EXHIBIT 2

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF MASSACHUSETTS

Certified Copy

AMGEN INC.,)

Plaintiff,)

vs.) No. 05-12237 WGY

F. HOFFMANN-LA ROCHE LTD., a)
Swiss Company, ROCHE DIAGNOSTICS)
GmbH, a German Company, and)
HOFFMANN-LA ROCHE INC., a New)
Jersey Corporation,)

Defendants.)

Continued Videotaped Deposition of EUGENE GOLDWASSER, Ph.D., taken before GREG S. WEILAND, CSR, RMR, CRR, Notary Public, pursuant to the Federal Rules of Civil Procedure for the United States District Court pertaining to the taking of depositions, at Suite 4100, Three First National Plaza, in the City of Chicago, Cook County, Illinois, commencing at 9:08 o'clock a.m., on the 26th day of February, 2007.

VOLUME 2

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containing cells are grown, and we purified mouse erythropoietin by that same method.

Q. And is your testimony with respect to recombinant erythropoietin being purified in a manner different from that of urinary erythropoietin based on that work that you've done?

A. Yes.

Q. Now, do you have an understanding as to what the specific activity was as to the urinary erythropoietin that you obtained from Kumamato?

MS. BEN-AMI: Objection.

THE WITNESS: We published the number of, if I remember right, 70,000 units per milligram of protein. That was a rounded off number. It varied from somewhat lower than that to almost twice that.

BY MR. MADRID:

Q. Do you have an understanding of what specific activity is?

A. Yes.

Q. What is it?

A. Units of activity per milligram of protein as we defined it.

Q. And are those units of activity in a biological sense or in some other sense?

A. The units are biological activity as

referred to a standard reference preparation.

Q. Now, do you know what the specific activity is as to the recombinant epo produced by AMGen from CHO cells?

MS. BEN-AMI: Objection.

THE WITNESS: I think I can remember the number. I think it's on the order of 160,000 units per milligram, something like that.

BY MR. MADRID:

Q. Do you know whether or not urinary and recombinant epo have the same or different specific activities?

A. Yes, I do.

Q. What do you know?

A. They're different.

Q. And how do they differ?

A. The urinary erythropoietin has a lower specific activity.

Q. When did you first come to this understanding?

A. Understanding of the difference?

Q. Yes.

A. When I learned what the specific activity of the recombinant erythropoietin was.

Q. Did you examine -- let me withdraw that.

Did you ever examine why the specific activity of urinary erythropoietin and recombinant erythropoietin differ?

A. Yes.

Q. When was that?

A. I can't tell you the year, but the paper was published in about '97, '98, something like that.

Q. And why did you make such examination?

A. I was curious to see what the difference was, why there was such a difference.

Q. Did you make any scientific findings with respect to why urinary erythropoietin differs from recombinant erythropoietin --

A. Yes.

Q. -- in specific activity?

A. Yes, I did.

Q. And what were your findings?

MS. BEN-AMI: Objection, calls for expert testimony.

THE WITNESS: Our conclusion was that there was a probable conformational difference in the two preparations, and we had evidence to substantiate or at least justify that conclusion.

BY MR. MADRID:

Q. What do you mean by conformational difference?

A. The way the molecule is folded up.

Q. Is that a difference in structure?

A. Yes.

Q. I want to show you what I believe is a grant proposal of yours.

This is Goldwasser Exhibit 41, and it bears the Bates 00146339 and it continues through to 00146346, Goldwasser Exhibit 41.

(Exhibit 41 marked as requested.)

MR. MADRID: Counsel, I'm going to need that notebook in a few seconds, so if you can finish taking a look at it.

MS. BEN-AMI: I'm not done inspecting it. I need to take a break to inspect it. I'll be happy to give it to you, but I need it back.

MR. MADRID: When will you be returning it to us?

MS. BEN-AMI: Today.

MR. MADRID: What time?

MS. BEN-AMI: I don't know. I don't know when the deposition is over. I don't know when

you're going to take a break. I'm not going to tear apart your notebook.

BY MR. MADRID:

Q. So take a moment to take a look at that exhibit.

Have you had an opportunity to look at Goldwasser 41?

A. Yes.

Q. What is it?

A. It's an application for a continuation grant, which in essence is essentially a formality at NIH.

Q. Did you prepare this document?

A. Yes.

Q. I want to direct your attention to the page that has the Bates number AM-ITC 00146344. If you look on this page, there's a series of numbered entries, and then there's a lettered entry D. It's about midpoint on the page.

Do you see that?

A. Yes.

Q. And I'll read it for the record. It says, our study of the structure function relationship of both urinary and recombinant epo has shown a very clear difference between them.

Do you see that?

A. Yes.

Q. Did you believe this to be a true and correct statement when you wrote it?

A. Yes.

Q. Does it remain true and correct as far as you know?

A. Yes.

MS. BEN-AMI: Objection.

BY MR. MADRID:

Q. Now, the reference in this sentence to urinary erythropoietin, is this the same urinary erythropoietin that was given to the three patients in the three-patient study?

A. I'd have to check the notebook to know.

Q. Was it produced by the Miyake purification method?

A. Yes.

Q. That is the urinary erythropoietin that's referred to in this Goldwasser Exhibit 41?

A. Yes.

Q. Now, what did you mean when you wrote our study of the structure function relationship of both urinary and recombinant epo has shown a very clear difference between them?

A. I meant that there was a very clear difference between them. We found a number of differences, structural, chemical differences between the two of them.

Q. And after the term for this grant, did you continue to study the structure function relationship of both the urinary and recombinant erythropoietin?

A. I think so. The dates are not clear in my mind, but I think we published a paper on it sometime after this, the date of this proposal.

Q. When was this proposal prepared?

A. When was it prepared? Well, it was signed in April '88.

Q. Okay. So did you submit GW 41 to the NIH in or about the spring of 1988?

A. Yes. It was sent in that month.

MR. MADRID: All right. So let's take a break, ten-minute break.

THE VIDEOGRAPHER: The time is now 3:31. We are going off the record.

(Whereupon, a short recess was taken.)

THE VIDEOGRAPHER: This is the end of Videotape Number 4, Volume 2, in the deposition of

Eugene Goldwasser.

(Whereupon, a short recess was taken.)

THE VIDEOGRAPHER: This marks the beginning of Videotape Number 5, Volume 2, in the deposition of Eugene Goldwasser. The time is now 3:45 p.m.

Please continue.

BY MR. MADRID:

Q. Dr. Goldwasser, in your deposition, in this deposition on February 14, you referred to a publication from 1997, and just before the break earlier, you referred to a publication from 1997. I want to show you a document and see if you recognize this.

The document is marked Goldwasser 42, and it bears the Bates numbers AM-ITC 00991084 through 88. It bears the title A Probable Conformational Difference Between Recombinant and Urinary Erythropoietins, Goldwasser 42.

(Exhibit 42 marked as requested.)

BY MR. MADRID:

Q. Would you please take a look at that and tell me if you recognize that document.

A. I do.
Q. What is it?
A. It's a paper we published in 1997.
Q. Now, is this the paper you were referring to earlier in your testimony when you talked about publishing in 1997?
A. I think so, the paper about the difference between the two forms, yeah.
Q. Okay. Did you participate in authoring this publication?
A. I wrote it.
Q. And were you involved in doing the experimental work that underlies this publication?
A. I designed the experiments, and Charles Kung did the actual handling of it.
Q. Were you involved in supervising Charles Kung in handling those experiments?
A. Supervising is a strong word. He knew what to do. I didn't have to tell him what to do.
Q. Okay. How long have you been working with Mr. Kung?
A. About 35 years.
Q. Now, with respect to this publication, GW 42, what was the source of the urinary erythropoietin material that's discussed in that

publication?

A. It was -- do you mind if I check in here?

Q. Sure, please go ahead.

A. It's somewhere in here.

Q. Let me ask you a separate question and direct your attention to the first page of GW 42, the second paragraph where it says, in the present paper, we demonstrate the differences between u-epo, open paren, the beta form, and there's a footnote there, and r-epo with a cross symbol with respect to ease of iodination and to inactivation by iodine.

Do you see that?

A. Yes.

Q. Okay. Now, does that refresh your recollection as to what the source of the urinary erythropoietin was that was examined with respect to the publication G 42?

A. Yes. It is the beta fraction or fraction 3 from a hydroxyl appetite column of the original preparation of urinary epo.

Q. Now, is this the same urinary erythropoietin that was administered to the three patients in the three-patient experiment we've talked about today?

A. Yes.

MS. BEN-AMI: Objection.

BY MR. MADRID:

Q. How do you know that?

A. It's the only one we called beta epo.

Q. Now, what was the source of the recombinantly produced human epo that are discussed in this publication, Goldwasser 42?

A. It came from AMGen.

Q. Now, in the experimental work for this publication, did you compare the urinary and recombinant erythropoietins by means of accessibility to iodination?

A. Yes.

Q. What does accessibility to iodination measure?

A. It's an indirect indication of something about the structure and the environment of the tyrosines that get labeled with iodine.

Q. Based on your work, did you make any scientific findings as to whether or not urinary erythropoietin and recombinant erythropoietin differ with respect to accessibility to iodination?

A. We did.

MS. BEN-AMI: Objection, expert testimony.

BY MR. MADRID:

Q. What were your findings?

A. The urinary epo had much more, or the tyrosines, tyrosine 15 to be specific of urinary epo, was much more available or accessible from the solvent than the recombinant epo.

Q. Now, I want to direct your attention to Figure 1 of this paper, which would appear on Bates 00991085.

Do you see that?

A. Yes.

Q. Did you make any findings as to the data reflected in Figure 1 of the publication?

A. Those data again indicate -- it's hard to -- that the urinary epo would only be iodinated to the extent of about one iodine per molecule whereas the recombinant went up much higher than that.

Q. Based on your findings and your work that's reflected in Goldwasser 42, do you know whether or not a difference in accessibility to iodination is consistent or inconsistent with a difference in structural conformation as between urinary erythropoietin and recombinant erythropoietin?

MS. BEN-AMI: Objection, calls for expert testimony.

THE WITNESS: The inference you draw from those experiments is that the conformation is different.

BY MR. MADRID:

Q. Did you draw that inference?

A. Yes.

Q. Do you continue to believe that the conformation is different on the basis of iodination?

MS. BEN-AMI: Objection, calls for expert testimony.

THE WITNESS: I used all the data to draw the conclusion about the difference in conformation, not the one experiment.

BY MR. MADRID:

Q. Okay, fair enough. Now, in this experimental work that's in GW 42, did you compare urinary and recombinant erythropoietin with respect to inactivation by iodination?

A. Yes.

Q. And what does inactivation by iodination measure?

A. Loss of biological activity.

Q. And based on your work, the work that was done for Goldwasser 42, did you make any scientific findings as to whether or not urinary erythropoietin and recombinant erythropoietin differ with respect to inactivation by iodination?

A. Yes.

MS. BEN-AMI: Objection, calls for expert testimony.

BY MR. MADRID:

Q. What were your findings?

A. The urinary erythropoietin was almost completely inactivated by substitution of two iodines. Recombinant erythropoietin was much more -- much less affected by substitution of iodine.

Q. Do you draw -- did you -- I'm sorry, let me withdraw that.

Did you draw any inference from that finding?

MS. BEN-AMI: Objection, calls for expert testimony.

THE WITNESS: We inferred that there was at least one tyrosine in urinary erythropoietin which was essential for its biological activity which was -- and that biological activity was

destroyed by putting that iodine on there.
BY MR. MADRID:
Q. Now, based on your finding, the findings in Goldwasser 42, do you know whether a difference in inactivation by iodination is consistent or inconsistent with a difference in structural conformation as between urinary erythropoietin and recombinant erythropoietin?
MS. BEN-AMI: Objection, calls for expert testimony.
THE WITNESS: To put it the other way around, we inferred the conformation difference from the experimental results.
BY MR. MADRID:
Q. In the experimental work for this publication, Goldwasser 42, did you compare the urinary and recombinant erythropoietin products by means of trypsin inactivation?
A. Yes.
Q. What does trypsin inactivation measure?
A. The sensitivity of the protein backbone, the peptide bonds of the protein to a proteolytic enzyme, trypsin.
Q. And did you make any scientific findings with respect to whether or not urinary

erythropoietin and recombinant erythropoietin differ with respect to trypsin inactivation?

A. We did.

Q. What were those findings?

MS. BEN-AMI: Objection, calls for expert testimony.

THE WITNESS: Urinary erythropoietin was much more sensitive to tryptic hydrolysis than recombinant.

BY MR. MADRID:

Q. Did you draw any inferences from that, from those findings?

MS. BEN-AMI: Same objection.

THE WITNESS: Once again, it suggests that there's a difference in conformation between those two molecules.

BY MR. MADRID:

Q. Between urinary erythropoietin and recombinant erythropoietin?

A. Yes.

Q. In the experimental work for Goldwasser 42, did you compare urinary and recombinant erythropoietin by means of circular dichroism?

A. Yes.

MS. BEN-AMI: Objection. And I would point out we have gone well beyond the scope of direct for quite some time. This is your direct exam, but I mean you've gone well beyond the scope of direct.

MR. MADRID: First of all, you're making a speech. Secondly, that's not correct. In point of fact, the subject of differences was raised in the examination on the 14th.

BY MR. MADRID:

Q. Doctor --

MS. BEN-AMI: Could you point that out to me?

MR. MADRID: I'll be happy to, but now is not the proper time.

BY MR. MADRID:

Q. Doctor, what does circular dichroism measure?

MS. BEN-AMI: Objection, beyond the scope of direct, it's calls for expert testimony.

THE WITNESS: It's a crude measure of the folding up of the molecule.

BY MR. MADRID:

Q. Based on your work, did you make any scientific findings as to whether or not urinary

erythropoietin and recombinant epo differ with respect to circular dichroism?

A. We did.

Q. And what were those findings?

A. They differed.

Q. Did you draw any inferences on those, from those findings?

A. That there was a probable conformation --

MS. BEN-AMI: Objection, expert testimony. I'm sorry.

THE WITNESS: That there was a probable conformational difference.

BY MR. MADRID:

Q. When you say that there was a probable conformational, conformational difference, was that as between the urinary erythropoietin and the recombinant erythropoietin?

A. Yes.

Q. Doctor, I'd like to direct your attention to the portion of your deposition testimony that was taken on February 14 on Page 178 of the transcript. Now, there's a question there on 178 at Line 3, and I'm going to read the testimony that follows:

"QUESTION: Okay. So what was your understanding of why the iodination of the epo

inactivated it?

"ANSWER: Because as we published some years later, the tyrosine in urinary erythropoietin at position 15 was very much involved with the binding to the receptor and therefore the biological activity, and by putting the bulky iodine in, you got -- you changed the structure so that it no longer had any biological activity.

"QUESTION: Did you know that in 1983?

"ANSWER: No.

"When did you learn that?

"ANSWER: '97 or something like that.

"QUESTION: 1997?

"ANSWER: '97 I think.

"QUESTION: Yeah, okay.

"ANSWER: Whenever we published that paper."

Doctor, can you tell me whether or not the reference in your testimony, published that paper, is Goldwasser Exhibit 42 that we've been looking at a reference to the '97 paper that's being referred to in your testimony?

A. Yes.

Q. Now, getting back to Goldwasser 42,

looking at the experimental work for that publication, did you compare urinary and recombinant erythropoietin by means of second derivative spectra?

A. Yes.

Q. And what does second derivative spectra measure?

A. That too is a crude indicator of the environment of the amino acid side chains that absorb ultraviolet light, which in this case are mostly tyrosines.

Q. Did you make any findings with respect to second derivative spectra?

A. Yes.

Q. What were those findings?

MS. BEN-AMI: Objection, calls for expert testimony, beyond the scope of direct.

THE WITNESS: There was a small difference in the exposure of tyrosines to the solvent.

BY MR. MADRID:

Q. And did you draw any inferences on the basis of those findings?

A. Once again, that there was a difference between those two molecules.

MS. BEN-AMI: Objection, calls for expert