just trying to understand what we're doing.

THE COURT: I know. But it is Mr. Miller's witness. Let him kind of manage the situation.

BY MR. ISMAIL:

Q. Are you with me, Doctor?

THE COURT: First of all, did you have a chance to look at it, Mr. Miller?

MR. MILLER: I really haven't.

THE COURT: You know what, no conversation. Just quietly. Thanks.

(Counsel confer off the record.)

MR. MILLER: Your Honor, I think for completeness, counsel really needs to start at line 25 on the page before. It's clear he's trying to isolate something --

MR. ISMAIL: Well, perhaps we don't need a speaking objection from Mr. Miller.

MR. MILLER: I object to --

THE COURT: Hold on just one second.

First of all, you're looking at line 25 for completeness?

MR. ISMAIL: Sure, I'll be happy to read it, Your Honor.

(Pause in the proceedings.)

MR. MILLER: Your Honor, if you could, please, look at page 378 starting at line 25.

THE COURT: I think counsel has agreed to read that question.

MR. ISMAIL: Sure, I'd be happy to.

MR. MILLER: Okay. Great.

MR. ISMAIL: May I, Mike?

MR. MILLER: Yes, go right ahead.

MR. ISMAIL: Thank you.

"Let's start with the body. Free radicals in the body, there are some -- there are some people who believe that free radicals are an important cause of cancer and there is some data to back that up.

"Q. Would you agree with me there's no way to rule out cancer that might be caused by free radical oxygen?

"A. In what situation?"

That's your answer.

"Q. If you're trying to determine the cause of a particular cancer. Like something of one of these studies. Someone else has associated free radicals or in this case" --

And then there's some back and forth with the lawyers.

And then your answer at line 4:

"Free radicals are a normal part of our physiology. And so a better question would be: Would an individual have some exposure that might increase free radicals? And since there is no evidence that free radicals cause non-Hodgkin's lymphoma, I didn't see any reason to pursue that line of thinking or that line of questioning."

Q. Was that your sworn testimony on this date, Dr. Weisenburger?

A. Yes, because in the vast majority of cases, the body has repair mechanisms to fix any abnormalities induced by free radicals. So it's only when you get an induction of free radicals above and beyond that repair process that you get a cumulative damage. That's what I

was getting at here.

MR. ISMAIL: Move to strike everything after "yes." The question was: Was that your testimony?

MR. MILLER: Your Honor, I object.

THE COURT: I'm going to overrule the objection.

MR. ISMAIL: May I approach, Your Honor?

THE COURT: Yes.

I'm not striking that testimony. I think it was in answer to your question.

MR. ISMAIL: I understand. Thank you, Your Honor.

Q. Do you recognize this paper, sir?

A. Yes.

MR. ISMAIL: Permission to publish.

MR. MILLER: It's fine, Your Honor.

(Document published.)

BY MR. ISMAIL:

Q. This is a paper you published, what, two weeks ago?

A. Yes.

Q. This is coming out of the NAPP; right?

A. Yes.

Q. And I guess unlike your glyphosate paper, you've actually published out of the NAPP on a different

pesticide; right?

A. Yes.

Q. And this one is malathion?

A. Yes. It looked at a whole group of pesticides, but most of the findings were for malathion.

Q. So you were on this paper and this came out a couple weeks ago; right?

A. Yes.

Q. You turn with me to page 204.

Now, malathion is one of the pesticides that has been frequently studied in each of the epidemiology studies you discussed with the jury; right?

A. I'm sorry. Repeat your question.

Q. Pesticide malathion is one of the pesticides that has been repeatedly studied in the epidemiology you discussed with the jury; correct?

A. It has been repeatedly discussed.

Q. And it is part of the study that you did in your Nebraska work that carried forward into the NAPP; right?

A. Yes.

Q. And so here you're talking about whether malathion increases the risk; right?

A. Yes.

Q. So you say there's mechanistic data supporting

the carcinogenic potential of malathion; right?

A. Yes.

Q. And you say the purported mechanisms of action include direct genotoxicity, disruption of cellular pathways, and the induction of oxidative stress and inflammation; right?

A. Yes.

Q. And then you say, "Aside from the known links between autoimmune and chronic inflammatory disorders in lymphoma," and then you have this phrase, "none of the above noted pathways"; do you see that?

A. Yes.

Q. And when you're talking about above noted pathways, you're talking about genotoxicity, you're talking about oxidative stress; correct?

A. Apparently, yes.

Q. And you say, "None of the above noted pathways have been concretely linked to the development of lymphoma."

Did I read that correctly?

A. Yes, but I don't understand it right now, but you read it correctly.

Q. Okay. You published this two weeks ago; right, Doctor?

A. Yes.

Q. All right. And then you go on to talk about this thing that we discussed earlier this afternoon, the specific genetic mutation t(14;18); right?

A. Yes. I think in this --

Q. Correct, sir?

A. I think in this paragraph we're talking specifically about malathion.

Q. My question, sir, is: Did I read that correctly?

A. I don't know. Do you want to read it again for me?

Q. Sure.

None of the above noted pathways have been concretely linked to the development of lymphoma.

Did I read that correctly?

A. Yes, but you have to read it in the context of the whole paragraph.

Q. May I continue?

And you go on to say.

Some studies have suggested that pesticide exposure is associated with common chromosomal alterations t(14;18) occurring in molecular lymphoma and DLBCL.

Right?

A. Yes.

Q. Now, you agree with the witnesses who were here earlier that genotoxicity studies, mechanism studies alone cannot prove that glyphosate or Roundup caused NHL; true?

A. Yes.

Q. And you agree with the witnesses who were here previously that the animal studies alone cannot prove that glyphosate or Roundup caused NHL; true?

A. Yes.

Q. Now let's turn to the discussion of the epidemiology evidence. You agree that the epidemiology alone is not sufficient to say there's a causal association; correct?

A. I think that's true. It's correct.

Q. Now, there is a difference between association and causation; you would agree with that, right, Doctor?

A. Yes.

Q. Two things can be associated with one another but there be no causal relationship; true?

A. Yes.

Q. And one of the things you have to consider when you're looking at a potential association is the issue of confounders; right?

A. Yes.

Q. So you would agree that to properly assess epidemiology, one has to look to see whether the association can be explained by potential confounders; right?

A. Yes.

Q. One of the important confounders in the data set we're looking at in this trial is the issue of other pesticide exposure; correct?

A. Yes.

Q. And you agree that it's appropriate to adjust for the participants' exposure to multiple pesticides when trying to answer the question of whether Roundup causes NHL; true?

A. Yes.

Q. And you agree that it's not only appropriate, it improves the accuracy of the data that you are looking at; true?

A. Yes.

Q. Because if you don't adjust for other pesticides when examining whether Roundup increases the risk of NHL, you might be introducing a confounder in your analysis; right?

A. Yes.

Q. So with respect to the papers you looked at earlier, if you still have in front of you the McDuffie

paper, that's Exhibit 5502, that was a paper that you relied upon for your opinions in this case; right?

A. Yes.

Q. And that analysis did not adjust for other pesticide exposure; correct?

A. It did not.

Q. And so the data on greater than two days of use and the relative risk that you put up on your slide with Mr. Miller, that's data that did not adjust for other pesticide exposure; correct?

A. Yes.

Q. There is other data reported in the McDuffie analysis that looked to this question of ever/never; right?

A. Yes.

Q. And that is where you're asking: Have you ever been exposed to glyphosate? And then comparing that to the control to see if there's an increased risk; correct?

A. Yes.

Q. And in the McDuffie paper, even though they did not adjust, there was no increased risk for glyphosate exposure using that metric; true?

A. There was no significant increase.

Q. Thank you.

Now, the McDuffie analysis -- sorry, the McDuffie paper came from Canada; correct?

A. Yes.

Q. There have been other articles published about that same Canadian data study; correct?

A. Probably.

Q. Have you looked at them?

A. I probably didn't.

Q. Do you recognize Exhibit 5152, first author Hohenadel?

A. Yes.

Q. You do recognize this paper?

A. Yeah, I think I had it. I didn't rely on it.

Q. So let's take a look at this paper.

MR. ISMAIL: Permission to publish?

MR. MILLER: No objection, Your Honor.

THE COURT: Yes.

(Exhibit published.)

BY MR. ISMAIL:

Q. So you recognize this paper actually looked at the same data set as McDuffie; right?

A. I believe so.

Q. Do you recognize the question of -- well, the McDuffie paper came out of the Cross-Canada Study of Pesticides and Health; right?

A. Yes.

Q. And so if we look at this paper we have up on the screen, under methods, lo and behold it's the same data set; right?

A. It looks like it is, yes.

Q. And do you recall, sir, that this paper actually did attempt, unlike the McDuffie paper that you talked about with the jury, did attempt to control for at least one other pesticide; right?

A. I don't remember the details of this paper.

Q. Turn to page 2326.

Tell me when you're there.

A. Yes.

Q. And so we have this pesticide malathion, which you just published two weeks ago increases the risk of NHL; right?

A. Yes.

Q. And so you would agree that it's a confounder when you want to look at individuals who were exposed to malathion in something else?

A. Yes.

Q. And so you'd certainly want to control for malathion to try to isolate better whether the other exposure really is increasing NHL; true?

A. Yes.

Q. And that's what this paper did in looking at the McDuffie analysis; right?

A. It looks like that they did here, yes.

Q. And so when you control for malathion exposure, glyphosate, as it turns out, in the same data set that McDuffie used has no increased risk; right?

A. That's what it seems to show.

Q. And you said this is not data that you considered for your opinions in this case; correct?

A. I did not consider this paper, no.

Q. The Eriksson paper that we looked at -- I'm sorry -- that you discussed on direct?

A. Yes.

Q. That was the paper that had data about more than 10 days of exposure to glyphosate?

A. Yes.

Q. And that was what you put up on your chart that Mr. Miller showed; correct?

A. Yes.

Q. I think you agreed that that data is not controlled for other pesticide use; true?

A. That's true.

Q. The Eriksson authors did in fact look at their overall data set and did control for other pesticides; correct?

A. Yes.

Q. And when they did that, the relative risk for glyphosate became nonsignificant; true?

A. Yes, it decreased, but -- it became nonsignificant, yes.

Q. Thank you.

Now I have one more topic with you, Doctor, and unfortunately I'm not going to be able to do it in three minutes.

So, Your Honor, if it's appropriate.

THE COURT: It's a good time if you're going to go beyond 4:30, the hard stop.

MR. ISMAIL: Yes, I apologize.

THE COURT: So there's also redirect. So we're going to have to see you tomorrow morning --

THE WITNESS: Okay.

THE COURT: -- Dr. Weisenburger. 9:00 o'clock.

Thank you, ladies and gentlemen, we're done for the day. I'll see you tomorrow morning here at 9:00 a.m. and ready to go. Thank you for your time and attention. Forget you're jurors, enjoy your evening, and I will see you tomorrow. Thank you.

(Jury excused for the evening recess.)

(Proceedings continued in open court out of

the presence of the jury:)

THE COURT: So we have Dr. Weisenburger tomorrow. Who do we have?

MR. WISNER: So one of the issues, Your Honor, is we need to address a couple of outstanding deposition issues so we can have videos cut for tomorrow.

THE COURT: Which ones are those?

MR. WISNER: I think for tomorrow the most pressing one is the issue with Dr. Reeves and the text messages. We've met and conferred. We've been able to resolve everything except for that issue. So everything else is resolved.

So I think they wanted to have a chance to argue -- we wanted to argue that issue quickly.

THE COURT: Yeah.

MR. ISMAIL: Your Honor, we can excuse Dr. Weisenburger.

THE COURT: I'm sorry, Dr. Weisenburger.

THE WITNESS: I'm enjoying this.

THE COURT: When I excuse the jury, you're free.

MR. ISMAIL: I assume the witness is still under cross-examination, and the same admonition applies. So nobody on their team --

MR. MILLER: Yeah, of course.

(Pause in the proceedings.)

THE COURT: Video after Dr. Weisenburger?

MR. WISNER: So the plan is tomorrow to finish Dr. Weisenburger. I can't imagine it will be very long. Then we're going to have -- sorry. We're going to finish the Martens deposition video. Then Dr. O'Shanick will testify. He'll be very quick. So I can't imagine our direct will be longer than 45 minutes. I can't imagine cross is longer than 10 or 15. So he'll be gone basically in an hour. If we have time left over, we'd like to start Reeves.

THE COURT: Sure.

MR. WISNER: That's the issue.

So the issue, Your Honor, and we talked about this, I was appearing by phone at the time, with these text messages that Mr. -- that Dr. Reeves was asked questions about. And they're specifically text messages from Dr. Daniel Jenkins.

And so here's the factual things that I think both sides will agree on.

The text messages that he was questioned about were actually given to them as part of that original documentation to which we asked them to present a witness and testify about.

And then to give you some context, this was

actually during the *Johnson* trial -- we talked about this before -- but during the *Johnson* trial. And we met with Judge Petrou because we were going to move to compel redepositions for every single one of these witnesses including Dr. Jenkins. That's the e-mail.

THE COURT: I have it in my mind. So there was this agreement where certain documents were included within the agreement to produce and as a result of that, there would be an agreement not to further require authenticity business records exception to the hearsay rule.

MR. WISNER: Precisely.

THE COURT: So you're saying that the text messages were included in that group of documents?

MR. WISNER: That's correct.

THE COURT: Okay.

MR. WISNER: And then the way we sent them the documents were -- we sent them a group of just authenticity hearsay, will you stipulate to it. And then there was documents that not only would we ask them to stipulate to them, but that in fact would present a witness to testify about.

THE COURT: Okay.

MR. WISNER: This was in that group of documents that we wanted testimony about.

So this was part of the compromise that we would let them know what we would want them to be able to testify about before we got there.

There was some back-and-forth about the timing of it. Ultimately when right around this time Judge Chhabria ordered a trial in February kind of out of the blue, and we decided that we needed to take the deposition in the MDL as well.

So this PMK deposition ultimately got dovetailed into both an MDL deposition and a JCCP one. So it was taken cumulatively.

THE COURT: All right.

MR. WISNER: The last part, factual stuff is as part of the MDL process, they're required to disclose what documents the witness has reviewed prior to the deposition. It's a sheet that was disclosed. And this document was on that list of the documents that Dr. Reeves had reviewed.

So we have what we sent earlier, he's actually reviewed it. And in addition to that, Dr. Reeves also testified that he fully reviewed Dr. Jenkins' deposition, and Dr. Jenkins fully authenticated these text messages as belonging to him and as being created as part of his work at Monsanto. So we have all these little pieces coming together for this document.

Now what we'd like to do is we don't seek to admit the entire text messages into evidence. We plan to only present those portions of the text messages that questions were asked about. So it wouldn't be random stuff in there that has nothing to do with the questions that were asked.

Like there was some concerns about monarch butterflies, that's not going to be in there. Okay? And we wouldn't admit the document into evidence, but we would seek leave to show it while it's being read in the deposition. That's it.

So that's sort of where we reached -- I think we even proposed not showing it as part of a compromise, but they refused that. So that's where we're at.

We're just seeking to be able to play the testimony about those text messages. They're documents he reviewed, he relied -- he knows about and can talk intelligently about them to the extent that he's presented as the Monsanto corporate rep.

So that's where we are. If we can resolve that, I think we're ready to cut the video. So --

THE COURT: So Mr. Griffis.

MR. GRIFFIS: Yes, Your Honor.

If I may approach, I'd like to hand up a declaration, Your Honor.

I told you on Friday that although I wasn't personally involved, I had an understanding of the history of this that differed from what Mr. Esfandiary told you and the e-mail that you were provided which was an e-mail that occurred very early in the process.

And what this declaration confirms is that what happened was that there was an initial request to put up a witness on a number of documents. This was done with Judge Petrou.

And at the meeting with Judge Petrou -- this is in paragraph 5, this is my colleague, Mr. Calhoun, who was present for this meeting. Mr. Wisner said that he intended to use about 40 to 50 documents with the PMQ.

So Mr. Calhoun then followed up asking for the list and received on August 20th, 2018, a couple of folders, one with more than 500 documents, with a request to stipulate as to authenticity and hearsay, and then another request, 700 documents, plus these were ones that we may ask Monsanto corporate representative about. And now I'm in paragraph 7.

So this was 10 times or more -- more than 10 times for the 700 documents -- what was initially agreed to before Judge Petrou and what our initial understanding was.

So we disputed that. We objected and said this is way too broad, we can't do that. And that issue was never resolved. There was never a resolution of that.

And what happened, as I said I understood on Friday and Mr. Calhoun has confirmed in his declaration, is that the 30(b)(6) process in federal court sort of overtook that. We agreed to put up a witness with regard to various topics and never undertook to put up a witness with regard to more than 500 specific documents.

It is true that Mr. Reeves attempted to look at hundreds of documents to prepare for his deposition because we didn't know what he'd be asked. We don't believe that a party can unilaterally impose upon a PMQ without agreement by the parties a duty to be fully prepared to testify about all of these documents. And the fact that he tried to look at a bunch of documents does not create such a duty. It can't be imposed upon him nor does it create one.

The colloquy that occurs on page 690, which is where Exhibit 88 was introduced, shows this. Mr. Beruca (phonetic) is defending the deposition there, says that he's not there. He says this on page 691 at the bottom. It's not one of the subjects he's here to testify about, he's not a custodian of records.

And then there's, you know, some discussion between counsel about the scope of this, and it's very clear that there was disagreement and disagreement at the time about whether this was within the scope.

Now, the questions that you consider to be foundational for a business record exception with regard to some of the documents that immediately follow this, Mr. Wisner asked as to some of those documents, the very conclusory ultimate question "Was this kept in the ordinary course of business?" and got a yes, and Your Honor ruled as to several subsequent documents that brought those documents into evidence.

In fact, that's a little bit of a generous interpretation of the business records exception because the business records exception only applies in the first place to documents that are intended by the company to document and act or an event, not opinions --

THE COURT: I agree with you on a lot of that except he's the PMK, he's the company. I wouldn't say that about any document and perhaps not a lot of other witnesses that would appear for Monsanto to just simply hand them a document and say --

MR. GRIFFIS: Okay.

THE COURT: -- is this created in the ordinary course of business?

MR. GRIFFIS: So we may get into that with regard to --

THE COURT: But he's the company. He's standing there as the company.

MR. GRIFFIS: He wasn't asked that one.

THE COURT: All right. So those questions weren't asked about that.

MR. GRIFFIS: For this document, he wasn't asked that question.

THE COURT: But I just want to clarify when we were discussing that the other day and I think I sort of ended the discussion with that, which was, that's fine and that's true regarding laying a foundation for a lot of documents, you can't just put it in front of a witness and ask that question and have it stand for Monsanto as a business record. But when the company is sitting there, it's a little different story.

And so that was why, just to clarify, I came to that conclusion on those particular documents.

MR. GRIFFIS: Okay.

THE COURT: I don't have the testimony in front of me. I can go get it. I don't know. Did he ask those questions about this? Or was there -- I know there was a discussion and some disclaimer like "I'm not here to talk about that."

What was the colloquy around this particular document? And I can go back and get Dr. Reeves' testimony.

MR. WISNER: I have it right here, Your Honor.

So what happened was the lawyer who was representing Dr. Reeves at the deposition didn't even get involved in this litigation until well after this agreement was reached.

In any event, at least no appearance, maybe he was involved behind the scenes, I don't know. It was not Mr. Griffis, it was an attorney from a different law firm.

In any event, I handed him the document. It was on the reliance list notwithstanding. And then we get into this fight. And I say:

> Okay, I gave you this guy's documents four months ago and asked you to give me the witness to talk about --

This was all on the record.

And he goes:

> I mean --

And I go:

> It's literally about glyphosate for your regulatory official for the EPA. So if you're going to tell me that this guy

can't talk about this, this is nonsense. Can you please just go and confer and confirm this is in fact from Mr. Jenkins' phone. Or are you not going to do that? And then he goes:

Well, we can take this up after the deposition, but I -- we're not going to stop now to go do that. And the fact that this may have been given to us in a huge stack of documents, I mean, we've -- we've -- I don't think you have any credible argument that Mr. Reeves has not prepared himself exceptionally well for this deposition. He's prepared to answer these questions to the extent he can. And other than that, if you think something more needs to be done, we can take it up afterwards.

And then I asked Dr. Reeves:

You read Dr. Dan Jenkins' deposition; right?

I have read the deposition.

And in his deposition he testified this was from his phone, didn't he?

And this -- I remember him discussing

that, if that's those modeling numbers.

And so actually at the break, I said, listen, do we need to call the judge to resolve this?

He said no, we're fine. That's not on the record unfortunately, I don't have anything to say that. So I'm being a little sandbagged here because the entire purpose of this PMK was to avoid the very argument they're making. And they're completely doing a 180 now in the middle of trial. And that's why we reach agreements. Go call Judge Petrou if you want. She was there. And I have two witnesses who were there at that meeting.

THE COURT: I don't think Judge Petrou wants to hear about this. I guarantee you that she doesn't want to hear about this, if she remembers.

MR. WISNER: We're getting husband and wife here, okay. We have one person say, well, we didn't come to an agreement, ha, ha, ha, too late. When it's clearly what these e-mails show. We reached an agreement about this.

And if they're going to do that, that's fine. Then I want Mr. Jenkins tomorrow for a deposition compelled to appear so I can ask him to authenticate this. Because that was what the agreement was avoiding. It was trying to avoid the situation where we came to

trial, and they went, uh-uh-uh, you don't have the magic words.

And I think our proposed compromise is eminently reasonable. We're not even seeking to admit the document. We're simply offering the testimony about the very document that this witness specifically reviewed and who this witness was specifically put forward to testify about on behalf of Monsanto.

If these agreements aren't honored and enforced, then this is going to turn into some scorched earth discovery.

THE COURT: Are there other documents that fall in this category? Or is this the first I'm hearing about them? This is the first time it's come up, but I don't know whether -- is this just the first of many? Or is this the only time this is going to come up?

Do we need to have a more comprehensive conversation about which documents are in, which are out, who's going to be testifying as to them, and sort of lay a plan? Because that's a little different than, okay, we have this one disagreement, let's figure it out. Because this agreement covers, you know, sort of unspecified documents. And if we're going to have a disagreement later about, well, this was in the unspecified document group, this was not, and we're

going to be fighting about this with regard to other either witnesses or deposition designations, then tell me now.

MR. GRIFFIS: We're down to one document for this one.

MR. WISNER: This is the only one. And the reason why this is the only one is because this agreement was about this witness. It wasn't about Dr. Farmer or anyone else.

And so the hearsay objections about those documents, did we lay the foundation, we can make those arguments later and you can rule on them as you see them.

But this is different.

THE COURT: Let me go get my copy of Dr. Reeves' deposition.

(Pause in the proceedings.)

THE COURT: You're on page 630; right?

MR. WISNER: Yes, Your Honor. And actually I forgot to mention on page --

THE COURT: Hold on. I've got the exhibits. Let's see.

MR. WISNER: So I just want to point out on page 690 as well, in the middle of the deposition he started waffling about authentication.

And I said:

Okay, we'll go off the record and you guys can get me a witness that can verify this document.

Right? And that's how it works, they can put up anybody they want. I didn't even know Dr. Reeves would be testifying until he walked in the room that morning. And they have to give me somebody who represents the company.

And if you go through the questions, Your Honor, and obviously it jumps back between other document and the text messages, but the portions that are designated are clearly he's kind of authenticating and saying, okay, this is sent to a specific person. Who is that person? And he testifies who they were within Monsanto and what role they have.

THE COURT: Okay. Let me just say this.

The question really is if he was there to testify about these topics and they provided these documents, the question for me at this moment is: Is this part of the deal or not? Because I think otherwise -- well, if it is, then that solves it because it was part of the original agreement. And he's testifying and he goes on to testify about the document.

I guess my question is: You were mentioning a

colloquy earlier. Where was that? Apparently not 690. You were reading something to me.

MR. WISNER: It was the next page, it was 691 -- 692. Sorry, Your Honor.

And this was the colloquy. This was between the lawyers. It wasn't the witness. The witness doesn't start until line 20.

THE COURT: Yeah, I'm looking at it.

And so, Mr. Griffis, I can't digest this entire declaration, but what you're really telling me is that it was uncertain which of these documents was in or out of the agreement and so therefore --

MR. GRIFFIS: No, not exactly, Your Honor.

It's that the original understanding of the agreement in front of Judge Petrou was that Mr. Wisner would provide us with 40 to 50 documents and that we would provide a witness to address those 40 to 50 documents.

Then we were provided with two, one of 500 and one of 700, which is a document dump and way beyond what is reasonable for anyone to be put up for as a PMQ. And --

THE COURT: So I'll tell you what the problem is. He showed up and he testified. That's my problem. Which is then there should have been perhaps a motion

practice around it.

MR. GRIFFIS: Well, he didn't show up with regard to a document that says here's 500 documents, put up a witness on these 500 documents. He showed up in response to a federal 30(b)(6) request listing topics, areas, you know, advertising, company policies on this subject, et cetera. He was there for that. He was not additionally there to testify about the authenticity and hearsay exception --

THE COURT: But you have this underlying agreement. That's my problem. If you have an underlying agreement, you have a PMK who is there to talk about these things which includes a lot of documents that he would not have necessarily personally authored or otherwise, but he's there to talk about them. And talking about the topics includes a whole lot of documents he probably knew nothing about before he prepared for the deposition, but he talks about them anyway because he's the corporation, that's why he's there.

MR. GRIFFIS: Yes, Your Honor.

THE COURT: So all these individual documents, you don't have to bring somebody in to authenticate each one or lay a foundation for each one because that's why he's there.

My problem with this whole conversation now is that he was there and then he testified about it.

So why wasn't there some agreement either for you to have filed a motion to clarify this -- all of this ahead of time to say we're not going to bring this guy to talk about all this stuff because we're not agreeing that he's going to be prepared to?

But he goes to the deposition and then he talks about it.

MR. GRIFFIS: Because our agreement was for him to talk about subjects, not about documents.

THE COURT: But he talked about this. That's the problem. And then he goes and discusses these things are part of his deposition. And so he's the company offering testimony about this.

Now whether there was a protest -- and he then goes on to talk about it.

MR. GRIFFIS: What we have them -- with required to this one document, there's only one left to discuss with this witness, is a text message log. And, you know, you've heard what I had to say about that on Friday. But it isn't a document in any ordinary sense of the word.

It's an artificially created artifact of discovery. Nobody has ever seen it before like this

before a discovery request came in and it was created for this purpose. It mashes together dozens and dozens of different text communications between Mr. Jenkins and other people about which Mr. Jenkins testified at his deposition --

THE COURT: Texts, e-mails. I mean, it is a documentation. It's a conversation, but it's also a document. That's the nature of technology. I mean, we wouldn't ordinarily sit here and have a conversation with you about something. You'd go to a meeting room and talk about something and walk away. There'd be no document. But now there are extensive e-mail exchanges and now text exchanges about all kinds of things in companies and as a part of everyday doing business.

So, you know, maybe 20 years ago you may not have had any of that document, there might not have been any part of it because there was no way to do it, but now there is. And so there's paper trails, all kinds of things that there have never been paper trails for.

And so whether you're telling me that the topics -- I don't know if you're telling me that the way in which it is actually documented doesn't constitute -- couldn't be a business record or the topics that are discussed weren't business, I mean that's probably open to interpretation. But the fact of it in this

particular form, it was turned over to them, I mean, I can't say I would -- I can kind of go along with that.

MR. GRIFFIS: Well, I mean, as far as the issue of it being a business record, there's two issues. One is he wasn't asked any foundational questions to establish it as a business record. You know, whether or not --

THE COURT: I'm talking separate and apart about the status of this particular type of communication, whether it can or can't be a business record. All I'm saying to you is the argument that, you know, it's a bunch of text messages mushed together, that's kind of neither here nor there. It's a means of communication. It can be interpreted a lot of different ways.

MR. GRIFFIS: Whether or not he's the right witness for this, and Your Honor is telling me that your interpretation is that he is, notwithstanding that we never anticipated getting a 500-document list and a 700-document list, he wasn't -- he was there and he was answering questions, but he wasn't asked foundational questions that would be --

(Simultaneous colloquy.)

THE COURT: I'm going to rule that he can testify, and that testimony can be played.

The problem is all the things that led up to this, there were opportunities to resolve this and there should have been. If there's a document dump, you know, you can spend the time for the deposition but resolves: What are we turning over to you? What are the documents that are actually going to be a part of this deposition? You know, those ships sailed.

And I mean, at this point I don't know whether or not I can specifically find that it was referenced in this e-mail. But the problem is that even doesn't matter at this point because he's there and he's talking about all these things and he is the company. He volunteered. He's saying, yeah. And he does seem to know about these topics. But the problem -- you know, the topics that are discussed in these text strings.

But if there had really -- you objected to them, but the follow-up would have been a motion of some sort of way to delineate specifically: What are we talking about here? What are we going to be talking about? Before you put your PMK up and he's answering all kinds of questions on the record as the corporation.

So that's going to be it on this particular document.

MR. GRIFFIS: We have a couple of issues with it then.

THE COURT: Okay.

MR. GRIFFIS: I don't understand what Mr. Wisner's position is, if they're not going to display it or are going to display it.

If they are, there's a lot of redaction that needs to happen. There's also testimony that's being elicited on page 694, the very first thing that's shown talks about labels for killing butterflies. It has nothing to do with anything in this case.

THE COURT: 694. I'm sorry. Message outgoing. I'm looking at 694.

MR. GRIFFIS: It's towards the bottom.

THE COURT: "We have a good program. It's time for it to work. In the meantime --

MR. GRIFFIS: "GE" is genetically engineered and "gly" is glyphosate. So, you know, we've got a GMO issue. Massive buffers, those are, you know, crop-spraying buffers. That's an agriculture overspray for other crops issue. Butterflies issue.

THE COURT: Okay. So is that relevant?

MR. WISNER: We can withdraw that designation starting on page 694, lines 4 through 25.

MR. GRIFFIS: And what happened with -- when Mr. Jenkins' testimony was played, he's the one, you know, that actually this is his text message log, and

Dr. Reeves' deposition didn't exist during the *Johnson* trial so there wasn't a solution there. So we needed to redact it to only show the lines about which Mr. Wisner asked so that there wasn't a whole bunch of extraneous stuff.

THE COURT: Right. And I agree that's appropriate.

MR. WISNER: Yeah.

MR. GRIFFIS: Okay.

THE COURT: Because he can certainly establish it, but it's not necessarily all relevant. So I think what you guys need to do is then go through with that advice, make sure that it's relevant to the questions that are being asked and that other things aren't published.

MR. WISNER: We will definitely redact it, Your Honor. And we will not seek to admit the document. We are simply going to display it with the testimony, and that's it. So kind of like how we've been treating the published literature.

THE COURT: All right.

MR. MILLER: Your Honor, unrelated -- are we done with that? I don't want to jump in.

MR. WISNER: I think we're done with Reeves.

MR. MILLER: We provided the Court with our

proposed jury instructions in Word form. We have not seen Monsanto's yet. We're asking to have them so that we can have a discussion hopefully with the Court starting Friday afternoon if the Court has time.

THE COURT: Oh, I'm not ready to talk about jury instructions quite. I just wanted them so I could familiarize myself with the universe of jury instructions that you're going to be asking for and do some research so that I'll be ready to have a conversation. But I'm not there yet. I really just wanted to know --

MR. MILLER: They have filed them. I apologize.

MR. ISMAIL: We did file them first day of trial.

THE COURT: No, no, no. What I want is a combined document, a document that even if you're suggesting the same ones, I want the ones for the plaintiff and ones for the defendant in one single document. And so then I can go through and sort of systematically see where they're the same, where they're different, where the modifications, you know, how you want to modify them, which ones are special, who's offering special ones. Because it's going to take a little time for me to get my arms around them and do a

little research so when we have a conversation, I'll know what I'm talking about.

MR. MILLER: That's understandable. Does Your Honor want hard copy?

THE COURT: Just send it to me in Word format and I print it out myself. I mean, somebody can give me a copy, but I can print it out. I just want a combined set, you know, plaintiff, defendant, and mark each one as who's offering it and what form -- that's all I'm looking for.

MR. MILLER: Thank you, Your Honor.

MR. WISNER: The last thing, I hate to pile on stuff. Nothing to argue today, but just on your radar. Next week we only have one live witness. Next week is going to be mostly videos.

THE COURT: Okay.

MR. WISNER: And so with that in mind, we have some videos that we've given you a lot of binders. And if I could just tell you the ones.

THE COURT: I gave you Blair; right?

MR. WISNER: Yeah, we have Blair.

It would be Dr. Koch, K-O-C-H.

THE COURT: I think I started his. Was he on the list before?

MR. WISNER: Yeah.

THE COURT: I started.

MR. WISNER: And then there's three treater depositions that we want to play probably on Thursday, it's Dr. Raj, R-A-J, Gupta, and Rubenstein.

THE COURT: And is that this Thursday?

MR. WISNER: No, not tomorrow, but next week.

THE COURT: Next week. Tomorrow is Wednesday.

MR. WISNER: Sorry.

THE COURT: So next Thursday you want to play Raj, Gupta, and Rubenstein?

MR. WISNER: That's right. We want to be ready to play them.

THE COURT: I'll have them ready. I'm working on them.

MR. WISNER: And then Koch. The only one that we'd have you take a look at as well over the weekend if you have time is Goldstein. It's not too long. It's only about an hour. In fact, all these are not too bad. And the treater ones are a little easier. They're sort of just basically relevance objections to stuff.

THE COURT: All right.

MR. WISNER: So that would be really helpful for us.

And I know both sides wanted to argue some minor points for Grant.

THE COURT: Did you say Grant?

MR. WISNER: Yeah, Grant. And then Heydens. In Heydens, we have an issue -- remember you asked us to meet and confer about -- remember there's a portion about the EPA documents?

THE COURT: Right.

MR. WISNER: And you sustained all of our objections and said why don't you meet and confer and see if there are specific questions that are okay.

We did. We agreed on a lot, we disagreed on some. And I think what we have disagreement on, I don't think we need to argue, we just need rulings.

THE COURT: So the Heydens. Give me the binder with a brief on Heydens.

Have I responded to that or is that still outstanding?

MR. GRIFFIS: That is kind of -- the brief I handed up on Heydens doesn't reflect the current state of play because we've agreed to some more.

THE COURT: Okay.

MR. GRIFFIS: So we could stand up and argue this for 20 minutes at some point when there's some free time and just show you the pages and lines that's at issue.

THE COURT: That's fine.

MR. GRIFFIS: Or we could submit a new piece of paper.

THE COURT: No, you don't need to submit any more paper. We'll see what happens tomorrow. I mean, 4:30 to 5:00 is okay time frame within which to talk. At 5:00, we've really got to get out. There's so many other people here that have to get out of the building when it's time to go.

(Proceedings adjourned at 5:00 p.m.)

State of California)
)
County of Alameda)

We, Kelly L. Shainline and Lori Stokes, Court Reporters at the Superior Court of California, County of Alameda, do hereby certify:

That we were present at the time of the above proceedings;

That we took down in machine shorthand notes all proceedings had and testimony given;

That we thereafter transcribed said shorthand notes with the aid of a computer;

That the above and foregoing is a full, true, and correct transcription of said shorthand notes, and a full, true and correct transcript of all proceedings had and testimony taken;

That we are not a party to the action or related to a party or counsel;

That we have no financial or other interest in the outcome of the action.

Dated: April 9, 2019

Kelly L. Shainline
CSR No. 13476, CRR

Lori Stokes
CSR No. 12732, RPR