

CONFIDENTIAL

Hausinger, Ph.D., Robert P.

August 1, 2024

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BAYER CROPSCIENCE LP, MONSANTO COMPANY, AND
INARI AGRICULTURE, INC.

Petitioner,

v.

CORTEVA AGRISCIENCE LLC,
Patent Owner.

Case IPR2023-01036

Patent No. 10,947,555

Case IPR2023-01037

Patent No. 11,149,283

Case IPR2023-01038

Patent No. 11,299,745

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REMOTE VIDEOTAPED DEPOSITION OF

ROBERT P. HAUSINGER, PH.D.

August 1, 2024

8:01 a.m. EST

Reported by:
Janice M. Kocek, CSR, CLR
Job No. 55812

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1 The videotaped deposition of
2 ROBERT P. HAUSINGER, PH.D., via Zoom
3 videoconferencing, called by the Patent Owner for
4 examination, reported stenographically by
5 Janice M. Kocek, License No. 084-002871,
6 Certified Shorthand Reporter, Certified LiveNote
7 Reporter, and Notary Public for the State of
8 Illinois, commencing at the hour of 8:01 a.m.
9 EST, on the 1st day of August, 2024.

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DEPOSITION EXHIBITS REFERENCED

Exhibit 1017	Patent 2016/0108 422 A1
Exhibit 1021	WO 2005/1074347 A2
Exhibit 1025	Critical Review In...Biochemistry and Molecular Biology
Exhibit 1027	Site-directed Mutagenesis of 2,4-Dichlorophenoxyacetic Acid/ α -Ketoglutarate Dioxygenase - Hogan, et al.
Exhibit 1035	Structural basis for the enantiospecificities of R- and S-specific phenoxypropionate/ α -ketoglutarate dioxygenases - Müller

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1 DEPOSITION EXHIBITS REFERENCED

2 Exhibit 1042 Localization and Characterization
3 of Two Novel Genes Encoding
4 Stereospecific Dioxygenases Catalyzing
5 2(2,4-Dichlorophenoxy)propionate
6 Cleavage in *Delftia acidovorans* MC1 -
7 Schleinitz

8 Exhibit 1043 United States Patent 6,143,401

9 Exhibit 1052 Development of enzymes for robust
10 aryloxyphenoxypropionate and synthetic
11 auxin herbicide tolerance traits in
12 maize and soybean crops - Larue

13 Exhibit 1070 Reply Declaration of
14 Robert P. Hausinger, Ph.D.

15 Exhibit 1078 Site-directed Mutagenesis of
16 Putative Substrate-binding Residues
17 Reveals a Mechanism Controlling the
18 Different Stereospecificities of
19 Two Tropinone Reductases - Nakajima

20 Exhibit 1079 Structural and functional comparison
21 of 15S- and 15R-specific
22 cyclooxygenases from the coral
23 *Plexaura homomalla* - Valmsen
24
25

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1 DEPOSITION EXHIBITS REFERENCED

2 Exhibit 1080 On the Relationships of Substrate
3 Orientation, Hydrogen Abstraction,
4 and Product Stereochemistry in Single
5 and Double Dioxygenations by
6 Soybean Lipoxygenase-1 and Its
7 Ala542Gly Mutant - Coffa

8 Exhibit 1081 Inversion of enantioselectivity
9 of asymmetric biocatalytic
10 decarboxylation by site-directed
11 mutagenesis based on the reaction
12 mechanism - Ijima

13 Exhibit 1082 Directed Mutagenesis Alters
14 the Stereochemistry of Catalysis by
15 Isolated Ketoreductase Domains from
16 the Erythromycin Polyketide Synthase -
17 Baerga-Ortiz

18 Exhibit 2004 Sequencing
19 COR-AAD-1-00585579-00585584

20 Exhibit 2042 Schleinitz excerpt

21 Exhibit 2062 Bayer vs. Dow Transcript,
22 June 25, 2012

23

24

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DEPOSITION EXHIBITS REFERENCED

Exhibit 2065 Declaration of
Robert P. Hausinger In Support
of Plaintiff Bayer's Motion
for Partial Summary Judgment
of Infringement Infringement
U.S. Patent No. 6,153,401 by
Dow AgroSciences LLC

1 (Witness remotely sworn.)

2 ROBERT P. HAUSINGER, PH.D.,
3 called as a witness herein, having been first
4 duly sworn, was examined and testified as
5 follows:

6 EXAMINATION

7 BY MR. DeR00:

8 Q. Good morning, Dr. Hausinger. I'm
9 Pier DeRoo with the law firm Finnegan
10 representing Corteva. And I'm joined by Mark 08:01
11 Lampert, who is also with Finnegan.

12 Do you understand that you are
13 testifying today in IPR proceedings before the
14 U.S. Patent and Trademark Office involving three
15 Corteva patents? 08:01

16 A. Yes.

17 Q. And those are the '555, '283, and
18 '745 patents?

19 A. That sounds right, yes.

20 Q. Today's deposition is being held 08:01
21 remotely. So the way it will work is that when
22 we have documents to look at, we can call them
23 up electronically on the screen. But if you
24 prefer to look at hard copy documents, we sent a
25 box to your address. 08:02

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1 Did you receive it?

2 A. I did.

3 Q. Have you opened the box or is it
4 still sealed?

5 A. It's still sealed. 08:02

6 Q. Do you understand that your testimony
7 today will be transcribed and made public in
8 these proceedings?

9 A. Yes.

10 Q. And do you understand that your 08:02
11 answers today are under oath?

12 A. Yes.

13 Q. Is there any reason you cannot
14 provide full and truthful testimony today?

15 A. No. 08:02

16 Q. Would you please go ahead and open
17 the box that we sent you.

18 A. Okay.

19 Q. Would you please retrieve Exhibit
20 1070. 08:03

21 A. Okay. It's my declaration.

22 Q. And this is the second declaration
23 you've submitted in these IPRs, correct?

24 A. Yes.

25 Q. And you reviewed your declaration 08:03

10

1 before you signed it?

2 A. I did, yes.

3 Q. Would you turn to page 57, please.

4 A. Okay.

5 Q. And this is your signature on page 08:03
6 57, correct?

7 A. (No audible response.)

8 Q. And this is your signature on page
9 57, correct?

10 A. I said correct. 08:04

11 Q. When you signed your declaration you
12 believed it was complete and accurate?

13 A. Yes.

14 Q. And sitting here today, is there
15 anything in your declaration that you believe 08:04
16 requires correction?

17 A. No.

18 Q. About how many hours did you spend in
19 preparing this declaration?

20 A. Roughly 20 to 25 hours. 08:04

21 Q. What did you do to prepare for your
22 deposition today?

23 A. For preparing for today I had -- I
24 had I think five virtual meetings, practice
25 sessions, with counsel. I reread my 08:04

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1 **declaration. I read the declarations from**
2 **Dr. Bollinger. And then I looked at a few of**
3 **their other documents that were exhibits.**

4 MR. GROSSMAN: Apologize. I'm just
5 going to remind Dr. Hausinger not to get 08:05
6 into any specific documents that you
7 reviewed with counsel.

8 THE WITNESS: Okay.

9 BY MR. DeR00:

10 Q. And how long were these virtual 08:05
11 sessions that you held with counsel?

12 A. **One to one and a half hours.**

13 Q. In reviewing documents in preparation
14 for your deposition today, did you review any
15 documents that were not listed in your table of 08:05
16 exhibits at Appendix 1 to this declaration?

17 A. **No.**

18 Q. Did you meet with anyone other than
19 Mr. Grossman, Mr. Picozzi, or Ms. Ryen in
20 preparing for your deposition? 08:06

21 A. **No.**

22 Q. Please turn to paragraph 61 in your
23 second declaration here.

24 A. **I'm there.**

25 Q. In the middle of this paragraph you 08:06

12

1 cite the Valmsen, Ijima, Baerga-Ortiz, and Coffa
2 references, correct?

3 **A. That is correct.**

4 Q. And those are Exhibits 1079 through
5 1082?

08:06

6 **A. Yes.**

7 Q. In the previous paragraph of your
8 declaration at the top of the page you also cite
9 Nakajima 1999, which is Exhibit 1078, correct?

10 **A. Correct.**

08:07

11 Q. Were Exhibits 1078 through 1082
12 provided to you by counsel or did you search for
13 and select them yourself?

14 **A. My recollection is that 1078 was
15 provided by counsel. The other four I found
16 myself.**

08:07

17 Q. In your box of documents please
18 retrieve Exhibit 1079.

19 **A. Okay. The Valmsen, yes.**

20 Q. Yes. This is the Valmsen publication
21 you relied on in your declaration concerning COX
22 enzymes, correct?

08:08

23 **A. That is correct, yes.**

24 MR. GROSSMAN: Pier, are you

25 providing a copy virtually or -- just so I

08:08

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1 know for purposes of --

2 MR. DeR00: If it's in the record, do
3 you have --

4 MR. GROSSMAN: I can. I do have
5 them. I just wanted to make sure that I 08:08
6 had time to pull them up.

7 MR. DeR00: I'm happy to slow down.
8 I think it will be easier if you have
9 electronic copies.

10 MR. GROSSMAN: No. That's fine. I 08:08
11 just needed to make sure that I had them
12 pulled up.

13 MR. DeR00: Fair enough. I won't be
14 offended if you ask me to slow down.

15 MR. GROSSMAN: I've got it. 08:08

16 BY MR. DeR00:

17 Q. Dr. Hausinger, these COX enzymes
18 convert arachidonic acid to either (S)- or
19 (R)-prostaglandins; is that right?

20 A. Yes. 08:09

21 Q. If we could turn in the discussion
22 session to Exhibit 1079 to page 3537, please.
23 Just let me know when you're there.

24 A. I'm there.

25 Q. In the bottom left paragraph, a few 08:09

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14

1 lines down, it says that the wild-type R- and
2 S-variant COX enzymes formed almost pure 15R-
3 and 15S-PGs.

4 Do you see that?

5 **A. Yes, I do.** 08:09

6 Q. And PGs are prostaglandins?

7 **A. Correct.**

8 Q. The next sentence tells us that the
9 mutant 15R-COX enzyme formed 70 percent
10 (S)-prostaglandins, correct? 08:10

11 **A. That is correct, yes. So a single**
12 **substitution can alter the (audio distortion).**
13 **(Stenographer clarification.)**

14 THE WITNESS: A single substitution
15 can alter the stereospecificity of the 08:10
16 reaction.

17 BY MR. DeR00:

18 Q. And the mutant 15S-COX enzyme formed
19 35 percent (R)-prostaglandins?

20 **A. Correct.** 08:10

21 Q. If we turn to the previous page,
22 3536, are those results shown in Table 2 in the
23 left-hand column?

24 **A. Yes, that's what's shown.**

25 Q. Looking at the bottom two rows of 08:11

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1 Valmsen's Table 2, the wild-type R-COX enzyme
2 formed 98 percent (R)-prostaglandins and the
3 mutant formed 30 percent (R)-prostaglandins.

4 Do you see that?

5 **A. Yes.** 08:11

6 Q. Does the wild-type R-COX enzyme have
7 (R)-enantioselectivity?

8 **A. The wild-type enzyme is specific in
9 creating the (R) epimer, the (R) product.**

10 Q. Does that mean it's (R) selective? 08:11

11 **A. That would mean that it is specific
12 for creating the (R)-enantiomer.**

13 Q. Is it selective for creating the
14 (R)-enantiomer?

15 MR. GROSSMAN: Objection to the form 08:12
16 of the question.

17 THE WITNESS: I'm not sure exactly
18 what you're saying. It's -- it is creating
19 specifically selectively the (R)-enantiomer.

20 BY MR. DeR00: 08:12

21 Q. Is there a difference in your mind
22 between an enantioselectivity and
23 enantiospecificity?

24 **A. So perhaps you're getting at -- well,
25 the point of this article is that there are** 08:12

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1 residues that are very specific for the
2 chemistry going on related to
3 enantiospecificity.

4 And so the -- the enzyme is using the
5 -- the two enzymes are using the same substrate 08:12
6 in creating different products. It's a little
7 bit nuanced difference from a -- two enzymes
8 using different starting substrates. But it's
9 still focused on very subtle changes. Single
10 substitutions can make a huge difference in 08:13
11 terms of the reactivity of the enzyme.

12 Q. I appreciate that. But my question
13 is a little bit simpler.

14 When I'm asking if a wild-type R-COX
15 enzyme has (R)-enantioselectivity, you answer in 08:13
16 terms of enantiospecificity.

17 A. Right.

18 Q. So is there a difference in your mind
19 between enantioselectivity and
20 enantiospecificity here? 08:13

21 MR. GROSSMAN: Objection to the form
22 of the question.

23 THE WITNESS: So as I thought I was
24 trying to say, the specificity is where you
25 have two enantiomers and so the enzyme 08:13

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17

1 would be specific for one of the two
2 enantiomers. Here you're creating the two
3 different products, the two enantiomers.

4 BY MR. DeR00:

5 Q. Does the mutant R-COX enzyme in 08:14
6 Table 2 have S-specificity?

7 A. The isoleucine 349 valine variant
8 enzyme -- I prefer not to call it a mutant
9 enzyme because it mutates DNA, not protein -- is
10 able to create both the 15S and the 15R epimers 08:14
11 but it favors the 15S epimer.

12 Q. Does the variant R-COX enzyme have
13 R-specificity?

14 A. The variant 15 -- say it again. 15S
15 or 15R? 08:15

16 Q. 15S -- I'm sorry, the variant FT --
17 why don't I start again.

18 A. Okay.

19 Q. Does the variant R-COX enzyme have
20 R-specificity? 08:15

21 A. So as I just said, the variant R-COX
22 enzyme creates both the 15S and 15R epimers but
23 it preferentially creates the 15S epimer.

24 Q. Is that a yes for R-specificity?
25 Is it a maybe because it creates 08:15

18

1 both?

2 **A. Well, it's the --**

3 MR. GROSSMAN: Objection to the form
4 of the question.

5 THE WITNESS: It's dealing with 08:16
6 selectivity. It's dealing with preference
7 for making 15S epimer but it is creating
8 both. But again, a single substitution can
9 alter the reaction dealing with
10 stereochemistry. 08:16

11 BY MR. DeR00:

12 Q. Does Valmsen report any variants of
13 S-COX enzymes that produce exclusively
14 (R)-prostaglandins and no (S)-prostaglandins?

15 **A. No, they do not.** 08:16

16 Q. Does Valmsen report any variants of
17 R-COX enzymes that produce only
18 (S)-prostaglandins and no (R)-prostaglandins?

19 **A. No, they do not. But again, I cited**
20 **this -- I thought this was a pertinent** 08:17
21 **publication because a single substitution can**
22 **create dramatic changes in the stereochemistry**
23 **of the reaction.**

24 Q. So to be clear, Valmsen does not
25 report variants of R-COX enzymes that produce 08:17

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1 exclusively (S)-prostaglandins, correct?

2 MR. GROSSMAN: Objection to the form
3 of the question.

4 THE WITNESS: The publication here
5 only focuses on two variants and they do 08:17
6 not completely swap the reactivity to the
7 other enantiomer. It's somewhat of a
8 mixture.

9 (Stenographer clarification.)

10 THE WITNESS: It's somewhat of a 08:17
11 mixture of products.

12 BY MR. DeR00:

13 Q. Thank you, Doctor.

14 In your box would you please retrieve
15 Exhibit 1078. 08:17

16 A. Got it. Nakajima 99.

17 Q. And Dr. Hausinger, the enzymes in
18 Nakajima 1999, Exhibit 1078, are tropinone
19 reductases, correct?

20 A. That is correct. I will point out 08:18
21 that reductases by their nature are, in fact,
22 reversible enzymes. And so they do the
23 reduction but then they can also catalyze the
24 reverse reaction, the oxidation reaction.

25 Q. And the two tropinone reductases 08:18

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1 referred to in Nakajima here, they convert the
2 substrate tropinone into alcohol products that
3 have either R- or S-stereospecificity, correct?

4 **A. That is correct. But as I was just**
5 **saying, they do the reverse reaction where they** 08:19
6 **can take the (R)-enantiomer in one case and form**
7 **the keto group or they can take the**
8 **(S)-enantiomer, the alcohol, and form a keto**
9 **group. So it's a little bit closer to the type**
10 **of chemistry seen with RdpA, for example.** 08:19

11 **Q. In your box would you please retrieve**
12 **Exhibit 1080.**

13 **A. Okay. That's the Coffa, et al.**

14 **Q. Yes. And the enzymes in Coffa are**
15 **LOX enzymes, correct?** 08:20

16 **A. Lipxygenases, yes.**

17 **Q. The substrate these enzymes act on is**
18 **linoleic acid; is that correct?**

19 **A. Yes.**

20 **Q. And the LOX enzymes convert linoleic** 08:20
21 **acid to (S) or (R) hydroperoxide products,**
22 **correct?**

23 **A. Yes.**

24 **Q. Would you please retrieve Exhibit**
25 **1081.** 08:20

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21

1 **A. Okay.**

2 Q. This is the Ijima paper you rely on
3 in your declaration?

4 **A. Yes.**

5 Q. The enzymes in Ijima are AMDases, 08:21
6 A-M-D, capitalized?

7 **A. Right. So it's arylmalonate**
8 **decarboxylase.**

9 Q. And looking at the one-sentence
10 abstract, the substrate these enzymes act on is 08:21
11 arylmethylmalonate?

12 **A. That is the substrate that they**
13 **studied.**

14 Q. And the AMDases convert that
15 substrate to produce optically active products, 08:21
16 correct?

17 **A. Yes, that is correct.**

18 Q. And optically active means that those
19 products are enantiomers, (S) or (R), correct?

20 **A. Right. So they probably use circular** 08:22
21 **dichroism, for example, to monitor the optical**
22 **activity.**

23 Q. Would you please retrieve Exhibit 1082
24 from your box.

25 **A. Baerga-Ortiz.** 08:22

22

1 Q. Yes. The enzymes in Baerga-Ortiz,
2 Exhibit 1082, were ketoreductase domains; is
3 that correct?

4 A. That is correct.

5 Q. These are domains from a multi-enzyme 08:23
6 that has multiple domains?

7 A. Yes, polyketide synthase.

8 Q. In a multi-enzyme do the multiple
9 domains catalyze different types of reactions?

10 A. Typically that would be the case, 08:23
11 yes.

12 Q. And in Exhibit 1082 here, single
13 ketoreductase domains were isolated and used in
14 this study, correct?

15 A. Yes. 08:23

16 Q. If you look to the abstract -- I
17 think I'm going to ask you to pronounce this.
18 But going halfway down, there is a compound
19 beginning (2R, S)-2 methyl.

20 Do you see that? 08:23

21 A. Yes.

22 Q. Is that the substrate used with these
23 KR domains?

24 And can you read that into the
25 record, please? 08:24

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1 **A. So yes, they did use the**
2 **(2R, S)-2-methyyl-3-oxopentanoic acid and**
3 **N-acetylcysteamine thioester.**

4 **Q. Thank you.**

5 In your box, Dr. Hausinger, would you 08:24
6 please retrieve Exhibit 1035.

7 **A. Okay. That's the Müller, et al.,**
8 **paper from 2006.**

9 **Q. Exhibit 1035 names you as an author,**
10 correct? 08:24

11 **A. That is correct.**

12 **Q. And Tina Müller is also an author?**

13 **A. Yes.**

14 **Q. Did she work in your lab?**

15 **A. Yes, she did.** 08:25

16 **Q. How did she come to work in your lab?**

17 **A. She came to know about some of our**
18 **work on TfdA. As a graduate student she had**
19 **been working on RdpA and SdpA and wanted to get**
20 **more into the understanding of the biochemistry** 08:25
21 **of those enzymes and so came to my lab as the**
22 **best place to be able to do that.**

23 **Q. In your experience, is Dr. Müller a**
24 good scientist?

25 **A. Oh, she was excellent, yes.** 08:25

24

1 Q. She was careful and accurate with her
2 work?

3 A. Yes.

4 Q. In the abstract of Müller 2006, a
5 little more than halfway down, it states that 08:25
6 "Four SdpA variants were (slightly) active with
7 (R)-mecoprop," correct?

8 A. That is what it states, yes.

9 Q. Would you please turn to Table 1 of
10 Müller 2006 on page 1361. 08:26
11 Just let me know when you're there.

12 A. I'm there.

13 Q. In the lower half of Table 1, those
14 four SdpV -- those four SdpA variants mentioned
15 in the abstract are the ones showing a value in 08:26
16 the right-hand column for activity on
17 (R)-mecoprop, correct?

18 A. That is correct.

19 Q. For the first of those four SdpA
20 variants, E69A, did it have greater activity on 08:26
21 (S)-mecoprop or (R)-mecoprop?

22 A. The specific activity was slightly
23 higher on (S)-mecoprop than on the (R) -- I'm
24 sorry. Where am I here? -- than on the racemic
25 mixture of (R)- and (S)-mecoprop. But it was 08:27

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1 **within standard error. So it was really**
2 **basically equivalent, which means that all of**
3 **the activity seen was from the (S)-mecoprop.**

4 Q. I see you're comparing the
5 (R)-mecoprop activity in the last column to 08:27
6 racemic mixture of mecoprop and the -- we'll
7 call it the third column of data.

8 A. **Okay. I see what you're --**

9 Q. Does it make more sense to do a
10 comparison of the first column, (S)-mecoprop at 08:28
11 4 millimolar to (R)-mecoprop at 4 millimolar?

12 A. **Yeah. It has been quite a while**
13 **since I looked at this paper.**

14 **So you're correct, those comparisons**
15 **amplify the results that the activity is much** 08:28
16 **greater with the (S)-mecoprop.**

17 Q. Does the first SdpA variant there,
18 E69A, have (R)-enantioselectivity or
19 (S)-enantioselectivity?

20 A. **The E69A has almost essentially** 08:28
21 **(S)-mecoprop specificity and has just a very**
22 **tiny amount of specificity for the (R)-mecoprop.**

23 Q. And is the answer the same for the
24 other three SdpA variants showing some
25 (R)-mecoprop activity? Those are R207A, R207B, 08:29

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1 and G97I/N98G.

2 MR. GROSSMAN: Objection to the form
3 of the question.

4 THE WITNESS: The variants you
5 indicate all are active with (S)-mecoprop 08:29
6 but then also have a small amount of
7 activity with the (R)-mecoprop.

8 So the point of this is that
9 making very small changes in protein can
10 change it from one that is exclusively 08:30
11 S-specific to one that relaxes the
12 specificity so that it does act on the
13 other enantiomer. Small changes, big
14 effect.

15 BY MR. DeR00: 08:30

16 Q. Table 1 shows the wild-type SdpA as
17 having zero activity on (R)-mecoprop, correct?

18 A. Yes.

19 Q. Did any of the variants reported in
20 Müller 2006 completely switch selectivity from 08:30
21 wild-type SdpA so that there is only activity on
22 (R)-mecoprop and no activity on (S)-mecoprop?

23 MR. GROSSMAN: Objection to the form
24 of the question.

25 THE WITNESS: None of the variants we 08:31

27

1 studied had swapped the activity. We were
2 excited to see the relaxation of
3 specificity. It would have been requiring
4 additional mutagenesis studies to identify
5 something that had swapped that activity. 08:31

6 BY MR. DeR00:

7 Q. Would you please turn to page 1362.

8 A. **I'm there.**

9 Q. The lower right paragraph refers to
10 RdpA variants. 08:32

11 Do you see that?

12 A. **Yes.**

13 Q. And it states that the Q93A variant
14 retains 60 percent of wild-type RdpA activity,
15 but it dropped to 35 percent when the racemate 08:32
16 was provided, suggesting that glutamine 93
17 prevents the incorrect enantiomer from binding
18 to and inhibiting the enzyme.

19 Correct?

20 A. **That is what it states.** 08:32

21 Q. And does that indicate that the
22 glutamine was believed to sterically exclude
23 (S)-mecoprop from binding in RdpA and the
24 mutation and the Q93A variant removed some of
25 that steric hindrance? 08:33

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1 MR. GROSSMAN: Objection to the form
2 of the question.

3 THE WITNESS: It means that the
4 glutamine 93 is disallowing the wrong
5 enantiomer from binding. And so when it 08:33
6 was substituted with an alanine, then some
7 of that wrong enantiomer could bind and
8 prevent binding of the proper substrate.

9 BY MR. DeR00:

10 Q. In Table 1, the Q93A, RdpA variant 08:33
11 still retained some ability to degrade
12 (R)-mecoprop, correct?

13 MR. GROSSMAN: Objection to the form
14 of the question.

15 THE WITNESS: The Q93A had reduced 08:33
16 specific activity, whether looking at
17 4 millimolar or 2 millimolar of the
18 substrate. In both cases you see a
19 reduction in specific activity from 7.11
20 down to 4.3 or from 5.6 down to 3.27 units 08:34
21 per milligram.

22 BY MR. DeR00:

23 Q. And so Q93A was still able to degrade
24 (R)-mecoprop at about 60 percent compared to
25 wild-type activity? 08:34

1 MR. GROSSMAN: Same objection.

2 THE WITNESS: Q93A has about
3 60 percent of the wild-type activity with
4 the (R)-mecoprop.

5 BY MR. DeR00: 08:35

6 Q. In your box would you please retrieve
7 1001.

8 A. Okay. That's the '555 patent.

9 Q. Would you please turn to Claim 1.
10 Let me know when you're there. 08:35

11 A. I'm there.

12 Q. Let's look at the first part of Claim
13 1 stating, a transgenic plant cell comprising
14 polynucleotide that encodes an AAD-1 protein
15 that exhibits aryloxyalkanoate dioxygenase 08:35
16 activity wherein said activity enzymatically
17 degrades a phenoxy auxin herbicide and an
18 (R)-aryloxyphenoxypropionate herbicide.

19 Did I read that correctly?

20 A. That's what it states. 08:36

21 Q. The first type of herbicide referred
22 to in Claim 1 is the phenoxy auxin herbicide,
23 correct?

24 A. Yes.

25 Q. Is 2,4-D a phenoxy auxin herbicide? 08:36

30

1 A. 2,4-D is a phenoxy auxin herbicide,
2 yes.

3 Q. 2,4-D is a chiral, correct?

4 A. Yes.

5 Q. Is (R)-mecoprop a phenoxy auxin 08:36
6 herbicide?

7 A. Yes.

8 Q. And it's an (R)-enantiomer as the
9 name says, correct?

10 A. Correct. 08:37

11 Q. The AAD-1 protein of Claim 1 can
12 degrade both a chiral and (R)-enantiomers of the
13 phenoxy auxin herbicides, correct?

14 A. RdpA --

15 MR. GROSSMAN: Objection to the form 08:37
16 of the question.

17 THE WITNESS: RdpA can degrade to 4-D
18 and (R)-mecoprop and similar (R)-phenoxy
19 auxins.

20 BY MR. DeR00: 08:37

21 Q. The second type of herbicide referred
22 to in Claim 1 is an (R)-aryloxyphenoxypropionate
23 herbicide, correct?

24 A. Correct.

25 Q. Can we agree to call this an (R)-FOP, 08:37

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1 (R)- F-O-P?

2 A. That works for me.

3 Q. Perfect. (R)-FOPS include
4 (R)-enantiomers like (R)-haloxyfop?

5 A. It has the same substructure, the 08:38
6 same chirality, yes.

7 Q. Does Claim 1 require any minimum
8 level of degrading activity on phenoxy auxin or
9 (R)-FOP herbicides?

10 MR. GROSSMAN: Objection. Objection 08:38
11 to the form of the question.

12 THE WITNESS: Claim 1 does not
13 specify how much of a compound needs to be
14 degraded. And so -- yeah, it's just not
15 specified. 08:38

16 BY MR. DeR00:

17 Q. Is the term (R)-enantioselective
18 stated anywhere in Claim 1?

19 A. It doesn't have --

20 MR. GROSSMAN: Objection to the form 08:38
21 of the question.

22 THE WITNESS: It doesn't have to be
23 because it states that it is able to
24 degrade the (R)-aryloxyphenoxypropionate,
25 which means that it is able to degrade that 08:39

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1 type of compound, that enantiomer.

2 BY MR. DeR00:

3 Q. The question was a little bit
4 different.

5 Do you see the term 08:39

6 "(R)-enantioselective" in Claim 1 or is that
7 something you're interpreting?

8 MR. GROSSMAN: Objection to the form
9 of the question.

10 THE WITNESS: That term is not part 08:39
11 of Claim 1.

12 BY MR. DeR00:

13 Q. Is the term "(R)-enantiospecific"
14 part of Claim 1?

15 MR. GROSSMAN: Same objection. 08:39

16 THE WITNESS: That term
17 "(R)-enantiospecific" is not part of
18 Claim 1. And I think it would be inherent
19 in -- a POSA looking at this would assume
20 that they are seeking specific chemistry 08:39
21 here that is for the (R)-enantiomers. And
22 so probably assume that it means it's only
23 acting on (R)-enantiomers.

24 BY MR. DeR00:

25 Q. Will you return to your declaration, 08:40

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1 please.

2 A. Okay. Where?

3 Q. At the back of your declaration you
4 have an Appendix 1 that is a table of exhibits,
5 correct?

08:40

6 A. Yes.

7 Q. Are these exhibits that you
8 considered in preparing your declaration?

9 A. Yes.

10 Q. Is it an accurate and complete list
11 of materials that you considered?

08:41

12 A. Yes.

13 Q. I understand from your declaration
14 that you reviewed some sequences of RdpA that
15 were published in a Monsanto patent application,
16 Exhibit 1017, and then the Larue 2019
17 publication, which is Exhibit 1052.

08:41

18 And my question is actually pretty
19 simple, Dr. Hausinger, which is whether Exhibit
20 1017 and Exhibit 1052 are both on your list of
21 materials considered?

08:42

22 A. Yes.

23 Q. Did Bayer provide you access to any
24 amino acid sequences beyond those reported in
25 Bayer's patent application or the Larue 2019

08:42

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1 publication?

2 **A. Did Bayer provide me with any? So**
3 **there were some variants that were created by**
4 **Bayer beyond those shown -- beyond those shown**
5 **in Larue.**

08:43

6 Q. And that's kind of what I'm getting
7 at, Dr. Hausinger.

8 Some RdpA variants were published by
9 Bayer either in Larue or in the patent
10 application.

08:43

11 And my question is whether you were
12 provided access to amino acid sequences of
13 variants beyond what was published, so internal
14 Bayer information.

15 **A. So in my declaration on page 51**
16 **you'll see a list of a number of different**
17 **variants that had been created. And only a**
18 **subset of these were in Larue.**

08:43

19 Q. Right. So we have variants that were
20 in Larue. We have variants that were published
21 in the patent application.

08:44

22 Did Bayer provide you with access to
23 any additional RdpA variants?

24 **A. No, I don't believe so.**

25 Q. Would you please retrieve Exhibit

08:44

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1 1027 in your box.

2 A. Okay. Hogan, et al., 2000.

3 Q. In the author line you're an author
4 of Exhibit 1027, the Hogan publication?

5 A. That is correct. 08:45

6 Q. In the abstract about 13 rows down
7 you stated that variants of TfdA were created
8 starting with H167A.

9 Do you see that?

10 A. Yes. 08:45

11 Q. This states that the H167A, H200A,
12 H213A, H245A, and H262A forms of TfdA formed
13 inclusion bodies when overproduced in E.coli,
14 correct?

15 A. That is what it states. 08:46

16 Q. What is an inclusion body?

17 A. It's where the protein is insoluble
18 and so comes out sort of as a precipitate within
19 E.coli cell.

20 Q. Your article goes on to state that, 08:46
21 these proteins were soluble when fused to the
22 maltose-binding protein (MBP).

23 Correct?

24 A. Yes.

25 Q. What is maltose-binding protein? 08:46

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1 A. It's a protein that is often used in
2 protein engineering studies because it's highly
3 soluble. And so when you fuse this protein to a
4 desired protein it can retain its solubility of
5 that desired protein. The actual function of a
6 maltose-binding protein is to bind maltose.

08:46

7 Q. And if you're able to fuse MBP to a
8 desired protein then you could test it in
9 purified form, correct?

10 A. That is why we used it, to get
11 soluble material.

08:47

12 Q. Would you turn to page 12402, please.

13 A. Okay.

14 Q. Do you see the header Results?

15 A. Yes.

08:47

16 Q. In the second sentence of the first
17 paragraph you referred to a standard protocol
18 here that was used and the H8A, H113A, D115A,
19 H216A, and H235A variants existed as soluble
20 proteins.

08:48

21 Do you see that?

22 A. Yes.

23 Q. It says all of the other TfdA
24 variants were present as inclusion bodies even
25 when grown at lower temperatures

08:48

37

1 (22 degrees Celsius), in M9 minimal medium, or
2 in LB broth containing 660 millimolar sorbitol
3 and 2.5 millimolar betaine, correct?

4 **A. That's correct. They're a set of**
5 **standard approaches that people use to try to**
6 **get soluble protein.**

08:49

7 Q. What effect does lowering temperature
8 have on enzyme expression or solubility?

9 MR. GROSSMAN: Objection to the form
10 of the question.

08:49

11 THE WITNESS: When you place the
12 cells at lower temperature, they are
13 metabolizing more slowly. They are
14 producing proteins more slowly. And so
15 there are enzymes within the cells,
16 chaperonin proteins, that are present to
17 help fold the proteins properly.

08:49

18 And at lower temperature, if
19 they are formed more slowly, then the
20 chaperonins have a greater ability to do
21 their function and fold the proteins
22 properly. Whereas at high temperature if
23 you have very rapid formation of the
24 proteins they overwhelm the chaperonin
25 system.

08:49

08:50

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1 BY MR. DeR00:

2 Q. Can pH also have an effect on enzyme
3 solubility?

4 MR. GROSSMAN: Objection to the form
5 of the question.

08:50

6 THE WITNESS: When you're dealing
7 with purified proteins, a lot of times
8 people will look at the pH stability of the
9 proteins. You can unfold the protein and
10 so forth. But at high temperature -- I
11 mean high pH or low pH. But in the cell
12 the cytoplasm -- the cells are homeostatic.
13 They maintain pretty much of the same pH
14 within the cell. That's not a trick that's
15 often used for enhancing stability and
16 solubility of proteins.

08:50

08:50

17 BY MR. DeR00:

18 Q. And enzymes typically exist in cells
19 in nature, not in a purified form, right?

20 A. That is --

08:50

21 MR. GROSSMAN: Objection.

22 THE WITNESS: That is correct.

23 BY MR. DeR00:

24 Q. And so once an enzyme has been
25 extracted and purified, can it be important to

08:51

39

1 maintain it at its natural pH to confer

2 solubility?

3 MR. GROSSMAN: Objection to the form
4 of the question.

5 THE WITNESS: When you are dealing 08:51
6 with a purified protein, you want to keep
7 that protein at a -- within a pH regime
8 where it's going to stay soluble usually,
9 depending on what your -- your effort is,
10 your experiment. 08:51

11 BY MR. DeR00:

12 Q. What is the M9 minimal medium that is
13 referred to under the results section of Hogan
14 here?

15 A. So it's a medium in which all of the 08:51
16 components are well characterized. You put
17 together the phosphate buffer and all -- all of
18 the different components. Unlike the LB where
19 it just contains something like hydrolyzed
20 proteins and you don't know exactly what all is 08:52
21 in that milieu.

22 Q. So for the insoluble TfdA variants
23 you tried both the M9 minimal medium and the LB
24 broth.

25 A. Right. 08:52

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1 Q. Is that right?

2 A. Yes.

3 Q. What effect does including sorbitol
4 have on stability?

5 A. I frankly don't recall why it acts in 08:52
6 a positive fashion -- fashion in many cases.
7 But I know that that is a standard approach for
8 enhancing solubility of proteins preventing
9 inclusion body formation. I used to know it but
10 I don't remember now. 08:53

11 Q. Do you recall what effects betaine
12 can have on solubility?

13 A. That's the same quandary, that this
14 was 24 years ago and, yeah, I don't recall.
15 It's just one of the tools that we have in our 08:53
16 arsenal.

17 I would guess that it's referenced in
18 -- yeah, reference 32 would have that
19 information. The Blackwell and Horgan FEBS
20 Letter would probably have it. But... 08:53

21 Q. Would you please look at the bottom
22 of the right-hand column of page 12402 of
23 Exhibit 1027. I'm looking at the last two
24 sentences here.

25 It says, MBP-H245A and MBP-H262A 08:54

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1 proteins were soluble; however, gel filtration
2 analysis indicated the presence of only highly
3 aggregated material eluting in the void volume.

4 Because these mutant proteins exhibited
5 aberrations in their folding properties, the
6 catalytic role of histidine-245 and
7 histidine-262, if any, could not be assessed.

08:54

8 Do you see that?

9 A. Yes.

10 Q. In this project did you conclude that
11 these aggregated 245 and 262 TfdA variants had
12 no activity or could they not be tested?

08:54

13 MR. GROSSMAN: Objection to the form
14 of the question.

15 THE WITNESS: So the highly
16 aggregated samples there was clearly
17 something non-natural about how they
18 behaved. I don't recall if we actually
19 tried to test for activity or not. It's
20 just been too long. But in any case, we
21 didn't want to try to extract information
22 from these proteins that are clearly not
23 folded properly.

08:55

08:55

24 BY MR. DeR00:

25 Q. Were there additional techniques that

08:55

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1 you could have carried out on them to try to get
2 them in position for accurate testing or did you
3 reach the end of the road?

4 MR. GROSSMAN: Objection to the form
5 of the question. 08:56

6 THE WITNESS: One can always devise
7 additional experiments to try to push the
8 limits here and overcome whatever barriers
9 you have, such as with these proteins. But
10 we wanted to get this publication wrapped 08:56
11 up and chose to stop looking at those
12 variants at that point.

13 BY MR. DeR00:

14 Q. Do you still have the '555 patent in
15 front of you here? 08:56

16 A. Let me --

17 MR. GROSSMAN: Pier, I was actually
18 going to say, if you're moving on to a new
19 topic, we've been going for about an hour,
20 can we take a short break? 08:56

21 MR. DeR00: Yeah, that works for me.

22 Dr. Hausinger, five or ten
23 minutes?

24 Let's go off the record.

25 THE STENOGRAPHER: We're off the 08:56

43

1 record at 8:56 a.m.

2 (Whereupon, a recess was taken
3 from 8:56 a.m. to 9:08 a.m.)

4 THE STENOGRAPHER: We're back on the
5 record at 9:08.

09:08

6 BY MR. DeR00:

7 Q. Welcome back, Dr. Hausinger. I
8 assume you didn't discuss the substance of your
9 testimony with counsel during the break, but
10 would you please confirm?

09:08

11 A. I confirm.

12 Q. We were just turning to the '555
13 patent before the break.

14 Do you have it in front of you?

15 A. Yes.

09:08

16 Q. Could you please turn to column 18.
17 Let me know when you're there.

18 A. I'm there.

19 Q. Towards the top of column 18 do you
20 see what's referred to as a consensus motif with
21 variable spacing for alpha-kg-dependent
22 dioxygenases, beginning HX(D/E)?

09:09

23 A. Yes.

24 Q. In that consensus motif the first
25 spacer must be 1 amino acid, the second spacer

09:09

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1 must be 23 to 26 amino acids, the third spacer
2 must be 114 to 183 amino acids, and the fourth
3 spacer must be 10 to 13 amino acids, correct?

4 **A. I wouldn't phrase it as "must be."**

5 **Those were the spaces that were identified back**
6 **around 2004 for the known enzymes. There have**
7 **been a lot of other enzymes in this family since**
8 **then. And the spacing could have been expanded,**
9 **for example. I just don't know about that. But**
10 **that was the conical motif at the time.**

09:09

09:10

11 **Q. And in your declarations, do you**
12 **provide any expanded consensus motif since 2004**
13 **or 2005?**

14 **A. No, that wasn't part of what I was**
15 **asked to look at.**

09:10

16 **Q. Okay. Would you please turn to**
17 **paragraph 26 of your second declaration.**

18 **A. Okay.**

19 **Q. And towards the bottom of your**
20 **paragraph 26 you referred to I think eight plant**
21 **enzymes.**

09:11

22 **Do you see that?**

23 **A. Yes.**

24 **Q. And in this paragraph 26 you're**
25 **referring to a Hausinger 2004 publication, which**

09:11

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1 is Exhibit 1025, correct?

2 **A. Yes.**

3 Q. Would you please retrieve Exhibit
4 1025 from your box.

5 **A. Okay.** 09:11

6 Q. And would you please turn to Table 1
7 on page 22 and confirm this is the Table 1 that
8 you cited in your paragraph 26.

9 **A. That is correct.**

10 Q. And about one-third of the way down 09:12
11 Table 1, do you see the enzyme beginning Petunia
12 hydrida?

13 **A. The flavanone 3 beta-hydroxylase,**
14 **yes.**

15 Q. So the eight enzymes from plants that 09:12
16 you identify in your paragraph 26 in

17 Table 1 -- I'm going to go in the order of

18 Table 1 here -- but it is the petunia enzyme,
19 the citrus enzyme, the arabidopsis enzyme, the

20 two gibberellin oxidases from cucurbita, the 09:12

21 caranthus enzyme, the hyoscyamus niger enzyme,

22 and then we jump all the way to the bottom and

23 it's the tomato oxidase -- ACC oxidase, correct?

24 **A. Yes.**

25 Q. Are those the eight that you referred 09:13

46

1 to in your paragraph 26?

2 A. I believe so, yes.

3 So the point that I was making was
4 that you can have identical spacing in different
5 representatives of this enzyme family working on
6 very different substrates.

09:13

7 Q. And for those eight plant enzymes,
8 they all have 53, 54, or 55 amino acids in their
9 third spacer, correct?

10 A. It looks like it.

09:13

11 Q. And they all have nine amino acids in
12 their fourth spacer, correct?

13 A. I believe so, yes.

14 Q. And these eight plant enzymes do not
15 have between 114 and 183 amino acids in their
16 third spacer; do they?

09:14

17 A. I think I've answered that, but -- I
18 agreed with the prior statement.

19 (Stenographer clarification.)

20 THE WITNESS: I agreed with the prior
21 statement.

09:14

22 BY MR. DeR00:

23 Q. You had one other comparison of
24 enzyme spacing in your paragraph 26, which was
25 between TauD and AtsK?

09:14

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1 Do you see that?

2 **A. Yes.**

3 Q. You did not identify the overall
4 sequence between TauD and AtsK in your
5 declaration; did you?

09:14

6 **A. No, I did not.**

7 Q. And I think I've seen both TauD and
8 AtsK in a few of your publications, like this
9 one and in Elkins.

10 Are you familiar with TauD and AtsK?

09:15

11 **A. Yes. We had done work on TauD from**
12 **one organism. There are actually multiple TauDs**
13 **known that are not all identical in sequence.**
14 **And I'm familiar with a couple papers that have**
15 **been published on AtsK.**

09:15

16 Q. And do you know roughly what the
17 sequence identity is between TauD and AtsK?

18 **A. I do not recall.**

19 Q. Would it surprise you if the sequence
20 identity between TauD and AtsK is about
21 33 percent?

09:15

22 **A. That does not surprise me. They work**
23 **on quite different substrates. They retain the**
24 **same overall fold. But yeah, they are different**
25 **enzymes within the family.**

09:15

48

1 Q. Would it help if I showed you a
2 sequence comparison between these two enzymes?

3 A. **Help in what way?**

4 Q. To confirm the -- the sequence
5 identity between these two.

09:16

6 A. **I have no reason to doubt you. I**
7 **don't think a sequence alignment is necessary.**

8 Q. In your declaration did you identify
9 the overall sequence identities between any of
10 the eight plant enzymes that you cited in
11 paragraph 26?

09:16

12 A. **That was not the point of the**
13 **paragraph. And so, no, I did not include**
14 **overall sequence identity.**

15 Q. Does any enzyme listed in your
16 Table 1 of Exhibit 1025 have the exact same
17 spacings as in the sequence of RdpA?

09:16

18 A. **I don't recall but I don't think so.**
19 **Yeah, I don't think so.**

20 Q. Two rows below AtsK in your Table 1
21 is TfdA.

09:17

22 Do you see that?

23 A. **Yes.**

24 Q. And TfdA was at one time mistakenly
25 believed to be a monooxygenase, correct?

09:18

1 **A. Before the biochemistry was**
2 **elucidated it was called a monooxygenase.**

3 **Q. And you published an article in 1993**
4 **reporting that TfdA is actually a dioxygenase,**
5 **correct?**

09:18

6 **A. That is correct. So we showed that**
7 **one atom of oxygen ends up being incorporated**
8 **into this TfdA in the 2,4-D substrate. The**
9 **other atom of oxygen ends up going into the**
10 **alpha-ketoglutarate, the other cosubstrate which**
11 **was not known to be a cosubstrate at the time.**

09:18

12 **Q. And is that why TfdA is now known as**
13 **an alpha-ketoglutarate-dependent dioxygenase?**

14 **A. Yes.**

15 **Q. RdpA is also an alpha-ketoglutarate-**
16 **dependent dioxygenase, correct?**

09:18

17 **MR. GROSSMAN: Objection to the form**
18 **of the question.**

19 **THE WITNESS: RdpA is an**
20 **alpha-ketoglutarate-dependent dioxygenase.**

09:18

21 **BY MR. DeR00:**

22 **Q. Since you published your article in**
23 **1993, would it be scientifically invalid to**
24 **refer to TfdA as a monooxygenase?**

25 **A. It would be incorrect in the same way**

09:19

50

1 in some ways that referring to these ADD
2 (verbatim) enzymes as dioxygenases is invalid
3 because the two atoms of oxygen do not end up in
4 the -- that single substrate. But yes, that is
5 correct.

09:19

6 Q. I'd like to focus on TfdA for now.
7 We'll get to AAD-1.

8 Since you published your article in
9 1993, would it be misleading to refer TfdA as a
10 monooxygenase?

09:19

11 MR. GROSSMAN: Objection to the form
12 of the question.

13 THE WITNESS: We showed that TfdA is
14 not a monooxygenase even though the
15 activity looks like a monooxygenase in
16 terms of only one atom being incorporated
17 into the substrate. It is, in fact, a
18 dioxygenase and the name of the enzyme
19 should include both 2,4-D and
20 alpha-ketoglutarate.

09:20

09:20

21 BY MR. DeR00:

22 Q. Since you published your article in
23 1993, have you ever taken the position that TfdA
24 and AAD-1 have monooxygenase activity?

25 A. So there was a patent issued that I

09:20

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1 was an expert witness in. And I tried to
2 explain that the monooxygenase was a natural
3 understanding, a natural assumption at the time
4 in the original patent. Because the
5 biochemistry had not been carried out, it was 09:20
6 not known to be alpha-ketoglutarate-dependent.
7 And I was emphasizing that, again, one atom of
8 oxygen ends up being incorporated into the
9 2,4-D. So it's like a monooxygenase but it is,
10 in fact, a alpha-ketoglutarate-dependent 09:21
11 dioxygenase.

12 Q. In that previous expert witness role,
13 was that a case where you were an expert for
14 Bayer against Dow AgriSciences?

15 A. Yes. 09:21

16 Q. And that case involved AAD-1,
17 correct?

18 MR. GROSSMAN: Objection to the form
19 of the question.

20 THE WITNESS: That case did -- was -- 09:21
21 I don't recall AAD-1 being a focus of that
22 case, no.

23 MR. DeR00: Mark, could we please
24 transfer Exhibit 2065 into the publish
25 folder so counsel can retrieve it. 09:22

1 MR. GROSSMAN: I'm going to object to
2 the introduction of new exhibits at this
3 phase, which patent owner is not permitted
4 to do.

5 MR. DeR00: Okay. So I think the 09:23
6 exhibit is in there. If you guys can
7 refresh it, a link, or do we need...

8 MR. GROSSMAN: I don't see the
9 exhibit in the chat.

10 MR. DeR00: So it's in the ShareFile 09:24
11 that was attached to the court reporter
12 email with the Zoom link. Let's see if we
13 can get it in the chat, which might be
14 simpler.

15 Dov, do you see it in the chat? 09:25

16 MR. GROSSMAN: I'm still trying to
17 open it.

18 I'm going to object to this
19 exhibit again on the basis that patent
20 owner is not permitted to introduce new 09:25
21 exhibits at this phase of the case, number
22 one.

23 Number two, I'm going to object
24 to this on relevance grounds.
25

1 BY MR. DeR00:

2 Q. Dr. Hausinger, could you please
3 retrieve Exhibit No. 2065 from your box.

4 MR. GROSSMAN: I'm also going to
5 object to this as incomplete. 09:26

6 THE WITNESS: I have 2065.

7 BY MR. DeR00:

8 Q. Dr. Hausinger, this is your
9 declaration in that previous case between Bayer
10 and Dow AgriSciences, correct? 09:26

11 A. Yes.

12 Q. And you signed this declaration on
13 page 20, correct?

14 A. Yes.

15 Q. At the top of the page there's a 09:27
16 filing date on December 2011.

17 Do you see that?

18 A. Yes.

19 Q. Your declaration is about 18 years
20 after your 1993 article reporting that TfdA was 09:27
21 a dioxygenase, correct?

22 MR. GROSSMAN: Objection to form.

23 THE WITNESS: Right.

24 BY MR. DeR00:

25 Q. Would you please turn to paragraph 21 09:27

54

1 of your Bayer litigation declaration on page 13,
2 please.

3 **A. Okay.**

4 **Q.** And the last sentence stated that,
5 the clear and unequivocal association of the 09:28
6 name "2,4-D monooxygenase" with TfdA and enzymes
7 like TfdA renders it an unambiguous identifier
8 of the class of biological activities to which
9 the claims of the '401 patent refer.

10 Correct? 09:28

11 **A. I see that. That is what it states.**

12 **But I'd like to point out that the**
13 **biochemistry was not known at the time this**
14 **particular patent was filed. And so --**

15 **Q.** Would you look at -- 09:28

16 (Simultaneous speaking.)

17 BY MR. DeR00:

18 **Q.** Sorry.

19 **A. So earlier in that paragraph I talk**
20 **about how TfdA hydroxylates by monooxygenation** 09:29
21 **but has the separate distinct reaction in which**
22 **the second oxygen atom is added to**
23 **alpha-ketoglutarate.**

24 **And so I'm saying that the patent as**
25 **it was written was the best known at the time** 09:29

55

1 **and it was later corrected to show that it does**
2 **more than add the single atom of oxygen.**

3 Q. Would you please retrieve Exhibit
4 1043 from your box.

5 **A. Okay. The Streber, et al., patent.** 09:29

6 Q. Yes. This is the Streber '401 patent
7 you referred to in your Bayer litigation
8 declaration and also in your declarations in
9 these IPRs?

10 **A. Yes.** 09:30

11 Q. Would you please turn to Claim 1 of
12 the '401 patent.

13 Let me know when you're there,
14 column 32.

15 **A. Okay. Got it.** 09:30

16 Q. Do you see that Claim 1 of the '401
17 patent requires a DNA sequence encoding a
18 polypeptide having the biological activity of
19 2,4-D monooxygenase?

20 Do you see that? 09:31

21 **A. That is what it states.**

22 Q. That's the monooxygenase activity you
23 associated with TfdA in paragraph 21 of your
24 Bayer litigation declaration, correct?

25 **A. So that was the biological activity,** 09:31

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1 **which turns out when you get into the enzymology**
2 **it's actually a 2,4-D alpha-ketoglutarate**
3 **dioxygenase.**

4 Q. You gave the opinion in the Bayer
5 litigation that AAD-1 infringes this '401 patent 09:31
6 claim by having that monooxygenase activity,
7 correct?

8 MR. GROSSMAN: Objection to the form
9 of the question.

10 THE WITNESS: So can you clarify 09:31
11 where I state that?

12 BY MR. DeR00:

13 Q. Would you turn to page 14 of your
14 Bayer litigation declaration.

15 MR. GROSSMAN: I'm going to make a 09:32
16 continuing objection to patent owner's
17 attempt to use a document that patent owner
18 is not properly permitted to put into
19 evidence at this stage to try to have
20 testimony about it. 09:32

21 BY MR. DeR00:

22 Q. Are you on page 14 of your
23 declaration?

24 A. **I was on paragraph 14. Sorry.**

25 Q. Oh, I'm sorry. So on page 14 you 09:32

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1 have a section titled Infringement by DAS.

2 Do you see that?

3 A. Yes, I see that.

4 Q. And DAS is Dow AgriSciences?

5 A. I'm assuming so. It's been a long 09:32
6 time since I've looked at this. I assume so.

7 Q. Below the heading Infringement by
8 DAS, in paragraph 25 you refer specifically to
9 AAD-1, correct?

10 A. Yes, I do. 09:33

11 Q. Would you please turn to paragraph 33
12 of your Bayer litigation declaration?

13 A. Okay.

14 Q. You said here in paragraph 33, I
15 understand that DAS has asserted as its defense 09:33
16 to infringement that the accused recombinant AAD
17 genes, code for dioxygenases, not
18 monooxygenases; and therefore they are not
19 encompassed by the '401 patent claims, which all
20 require recombinant genes that encode 09:33
21 monooxygenases.

22 Correct?

23 MR. GROSSMAN: Objection to the form
24 of the question.

25 THE WITNESS: What you said is what 09:34

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1 is stated in the document.

2 BY MR. DeR00:

3 Q. In the next sentence you said that

4 DAS's argument that its AAD proteins were

5 dioxygenases rather than monooxygenases was, 09:33

6 quote/unquote, "simply indefensible."

7 That was the word you used, correct?

8 MR. GROSSMAN: Objection to the form

9 of the question.

10 THE WITNESS: That is the word that I 09:34

11 incorporated there.

12 BY MR. DeR00:

13 Q. Did the Court in this previous Bayer

14 litigation agree with your argument that AAD-1

15 had the monooxygenase activity required by the 09:34

16 '401 patent claims?

17 A. I know that the -- the case was

18 viewed in favor of Dow. I don't know how they

19 weighed all the different components of it.

20 Q. Dr. Hausinger, do you recall giving 09:35

21 live testimony before the judge in this previous

22 Bayer litigation?

23 A. I do recall that, yes.

24 Q. And that testimony was under oath,

25 correct? 09:35

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1 **A. Of course, yes.**

2 MR. DeR00: Mark, would you please
3 drop Exhibit 2062 into the chat, please.

4 And Dr. Hausinger, can you
5 retrieve Exhibit 2062 from your box. 09:36

6 Dov, do you have the exhibit?

7 MR. GROSSMAN: Not yet.

8 THE WITNESS: I have it.

9 MR. DeR00: Let's wait for counsel
10 for a second here. 09:36

11 MR. GROSSMAN: I'm going to -- I have
12 it.

13 I'm going to object to this
14 exhibit, again, on the basis that what
15 patent owner is doing by trying to 09:37
16 introduce new exhibits at this phase of the
17 case is improper and, number two, for
18 relevance reasons.

19 BY MR. DeR00:

20 Q. Dr. Hausinger, this is a transcript 09:37
21 from the Markman hearing in Bayer CropScience AG
22 versus Dow AgriSciences, LLC, Civil Action
23 10-1045 before Judge Bumb, B-u-m-b.

24 And if you turn to page 3, are you
25 the Dr. Hausinger identified there in the table 09:37

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1 of contents for your direct and
2 cross-examinations?

3 **A. Yes.**

4 Q. Let's turn in your direct testimony
5 to page 64 of the transcript, please. 09:37

6 Starting at line 6 of page 64, you
7 were asked if the TfdA enzyme is a
8 metal-containing enzyme.

9 Do you see that?

10 MR. GROSSMAN: Objection to the form 09:38
11 of the question.

12 I'm making again a continuing
13 objection to patent owner's attempt to try
14 to find a way to get a document into
15 evidence at this stage of the proceeding. 09:38

16 THE WITNESS: I do see that.

17 BY MR. DeR00:

18 Q. And you answered that, yes, TfdA is a
19 metal-containing enzyme.

20 **A. I answered: "Yes. We demonstrated 09:38
21 that it requires an iron atom in its ferrous
22 state."**

23 Q. Then were you asked on line 10: "And
24 do you know whether the AAD enzyme that Dow uses
25 is also a metal-containing enzyme?" 09:39

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1 Do you see that?

2 A. Yes.

3 Q. And you answered: "It's the same
4 reaction mechanism, it has the same
5 requirements, yes."

09:39

6 Correct?

7 A. That's what I said.

8 Q. Would you turn to page 69 of the
9 transcript, which is still in your direct
10 examination, please.

09:39

11 A. Okay.

12 Q. Starting on line 17 of page 69 it
13 referred to a paper by Tiedje and Alexander.

14 Is that one of the papers that
15 mistakenly referred to TfdA as a monooxygenase?

09:39

16 MR. GROSSMAN: Objection to the form
17 of the question.

18 Again, a continuing objection to
19 patent owner's use of this exhibit in this
20 manner.

09:40

21 THE WITNESS: That was the original
22 publication where 2,4-D was shown to
23 generate the 4 dichloro- --

24 2,4-dichlorophenol and glyoxylate. And
25 based on what was known at the time, the

09:40

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1 author suggested that it was a
2 monooxygenase reaction.

3 BY MR. DeR00:

4 Q. Starting on line 22 of page 69, you
5 explained that the author: "...suggested that a 09:40
6 similar action was being carried out in these
7 intact bacteria, but they did not characterize"
8 -- "they did not purify the protein and
9 characterize it."

10 That protein you were referring to is 09:40
11 TfdA?

12 MR. GROSSMAN: Objection to the form
13 of the question.

14 THE WITNESS: The supposed
15 monooxygenase that was characterized in 09:41
16 cells by Tiedje and Alexander is TfdA that
17 we ended up characterizing as a 2,4-D
18 alpha-ketoglutarate dioxygenase.

19 BY MR. DeR00:

20 Q. You explained: "They did not purify 09:41
21 the protein and characterize it. So that's what
22 we wanted to do."

23 Did your lab purify TfdA as part of
24 determining that it was a dioxygenase?

25 A. Yes, we did. 09:41

1 Q. Would you please turn to page 143,
2 which is in your cross-examination.

3 A. I'm there.

4 Q. Starting at line 4 of page 143, you
5 were asked a question showing you your 09:42
6 deposition testimony in this case.

7 Do you see that?

8 A. Yes.

9 MR. GROSSMAN: Object to the form of
10 the question. 09:42

11 I'm also going to object to this
12 exhibit as incomplete.

13 BY MR. DeR00:

14 Q. At line 10 of page 143 a piece of
15 your testimony was read back to you: "If one 09:42
16 knows that it's a 2,4-D alpha-ketoglutarate
17 dioxygenase, I think it's misleading to call it
18 a 2,4-D monooxygenase."

19 And you were asked to confirm that's
20 testimony you gave, line 16. 09:43

21 Your answer: "That is correct."
22 Correct?

23 MR. GROSSMAN: Objection to the form
24 of the question.

25 THE WITNESS: That is what the 09:43

1 document shows.

2 BY MR. DeR00:

3 Q. And line 13 you were also provided
4 with your previous testimony: "If one calls it
5 a 2,4-D alpha-ketoglutarate dioxygenase, a 09:43
6 2,4-D monooxygenase, that's scientifically
7 invalid."

8 That was also your testimony in this
9 case, correct?

10 MR. GROSSMAN: Same objection. 09:43

11 THE WITNESS: When one knows what the
12 reaction mechanism is, and it is a 2,4-D
13 alpha-ketoglutarate dioxygenase, then that
14 is what it should be called.

15 BY MR. DeR00: 09:44

16 Q. Would you please turn to page 176,
17 please. At the bottom of this page you were
18 asked about some legalese language in your
19 affidavit.

20 On line 22 you were asked: "Do you 09:44
21 ever in your scientific writing say that
22 somebody made an admission?"

23 Do you see that?

24 A. I see that.

25 Q. You answered: "This is not 09:44

65

1 scientific writing."

2 Correct?

3 MR. GROSSMAN: Same objection to the
4 form of the question.

5 THE WITNESS: That was my answer. 09:45

6 BY MR. DeR00:

7 Q. And at the top of the page 177 you
8 attributed legal words like "admission" in your
9 declaration as being provided by the lawyers who
10 helped you write your declaration, correct? 09:45

11 MR. GROSSMAN: Same objection.

12 THE WITNESS: That is what it says.

13 BY MR. DeR00:

14 Q. This is the transcript of your
15 testimony, correct? 09:45

16 A. **Yes, that is correct.**

17 Q. You can put that aside now.

18 Could you please turn in your second
19 IPR declaration, to paragraph 27, please.

20 A. **Okay.** 09:46

21 Q. You start paragraph 27 saying, I
22 understand that Corteva has suggested a briefing
23 to the Board that, at my deposition, I somehow
24 acknowledged that Figure 2 of Schleinitz 2004
25 discloses the AAD-1 motif. 09:46

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1 My question is: Is this information
2 that was provided to you by counsel?

3 **A. Writing a declaration was an**
4 **iterative process. I contributed some parts and**
5 **counsel offered some suggestions. I don't**
6 **remember specifically who provided this sentence**
7 **or who came up with this sentence.**

09:46

8 Q. Did you review the briefing to the
9 Board or was that information just conveyed to
10 you by counsel?

09:47

11 **A. That was just conveyed to me by**
12 **counsel.**

13 Q. If you look maybe four or five lines
14 up from the bottom of the paragraph, do you see
15 that you referred to me as "counsel for
16 Corteva"?

09:47

17 Do you see that?

18 **A. Yes.**

19 Q. Is that what you call people in real
20 life in your scientific writing or was that
21 written by counsel?

09:47

22 MR. GROSSMAN: Objection to the form
23 of the question.

24 THE WITNESS: Again, this was a joint
25 effort to create this document. This

09:47

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1 particular line could well have been
2 provided by counsel. Maybe I modified it.
3 I don't recall.

4 BY MR. DeR00:

5 Q. In this -- if you go up just a couple 09:48
6 more lines in your paragraph 27, you wrote that
7 during our first deposition together you
8 identified in RdpA where the five amino acid
9 residues of the consensus motif were located, as
10 well as what the spacing was between the 09:48
11 residues. And then in the next sentence you
12 disagreed that those five amino acids at their
13 particular locations in the sequence of RdpA
14 discloses the AAD-1 motif.

15 Do I have the gist of that correct? 09:48

16 MR. GROSSMAN: Objection to the form
17 of the question.

18 THE WITNESS: Schleinitz did not
19 specify anything about an AAD-1 motif.
20 Schleinitz was talking about the sort of 09:49
21 general type of alpha-ketoglutarate-
22 dependent dioxygenase motif.

23 BY MR. DeR00:

24 Q. And RdpA sequence is provided as
25 Seq. ID 9 in the Corteva patents, correct? 09:49

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1 **A. Correct.**

2 Q. And '555 patent claims priority back
3 to a PCT application filed in 2005 and a
4 provisional application filed in 2004; is that
5 correct?

09:50

6 **A. Those patent applications never had**
7 **an AAD-1 motif specified.**

8 Q. In your box would you please retrieve
9 Exhibit 1021, please.

10 **A. Okay.**

09:50

11 Q. And Exhibit 1021 is the priority PCT
12 application, Corteva '437, that you've used in
13 your declarations, correct?

14 **A. Yes.**

15 Q. Would you turn at the back to
16 Seq. ID No. 9, which starts at page 4/22 at the
17 top.

09:51

18 **A. Got it.**

19 Q. I'm going to ask you about a few
20 residues at particular positions, if you can
21 follow along.

09:51

22 **A. 422 shows DNA sequence, not protein**
23 **sequence.**

24 Q. At the bottom of 422, do you see
25 there is an amino acid sequence? Just the first

09:51

1 line appears on page 422 and it's 5 of 22.

2 Do you see that?

3 A. Yes.

4 Q. So Seq. ID No. 9 in Exhibit 1021 has
5 a histidine at position 111, an aspartic acid at
6 position 113, a threonine at position 138, a
7 histidine at position 270, an arginine at
8 position 281, and an arginine at position 285.

09:52

9 Did I identify those particular
10 residues correctly?

09:52

11 MR. GROSSMAN: Object to the form of
12 the question.

13 THE WITNESS: The sequence does
14 include the residues as you've listed.

15 BY MR. DeR00:

09:53

16 Q. In your opinion does the disclosure
17 in Seq. ID 9 of the histidine at position 111,
18 aspartic acid at position 113, threonine at
19 position 138, histidine at position 270, and
20 arginine at position 281 disclose the AAD-1
21 motif of the challenged claims?

09:53

22 MR. GROSSMAN: Same objection.

23 THE WITNESS: One can apply the
24 canonical alpha-ketoglutarate motif,
25 consensus motif, to this sequence and those

09:53

1 residues will be highlighted.

2 I don't view that as indicating
3 an AAD-1 motif.

4 BY MR. DeR00:

5 Q. So the answer is, no, it does not 09:53
6 disclose an AAD-1 motif?

7 A. Correct.

8 Q. In your opinion, it is not sufficient
9 for Seq. ID No. 9 to have the required amino
10 acids at those positions; is that correct? 09:54

11 A. State the question again.

12 Q. In your opinion, it's not sufficient
13 to disclose the AAD-1 motif by having Seq. ID
14 No. 9 with the required amino acids at those
15 positions that we just went through? 09:54

16 A. Absolutely. The AAD -- not. The
17 AAD-1 motif, if there's such a thing, would
18 require something dealing with
19 (R)-enantiospecificity. And nothing is
20 indicated in the patent about that, what 09:54
21 residues are necessary.

22 Q. So I have the same questions for you
23 regarding Seq. ID No. 10 in Exhibit 1021. So
24 this starts on page 6 of 22.

25 Just let me know when you're there. 09:55

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1 **A. I'm there.**

2 Q. Would you confirm for me that
3 Seq. ID No. 10 has a histidine at position 111,
4 aspartic acid at position 113, threonine at
5 position 138, histidine at position 270,
6 arginine at position 281, and arginine at
7 position 285.

09:55

8 Did I identify those positions
9 correctly?

10 **A. The sequence does include those**
11 **residues as you've stated.**

09:55

12 Q. Same questions as before, does the
13 disclosure in Seq. ID No. 10 with the histidine
14 at position 111, aspartic acid at position 113,
15 threonine at position 138, histidine at position
16 270, arginine at position 281 disclose the AAD-1
17 motif of the challenge claims?

09:56

18 **A. And I would say no.**

19 Q. And again in your opinion, it's not
20 sufficient to disclose the AAD-1 motif for
21 Seq. ID 10 to have the required amino acids at
22 those positions, correct?

09:56

23 **A. In my opinion, there is no AAD-1**
24 **motif denoted in this patent. It's really the**
25 **consensus motif just applied to these sequences.**

09:56

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1 MR. DeR00: Why don't we take another
2 short break here.

3 THE STENOGRAPHER: We're going off
4 the record at 9:56 a.m.

5 (Whereupon, a recess was taken 09:57
6 from 9:56 to 10:07 a.m.)

7 THE STENOGRAPHER: Back on the record
8 at 10:07.

9 BY MR. DeR00:

10 Q. Dr. Hausinger, would you turn in your 10:07
11 Appendix 1 to your list of materials considered,
12 please.

13 A. Okay.

14 Q. And would you confirm that you listed
15 Exhibit 2004, "Protein Sequences"? 10:07

16 A. Yes.

17 Q. Would you please retrieve that
18 exhibit from your box, please.

19 MR. DeR00: And at this point I'll
20 mark the transcript confidential under the 10:08
21 protective order.

22 THE WITNESS: Okay.

23 BY MR. DeR00:

24 Q. And this is the Exhibit 2004 you
25 considered in forming your opinions in your 10:08

1 second declaration?

2 A. Correct.

3 Q. And on this document are [REDACTED]

4 [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED].

5 Do you see that?

10:09

6 A. Yes.

7 Q. [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

8 [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED],

9 correct?

10 A. Correct. [REDACTED]

10:09

11 [REDACTED].

12 Q. And [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

13 [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED], correct?

14 A. That's correct. [REDACTED]

15 [REDACTED]

10:09

16 [REDACTED].

17 Q. The sequences for [REDACTED] [REDACTED] [REDACTED]

18 [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

19 [REDACTED] [REDACTED]; is that correct?

20 A. Yes.

10:10

21 Q. And would you also confirm the [REDACTED]

22 [REDACTED] [REDACTED] [REDACTED] [REDACTED].

23 A. [REDACTED]

24 [REDACTED]. Oh, okay.

25 Q. And you can see at the top of

10:10

1 page 6 --

2 A. Page 6, yes.

3 Q. -- [REDACTED] [REDACTED] [REDACTED] [REDACTED]

4 [REDACTED] [REDACTED]?

5 A. Yes. 10:10

6 Q. So there is a standardized way here
7 where I think I can help with counting residues.
8 Would you mind confirming for me that
9 the full rows here have 50 amino acids.

10 A. Each row has 50 amino acids. 10:11

11 Q. At the end of the first row it would
12 be position 50, the end of the second row would
13 be 100, third row would be 150, et cetera,
14 correct?

15 A. Correct. 10:12

16 Q. Looking at the native AAD-1 sequence,
17 it has a glycine shown as G at position 59,
18 correct?

19 A. Yes.

20 Q. Looking at [REDACTED] [REDACTED] [REDACTED] [REDACTED], 10:12

21 [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

22 [REDACTED] [REDACTED] [REDACTED], correct?

23 A. That is correct.

24 Q. Would you confirm for me that

25 [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] 10:12

1 [REDACTED].

2 A. That seems to be the case, yes.

3 Q. Turning back to the native AAD-1
4 sequence, there is a threonine at position 145,
5 correct?

10:13

6 A. That's correct.

7 Q. Can you confirm for me that [REDACTED]
8 [REDACTED]
9 [REDACTED].

10 A. That is correct.

10:14

11 Q. The native AAD-1 sequence has a
12 lysine at position 213, correct?

13 A. That is correct.

14 Q. Would you please confirm for me that
15 [REDACTED]
16 [REDACTED]?

10:14

17 A. Yes.

18 Q. In the native AAD-1 sequence there is
19 an alanine at position 231, correct?

20 A. Correct.

10:15

21 Q. Would you please confirm for me that
22 [REDACTED]
23 [REDACTED].

24 A. I can confirm that.

25 Q. And last one, the native AAD-1

10:16

1 sequence has a leucine at position 236, correct?

2 A. Yes.

3 Q. Would you please confirm for me that

4 [REDACTED]

5 [REDACTED]. 10:16

6 A. That's correct.

7 Q. Would you please retrieve Exhibit

8 1042 from your box of documents, please.

9 A. The Schleinitz paper.

10 Q. And actually we have the blowup again 10:17

11 of the sequence alignment as Exhibit 2042 from

12 your last deposition, if that would be easier to

13 look at.

14 A. Okay.

15 Q. For the record, this is a blowup of 10:17

16 Schleinitz Figure 2.

17 Would you please confirm for me that

18 this is a sequence alignment of RdpA, TauD,

19 TfdA, and SdpA, those four enzymes?

20 A. I confirm that. 10:17

21 Q. And would you please using the -- let

22 me start again.

23 Using the numbering for the RdpA

24 residues, turn to position 59 in the sequence

25 alignment. 10:18

1 And at position 59 RdpA has a

2 G shaded in gray, correct?

3 **A. Yes, that is correct.**

4 Q. And this glycine at position 59 is

5 conserved in three of the four sequences in the 10:18

6 alignment, correct?

7 **A. Yes.**

8 Q. Would you turn to position 145,

9 please.

10 RdpA has a T while all three other 10:18

11 enzymes have an A shaded in gray, correct?

12 **A. That is correct.**

13 Q. That alanine is conserved in three of

14 four sequences in this alignment, correct?

15 **A. Yes.** 10:19

16 Q. Would you turn to residue 213,

17 please.

18 Can you confirm that RdpA has a K

19 shaded in gray.

20 **A. Yes.** 10:19

21 Q. This lysine is conserved in three of

22 the four sequences, correct?

23 **A. Correct. It's a proline in SdpA.**

24 Q. Let's turn to position 231, please.

25 RdpA has an A shaded in gray, 10:19

1 correct?

2 A. Yes.

3 Q. This alanine is conserved in all four
4 sequences, correct?

5 A. Yes. 10:20

6 Q. And let's turn to position 236,
7 please.

8 RdpA has an L shaded in gray,
9 correct?

10 A. Yep. 10:20

11 Q. And this leucine is conserved in
12 three of four sequences, correct?

13 A. That's correct. It's a phenylalanine
14 in SdpA.

15 MR. DeR00: Dr. Hausinger, thank you 10:20
16 for your time. I don't believe I have more
17 questions for you at this moment.

18 I will confirm marking the
19 transcript confidential.

20 MR. GROSSMAN: Can we confirm here 10:20
21 that the portion that you're marking --
22 just for clarity, the portion that's
23 confidential is the portion that was
24 talking about Exhibit 2004?

25 MR. DeR00: I believe that's right. 10:21

1 MR. GROSSMAN: If you want to do 2004
2 through the end of the depo, that's fine.
3 But at least for present purposes until
4 it's filed. But prior to that, it's not
5 confidential.

10:21

6 MR. DeR00: I think that's right,
7 Dov.

8 (Whereupon, a discussion was had
9 off the record at 10:21 a.m.)

10 MR. GROSSMAN: Why don't we take a
11 break now.

10:21

12 THE STENOGRAPHER: Off the record at
13 10:21 a.m.

14 (Whereupon, a recess was taken
15 from 10:21 a.m. to 10:36 a.m.)

10:37

16 THE STENOGRAPHER: The time is 10:36
17 and we're back on the record.

18 EXAMINATION

19 BY MR. GROSSMAN:

20 Q. Good morning, Dr. Hausinger.

10:37

21 A. Hi, Dov.

22 Q. Dr. Hausinger, if Claim 1 were
23 understood to allow for degradation of both
24 (R)-FOPS and (R) phenoxy auxins as well as
25 (S)-FOPS and (S) phenoxy auxins so long as it

10:37

80

1 still had activity on the (R) enantiomers, would
2 that change your opinions in this case regarding
3 written description?

4 A. No, it would not.

5 Q. Why not? 10:37

6 A. So the -- the claims really focused
7 on (R)-enantiospecificity. But, in fact, they
8 don't have any idea of which residues are
9 responsible for that.

10 And so all of the concerns that I 10:38
11 expressed in my declaration about the AAD-1
12 motif, including the lack of arginine 285, for
13 example, in Claim 1 and the 85 percent sequence
14 identity, all of those issues are still present.
15 They don't know what is necessary in order to 10:38
16 have the (R)-enantiospecificity, which is really
17 what they are aiming for in their engineered
18 constructs.

19 MR. GROSSMAN: Thank you,
20 Dr. Hausinger. I have no further 10:38
21 questions.

22 MR. DeR00: I have just one.

23 FURTHER EXAMINATION

24 BY MR. DeR00:

25 Q. Dr. Hausinger, did you consult with 10:38

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1 Mr. Grossman and your counsel in the break

2 between my questioning and his?

3 A. Yes, we did discuss --

4 MR. GROSSMAN: I'll let the witness

5 answer "yes" or "no." 10:39

6 THE WITNESS: Okay. Yes.

7 BY MR. DeR00:

8 Q. And you did discuss.

9 And what did Mr. Grossman tell you he
10 was going to ask? 10:39

11 A. He --

12 MR. GROSSMAN: I'm going to instruct
13 the witness not to answer. Those
14 conversations are privileged.

15 MR. DeR00: And my understanding is 10:39
16 that if there is consulting in between
17 cross and redirect, that's valid for
18 discovery.

19 Do you disagree with that?

20 MR. GROSSMAN: I do disagree with 10:39
21 that.

22 But Dr. Hausinger, if you'd like
23 to generally describe if you agree it's not
24 a waiver here.

25 MR. DeR00: Okay. 10:39

1 THE WITNESS: Okay.

2 MR. GROSSMAN: You may at a high
3 level generally describe what was
4 discussed.

5 THE WITNESS: So counsel asked me if 10:40
6 there were any concerns that I had. And
7 then we focused in on one question where I
8 was perhaps less clear than I should be.
9 And the counsel suggested one line of
10 argument -- or of questioning that he would 10:40
11 proceed on.

12 BY MR. DeR00:

13 Q. Dr. Hausinger, did you help craft the
14 questions that you were asked in redirect by
15 your counsel? 10:40

16 A. I would not say that, no.

17 Q. Okay. Did counsel provide any
18 suggestions on what you should include in your
19 answers?

20 A. Counsel -- 10:40

21 MR. GROSSMAN: I'm going to object.
22 I've given you enough leeway
23 here.

24 MR. DeR00: That's a "yes" or "no."
25 It's a "yes" or "no." 10:40

1 MR. GROSSMAN: Did you -- fine. You
2 can answer that question "yes" or "no."

3 THE WITNESS: I would say no.

4 MR. DeR00: All right. No further
5 questions.

10:41

6 THE STENOGRAPHER: We're off the
7 record at 10:41 at the conclusion.

8 (Time concluded: 10:41 a.m.)
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1 CERTIFICATE OF REPORTER

2

3 I, Janice M. Kocek, Certified Shorthand
4 Reporter, Certified LiveNote Reporter, and
5 Notary Public in and for the State of Illinois,
6 County of Cook, the officer before whom the
7 proceedings were taken, do hereby certify that
8 the foregoing transcript is a true and correct
9 record of these proceedings; that said
10 proceedings were taken in Stenotype notes by me
11 on the 1st day of August, 2024, via Zoom
12 videoconferencing, commencing at 8:01 a.m. EST
13 and ending at 10:41 a.m. EST.

14 I further certify that present on
15 behalf of Petitioner Bayer CropScience LP,
16 Monsanto Company, and Inari Agriculture, Inc.,
17 were Dov P. Grossman, Ben Picozzi and Jessica
18 Palmer Ryen of Williams & Connolly, and present
19 on behalf of Patent Owner Corteva AgriScience
20 LLC were Pier DeRoo and Mark Lampert of
21 Finnegan, Henderson, Farabow, Garrett & Dunner,
22 LLP.

23 I further certify that I am not
24 related to, nor associated with any of the
25 parties or their attorneys, nor do I have any

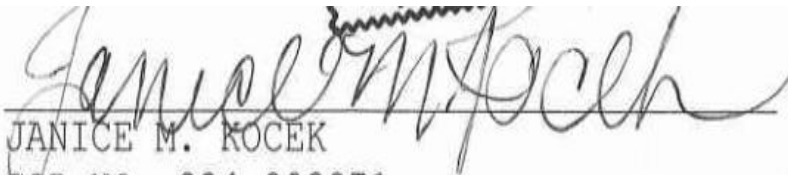
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1 disqualifying interest, personal or financial in
2 the actions within.

3 Dated this 4th of August, 2024, at
4 the County of Cook, State of Illinois.

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11 JANICE M. ROCEK
12 CSR NO. 084-002871
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