

UNITED STATES DEPARTMENT OF JUSTICE
DRUG ENFORCEMENT ADMINISTRATION

IN THE MATTER OF:

Schedules of Controlled
Substances: Placement of : Docket No.
2,5-dimethoxy-4- : 24-24
iodoamphetamine (DOI) and :
2,5-dimethoxy-4- :
chloroamphetamine (DOC) :
in Schedule I :
:

Thursday,
November 14, 2024

700 Army Navy Drive
Arlington, Virginia

The above-entitled matter came on for
hearing, pursuant to notice, at 9:00 a.m. EST

BEFORE:

THE HONORABLE PAUL E. SOEFFING,
Administrative Law Judge

APPEARANCES:

On Behalf of the Government:

FRANK W. MANN, ESQ.
KAYLA L. KREINHEDER, ESQ.
ALEXIS B. ATTANASIO, ESQ.
Office of Chief Counsel
Drug Enforcement Administration
8701 Morrisette Drive
Springfield, VA 22152
(571) 362-7908

On Behalf of the Science Policy Counsel,
Students for Sensible Drug Policy:

BRETT PHELPS, ESQ.
Phelps Law Office
1917 Hot Springs Boulevard
Las Vegas, NM 87701
brett@brettphelpslaw.com
(505) 425-5129

On Behalf of Dr. Raul A. Ramos:

ROBERT T. RUSH, ESQ.
Law Office of Robert T. Rush
600 17th Street
Suite 2800 South
Denver, CO 80202
rrush@rrushlaw.com
(201) 759-1493

ALSO PRESENT:

THERESA M. CARBONARO, Government's Expert
T.J. GLEASON, Law Clerk
ALAINA M. JASTER, Petitioner's Expert

CONTENTS

WITNESS DIRECT CROSS REDIRECT RECROSS

Raul Ramos	628	682	696
Harrison Elder	707		

EXHIBITS MRKD RECD

Petitioner

65	Journal Article published 2009	635	635
50	Research Article	638	638
74	Resume of Alexis Attanasio	708	708

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

2 (9:03 a.m.)

3 JUDGE SOEFFING: Very good. We're back
4 on the record. Dr. Ramos is on the stand. I
5 remind you, Dr. Ramos, you're still under oath. And
6 Mr. Mann, you may conduct your voir dire of the
7 witness.

8 VOIR DIRE

9 BY MR. MANN:

10 Q Good morning, Dr. Ramos.

11 A Good morning.

12 Q Dr. Ramos, have you ever worked with a
13 Schedule I controlled substance?

14 A I have not. No.

15 Q Have you ever tested or used a psychedelic
16 in any research?

17 A Yes, I have been working every day with
18 DOI for the last two and a half years.

19 Q And the purpose, is that to assess the use
20 of DOI as a therapy?

21 A My research, at its core, because my
22 research is basic neuroscience where I perform
23 experiments in rodent models, the premise of my
24 research has the potential to inform future
25 therapies in humans.

1 Q All right. Are you testing any other
2 psychedelics?

3 A Just DOI.

4 Q No other scheduled controlled
5 substances?

6 A No, sir.

7 Q Are you testing any non-controlled
8 substances other than DOI?

9 A My research is primarily focused on DOI.

10 Q What are you planning to testify about
11 today?

12 A I'm planning to testify about the
13 potential anti-pain properties of DOI.

14 Q That's all you're testifying about,
15 correct?

16 A I'm not sure how much -- I can't predict
17 --

18 Q What are you testifying about today?

19 JUDGE SOEFFING: Hold on one second.
20 The mic is apparently too close here.

21 THE WITNESS: Okay. Yeah, yeah.

22 JUDGE SOEFFING: Sorry.

23 THE WITNESS: I find the question
24 confusing because I can't predict what the future
25 is, right? I'm here to answer questions for both

1 my party and the Government's party.

2 MR. MANN: All right. One moment. Is
3 it fair to say, Dr. Ramos, that you will testify
4 about the study of serotonin and serotonin
5 receptors, that it is fundamental for advancing our
6 understanding of the brain as well as the spinal
7 cord and the peripheral nervous system?

8 THE WITNESS: Yes, sir.

9 BY MR. MANN:

10 Q And that you will primarily testify about
11 your current research, is that correct?

12 A Yes, sir.

13 Q And that you are not here to testify about
14 the Eight Factor test, is that correct?

15 A Yes, sir.

16 Q Thank you. Now, I want to look at your
17 CV. That would be Exhibit 81. Do you have that
18 in front of you? Now, it would be fair to say that
19 DOI is not mentioned anywhere in your CV. Is that
20 correct?

21 A Yes, sir.

22 Q And do any of these publications concern
23 DOI?

24 A No, I think that we couldn't --

25 Q Yes or no?

1 A No.

2 Q Do any of these research grants concern
3 DOI?

4 A Yes.

5 Q Which one?

6 A The Hannah H. Gray Fellow Award by the
7 Howard Hughes Medical Institute.

8 Q Okay. And that is a project that is
9 ongoing, correct?

10 A Yes, sir.

11 Q All right. Do you have a copy of your
12 research proposal for that?

13 A Not on me.

14 Q You didn't bring that. Do you have a copy
15 of the research protocol for that?

16 A Not on me.

17 Q You didn't bring that. Is that correct?

18 A Yes, sir.

19 Q All right. And you're not testing any
20 other psychedelics to determine the effects on
21 somatosensory perceptions, correct?

22 A No, sir. Just DOI.

23 Q And you've been working on this, I'm
24 sorry, I asked you that already. You've been
25 working on this project for two years?

1 A Yes, sir.

2 Q And you have at least two years more to
3 go, is that correct?

4 A Yes, sir.

5 Q And you don't know the full effects of DOI
6 on somatosensory perception, do you?

7 A No, sir.

8 Q And you've authored no papers on this
9 particular specialty, this effect of DOI on
10 somatosensory perception, correct?

11 A Not yet.

12 Q And none of your work on DOI has been peer
13 reviewed?

14 A Not yet.

15 Q And none of it has been published, is that
16 correct?

17 A Not yet.

18 Q Now, I noticed that in your CV you wrote,
19 fellows will receive, and I'm reading from the top
20 of page two, fellows will receive funding through
21 their academic institution for postdoctoral
22 training. Is that correct?

23 A Yes, sir.

24 Q So you're still in training, aren't you?

25 A That is how scientists generally talk

1 about their work.

2 Q Yes or no, are you still in training?

3 A Yes. Yes.

4 Q And this research grant dealing with the
5 Miller Postdoctoral Research Fellowship Award,
6 that has nothing to do with psychedelics, does it
7 not?

8 A The award was given to me for the study
9 of MDMA, and I've been using the funding to study
10 DOI because the grant allowed the breathing room.

11 Q So we're talking about the same grant,
12 2022 to 2025?

13 A Yes, sir.

14 Q But you're not studying MDMA?

15 A No. The grant gave me the opportunity to
16 refocus my research on DOI.

17 Q Could you tell me, Doctor, your study is,
18 it's fair to say your study is only half done,
19 correct?

20 A Yes, sir.

21 Q Could you tell me how engaging in a half
22 completed study qualifies you to be an expert in
23 the effects of psychedelics on somatosensory
24 perception when you don't even know the full
25 effects of somatosensory perception?

1 A Yes, sir. I can tell you how that
2 qualifies me as an expert. I've spent the last 10
3 years training in experimental neuroscience
4 techniques. I've been reading about
5 somatosensation and performing experiments on
6 touch, itch, and pain neurons since 2019. This
7 project, I've been thinking about it
8 intellectually for probably over five years and
9 been working on it every day for the last two and
10 a half years. This is not science. Doesn't
11 happen overnight. Science is slow and it takes a
12 long time. Biology is slow. So saying that I'm
13 not an expert because there are no publications is
14 a mischaracterization of my expertise.

15 Q Well, I'm not trying to mischaracterize
16 anything. I'm just telling -- I think you
17 testified that you do not know the full effects of
18 DOI on somatosensory perception, and you're not
19 researching any other psychedelics. And
20 apparently you're being offered as an expert in the
21 effects of psychedelics on somatosensory
22 perception. So is that a mischaracterization?

23 A No.

24 MR. MANN: Your Honor, this witness is
25 certainly not an expert in psychedelics,

1 hallucinogens, drug abuse, drug addiction. He has
2 no published works on hallucinogens. His research
3 is only half done. It appears he's going to
4 testify only about his project. He's not going to
5 testify about the Eight Factor test. And based on
6 his prior testimony yesterday, it appears he's only
7 going to testify about the perceived difficulties
8 he thinks he may face if DOI -- DOC and DOI are
9 scheduled. He's not an expert on how scheduling
10 a controlled substance affects research as a whole.
11 He's certainly not an expert in research
12 techniques. He's not being offered for that.

13 And so I see no reason here to qualify him
14 as an expert. If he's going to testify about what
15 he thinks the scheduling of DOI or DOC might have
16 on his research, he could be offered as a fact
17 witness. But there's no need to qualify him as an
18 expert for the purposes of his testimony today.

19 JUDGE SOEFFING: Thank you, Mr. Mann.
20 Mr. Phelps, your position?

21 MR. PHELPS: Yes.

22 JUDGE SOEFFING: Come on up to the
23 podium.

24 VOIR DIRE

25 BY MR. PHELPS:

1 Q So, Dr. Ramos, could you explain the
2 context of what it means that you are in training
3 in the academic world?

4 A Yes. Being a scientist means that you're
5 a lifelong learner, and so you're always learning
6 and always in training. We're trained by people
7 who are more senior than us, and we learn from
8 people that are more junior than us. It's very
9 common language in science to refer to almost any
10 stage of your career as training.

11 It's even in the language of grants. You
12 often receive grants that are called training
13 grants because they give you the money to perform
14 science that's going to improve your abilities. So
15 it's really common to use the word training at
16 almost any stage of the scientific career. Yes.

17 BY MR. PHELPS:

18 Q Okay. When did you begin studying
19 somatosensory perception?

20 A I first began studying somatosensory
21 perception in 2019.

22 Q 2019. And how, what -- how did you begin
23 those studies?

24 A In 2019, I began studying somatosensation
25 by working as an electrophysiology teaching

1 assistant with Dr. Diana Bautista and Dr. Ellen
2 Lumpkin. Both of these scientists are incredibly
3 renowned in the field, and I worked for them at the
4 Marine Biological Laboratory, preparing samples of
5 touch, itch, and pain neurons for
6 electrophysiology experiments.

7 Q If you had to estimate, how many hours do
8 you think you've spent in the lab working on
9 somatosensory perception research?

10 A Gosh, I couldn't tell you, but it would
11 be thousands.

12 Q Thousands over the course of the last five
13 years?

14 A Yes.

15 Q And how many -- could you describe your
16 review of the literature on somatosensory
17 perception?

18 A Yes. I read papers on somatosensation
19 almost every day and I've been reading papers on
20 somatosensation since 2019. I've met several of
21 the foremost leading experts on somatosensation in
22 science over the last several years and maintained
23 close correspondence with many, as well as I follow
24 all of their work very closely.

25 Q How would you describe your knowledge of

1 the history of the study of somatosensory
2 perception?

3 A My historical knowledge of the study of
4 somatosensory perception is great, actually.

5 Q And how would you describe your knowledge
6 or understanding of the most current or cutting
7 edge research in somatosensory perception?

8 A I would say that I'm up to date on the
9 latest understandings and everything that has to
10 do with somatosensation.

11 Q Dr. Ramos, how long have you, either
12 formally or informally, been studying or educating
13 yourself about the field of psychedelics?

14 A I think I begun -- I first began writing
15 down and proposing my research ideas for the study
16 of psychedelics during the last year of my PhD as
17 I prepared to transition into my postdoctoral
18 research studies. And I think I completed my PhD
19 at the end of, let me look at my CV. Yes. So I
20 first probably began reading about and developing
21 my psychedelics research ideas at the end of 2020,
22 beginning of 2021.

23 Q Okay. And had you done any literature
24 review about the field of psychedelics prior to it
25 being part of your formal research proposal

1 process?

2 A Yes. So, in graduate school, there's a
3 really common type of seminar known as a journal
4 club, where people get together to discuss
5 groundbreaking research occurring generally in the
6 field of neuroscience. And in this process, in a
7 journal club in my lab, we began to review papers
8 on psilocybin.

9 Q And what is, what other research is going
10 on out there today regarding psychedelics and
11 somatosensory perception?

12 A Yeah, there's actually a lot happening
13 out there today. So I'm aware of, there are
14 research groups trying to understand how MDMA
15 alters our perception of touch in humans. There
16 are research groups trying to understand how MDMA
17 alters our perception of pain in rodent models.
18 There are people studying psilocybin, ayahuasca,
19 DOI, in the context of touch and pain. And that's
20 what I'm recalling right now off the top of my head.

21 Q Okay. And, can --

22 A It's important to recall that until
23 recently, psychedelic research was considered
24 incredibly taboo. And it is now that it's
25 experiencing a revitalized effort by the

1 scientific community, it's important to state that
2 a lot of research on psychedelics right now and even
3 in the field of somatosensation is in progress.
4 There are a lot of people like me that are currently
5 in the middle of doing a lot of important work in
6 the context of psychedelics and somatosensation.

7 Q So these other leading experts in the
8 field, do you know approximately when they, when
9 their studies on these topics began?

10 A I would say that my project is pretty
11 representative of where the field is at. So it's
12 probably within the last two years that people have
13 started and everyone is probably at a similar
14 timeline.

15 Q Dr. Ramos, are you familiar with the
16 review process that takes place when you apply for
17 either an HHMI grant or your other fellowship?

18 A Yes. So for the HHMI grant, what you do
19 is you submit a research proposal. And this is,
20 it's funny, scientists always say that's a great
21 question. That's a great question. So when you
22 submit a grant for, because you want to try and
23 receive that funding, you write a research
24 proposal. In the context of HHMI, the grant was
25 peer reviewed by, I would say, at least 40

1 incredibly esteemed scientists. HHMI is known to
2 fund some of the best scientists in the country.
3 The Nobel Prize Laureate this year in chemistry was
4 an HHMI investigator. These people review the
5 grant and this grant that I wrote included
6 preliminary data on DOI. They review this grant
7 and then based on how promising they think it is
8 and how promising they think you are as a scientist,
9 they decide whether or not to fund it. So my
10 preliminary experiments on DOI were included in my
11 HHMI grant and reviewed by my peers at HHMI.

12 Q And the research that you've done, is it
13 contributing to the scientific community's
14 understanding of the neurochemical effects of DOI?

15 A Yes, sir.

16 Q How so?

17 A The fact that DOI is a psychoactive
18 chemical and I'm administering it to awake and
19 behaving animals and I'm recording how that changes
20 their behavioral properties. And so in that way
21 it could be said that I'm adding to our
22 understanding of the neurochemical effects of DOI.

23 Q And is the work that you've done so far,
24 is it contributing to -- how is that contributing
25 to the scientific community's understanding of the

1 central nervous system effects of DOI?

2 A So DOI has effects on both the central and
3 the peripheral nervous system. The scientists,
4 for a long time with respect to psychedelics, have
5 focused their research on the central nervous
6 system. In science, it's called having a brain
7 bias. The brain is a very attractive organ to
8 study, and so people study it, but when they do so,
9 and when they only study the brain, they neglect
10 the peripheral nervous system, which is quite
11 literally everything else.

12 And my research right now, when I give an
13 animal DOI, it has an effect over their entire body.
14 The experiments I'm working towards performing
15 right now is actually trying to understand when I
16 see changes in behavior that are a consequence of
17 DOI, are they caused by DOI's actions on the central
18 nervous system, or are they caused by DOI's actions
19 in the peripheral nervous system? So I'm working
20 to provide context to a blind spot that has been
21 long overlooked.

22 Q Would you say at this point that the full
23 effects of psychedelics on somatosensory
24 perception is known?

25 A No, not even close.

1 MR. MANN: Objection. Your Honor, I
2 think we're way beyond getting this witness
3 qualified.

4 JUDGE SOEFFING: I agree. Stick to the
5 qualifications and less on actual opinions.

6 MR. PHELPS: Okay, no problem. I was
7 just trying to follow up on what he was saying.

8 JUDGE SOEFFING: So I sustain the
9 objection.

10 MR. PHELPS: Okay, I think that's it on
11 questions then, Your Honor. The assertion that
12 he's going to testify on the full effects is what
13 the Government was asking about, and that's not
14 known. Dr. Ramos is in the midst of leading
15 research on the somatosensory perception and how
16 that's affected by DOI.

17 In regards to how that's relevant to the
18 Eight Factors, Factors 2 and 3, Factor 2 is the
19 scientific evidence of its pharmacological
20 effects. So he is contributing to that
21 understanding, as well as Factor number 3, the
22 state of current scientific knowledge regarding
23 the drug and other substance. Dr. Ramos has a
24 particular expertise in a field of study that
25 nobody else is going to be testifying to or

1 testifying about. And while he's not directly
2 saying, I'm breaking down Factors 2 and 3, the
3 testimony and information and expertise that he's
4 providing is certainly helping the court
5 understand those factors. And the state of
6 current scientific knowledge regarding the drug
7 and other substance is very broad and there's lots
8 to be understood and he provides a particular
9 expertise in that field. He's got one of the most
10 prestigious grants to study this. Those go
11 through an extensive review process. And so this
12 isn't some backyard chemist that's just doing
13 things on his own. This is highly structured, he's
14 highly qualified, and we do believe that he should
15 be recognized as an expert in the field as described
16 in his proposed testimony.

17 JUDGE SOEFFING: Dr. Ramos, let me ask
18 you, have you ever been designated as an expert or
19 recognized as an expert in any legal proceeding?

20 THE WITNESS: No, sir.

21 JUDGE SOEFFING: Okay, so, Mr. Phelps, I
22 guess I'm not seeing why I need to designate him
23 as an expert witness or recognize him as an expert
24 witness for purposes of his testimony. He was not
25 designated as an expert witness in your original

1 pre-hearing statement. It wasn't until the
2 supplemental where he was added as a proposed
3 expert witness. I'm not sure why I would need to
4 recognize him as an expert witness to receive the
5 testimony that he's going to give. Is there some
6 particular reason why that's important, that I
7 recognize him as an expert?

8 MR. PHELPS: Well, yes, because he can,
9 as an expert, it gives him some leeway to opine on
10 the elements that relate to Factors 2 and 3
11 specifically, and can give a broader contextual
12 understanding of that through his opinions, based
13 on what he's understood of the field. He's able
14 to put it in a broader context than just what he's
15 talking about, than just his particular research.

16 JUDGE SOEFFING: I think what's at issue
17 here is really his research. He talked about the
18 fact that he has read a lot of what others have done,
19 he's reviewed other people's research. But it
20 sounds like he's really here to talk about his own
21 research. I'm not seeing why he needs to be
22 designated as an expert for that. So I'll receive
23 all the testimony that was in the summary, but I'm
24 not going to designate him as an expert witness in
25 the field that was proposed in the supplemental

1 pre-hearing statement.

2 MR. PHELPS: Understood, Your Honor.

3 JUDGE SOEFFING: Okay, so the
4 Petitioners have offered Dr. Ramos as an expert in
5 the study of the effects of psychedelics on
6 somatosensory perception. The Government has
7 objected to his qualification as an expert in that
8 field. For the reasons that the Government
9 stated, after conducting its voir dire, as well as
10 my own inquiries made to the witness, and because
11 I feel that I can receive the proposed testimony
12 without qualifying him as a witness, I will sustain
13 the Government's objection. I will not recognize
14 him as an expert at this time.

15 MR. PHELPS: Understood, Your Honor.

16 DIRECT EXAMINATION

17 BY MR. PHELPS:

18 Q So, Dr. Ramos, we're going to be
19 discussing your study of DOI in the context of pain.
20 What do you mean when you say you study pain?

21 A Yes. So pain, when we think about pain
22 as scientists, it's important to understand that
23 it has two different components. The first
24 component is the physical detection of a stimulus.
25 So when something that can actually hurt you makes

1 contact with your body. So physical, chemical, or
2 thermal stimulus, this phenomenon of being able to
3 recognize a stimulus and process that is painful,
4 that's called nociception, and it's the physical
5 processing of pain.

6 However, pain also has another face to it,
7 and that's the emotional component, the more
8 cognitive component. Humans can feel pain and can
9 feel pain without any physical assault on their
10 body. They could still just perceptually
11 experience pain through their thoughts. And so
12 pain is both nociception and the emotional
13 component.

14 Because we can only study the emotional
15 component in humans, my research is on nociception,
16 so the physical transformation of a stimulus into
17 a nociceptive perception. But to make our
18 conversation easier, so I don't have to keep saying
19 nociception, I'll be saying that I study pain.

20 Q And so far, your study has not been
21 conducted on human participants. You said that,
22 right?

23 A No.

24 Q How does the work that you're doing
25 translate potentially into humans?

1 A Yes. So many of the cells that we have,
2 many of the molecules that are in our body and the
3 functions that they undertake, those molecules and
4 those functions are preserved in other mammals such
5 as rodents. So if we can understand what molecules
6 DOI is binding to, how those molecules are changing
7 cellular function in the context of pain, we can
8 leverage that understanding in humans as well.
9 This is something called translational research,
10 and scientists are working on stuff like this all
11 the time, everywhere.

12 Q And is this translational research done
13 in other, is this specific to psychedelics or DOI,
14 or is that in other fields?

15 A No, it's done across every area of
16 medicine.

17 Q And could you explain why DOI is needed
18 to study pain?

19 A Yes, because DOI is a highly specific
20 agonist of the 2A receptor. It's fair to say that
21 DOI's agonism on the 2A receptor is, makes it a very
22 special research tool.

23 Q I'd like to turn your attention now to
24 what's been marked for identification purposes as
25 SSDP Ramos, Exhibit Number 65.

1 JUDGE SOEFFING: One second. Mr. Clerk,
2 Exhibit 81 was not ever admitted into evidence, is
3 that right?

4 MR. GLEASON: It was.

5 JUDGE SOEFFING: It was. Okay. Thank
6 you.

7 MR. PHELPS: Do you have that in front of
8 you?

9 THE WITNESS: Yes, sir.

10 BY MR. PHELPS:

11 Q And do you recognize that document?

12 A Yes.

13 Q What is it?

14 A It's a scientific research article on the
15 expression of the serotonin 2A receptor in pain
16 neurons.

17 Q And are you familiar with the contents of
18 the article?

19 A Yes, I am.

20 Q And is the document, as it's presented in
21 front of you, is that an accurate representation
22 of the article?

23 A Yes.

24 Q Well, first, can you give a general, well,
25 first, where was this article published?

1 A This article was published in the Journal
2 of Neuroscience.

3 Q And can you tell us a little bit about that
4 journal?

5 A Yes. In science, the smaller the journal
6 name, the more high profile that journal is. So
7 to have the name Neuroscience means that it is one
8 of the most high profile journals in the field of
9 neuroscience.

10 Q And when was this article published?

11 A This article was published, it looks like
12 in 2009.

13 Q 2009.

14 A Yes.

15 Q And could you just summarize what this
16 article is about?

17 A Yes, sir. So In this article, the
18 authors were interested in the expression of the
19 serotonin 2A receptors in pain neurons. So before
20 this article was conducted, there was evidence that
21 the receptor would be expressed in these neurons,
22 but the exact distribution of its expression
23 exactly where and what neurons it was in was not
24 known. And people had not done any work to validate
25 whether or not those neurons were pain neurons.

1 So in this experiment, the authors very
2 intricately take, perform experiments to
3 demonstrate that, in fact, this receptor is
4 expressed in neurons that are important, that in
5 neurons that transmit pain. And they do
6 experiments to kind of reveal a little bit more
7 information and the exact identity of these
8 neurons, because there's more than one population
9 of pain neurons, there's actually many populations
10 of neurons that transmit painful information. And
11 so the authors try and get an understanding of
12 exactly which populations express the 2A receptor,
13 because understanding which populations can give
14 us a better understanding of the function of the
15 2A receptor in pain.

16 Q Thank you. I'd like to turn to page four,
17 and you see figure one there at the top of the page.

18 A Yes.

19 Q Could you explain what's happening there
20 in figure one?

21 A Yes, I can.

22 JUDGE SOEFFING: So, Mr. Phelps, I think
23 it'd be better if you offered into evidence before
24 we start talking about what the document includes.

25 MR. PHELPS: Absolutely, Your Honor. At

1 this point, we would move to admit what's been
2 identified for identification purposes as Exhibit
3 65.

4 JUDGE SOEFFING: Mr. Mann, any
5 objection?

6 MR. MANN: Yes, Your Honor, I'm trying to
7 find out where in the pre-hearing statement, the
8 contents of this article and his discussion of it
9 has been noticed to the Government.

10 JUDGE SOEFFING: So your objection at
11 this time is that there was not proper notice to
12 the document?

13 MR. MANN: Yes. Well, I don't see it.
14 That's the problem with this pre-hearing
15 statement. There's a list of articles' names, and
16 there's no indication as to what this witness is
17 going to bring out of this particular article. I
18 don't see how the Government is expected to read
19 all these articles and solve a giant puzzle each
20 time trying to figure out what the witness is going
21 to take from these particular articles. He didn't
22 write this article. He's not recognized as an
23 expert and we don't know what he's going to take
24 out of it. So I don't know where the Government's
25 been put on notice as to what he's going to testify

1 about in this article.

2 JUDGE SOEFFING: Well, you had your
3 motion in limine. I don't believe you raised this
4 as an issue in your motion in limine which did cover
5 other documents which were excluded by the
6 tribunal.

7 MR. MANN: I understand that, Your Honor.

8 JUDGE SOEFFING: You've had it as part of
9 the document exchange. So if it's as to notice,
10 I'm going to overrule that objection. All right,
11 so.

12 MR. MANN: Fair enough.

13 JUDGE SOEFFING: So Petitioner's Exhibit
14 marked for identification number 65 has been
15 offered. Over the Government's objection, it is
16 received in the record as Petitioner's Exhibit 65.
17 It's in. You may use it.

18 (Whereupon, the above-referred to
19 document was received into evidence as
20 Petitioner's Exhibit No. 65.)

21 MR. PHELPS: Thank you, Your Honor. Dr.
22 Ramos, are you still there on page four?

23 THE WITNESS: Yes, sir.

24 BY MR. PHELPS:

25 Q Could you please explain what's shown in

1 figure one?

2 A Yes. Your Honor, do you see in panel A
3 that there is a kind of black oval running
4 diagonally across the panel against a blacker
5 background? That oval is called the dorsal root
6 ganglia. It's an organ that all mammals have. So
7 both humans and mice have 31 pairs of the dorsal
8 root ganglia, and they run down the length of your
9 spine. In this organ live all the neurons that
10 innervate your skin and transmit information
11 important for touch, itch and pain. And so what
12 you're seeing here is a cross section of the dorsal
13 root ganglia, and the smaller circles that you see
14 within it are the sensory neurons, important for
15 transmitting pain information.

16 The dark ones that you can't really see
17 in this picture don't have any expression of the
18 2A receptor. But as you can see in panel B, in a
19 more blown up version of what's in the white box
20 of panel A, what you're seeing here is fluorescent
21 tagging of the 2A receptor. So there are several
22 somatosensory neurons within the dorsal root
23 ganglia that are very clearly expressing the
24 serotonin 2A receptor, which is the target of DOI.

25 Q And can you explain the significance of

1 what all that means?

2 A Yes, it means that DOI can directly act
3 on these pain neurons and alter their function.

4 Q And so what inferences can you make from
5 that information?

6 A It means that DOI can be used to tell us
7 more about pain, and it might even be able to have
8 anti-pain properties.

9 Q Can you explain that connection with the
10 anti-pain properties or what you mean by that?

11 A Depending on how DOI acts on these cells
12 and the changes that it confers to them, it could
13 change their ability to transmit pain information.
14 So it could actually make it so that the signal that
15 the neurons transmit to the brain is dampened and
16 it could have pain relieving properties.

17 Q Now, Dr. Ramos, I'd like to turn your
18 attention to Exhibit Number 50.

19 A Thank you.

20 Q Do you recognize this document?

21 A Yes.

22 Q And can you identify what it is?

23 A Yes. It's a research article where the
24 authors aim to understand the effects of a few
25 different serotonin 2 receptor activators or

1 agonists on allodynia.

2 Q And are you familiar with the contents of
3 this article?

4 A Yes, I am.

5 Q And is this article, is the document in
6 front of you an accurate representation of the
7 article as a whole?

8 A Yes.

9 Q And is this the same - is this the article
10 that is cited on page 31 of your proposed summary
11 in the pre-hearing statement?

12 A I believe so.

13 MR. PHELPS: Your Honor, at this time, we
14 would move to admit what's been identified for
15 identification purposes as Exhibit 50.

16 JUDGE SOEFFING: Mr. Mann, any
17 objection?

18 MR. MANN: One moment. No objection.

19 JUDGE SOEFFING: Petitioner's Exhibit
20 marked for identification number 50 has been
21 offered and in the absence of objection is received
22 in the record as Petitioner's Exhibit 50. It's in.
23 You may use it.

24 (Whereupon, the above-referred to
25 document was received into evidence as

1 Petitioner's Exhibit No. 50.)

2 BY MR. PHELPS:

3 Q Thank you, Your Honor. What's the title
4 of this article, Dr. Ramos?

5 A Antiallodynic Effect of Intrathecally
6 Administered Serotonin 2 Agonists in Rats with
7 Nerve Ligation.

8 Q And can you break down what that means?

9 A Yes, I can break down what that means. The
10 first word, allodynia, is a word that scientists
11 use to refer to a specific somatosensory
12 phenomenon. Allodynia is when a stimulus that
13 would normally be benign, such as a gentle touch,
14 becomes painful. So when touch gives pain, when
15 touch leads to pain, we call that allodynia.

16 So you can imagine, we have all probably
17 experienced the phenomenon where we burn
18 ourselves, and then the area where we burned
19 ourselves is hypersensitive for maybe a few days
20 to even the most gentle touch. That is called
21 allodynia. And so that's what this paper is about.
22 When touch gives rise to pain.

23 Intrathecal means that they're going to
24 administer compounds, specifically serotonin 2
25 receptor activators, through the spinal canal. So

1 it's a technique that scientists use to directly
2 deliver these drugs into the spine. And rats with
3 nerve ligation are a model for neuropathic pain.

4 Q And where was this article published?

5 A It was published in the journal called
6 Pain. And I'll remind the court that the smaller
7 the name, the more high profile the journal.

8 Q And there's a little emblem up in the top
9 left corner. What is that?

10 A That means that the article has been, it
11 has the stamp of approval of the International
12 Association for the Study of Pain. So this journal
13 is recognized by scientists all over the world who
14 study pain.

15 Q Okay. Could you summarize what this
16 article is about?

17 A Yes. So the researchers in this article
18 take rats, and then they do a technique called nerve
19 ligation. So what this technique is, is they
20 actually tie a little knot around the nerves that
21 innervate the rat's leg. And it's a small surgery
22 that they perform. Because they tie this knot
23 around the nerve, what this does is it actually
24 simulates a nerve pinching injury, and the rats
25 develop allodynia so touching their leg is very

1 painful for them. So this is a model of pain in
2 humans. So people who receive or experience nerve
3 damage develop neuropathic pain. And this is how
4 we're able to study this phenomenon in rodents.

5 So the authors perform this surgery on the
6 animals. After the animals have recovered from
7 surgery and have developed allodynia, they can
8 administer different compounds. Specifically in
9 this paper, they administered DOI and ask, does DOI
10 relieve any of the animals' pain?

11 Q And what conclusions did they reach in
12 this paper?

13 A In this paper, they --

14 MR. MANN: Objection, Your Honor. This
15 witness is not an expert witness. The article
16 speaks for itself.

17 JUDGE SOEFFING: The article does speak
18 for itself. He is not an expert witness. He did
19 testify that he's very familiar with the research
20 in the area. He follows the studies. I do find
21 that he is familiar with this particular
22 publication. So I'll allow him to testify as to
23 what he believes the conclusions are and I will
24 review that, obviously for consistency, as the
25 document does speak for itself. So I'll overrule

1 the objection.

2 THE WITNESS: In this paper, they found
3 that DOI provides the animals relief to their
4 allodynia. So it makes the stimulus less painful.
5 BY MR. PHELPS:

6 Q Thank you. I'd like you to turn to page
7 three of this document. And there's several
8 figures there. Could you talk specifically about
9 figure two?

10 A Yes. So, Your Honor, I found in my
11 experience that when I talk about data such as those
12 that are represented in the graph, it's important
13 for people to be able to understand the technique
14 that underlies this data. And the tool that both
15 scientists and medical doctors use to perform the
16 experiments that are represented in the graph.
17 It's a small tool the size of a pen. And I have one
18 of those tools with me. Would I be able to present
19 it to the court? The court can keep it.

20 JUDGE SOEFFING: Let me see.

21 THE WITNESS: For visualization
22 purposes.

23 JUDGE SOEFFING: Okay. And why don't
24 you hold it a little higher?

25 MR. PHELPS: Could you hold that up and

1 could you explain what it is while you're holding
2 it up so everyone can see that?

3 THE WITNESS: Yes. This is a Von Frey
4 filament. It's the gold standard for assessing
5 touch and pain in humans and rodents. So what
6 you're looking at here is a filament calibrated to
7 deliver a specific amount of mechanical force when
8 it pokes. This is a small filament, so it delivers
9 a small amount of force.

10 But when we do these experiments, both
11 doctors and humans have a whole set of filaments
12 that deliver a range of forces. So for example,
13 if you're a human who has lost touch sensation, a
14 doctor will evaluate you by poking you with these
15 filaments. We can perform these similar
16 experiments in rodents, poke them and record their
17 behavioral response to see if they're
18 demonstrating behaviors associated with pain.
19 And so this is the tool that is used in these
20 experiments and it will help to understand the
21 data.

22 MR. PHELPS: And that's the same tool
23 that's used when similar types of studies are
24 conducted on humans?

25 THE WITNESS: Yes.

1 BY MR. PHELPS:

2 Q Anything else about figure two that's
3 noteworthy for you?

4 A Yes. So the actual result, Your Honor.
5 You can see in this figure there are two axes. The
6 X axis running across the horizontal plane and the
7 Y axes running across the vertical plane. If you
8 look at the Y axis, the unit there next to threshold
9 is grams. So it's referring to the amount of
10 force. And what they're recording here is the
11 amount of force required to elicit a response in
12 the animal. Less force, a smaller number, means
13 that the animal is in pain.

14 And so if you look at the beginning, these
15 animals have gone through this nerve ligation
16 procedure. They're in pain. So at time zero, the
17 amount of force required to elicit a response is
18 three grams. It's very little. And with a low
19 dose of DOI that doesn't have physiological action,
20 so that's the bottom line running across the graph,
21 you can see that the animal's response doesn't
22 change. It stays at three grams.

23 But in the white circles, after the
24 animals received DOI treatment, you can see that
25 the amount of force required to elicit a behavioral

1 response jumps up to nine. So that means the
2 animals are being less impacted by this force so
3 the interpretation of this data would be that the
4 animals are in less pain following DOI treatment.

5 Q Anything else there about figure two
6 that's noteworthy?

7 A The anti-pain effects of DOI seem to
8 persist for over two hours. And that's very
9 noteworthy in biology.

10 Q Why is two hours a noteworthy time there?

11 A It speaks to the fact that DOI can relieve
12 pain for several hours.

13 Q And I'd like you to now go to page four
14 of the exhibit.

15 A Yes.

16 Q And do you see what's marked there as
17 figure five?

18 A Yes.

19 Q Okay, and this one has got a lot of bars
20 here so we're going to break this one down just a
21 little bit. Could you explain what is identified
22 on each of the X and the Y? Or first, can you give
23 a kind of broad description of what this figure
24 shows?

25 Q Yes.

1 A So the part of this figure that is
2 relevant to our discussion today is the second
3 group of bars to the right where under which is the
4 DOI designation. Those are the experiments that
5 actually involve DOI. The Y axis, the axis running
6 vertically, is the maximum possible effect. And
7 so that's just showing the higher the number, the
8 higher the number, the more of the pain response
9 is there.

10 Q And so we're looking at specifically the
11 right side of that graph.

12 A Yeah.

13 Q And what is shown on the Y axis, on the
14 vertical axis?

15 A Yeah, sorry. So the Y axis is looking at
16 the effect, the magnitude or the intensity of the
17 DOI effect that we talked about in the previous
18 graph. So in the previous graph we saw that DOI
19 has anti pain properties and we see that there's
20 a difference after the animals are treated with
21 DOI. This is showing you the magnitude of that
22 effect in the black bar. So it's showing that DOI
23 drives, it's relative to the previous graph. It
24 has an effect size, as we would call it, of 60
25 percent.

1 Q Okay. And what are the other bars in that
2 graph showing? You said the black one is the DOI.

3 A Yeah. And the other bars, so the ones
4 relevant to the 2A receptor are the -- so next to
5 the black bar are two bars, the one that's dark gray
6 and one that's white. That's experiments performed
7 using something called ketanserin. Ketanserin is
8 an antagonist of the 2A receptor. It blocks DOI's
9 action at this receptor. So what this data is
10 showing is that DOI acting on the 2A receptor is
11 important for its pain relieving properties.

12 Q And what about the next three bars there
13 on the right?

14 A Those are during -- those are experiments
15 using other antagonists that don't target the 2A
16 receptor, except for MDL, that don't target the 2A
17 receptor and showing that there's no effect.

18 Q So in that right side, the black bar
19 showing DOI and the one on the far right with the
20 slanting left to right lines are almost at the same
21 level there. What's your interpretation of that?

22 A That means that the antagonist that
23 they're using on the far right is not relevant to
24 the mechanism at study.

25 Q What does that mean?

1 A It means that that drug is not important
2 for the underlying biology.

3 Q Okay, so what can be inferred from this
4 data?

5 A From this data, we can infer that DOI has
6 the ability to relieve allodynia in this rodent
7 model and that it does so through the serotonin 2A
8 receptor.

9 Q So based on these last three pieces of
10 data, these last three figures that we've covered,
11 what is the current state of our understanding
12 regarding the effects of DOI on pain?

13 A We know that the 2A receptor is expressed
14 in pain neurons. We have some evidence that DOI
15 could have the ability to relieve pain in this
16 rodent model. What we're lacking is everything
17 that comes in between. How does it do this? We
18 don't know that yet.

19 Q And so what's missing from that
20 understanding of the knowledge?

21 A We would need to understand when DOI is
22 given to these animals, what is its exact effect
23 on these pain neurons? How does it change their
24 function? How does it change the signals that they
25 transmit to other neurons that they connected to

1 because our body is not a vacuum. It's a highly
2 interconnected network. And so how does it change
3 their signal, the signal they transmit to other
4 neurons? And ultimately, how do those changes
5 give rise to these changes in behavior and
6 everything in between.

7 Q And why is this lack of knowledge
8 important or relevant?

9 A This lack of knowledge is important and
10 relevant because it could reveal novel molecules
11 and novel pathways important for our understanding
12 of pain and could potentially inform future
13 therapies for the treatment of pain in humans.

14 Q And so how does the work you're doing
15 through your grant shed additional light on this
16 phenomenon?

17 A Yes. I'm basically working to fill that
18 everything in between that I just discussed.

19 Q Can you -- What kind of work are you doing
20 to fill that gap?

21 A I'm performing many different types of
22 neuroscience experiments at several scales of
23 biology, as we discussed yesterday, to demonstrate
24 what exactly happens to the function of these
25 neurons when you apply DOI. What is its effects

1 on it? What are the changes to the neural circuits
2 and what are the actual -- I'm working to
3 characterize extensively the different behaviors
4 in somatosensation that DOI drives and the cellular
5 mechanisms of how DOI changes those behaviors.
6 I'm trying to provide the characterization that we
7 need to develop novel therapies.

8 Q And what kind of results or evidence have
9 you collected so far related to DOI and its direct
10 action on pain neurons?

11 A Yeah, so currently in my experiments, I
12 have found that DOI can directly act on pain neurons
13 and activate them. What this means is that DOI
14 binds to the 2A receptor on pain neurons and changes
15 their function. So I have unpublished evidence of
16 this phenomenon.

17 Q And what kind of evidence have you found
18 regarding the way that DOI alters pain behaviors?

19 A Yes, I have found in my experiments that
20 DOI can relieve two different types of pain in
21 rodent models. I have found that DOI can provide
22 relief to mechanical pain and that DOI can provide
23 relief to thermal pain.

24 Q And in the studies that you're
25 conducting, what kind of dosages of DOI are you

1 using in the animals?

2 A The dose that I'm using for DOI is one
3 milligram per kilogram. This is a standard dose
4 used across a scientific literature for the study
5 of DOI.

6 Q And do you know how that relates to, you
7 said this is standard across DOI studies,
8 specifically in the field of pain studies, or DOI
9 as a whole?

10 A More generally, it's specific to the
11 study of DOI as a whole across the psychedelic
12 literature in rodents.

13 Q Okay, and do you -- Are you familiar with
14 how the dosage you're using compares to the dosages
15 used in the self-administration studies that have
16 been testified to previously?

17 A That's outside the scope of my expertise.

18 Q Okay. Are you aware if the dosage that
19 you're using is an amount that causes what's
20 recognized as hallucinations?

21 A In animals, the dosage that I am using
22 causes the head twitch response.

23 Q It does. Okay. And so how does DOI
24 change the animal's response to pain?

25 A In my experiments, animals that do not

1 receive DOI show more of a pain response than
2 animals that do. So, for example, in the, in my
3 experiments where I apply a thermal stimulus, so
4 we're able to deliver a small pulse of heat to the
5 animal's paw. Animals that receive saline are
6 very sensitive to the heat. They feel like, not
7 to anthropomorphize them, but our interpretation
8 of that would be that they feel more of a burning
9 sensation. Animals that receive DOI feel this
10 less intensely.

11 Q And is your work on this complete?

12 A No, it's in progress.

13 Q And what's the timeline you would
14 estimate needed to finish this particular work
15 you're doing?

16 A I need two more years.

17 Q Two more years. And why is that?

18 A Biology is slow, right. These are
19 animals that are alive. We have to breed them, we
20 have to wait for them to get to the right age, and
21 then we have very narrow time windows to perform
22 the experiments that we need to perform and
23 everything is very slow. It's not uncommon for
24 projects in neuroscience to take three to six
25 years.

1 Q And how much time do you have remaining
2 in respect to your funding through the Berkeley
3 fellowship?

4 A Yes. My funding for the Berkeley
5 component of my fellowship expires in 2027. Since
6 we're about to start 2025, I would say that I have
7 two years left.

8 Q You have two years left of funding on that
9 particular grant.

10 A At Berkeley.

11 Q And so after those two years -- after that
12 section of the project is done, you said your HHMI
13 grant goes further than that, right?

14 A Yes. It provides me funding for me to
15 begin my own research lab at an R1 university here
16 in the United States and continue performing my
17 research, carrying out my research.

18 Q And how do you anticipate carrying out
19 this particular research after that two years
20 expires?

21 A After the two years expire? Well, if
22 everything goes according to plan, before those two
23 years expire, I will accept a job at a university
24 and transition to a university where I will run my
25 own research lab pursuing all of these ideas.

1 Q What particular ideas are those? Where
2 do you see this research going?

3 A Yes.

4 MR. MANN: Your Honor, I don't understand
5 why we're going on a discussion about Dr. Ramos'
6 career path. If this has to do with the effect of
7 scheduling on his career, we would object for the
8 record. We understand the court's position that
9 this evidence is going to be allowed, but we would
10 just object that research harm evidence is not
11 relevant to this proceeding.

12 JUDGE SOEFFING: So I'll overrule the
13 objection. I don't think we're necessarily
14 talking about his career path. As to the
15 trajectory of the future research that may be done
16 with DOI, which is something that I specifically
17 allowed to be presented at the hearing. Although
18 it may be given reduced rate weight, as I stated
19 in my order on the motion for limine due to the fact
20 that that's not part of the Eight Factor analysis.
21 But I'll overrule that objection. He may answer.

22 THE WITNESS: Can you repeat the
23 question?

24 BY MR. PHELPS:

25 Q Yes. Where do you anticipate the

1 research going after this two year window of what
2 you have currently planned? Where do you take the
3 research next?

4 A Yes. So right now my research is
5 currently characterizing the effects of DOI in, we
6 would call these in wild type animals. So animals
7 that have had no specific manipulations like the
8 nerve ligation in the previous study. The next
9 obvious steps would be to take the understanding
10 that I developed from my experiments and more
11 closely probe in several animal models of pain, how
12 does DOI exert its pain relieving effects? And so
13 that would probably be some of the first projects
14 that I would be running in my own lab.

15 Q And then ultimately, long term, how could
16 this research impact public health for humans?

17 A Yes, this research, in a way, this
18 research could inform us at a level way beyond
19 psychedelics. So this research is about
20 understanding what are the cells and molecules that
21 are important for our perception of pain. And if
22 we can understand why these cells and molecules are
23 important in the context of pain, we can manipulate
24 them to relieve pain. And so these experiments
25 will create a broader understanding of how mammals

1 feel pain and we can leverage that understanding
2 in the context of humans.

3 Q So specifically related to the timeline,
4 you talked about going to an R1 university before.
5 What is that?

6 A R1 stands for Research 1. It's very much
7 like Division 1 in sports. It's basically the
8 highest research division that a university can be
9 granted in the United States. And to qualify for
10 the R1 designation, the university needs to bring
11 in a certain amount of funding and have a high
12 caliber, the scientists working at the university
13 need to be of a high caliber.

14 Q And what other kinds of research is done
15 at R1 universities?

16 A Everything.

17 Q Medical research?

18 A Yes.

19 Q On humans?

20 A Yes.

21 Q And so if you were studying DOI at one of
22 these R1 research universities, would there be an
23 opportunity to collaborate with medical
24 researchers?

25 A Yes, that's the dream.

1 Q Could you explain that?

2 A Yes. So different universities have
3 different departments and different scientists
4 working at them. Ideally, it would be if I worked
5 at a university that, for example, had a medical
6 research unit, I could collaborate with scientists
7 in that unit to advance the findings of my
8 experiments in humans and begin to pursue that
9 research.

10 Q And so through that collaborative
11 research, is there a possibility in the future of
12 using DOI for similar experiments in humans?

13 A There's a possibility, yes.

14 Q So, how would DOI being placed in Schedule
15 I affect just the timeline of your work?

16 A It would totally disrupt my ability to
17 perform my experiments. From the information that
18 I have gathered from colleagues at Berkeley, if DOI
19 were scheduled and it became a Schedule I
20 substance, the laboratory that I am currently
21 affiliated with does not have a Schedule I license.

22 So let's say that tomorrow DOI was
23 Schedule I. I would not be able to perform the
24 experiments that I'm currently working on, and I
25 would need to begin the process of acquiring a

1 Schedule I license at Berkeley. From information
2 that I have gathered from speaking to my
3 colleagues, it seems like this process can take
4 about a year. And given my two year timeline and
5 two years of funding and all the momentum that I
6 would lose, it's quite possible that this
7 scheduling would derail my entire research career
8 at Berkeley and cause me to not be able to
9 accomplish what I need to accomplish in a timely
10 manner and before my funding at Berkeley expires.

11 Q So if you were unable to carry this on to
12 an R1, and you said the goal is ultimately to
13 collaborate with medical researchers, how would
14 your inability to do that impact public health?

15 A It means that all, that people are not
16 going to be able -- that means that humanity as a
17 whole will not benefit from all of the work that
18 I have invested in, all of the work that I've done,
19 everything that I've done before that turns into
20 anything good for anyone. The time that it will
21 take for that to happen will be significantly
22 stunted. Science is already slow as it is. This
23 is going to make it such that before we see anything
24 groundbreaking come out of my research, it will
25 take much longer.

1 Q Dr. Ramos, you signed on as a -- you
2 yourself filed as a petitioner in this case, right?

3 A Yes.

4 Q Why did you do that?

5 A Because I knew that I had standing in this
6 case.

7 Q And what do you mean by that?

8 A I mean that I knew that I am funded --

9 MR. MANN: Objection, Your Honor. These
10 are legal conclusions he's testifying to.

11 MR. PHELPS: We can move away from
12 standing. I would agree that is technical term,
13 but the why I think is still relevant.

14 JUDGE SOEFFING: I'll sustain the
15 objection and let you to rephrase the question.

16 MR. PHELPS: Okay. Thank you, Your
17 Honor. Why was filing this petition important to
18 you?

19 THE WITNESS: Yes. I want the ability to
20 continue to do my work as I've been doing it.
21 That's why I'm here today. I don't want to be here.
22 I just want to be able to do my work. That's all
23 that I want to do.

24 BY MR. PHELPS:

25 Q If you were not sitting here with us

1 today, where would you be?

2 A I'd be doing experiments in the lab.

3 Q How many hours a week do you spend doing
4 those?

5 A What people don't understand is that even
6 a minor deviation, such as one day from the
7 laboratory, can actually take weeks out of a
8 scientist's rhythm because setting up an
9 experiment isn't a one day thing. Oftentimes to
10 set up an experiment, you need three weeks of
11 preparation, and then you need the time it takes
12 to actually perform and run the experiment and the
13 time it takes to analyze the data. So by being
14 here, I'm actually losing out on weeks' worth of
15 work because I can't set up anything and I can't
16 do anything until after I've set something up.

17 Q And what are the financial impacts
18 potentially of a scheduling of DOI? How does that
19 relate to your funding currently?

20 A So, what are the financial impacts? I
21 mean, here's the thing is that my funding at
22 Berkeley expires in two years. In two years, in
23 2027, I need to either transition to the next part
24 of my grant by acquiring a job at a university and
25 to acquire a job, I need to complete my research.

1 Or I would have to stay on at Berkeley and try and
2 figure out some other alternative funding
3 mechanism, which would be incredibly difficult
4 because I would be a late stage postdoc, and the
5 opportunities available to me would be minimal.
6 And so I would have to figure out a way to support
7 myself while I continue my work.

8 Q So what could be the potential
9 professional consequences of that disruption?

10 A Yeah, it can make it so that I am unable
11 to find a job and I've been working at having a job
12 as a neuroscientist for the last 10 years.

13 Q So Dr. Ramos, you said your current
14 institution is UC Berkeley, right?

15 A Yes.

16 Q And can you just speak a little bit about
17 the UC system as a whole and UC Berkeley in
18 particular and its standing in the academic world?

19 A Yes. I think we've all heard of UC
20 Berkeley, and we've all heard - I mean people call
21 it Cal. UC Berkeley is a giant research institute.
22 There's so much science happening at UC Berkeley.
23 There's so much science happening at UC Berkeley
24 that it has a special parking lot dedicated only
25 to Nobel Laureates, where there are like 12 to 15

1 spots for all of the Nobel Laureates at UC Berkeley
2 scattered across the sciences. That's the level
3 at which UC Berkeley performs science. There's so
4 many HHMI investigators, HHMI awardees. There's
5 so many science buildings and research labs that
6 I'm only familiar with a fraction of them. It's just
7 an immense scale of science, and it's really on the
8 leading edge of scientific research.

9 Q And even as a leading research institute,
10 you said that they do not currently have a Schedule
11 I DEA license, correct?

12 A No, my lab does not. Other labs at UC
13 Berkeley do.

14 Q Can you explain the relationship between
15 other labs with those licenses and why you're not
16 able to just piggyback on that?

17 A I'm not affiliated with those labs, and
18 that's not -- you can't just piggyback onto
19 anything. Once it's a Schedule I substance it
20 becomes -- the protocols in place -- once something
21 becomes a Schedule I license and the scientific
22 laboratory has a Schedule I registration, that
23 doesn't mean that people can just piggyback onto
24 their studies. For someone to use a Schedule I
25 substance, they would need to be a member of that

1 lab mentored by the principal investigator of that
2 lab. The principal investigator is the person in
3 charge of the research happening in the lab. And
4 people need to be specifically on the IACUC
5 protocol. So yesterday we mentioned IACUC.
6 People need to be on the protocol and need to be
7 authorized controlled substances users. And so,
8 yeah, I can't just piggyback onto someone else's
9 research in the lab. Not only that, my research
10 is not a plan of the research happening in other
11 labs. It's my research plan.

12 Q And you said initially your plan was to
13 do some similar studies of this with MDMA, correct?

14 A Yes, I intentionally and initially wanted
15 to do research with MDMA, and I wrote a proposal.
16 That's the proposal that is on my CV for the Miller
17 Institute. I was awarded this proposal to perform
18 this research with MDMA. But because the lab that
19 I work in does not have a Schedule I license, and
20 because it could take me a year to get that license,
21 and the funding was only for three years, I decided
22 that pursuing this avenue was not the best use of
23 my time and was not conducive to me accomplishing
24 my goals. And so I pivoted to working with DOI.

25 BY MR. PHELPS:

1 Q So through that transition and exploring
2 MDMA, did you become familiar with the process that
3 it would take to obtain a Schedule I license for
4 your lab?

5 A Yes, I have familiarity with the process.

6 Q Okay. I'd like us to walk through that
7 process, and I think it would be most helpful to
8 have a kind of a visual understanding of what steps
9 need to be taken.

10 JUDGE SOEFFING: So let me stop you
11 there, Mr. Phelps. I see that there's an easel
12 that's been put up, and you're talking about visual
13 aids. Are you planning on using that easel?

14 MR. PHELPS: Yes, Your Honor. This is
15 such a complex process that a visual understanding
16 of all the places and steps that have to be taken,
17 I think, would be beneficial to the court.

18 JUDGE SOEFFING: Okay, and you're
19 planning on putting up something that's not been
20 an exhibit that's previously been admitted.

21 MR. PHELPS: No, he's going to be drawing
22 on the board to walk us through what his steps would
23 be.

24 JUDGE SOEFFING: Okay, so we need to have
25 that placed somewhere where everybody can see it.

1 MR. PHELPS: Absolutely.

2 JUDGE SOEFFING: Okay, so the law clerk
3 is motioning over here. Are you going to use it
4 for this next line of questioning?

5 MR. PHELPS: Yes. Yes, I think so.
6 It's what, 10:20 a.m.? I don't know what you're
7 thinking for a morning break. I don't know if now
8 would be an okay time and we can get it set up?

9 JUDGE SOEFFING: No, let's continue on
10 for maybe till 10:45 a.m. or whenever you're --

11 MR. PHELPS: Okay.

12 JUDGE SOEFFING: Around there. Okay.
13 Sorry to interrupt. Go ahead.

14 MR. PHELPS: No, no, no problem. So how
15 would you describe the level of bureaucracy that
16 goes into obtaining a Schedule I license?

17 MR. MANN: Objection, Your Honor. None
18 of this has been disclosed in the pre-hearing
19 statement.

20 MR. PHELPS: This is the impacts on his
21 research. Let me find it in our statement.

22 MR. MANN: What I see here is he says he
23 will testify if that the proposed Schedule I
24 classification is passed, Dr. Ramos' research into
25 the understanding of neuropathic pain and his

1 treatment will be significantly stunted. That is
2 it. And now we're on a journey through DEA
3 bureaucracy. He's not an expert in how DEA works
4 and none of this has been forecast.

5 MR. PHELPS: This is related
6 specifically -- what he is about to show, is going
7 to demonstrate how significantly his research will
8 be stunted. We've heard testimony before from Dr.
9 Carbonaro that this is an easy, mundane, you send
10 in an application process that's done in three
11 months and an actual researcher who is familiar
12 with this process from the applicant's standpoint
13 can provide certainly relevant information for the
14 court to consider and weigh against the
15 Government's characterization of a Schedule I
16 license and specifically how the research would be
17 stunted.

18 You've heard from -- every minute he has
19 to spend away from his lab is impacting his
20 research. And what he is going to show through this
21 is what the time actually takes. It's very
22 relevant.

23 JUDGE SOEFFING: Well, I think he has
24 testified as to how the need to get a registration
25 would impact his research. I don't see anything

1 in here specifically about an application process
2 and that he would testify as to what it would take
3 to apply to get a registration. So I think that
4 that is an overreach as to what has been disclosed
5 in the pre-hearing statement.

6 So in terms of the process to apply, I
7 don't really see that in here. If you want to
8 continue to ask about how the need for a
9 registration would impact the research, I think you
10 have covered that to some extent, but I would allow
11 you to continue to explore that. So I'll sustain
12 the objection as to the specifics as to application
13 process for registration because I don't see that
14 in the prehearing statement.

15 MR. PHELPS: Dr. Ramos, how would this
16 applying for a Schedule I license or having to
17 obtain a Schedule I license significantly stunt
18 your research?

19 MR. MANN: Objection. Asked and
20 answered.

21 JUDGE SOEFFING: I think it has been
22 asked and answered. If you want to refine that,
23 but I think he has spoken in general terms as to
24 how that would affect his research. So sustained.
25 You can reask a more specific question.

1 MR. PHELPS: Dr. Ramos, based on your
2 understanding of the scheduling process, you said
3 you believe it could take you up to a year?

4 THE WITNESS: Based on my --

5 MR. MANN: Objection. Asked and
6 answered.

7 JUDGE SOEFFING: Overruled. I'll allow
8 him to answer.

9 THE WITNESS: Based on my understanding
10 of the process, from what I've gathered from my
11 colleagues who have gone through it at Berkeley,
12 it could take up to a year, yes, or more.

13 Q Why is that?

14 A Because there's several levels of
15 administrative hurdles.

16 MR. MANN: Your Honor, this is also,
17 again, all hearsay.

18 MR. PHELPS: This is, he, so you have --

19 JUDGE SOEFFING: Hold on. Hearsay is
20 not specifically --

21 MR. MANN: He just testified that his
22 colleagues told him something.

23 JUDGE SOEFFING: Yeah, yeah. It is
24 hearsay. I will allow the testimony. Hearsay is
25 permitted in administrative proceedings if it has

1 sufficient reliability. Sounds like he had these
2 conversations as part of his professional duties.

3 MR. PHELPS: I can lay a bit of a
4 foundation there.

5 JUDGE SOEFFING: So I'll overrule the
6 objection. I'll allow you to further explore.

7 MR. PHELPS: Okay. Thank you. Who did
8 you consult with when you were looking into the
9 licensing?

10 THE WITNESS: I consulted with other
11 scientists at UC Berkeley that had acquired their
12 license already and had all the relevant documents
13 necessary to acquire the license.

14 BY MR. PHELPS:

15 Q And were those researchers working in the
16 field of psychedelics?

17 A Yes.

18 Q What specifically?

19 A These specific researchers were working
20 with psilocybin.

21 Q And based on that inquiry or following up
22 with them, why would it take a year?

23 A There are several steps and several
24 levels.

25 MR. MANN: Objection. Hearsay. Calls

1 for speculation.

2 JUDGE SOEFFING: Overruled. But we're
3 not going to spend a lot of time on this.

4 MR. PHELPS: Certainly.

5 THE WITNESS: May I answer the question?

6 MR. PHELPS: Yes, sir.

7 THE WITNESS: Okay. So there are
8 several levels of administrative hurdles that a
9 scientist would need to clear. The first levels
10 of which start at UC Berkeley and then they move
11 on to the State Research Advisory Panel as well as
12 the DEA. We would have to clear both through those
13 and then circle back around to the university for
14 final approval. And I could elucidate on some of
15 the smaller steps in between those different
16 administrative hurdles.

17 MR. PHELPS: And while you haven't done
18 this specifically for a Schedule I license, you are
19 familiar with the process for getting things
20 approved through your laboratory in other words,
21 right?

22 MR. MANN: Objection. Leading.

23 JUDGE SOEFFING: Overruled.

24 THE WITNESS: Yes, I am.

25 MR. PHELPS: And so this isn't an

1 entirely foreign process?

2 THE WITNESS: No.

3 BY MR. PHELPS:

4 Q Okay. What are those steps?

5 A At UC Berkeley, the first step that you
6 need to do as a researcher to work with the Schedule
7 I substance is be added to the laboratory's
8 research protocol, their IACUC protocol just in
9 general. After you've been added to the protocol,
10 and that takes approximately three months because
11 I've been added to my own lab's research protocol
12 and it's a very slow process.

13 Once you're added to your lab's research
14 protocol, the next thing that you have to do before
15 you can even think about working with Schedule I
16 substances or any scheduled substances is that you
17 need to surrender your fingerprints to the state
18 of California and present yourself for a background
19 check. I've also done that process and that takes
20 three months. So we're at six months.

21 After you've done those two processes, if
22 your lab, like my lab currently does not have a
23 Schedule I registration, you need to begin to write
24 a detailed experimental protocol that needs to be
25 added to your lab's current research protocol.

1 MR. MANN: Your Honor, we're way outside
2 the scope of what's been disclosed.

3 JUDGE SOEFFING: Well, this may not have
4 been specifically talked about, but it does give
5 me a better understanding of the impact of the need
6 for DEA registration and how it affects his
7 research. So I think that broadly this is covered
8 in the pre-hearing statement because he's talking
9 now not just about the need for a DEA registration,
10 but other impacts that the requirement for a DEA
11 registration would have on his research. So I'll
12 allow the continuation of the questioning.
13 Overruled.

14 MR. PHELPS: Thank you, Your Honor.

15 THE WITNESS: So just to summarize, we've
16 gone through two steps. We're about six months in.
17 So the next thing that I would have to do once I've
18 surrendered my fingerprints, done my background
19 check and been added to my lab's research protocol,
20 is that I would need to update the protocol to
21 include Schedule I substances.

22 These protocols need to be very detailed, very
23 well thought out. They need to include the exact
24 experiments that you're proposing to do, the exact
25 amount of the Schedule I substances that you will

1 use, and just in general, very detailed
2 understanding of experiments you will be carrying
3 out needs to be communicated. It could take
4 probably weeks to write this protocol. And after
5 I've written it, I would have to submit it for IACUC
6 approval. And that the IACUC approval at UC
7 Berkeley I think meets once a quarter. So
8 depending on when I submitted it, it could be
9 another three months before they review it.

10 Once UC Berkeley has reviewed it and if
11 they don't have any questions, if they do have
12 questions, we would have to go back and forth. If
13 they allow us to add Schedule I substances to our
14 IACUC protocol, then we could submit an application
15 to the Research Advisory Panel of California and
16 to the DEA. Dr. Carbonara yesterday testified
17 that the DEA reviews its applications in three
18 months. So we're about nine plus months in now,
19 but the Research Advisory Panel of California is
20 notoriously slow and meets infrequently. I would
21 not be able to move forward until I received
22 approval from both of these organizations.

23 Once I have received approval from the DEA
24 and the Research Advisory Panel of California, then
25 I would have to circle back around to the university

1 and receive final approval and authorization from
2 UC Berkeley to be able to work with these
3 substances.

4 And then we would need to perform physical
5 modification of our laboratory to comply with
6 diversion control measurements. And honestly,
7 who knows how long that could take because that
8 would require the physical alteration of the lab
9 to install things such as a safe.

10 MR. PHELPS: Could you take us back to
11 the timeline from where at this point when you're
12 onto the physical modifications?

13 THE WITNESS: Yes, we're at like 12
14 months in here.

15 BY MR. PHELPS:

16 Q And would that be the, would the
17 physical modifications then be the final step?

18 A I think that the physical modifications
19 need to take place before we can be approved because
20 the DEA needs to inspect these physical
21 modifications and our diversion control
22 measurements and approve them.

23 Q Have you in your, all of your general
24 research experience, have you ever had to make
25 physical modifications to a laboratory?

1 A I have never had to make physical
2 modifications to a lab, no.

3 Q Okay. So you couldn't speak to what
4 you would have to do through the --

5 A No.

6 Q Okay. So how does the
7 characterization of getting this approval being
8 just a letter compare to what you've understood the
9 process to be?

10 A To me, it sounds like a gross
11 mischaracterization of the process.

12 Q And why is that?

13 A Because the process is much more
14 complicated, much more time consuming and much more
15 involved than has previously been discussed in our
16 proceedings thus far.

17 Also, I can't do it by myself. I need
18 support from other people in my lab, from the
19 university and from my department. It's actually
20 not something that I can do alone.

21 And support from the other
22 administrations that are involved in the process.

23 Q Thank you for walking us through that,
24 Dr. Ramos. If DOI was placed into Schedule I, what
25 steps would you take next regarding the, where

1 would your -- there's kind of different options for
2 your research to go. Right?

3 A Yes.

4 Q Where would it go?

5 A If DOI was placed on Schedule I, was
6 scheduled as Schedule I substance and I could no
7 longer work with it, I would start pursuing
8 Schedule I registration and I would have to figure
9 out something else at work. That's the reality.

10 Q So I would like to move to just one other
11 topic here. What kind of measures does your lab
12 take to ensure that diversion of DOI is not
13 occurring?

14 A Yes, I can explain the steps that we
15 take to make sure that doesn't happen. First and
16 foremost, every order of DOI that our lab has ever
17 placed is recorded and we know exactly how many
18 times we've ordered DOI and how much DOI we have
19 ordered.

20 When DOI is received, the staff in our
21 lab hand it directly to me and I place that DOI in
22 a lockbox and only I have the key to that lockbox.
23 And then an emergency backup key exists.

24 But I keep all the DOI that I've ever
25 worked with in a lockbox that only I can access.

1 And when I do open the lockbox to work with DOI,
2 the amount of DOI that I take out is I take note
3 of the amount of DOI that I'm taking out because
4 every experiment that I perform I record and
5 measure the amount of DOI that I use in the
6 experiments and the amount of DOI that I administer
7 to the animals so we have the DOI.

8 The DOI goes through a strict chain of
9 custody. It comes directly to me. It's locked up
10 and all of the DOI that's ever used is recorded.

11 Q So you said the start of that process,
12 you have to order the DOI.

13 A Yes.

14 Q Can you explain a little bit about how
15 that works?

16 A Yes. Ordering DOI is amazingly
17 simple. And great. You, as a scientist, because
18 I have these qualifications, because I'm part of
19 a research university that has a relationship with
20 the companies that provide DOI for scientific
21 research, I am able to log onto our lab's ordering
22 system and order DOI as I would any other research
23 chemical.

24 And receive it in a timely manner so
25 that I can perform my experiments in a timely

1 manner.

2 Q You said your lab has an ordering
3 system. What is that?

4 A Yes, many labs have an ordering system
5 or use a third-party platform such as something
6 called Quartzy. What this does is it allows you
7 to upload your scientific credentials and then
8 communicates those scientific credentials to
9 scientific vendors so that you don't have to do that
10 process for every single order.

11 Instead, a relationship is formed
12 between you and these vendors. Your
13 qualifications are confirmed and verified. And
14 then after that, your lab can order reagents from
15 these vendors in a streamlined manner.

16 Q Are you familiar with the company,
17 Cayman Chemicals?

18 A Yes, Cayman Chemicals is a company that
19 provides research reagents to scientists.

20 Q Have you ever ordered DOI through
21 Cayman?

22 A I do not order DOI through Cayman
23 Chemicals. I order DOI through another company
24 called Sigma-Aldrich.

25 Q Is Sigma-Aldrich comparable to Cayman?

1 A Yes, sir.

2 Q And what is your understanding of what
3 that company is, Sigma-Aldrich?

4 A It is a company that sells scientific
5 reagents to scientists.

6 Q What are scientific reagents?

7 A They can be many things. They can be
8 tools, they can chemicals. They can be anything
9 that a scientist needs to do their work. They can
10 be flasks, they can be drugs.

11 Q So any scientific equipment, not
12 specifically chemicals or drugs.

13 A Yes, it depends on the specific
14 company, but they can be pretty broad in the things
15 that they provide.

16 Q And to order something like DOI, does
17 Sigma-Aldrich verify who's ordering it?

18 A Well --

19 A Or, let me rephrase --

20 MR. MANN: Objection. This witness
21 wouldn't have any knowledge of that.

22 MR. PHELPS: Well --

23 JUDGE SOEFFING: Sustained, I'll allow
24 Petitioner to rephrase.

25 MR. PHELPS: I can rephrase. Dr.

1 Ramos, what information do you have to provide to
2 be able to order chemicals?

3 THE WITNESS: I only need to provide
4 the order information, like what do I want.

5 BY MR. PHELPS:

6 Q Yes.

7 A And how much I want.

8 Q All right. I'm sorry. Let me
9 clarify. Do have to, to order chemicals from these
10 companies, do you have to demonstrate that it's for
11 a scientific or research purpose?

12 A I, so in labs, these administrative
13 tasks are sometimes performed by lab support staff.
14 I have not myself gone through the process of
15 establishing that relationship with a scientific
16 vendor so I can't speak to that.

17 Q Okay. To your knowledge, would you be
18 able to order these chemicals without going through
19 those channels?

20 A To my knowledge, no. Many scientific
21 vendors do not even let you see the price or add
22 a chemical to your cart unless you're registered
23 and affiliated with the university because I've
24 been doing this, I've only ever done this as a
25 scientist.

1 I wouldn't even know, I would not know
2 what that looks like. I just know that if you log
3 onto the websites without your scientific
4 credentials, they don't let you really see much
5 actually.

6 Q To your knowledge, would somebody be
7 able to order from these chemical companies DOI for
8 recreational use?

9 A I'm not --

10 MR. MANN: Objection, Your Honor. I
11 think he's established that he doesn't really know
12 how that works.

13 JUDGE SOEFFING: Overruled. If he
14 knows how it works, he can answer or state that the
15 doesn't.

16 THE WITNESS: To my knowledge, without
17 scientific credentials, individuals should not be
18 able to order DOI for recreational use and even with
19 scientific credentials, scientists would not order
20 DOI for recreational use because that would cause
21 them to lose all of their credibility and their
22 career in science.

23 MR. PHELPS: Thank you. No further
24 questions for this witness, Your Honor.

25 JUDGE SOEFFING: Okay. Mr. Mann, I

1 assume you're going to conduct cross-examination?

2 MR. MANN: Yes, sir.

3 JUDGE SOEFFING: So we will go ahead
4 and take our morning break for 15 minutes. We are
5 off the record.

6 (Whereupon, the above-entitled matter
7 went off the Record at 10:44 a.m. and resumed at
8 11:06 a.m.)

9 JUDGE SOEFFING: All right, we are back
10 on the record. Dr. Ramos, I remind you that you
11 are still under oath. Mr. Mann, you may conduct
12 your cross-examination.

13 CROSS-EXAMINATION

14 BY MR. MANN

15 Q Dr. Ramos, I would like you to look at
16 Exhibit No. 65. Respondent's -- or the
17 Petitioner's exhibit.

18 A Yes. I have it.

19 Q Now I believe you stated that a lot of
20 your work and research is based on up and coming
21 new studies and the most recent research. Is that
22 correct?

23 A I do not recall stating that.

24 Q All right. Well is it based on current
25 research?

1 A It's based on research.

2 Q All right. Not necessarily current
3 and up to date. You'll --

4 A Can I get a --

5 Q -- agree it's --

6 A -- can I get a definition for what is
7 considered current?

8 JUDGE SOEFFING: Yes, go and
9 supplement your answer.

10 THE WITNESS: Can I get a definition
11 for what is considered current?

12 MR. MANN: Well let's go the --

13 THE WITNESS: In this context.

14 MR. MANN: -- 15 years.

15 THE WITNESS: In the last 15 years.
16 The thing is, that that's now how science works.

17 BY MR. MANN:

18 Q My question is, would you say that your
19 work is based on current research?

20 A Yes.

21 Q Okay. And you'll acknowledge that
22 this report, this study is from 2009. Correct?

23 A Yes.

24 Q And it's from France. Correct?

25 A Yes.

1 Q So a Schedule I registration would not
2 be required to conduct this research. Correct?

3 A I'm unfamiliar with the laws of France.

4 Q Well I'm talking about the United
5 States. A Schedule I --

6 A Oh.

7 Q -- registration in the United States
8 would not affect this research at all. Would it?

9 A No.

10 Q Okay. All right. And I would like you
11 to -- I would like to ask you something about this
12 particular study, which you cited. Isn't it true
13 that it says here and I'm quoting from the second
14 column on Page 1, about two-thirds of the way down,
15 it says peripheral injection of 5HT2AR agonist and
16 that would be DOI. Correct?

17 A DOI is a 2A receptor agonist.

18 Q Okay.

19 A That doesn't necessarily mean that is
20 what these authors are referring to --

21 Q Right.

22 A -- in the citations.

23 Q But it says significantly reduces the
24 paw withdrawal latency to radiant heat or
25 mechanical stimulations and hyperalgesia induced

1 by and I don't know how to pronounce this word,
2 ketanserin.

3 That basically says in so many words
4 that the 2A agonist increases pain. Does it not?

5 A That is what these authors are
6 referring to --

7 Q Okay.

8 A -- in this sentence, yes.

9 Q And that the antagonist, which is not
10 DOI, reduced pain.

11 A That is what the authors are referring
12 to in this paragraph.

13 Q And I would like you to look at Page 6
14 of this same article that you cited.

15 A Yes.

16 Q The second column, DOI facilitates the
17 capsaicin-induced release of SP and the rat dorsal
18 horn essentially saying DOI enhances the pain.

19 A It's saying that DOI facilitates the
20 release of substance P in the rat dorsal horn.

21 Q And that in layman's terms mean it
22 enhances the pain does it not?

23 A Substance P is a molecule that can
24 signal pain. It doesn't necessarily mean that it
25 enhances the pain. It means that actually because

1 they're using the word facilitates, your
2 interpretation is correct. Yes.

3 Q Okay. Thank you. Now I would like to
4 move to Exhibit 50, which you also cited?

5 A Yes.

6 Q And I'll note that this is a study done
7 in Japan. Correct?

8 A Yes.

9 Q Which would not be affected by the
10 United States making DOI a Schedule I controlled
11 substance. Correct?

12 A Yes.

13 Q And this is from August of 2000.

14 A Yes.

15 Q Now you cited this too in support of
16 your position that DOI reduces pain.

17 A Yes.

18 Q And if you look on Page 3, I'll note that
19 you never really discussed the effect of
20 alpha-Methyl-5-HT did you?

21 A I did not discuss it. No.

22 Q And that actually on Page 3 if you look
23 at that left-hand chart at the bottom, shows that
24 alpha-Methyl-5-HT actually performed better in
25 terms of relieving pain for a longer period of time.

1 Correct?

2 A In this experiment, that's what the
3 data demonstrates.

4 Q Okay. And in your studies, have you
5 considered using any non-controlled substances?

6 A Yes, sir, I have.

7 Q Okay, but you're not using them are you?

8 A I have used non-controlled substances
9 in my studies.

10 Q In your current research, are you using
11 any substances I guess we would call them, well any
12 substances that do not produce hallucinations?

13 A Yes, sir. I am using substances in my
14 current studies that do not produce
15 hallucinations.

16 Q Any serotonin 2A agonists that don't
17 cause hallucinations?

18 A Yes, sir. I'm using a serotonin 2A
19 agonist called AL-34662.

20 Q Okay. Now your testimony and I don't
21 want to mischaracterize it. It seems to be
22 revolving around the idea that at one point DOI
23 would have a currently accepted medical use.

24 A That is not how I think of my testimony.

25 Q Well your testimony seemed to revolve

1 around the idea that DOI might be a pain reducer.

2 A My testimony in my own words is that DOI
3 could reveal novel, cellular molecular insights
4 into our understanding of pain.

5 Q Okay.

6 A And that insight could result in the
7 creation of novel therapies.

8 Q And you realize a DOI has no currently
9 accepted medical use. Correct?

10 A Yes, sir.

11 Q Okay. You acknowledge that. And
12 you're not really addressing any of the factors
13 that would relate to whether DOI should be
14 scheduled or not?

15 A I'm delivering my scientific
16 understanding.

17 Q You mentioned that when you do your
18 experiments with DOI, you lock up the DOI?

19 A Yes, sir.

20 Q And why bother doing that?

21 A Because I don't want anyone to tamper
22 with DOI in any way.

23 Q Okay. Are you worried that someone
24 might take it?

25 A Yes, sir.

1 Q Why? Because it's harmful isn't it?

2 A Because if someone doesn't know that
3 DOI is a hallucinogenic and they aren't instructed
4 in the proper reagent handling techniques, they
5 could accidentally expose themselves to DOI without
6 knowing the effects of DOI.

7 Q And that would be a problem wouldn't it?

8 A Yes, sir.

9 Q Now in your experiments, how do you
10 administer DOI to the -- I assume rodents?

11 A Yes. I dilute the DOI in saline
12 solution and then I inject the animals myself with
13 DOI.

14 Q Is it done intrathecally?

15 A It is not done intrathecally. No, it
16 is done intraperitoneally.

17 Q Would that be systemically?

18 A Yes, sir.

19 Q Yes?

20 A Yes, sir.

21 Q Okay. And you realize that that
22 according to Exhibit 50 increases pain?

23 A In the study that Exhibit 50 cites, the
24 authors that they're citing found that activation
25 of the 2A receptor in those studies can cause pain.

1 Q Okay. Thank you. All right so there
2 was a lot of discussion about the harm that might
3 occur to your research if DOI is Schedule I. Are
4 you going to shut down your research if DOI is
5 Schedule I? Yes or no?

6 A No.

7 Q And whom have you talked to at UC
8 Berkeley about the difficulties in attaining a
9 Schedule I registration?

10 A I have talked to other scientists at UC
11 Berkeley about the process of acquiring a Schedule
12 I registration.

13 Q And who are they?

14 A Do I name them?

15 Q Yes, please.

16 A I had spoken to the two people in
17 particular, I've spoken to multiple people, but two
18 people significantly contributed to my
19 understanding of the process, actually three
20 people.

21 Dr. Hillel Adesnik at UC Berkeley, Dr.
22 Andrea Gomez at UC Berkeley and the lab manager for
23 the Adesnik Lab, Janine Beyer I think is her name.

24 Q I believe you -- Adesnik?

25 A Adesnik.

1 Q And --

2 A Gomez.

3 Q Gomez? And did you mention Lammel?

4 A I did not mention Lammel. I have not
5 had correspondence with his lab regarding this --

6 Q Okay. And does Dr. Adesnik have a DEO
7 registration?

8 A To my knowledge, Dr. Adesnik does have
9 a DEA registration.

10 Q And does Dr. Gomez have a DEA
11 registration?

12 A To my knowledge, Dr. Gomez does have a
13 DEA registration.

14 Q Okay. Have you had discussions with
15 either one of them about possibly doing your
16 research under their DEA registrations?

17 A Yes, I talked about that with them and
18 neither of them seemed to communicate that. That
19 it would be a possibility. It seemed like they did
20 not feel like they had the breathing room to add
21 me onto their protocols.

22 Q So they both said no, they would not do
23 it?

24 A They did not say that.

25 Q They did not say no?

1 A They did not say no.

2 Q So they didn't give you a yes or no
3 answer on that?

4 A Correct.

5 Q Okay. And who are your advisors at
6 Berkeley?

7 A Dr. Diana Bautista and Dr. Ellen
8 Lumpkin.

9 Q All right. And who is the principal
10 investigator?

11 A Both of them.

12 Q All right. Do you, you've said you
13 ordered your DOI from Aldrich Sigma. Is that
14 correct?

15 A Sigma-Aldrich, yes, sir.

16 Q Sigma-Aldrich. I'm sorry. And are
17 you aware that Sigma-Aldrich has a Schedule I DEA
18 registration?

19 A I would imagine that they do.

20 Q All right. I believe it was your
21 testimony that even one day missing research can
22 harm your project. Correct?

23 A Yes, sir.

24 Q So how long is your research going on?
25 You've done it for two years.

1 A Two years.

2 Q And you're going to do it for two more
3 years?

4 A Yes, sir.

5 Q Okay. So you haven't taken a day of
6 vacation during all that time?

7 A Of course I do. I'm a human.

8 Q All right, so one day missing research
9 does not derail your research product. Does it?
10 Or your research project does it?

11 A It does, it can. Breaks need to be
12 structured and planned.

13 Q Dr. Ramos, you talked about having to
14 get IACUC approval?

15 A Yes, sir.

16 Q Okay. And what does IACUC stand for?

17 A IACUC is the Institute for Animal Use.
18 It's the Institute for Animal Use and Care.
19 Basically IACUC is a body of, is a group of people,
20 committee at universities that evaluate whether or
21 not the protocols are ethical and up to standards.

22 It consists of scientists, civilians,
23 and veterinarians.

24 Q And is it safe to assume that you got
25 IACUC approval to use DOI in this experiment?

1 A Yes.

2 Q Did you not? Okay. So you already had
3 to go through that process?

4 A Yes, I believe I said that during my
5 testimony.

6 Q And it's safe to say that you have not
7 applied for a DEA registration. Correct?

8 A No, I have not yet.

9 Q And you've not spoken to anyone at DEA
10 about the process of applying for DEA registration?

11 A I have not, no.

12 Q Okay. How much money have you received
13 to do your current research?

14 A I have received, I'm currently
15 supported by two grants. The one from the Miller
16 Institute and the one from Howard Hughes Medical
17 Institute.

18 The Miller Institute I have been
19 affiliated with them now for two complete years.
20 So that would include my salary for the first year
21 and a portion of the second year.

22 So that's going to be \$120,000 plus an
23 extra \$20,000 for extramural funds so that's
24 \$140,000 from the Miller Institute. And then the
25 Hannah Gray Fellowship that's going to be salary

1 for one year so \$140,000 plus \$80,000, whatever
2 that number is.

3 And then plus another \$40,000 of
4 extramural funds. So close to probably a quarter
5 of a million dollars I have received thus far.

6 Q I think you had in your CV it's \$1.5
7 million. Is that --

8 A Yes, it's administered over eight
9 years.

10 Q Okay. So two places, the Miller
11 Institute and the Hannah Gray Institute?

12 A Yes.

13 Q Okay, did I get that right?

14 A Yes, the Miller Institute and the
15 Howard Hughes Medical Institute.

16 Q Okay.

17 A Yes.

18 Q Why did I say Hannah Gray?

19 A That's the name of the Fellowship
20 Awarded --

21 Q Okay.

22 A -- by the Howard Hughes --

23 Q The Howard Hughes Institute?

24 A Yes, sir.

25 Q Okay. So have you informed the Miller

1 Institute or the Howard Hughes Institute that your
2 research may be hampered or hindered or shut down
3 at some point?

4 A I have not informed them of that because
5 if, because I have leeway to conduct other
6 experiments not related to DOI under the
7 stipulations of the grant.

8 Q And how long have you known about DEA's
9 efforts to control DOI?

10 A I have learned about them when the
11 proposed rulemaking was posted.

12 MR. MANN: All right just one moment,
13 Your Honor. That's all I have. Thank you.

14 JUDGE SOEFFING: Okay. Thank you, Mr.
15 Mann. Mr. Phelps, redirect?

16 MR. PHELPS: Yes, if we could have just
17 one moment.

18 JUDGE SOEFFING: Okay.

19 REDIRECT EXAMINATION

20 BY MR. PHELPS:

21 Q Dr. Ramos, the Government asked you
22 about in one of the papers that you cited there was
23 actually a citation to other research that DOI, in
24 fact, increases pain.

25 A Yes.

1 Q And the research you've been working on
2 is in how DOI can be used to decrease pain. Can
3 you explain how both of those things could be
4 determined in scientific experiments?

5 A Yes, I can do that. So biology is
6 really complicated and messy. And the biology of
7 serotonin is complicated and messy. There have
8 been experimental results demonstrating that
9 serotonin in our nervous system can both signal
10 pain and signal against pain.

11 And so it continues to be a mystery
12 amongst the scientific community of how and when
13 it does one or the other and that's why this
14 research is so important.

15 Q So that conundrum is really at the heart
16 of the research that you're doing?

17 A Yes, sir.

18 Q And why is it, why is it important to
19 understand that?

20 A If we can understand how serotonin in
21 some instances be pro-pain and in other instances
22 be anti-pain, that means we have a deeper
23 understanding of how pain works and we can leverage
24 that understanding in the development of therapies
25 and medicine.

1 Q And would a further understanding of
2 how that works be a benefit to public health?

3 A Yes, sir.

4 Q So would it be fair to say that making
5 it harder to find that out could harm public health?

6 A I think that's an accurate assessment.

7 Q Now the Government asked you if you had
8 spent every single day of the last two years working
9 in your lab. Correct?

10 A Yes, I recall the question.

11 Q And you stated that was not correct.
12 Right?

13 A Correct.

14 Q So can you explain how when every single
15 day is, every single day away from your research
16 can negatively impact your research, how do you
17 balance that with the fact that you can't work in
18 your lab 365 days a year?

19 A Yes, if I was working every day, I would
20 be burnt out. If I was burnt out, my ability to
21 perform my experiments to the best of my ability
22 at the quality that I need to perform them would
23 be significantly stunted.

24 So like every animal on the face of the
25 planet, I also need to rest.

1 Q And so do how you, I guess my question
2 is how do you, how do you structure your need to
3 rest and take breaks around the, you know, around
4 your research?

5 A Yes, so I, when I do experiments, I
6 outline very detailed plans for these experiments
7 and then I follow through on those plans and I also
8 program rest and break in between those
9 experiments.

10 So there are times where I am pushing
11 projects really hard and then there's times where
12 it's more of a slow burn and I'm analyzing the data
13 and results from projects that I have performed.

14 And thinking about the next steps.
15 Right? What people don't think about when it comes
16 to being a scientist is that doing experiments is
17 important, but thinking about what you do and
18 taking time to think about it and what it means is
19 just as important.

20 Q So you have to be very thoughtful in how
21 you structure your time away from the labs to not
22 impact your experience.

23 A Yes, I am very thoughtful about how I
24 structure my time away from the lab.

25 Q And what is the difference between time

1 spent away from your lab for rest or to think back
2 on your research versus time spent away from your
3 lab dealing with bureaucracy?

4 A Yes, one of those is restful and it
5 allows me to recharge and come back better and one
6 of those is not restful, it does not allow me to
7 recharge and does not allow me to come back to the
8 lab in a better state.

9 Q And does the, does your commitment to
10 the time you have to spend in your lab affect your
11 ability to take time out for things that you
12 sometimes would prefer to do?

13 A No.

14 Q You've never had to give something,
15 you've never had to forego doing something outside
16 of your lab because you had tests to conduct?

17 A Yes. I have.

18 Q And can you just explain how much having
19 to be in your lab impacts your, what you're able
20 to do outside of the lab?

21 A It has a significant impact and I could
22 give an example. When I was a graduate student,
23 the experiments that we conducted on animals
24 required that they were on a water restriction
25 schedule.

1 So that meant that the animals did not
2 have free access to water. They needed to receive
3 water at a specific time of day for a specific
4 amount of time and an animal can't go the weekend
5 without water because they're alive.

6 So throughout the entire duration of my
7 Ph.D., I actually had to go into lab every day
8 Monday through Monday. I had a team mate that
9 sometimes we allowed each other to take breaks and
10 he would do Saturday and I would do Sunday.

11 But for the duration of my Ph.D., I had
12 to work throughout the week and the weekend and I
13 had to plan my weekends. And sometimes I couldn't
14 do things that I wanted to do because on the
15 weekend, I still had to go in and take care of my
16 animals.

17 Q And when you're working through these
18 experiments, are you there at the lab on a standard
19 9:00 a.m. to 5:00 p.m. time schedule?

20 A That's not really how it works.
21 Sometimes I can be in the lab on a standard 9:00
22 a.m. to 5:00 p.m. schedule. Sometimes I have
23 experiments that last as long as 12 hours.

24 Q So it's not unusual for you to spend a
25 12-hour day in the lab just doing experiments?

1 A That's not unusual, no.

2 Q And the Government asked you a bit about
3 your communications with your, with your
4 fellowship and grant sponsors through this. So
5 I'd like to just kind of zoom out on that for a
6 minute.

7 And can you explain how your
8 relationship with those two organizations works?

9 A I'm a scientist affiliated with those
10 organizations and they fund me to do my research.

11 Q And do you provide them reports along
12 the way to --

13 A Yes, I provide them with updates and I
14 have the opportunity to communicate changes to my
15 research.

16 Q Okay.

17 A Yes.

18 Q And have you had to communicate those
19 changes in the past?

20 A When I switched from MDMA to DOI, I
21 don't think I had to, I did not officially
22 communicate it, but through discussion, everyone
23 for example, at the Miller Institute knows that I
24 work on DOI, even though my original proposal was
25 for MDMA.

1 And with HMMI, I communicated with
2 people at HMMI with someone in particular who has
3 actually I think since then retired. But I
4 communicated with someone that was involved in the
5 Hannah Gray administration that I would be
6 participating in these proceedings.

7 And yes, and I do give them regular
8 updates on the work that I am doing, the research
9 that I am doing. Yearly updates.

10 Q And how much do these granting
11 institutions manage your day-to-day activities in
12 your lab?

13 A They are not responsible for
14 micromanaging my day to day or the experiments that
15 I do.

16 Q And at this point with DOI not being
17 scheduled to this point, other than the time you've
18 had to take away from the lab to deal with this,
19 has it impacted your ability to conduct your
20 experiments?

21 A Yes, it has.

22 Q How so?

23 A We've had to prepare for these
24 proceedings and that has taken time away from my
25 job.

1 Q Okay. Looking at the job though, right
2 now you're able to continue the same experiments
3 with the DOI just around different time
4 constraints. Right?

5 A Yes.

6 Q Okay. So other than letting them know
7 maybe you're in these proceedings, you don't need
8 to report to them that your research has changed
9 yet. Right?

10 A No.

11 Q If DOI was to be placed in a Schedule
12 I, would you communicate that to your grant
13 funders?

14 A I don't necessarily need to tell them
15 that DOI is Schedule I. What I would communicate
16 is any alternative experiments that I begin to
17 pursue.

18 Q Would those, would those granting
19 institutions have any role in obtaining a DEA
20 license?

21 A No.

22 Q Would you have any reason to
23 communicate with them about your attempts to get
24 a DEA license?

25 A I do not have to communicate with the

1 granting funding agencies anything that has to do
2 with attempting to get a Schedule I license to my
3 knowledge.

4 MR. PHELPS: Thank you. No further
5 questions for this witness, Your Honor.

6 JUDGE SOEFFING: Thank you, Mr.
7 Phelps. Mr. Mann, any re-cross?

8 MR. MANN: One second.

9 JUDGE SOEFFING: Okay.

10 MR. MANN: Nothing further, thank you.

11 JUDGE SOEFFING: All right, Dr. Ramos,
12 thank you for your testimony. You are excused. I
13 direct you not to discuss your testimony with
14 anyone other than your attorney until the
15 conclusion of the hearing.

16 THE WITNESS: Thank you.

17 JUDGE SOEFFING: And, Mr. Phelps, did
18 he go to get the next witness?

19 MR. RUSH: Yes, he's yes.

20 JUDGE SOEFFING: Okay, very good.

21 MR. RUSH: I'll be, Your Honor, I'll be
22 conducting the examination --

23 JUDGE SOEFFING: Okay.

24 MR. RUSH: -- of the next witness.

25 JUDGE SOEFFING: We're off the record.

1 (Whereupon, the above-entitled matter
2 went off the Record at 11:36 a.m. and resumed at
3 11:37 a.m.)

4 JUDGE SOEFFING: Back on the record.
5 And Mr. Rush, I understand you're handling the next
6 witness.

7 MR. RUSH: Yes, Your Honor.

8 JUDGE SOEFFING: Okay. You may call
9 the witness.

10 MR. RUSH: Your Honor, the Petitioners
11 would like to call Dr. Harrison Elder.

12 JUDGE SOEFFING: Okay. Dr. Elder,
13 please come up to the witness stand. Please raise
14 your right hand. Do you swear or affirm under
15 penalty of perjury that the testimony you are about
16 to give shall be the truth, the whole truth and
17 nothing but the truth?

18 DR. ELDER: I do.

19 WHEREUPON,

20 HARRISON ELDER

21 was called as a witness by Counsel for the Petitions
22 and, having been first duly sworn, assumed the
23 witness box, was examined and testified as follows:

24 JUDGE SOEFFING: You may be seated.
25 Please state your first name, your last name and

1 spell them both for the record.

2 THE WITNESS: My first name is
3 Harrison, H-A-R-R-I-S-O-N, last name Elder,
4 E-L-D-E-R.

5 JUDGE SOEFFING: I thank you.
6 Counsel, you may inquire.

7 MR. RUSH: Thank you, Your Honor.
8 Good day. Thank you for taking the time to provide
9 testimony to us today. Would you please reference
10 Exhibit 74?

11 THE WITNESS: Thank you.

12 DIRECT EXAMINATION

13 BY MR. RUSH:

14 Q Would you please identify what the
15 document is?

16 A It is my CV.

17 Q And is this a CV that you drafted?

18 A I did.

19 Q And you prepared this?

20 A That's correct.

21 Q And is it accurate?

22 A It is. It might be a little bit out of
23 date depending on when it was submitted. But it
24 is accurate to the --

25 Q Were your --

1 A -- best of my knowledge.

2 Q -- qualifications, it's there, there's
3 nothing materially missing?

4 A That's correct.

5 MR. RUSH: All right. Your Honor, I
6 would like entered into evidence Exhibit 74.

7 JUDGE SOEFFING: Mr. Mann, any
8 objection?

9 MS. ATTANASIO: No objection, Your
10 Honor.

11 JUDGE SOEFFING: Okay. So who's
12 handling this witness for the Government?

13 MS. ATTANASIO: I will be, Your Honor.

14 JUDGE SOEFFING: Okay. Please
15 identify yourself for the record.

16 MS. ATTANASIO: Alexis Attanasio,
17 A-T-T-A-N-A-S-I-O.

18 JUDGE SOEFFING: Thank you. Okay so
19 no objection. Petitioner's Exhibit marked for
20 identification No. 74 has been offered. In the
21 absence of an objection, it is received in the
22 record as Petitioner's Exhibit 74. It's in, you
23 may use it.

24 (Whereupon, the above-referred to
25 document was received into evidence as

1 Petitioner's Exhibit No. 74.)

2 MR. RUSH: Thank you, Your Honor.

3 We're going to walk through your resume now so we
4 can get a full understanding exactly of your
5 experience and competencies and qualifications to
6 present at this hearing.

7 Your educational background, would you
8 please describe any degrees that you have?

9 THE WITNESS: Absolutely. So I
10 received my Bachelors of Arts in Biology from the
11 University of Virginia in 2016 where I first began
12 my research.

13 After graduating from the University of
14 Virginia, I obtained a post-baccalaureate
15 certificate from Northeastern before
16 matriculating into VCU, Virginia Commonwealth
17 University in Richmond where I earned my Ph.D. in
18 Pharmacology and Toxicology.

19 BY MR. RUSH:

20 Q Are these accredited universities?

21 A They are.

22 Q And you received degrees from each of
23 them. Correct?

24 A That's correct.

25 Q As part of your Ph.D., did you have to

1 provide a dissertation?

2 A I did. And defended it.

3 Q And you defended it?

4 A That's --

5 Q And you defended it successfully.

6 A That's correct.

7 Q What was the topic of that
8 dissertation?

9 A Well the title here on the CV is
10 Modulation of Opioid-Induced Respiratory
11 Depression by Stimulants and their Associated
12 Monoaminergic Receptor Mechanisms in Mice Using
13 Whole Body Plethysmography.

14 Q Now regarding your training and course
15 work that you've undertaken, would you please give
16 an overview of what type of coursework that was?

17 A Absolutely. I mean aside from my
18 general Bachelor's in Biology for undergraduate
19 where I learned the basics of cellular and in vivo
20 biology during my Ph.D. work, I took many courses
21 on biochemistry, chemistry, neuropharmacology,
22 the basics of pharmacokinetics and
23 pharmacodynamics among many other courses.

24 Q Were you trained in any sort of
25 methodology regarding how to evaluate data and

1 analyze data as part of your education?

2 A Absolutely. I took many courses on
3 statistics and data analysis.

4 Q Okay. And you've taken courses on what
5 are the standards for evaluation of, you know,
6 research.

7 A Yes.

8 Q Thank you. Now I see you worked at --
9 what's your current position?

10 A So over the last year, I completed a
11 post-doc, post-doctoral training at Johns Hopkins
12 University School of Medicine in their Behavioral
13 Pharmacology Human Behavioral Pharmacology Unit.

14 I very recently, I have left Johns
15 Hopkins to begin employment in the private
16 industry.

17 Q And with whom are you currently
18 employed?

19 A I am currently employed by DeFloria
20 Biosciences, but I am here on my own behalf and not
21 representing them today.

22 MR. RUSH: We understand that.

23 JUDGE SOEFFING: Let me ask, when did
24 you leave Johns Hopkins?

25 THE WITNESS: Roughly a month ago,

1 month and a half ago.

2 JUDGE SOEFFING: Okay, and when did you
3 begin the new employment?

4 THE WITNESS: About six weeks ago.

5 JUDGE SOEFFING: Okay. Thank you.

6 THE WITNESS: Yes.

7 BY MR. RUSH:

8 Q And what's involved in your current
9 employment?

10 A I'm the Senior Manager of Clinical
11 Development for the company. So I help to develop,
12 bring drugs through the clinical development
13 process Phase I through III trials and all the
14 regulatory documentation that's needed to
15 successfully get a drug approved.

16 That's essentially the core components
17 of my job. Including designing research and
18 trials and things like that.

19 Q So it has a compliance aspect of it as
20 well as analyze and research studies, things like
21 that?

22 A Absolutely. It's made me quite
23 familiar with the regulations surrounding
24 controlled substances and drug development.

25 Q All right, let's go to your previous

1 position. Where was that at?

2 A Prior to graduate school?

3 Q Prior to your current, no prior to your
4 current job that you currently have. Your most
5 recent one.

6 A Oh, that was, so when I was a
7 post-doctoral fellow at Johns Hopkins University's
8 Behavioral Pharmacology Research Unit. Yes, that
9 was my previous position.

10 Q This research unit, John Hopkins, is
11 this regarded, how is this regarded generally in
12 academia or popular, yes, in your, in the sector
13 of, you know, scientific research?

14 A I can confidently say without bias that
15 it's considered to be one of the top human behavior
16 pharmacology labs in the country, if not the world.

17 Q Are there any notable alumni from John
18 Hopkins University School of Medicine's Behavioral
19 Pharmacology Research Unit?

20 A Certainly. Roland Griffiths for one.
21 Matt Johnson, another psychedelic researcher, Ryan
22 Vandrey who is my advisor is another alumni who is
23 but one of the top cannabis researchers in the world
24 as well as the Government's witness, Theresa
25 Carbonaro. Dr. Carbonaro is I believe an alumni

1 of this program as well.

2 Q And will you please describe what type
3 of work were you doing at John Hopkins?

4 A When I was a post-doc at Hopkins, the
5 majority of my work was related to human laboratory
6 studies of drugs with abuse potential. So
7 primarily cannabinoids and other phytochemicals
8 from the cannabis plant.

9 But also working with the psychedelic
10 group that was there and conducting outside of the
11 human laboratory trials that I helped to develop
12 and conduct and publish, I also did a significant
13 amount of surveillance work, if you will, drug
14 surveillance work.

15 Q Would you please explain to us what you
16 mean by drug surveillance work?

17 A Absolutely. So there are at least two
18 projects during my time there that are still
19 actually ongoing that were involved with
20 determining the availability of various
21 cannabinoids and their analogs to the public
22 through retail and other means.

23 Purchasing those products and having
24 them analyzed for their contents. I also
25 undertook projects similar to that for psychedelic

1 compounds, unscheduled and scheduled and their
2 availability in the community and ratio locations
3 and online as well.

4 JUDGE SOEFFING: Mr. Rush, can you
5 adjust the microphone to get that a little bit
6 closer to you?

7 MR. RUSH: Oh, sure. Absolutely.

8 JUDGE SOEFFING: Where you're
9 speaking. Thank you.

10 MR. RUSH: Is that better? Oh.

11 JUDGE SOEFFING: Hold on a second.
12 We're having a little bit of a technical difficulty
13 with the reporter.

14 THE WITNESS: Is this loud enough?

15 JUDGE SOEFFING: You're fine. Yes,
16 we're off the record.

17 (Whereupon, the above-entitled matter
18 went off the Record at 11:47 a.m. and resumed at
19 11:48 a.m.)

20 JUDGE SOEFFING: Okay, back on the
21 record.

22 BY MR. RUSH:

23 Q I see on your resume it indicates that
24 you have experience. It looks like read
25 surveillance studies, product chemical

1 composition to identify safety risks. What does
2 that mean?

3 A So what that entailed was I'll just give
4 an example. For the first part of the study, we
5 went, we randomly selected various smoke shops and
6 other retail locations to go and purchase
7 cannabinoid products that were labeled with
8 various cannabinoid analogs, psychedelic analogs,
9 bought those products, sent them off to a lab for
10 analytical chemistry, to determine what chemicals
11 were in those products and at what concentration
12 and what dose.

13 So that's determining their safety for
14 consumption by the general public.

15 Q Okay, so we're working as a research
16 fellow at John Hopkins, you were as part of your
17 position, you conducted an analysis of illicit use
18 of the version of drugs.

19 A You could say that yes.

20 Q Okay, I've seen that it says you aided
21 in writing, reviewing, submitting regulatory
22 documentation for clinical research studies for
23 investigational new drug applications, clinical
24 protocols and IRB documentation.

25 What did that entail and what was the

1 purpose of that?

2 A Most of that was regulatory
3 documentation to ensure that the clinical trials
4 and clinical studies that we were running were
5 safe, were approved by HHS or at the FDA as well
6 as the DEA because we were running studies on
7 Schedule I through V drugs.

8 So much of that documentation was
9 documenting the safety of those scheduled drugs
10 that we were testing or we were proposing to test
11 in clinical laboratory studies.

12 Essentially due diligence on the safety
13 of our protocols and the purpose of the research.

14 Q And you, did you evaluate the
15 legitimacy of the research involving the
16 potentially controlled substances?

17 A Absolutely. I mean, as someone who had
18 a background in pharmacology and toxicology while
19 many of my colleagues were more in the psychometric
20 side of things, I was tasked with ensuring that the
21 toxicological data on scheduled substances was
22 accurate.

23 And proved that the drugs that we were
24 looking at would not be a safety risk in the
25 laboratory when administered in a controlled

1 setting.

2 Q And you were responsible with rendering
3 that determination?

4 A I was responsible for writing it up, but
5 these documents were then obviously reviewed by
6 various boards like our Institutional Review
7 Board, the IRB and HHS DEA so I wrote them up and
8 yes, and submitted them, but they were reviewed by
9 other agencies and groups.

10 Q And is that a difficult process that you
11 would, that they would, there's multiple levels
12 with this that this would be submitted through?

13 A Yes, that's very typical.

14 Q Okay. Thank you. Was your work group
15 viewed by any senior people to you there?

16 A Oh, certainly. I wasn't the principal
17 investigator on the grant so the PI of those grants
18 would review those, that documentation before
19 submission.

20 Q And the people senior to you supervised
21 you, did they approve your analysis?

22 A Yes.

23 Q Okay, I see here you've listed
24 independently authored critical reviews of
25 scientific literature in the field of clinical

1 pharmacology. Would you please explain what that
2 means and what that entailed?

3 A Certainly. One of the first projects
4 that I undertook at Johns Hopkins was to write up
5 a comprehensive review, which is just a large
6 research paper where you search the literature for
7 published studies and then summarize them in a
8 large, in a review paper to communicate the current
9 state of some topic in science.

10 So specifically, I was looking at the
11 human behavioral and clinical pharmacology of
12 cannabinoids, their analogs and related
13 phytochemicals.

14 Q And when you were conducting these
15 reviews, if for example, if you were conducting a
16 review of a substance say like heroin, a Schedule
17 I substance, would a person who opines on that as
18 part of your analysis be restricted to only people
19 who have conducted actually heroin research?

20 Or could it be people who have conducted
21 all sorts of research if it's relevant and
22 reflected in the science overall?

23 A I wouldn't say that it's restrict to
24 someone that's, I'm not sure I fully understand the
25 question, but I wouldn't say that only people

1 who've conducted research with certain drugs are
2 restricted, are the only ones that can publish and
3 opine on them in the peer reviewed literature.

4 For example, I undertook this review to
5 familiarize myself with the cannabinoid literature
6 as I had previously worked mostly with
7 monoaminergic drugs. So that's a common practice
8 I would like to say.

9 Q So typically people are in your
10 position, they can educate themselves and they
11 typically do educate themselves on a variety of
12 topics without actually conducting laboratory
13 research themselves?

14 A That's correct.

15 Q All right. Thank you. Let's move
16 onto your next position here. I see content, a
17 writer at Psychedelic Science Review. What is
18 Psychedelic Science Review?

19 A That is an online publication for
20 public readership.

21 Q And what type of topics are covered
22 there?

23 A The topics on Psychedelic Science
24 Review are essentially reviewing current
25 psychedelic science and happenings in the field of

1 psychedelic science so talking about new advances,
2 new published papers, potential legal issues,
3 things of that nature.

4 Q I see also it looks like you have
5 indicated that current topics also involve abuse
6 liability.

7 A That's correct, yes.

8 Q And that abuse liability, how many do
9 you, what did that involve the abuse liability
10 identifying?

11 A So the purpose of my work with
12 Psychedelic Science Review was essentially
13 scientific communication to the public. It was
14 something I felt that needed, we needed more of.

15 And so one of the articles that I wrote,
16 one of the last articles that I wrote was an article
17 explaining what an Eight Factor Analysis was in
18 simple terms, simple lay public, going over each
19 factor of an Eight Factor Analysis, what it meant
20 and how it might be applied to a drug like MDMA.

21 This was back before MDMA had been fully
22 submitted to the FDA for approval so I essentially
23 was explaining how an Eight Factor Analysis may
24 work for new and novel psychedelic or inactive
25 inert drugs so that was the gist of that paper or

1 that article I should say.

2 Q Okay. Thank you. Did you, did you
3 analyze any papers there on hallucinogenic
4 substances?

5 A Certainly. I mean, every article that
6 I wrote for the Psychedelic Science Review was well
7 cited with the published peer reviewed scientific
8 research that's out there.

9 I didn't just opine. I mean, it was,
10 they were well researched articles that I had
11 written for them.

12 Q Well let me ask you about that. Your
13 comment you've opined, you've evaluated these
14 articles. What's the standard that you go by to
15 do this? Is there a standard that research is
16 evaluated under?

17 A I mean the quality and legitimacy of
18 research is typically evaluated on being peer
19 reviewed and then published in journals by
20 reputable institutions and researchers.

21 Most of that article was based on a
22 published article by Dr. Jack Henningfield who is
23 another drug policy advocate and consultant who
24 wrote a peer reviewed and published paper outlining
25 the process for evaluating psychedelics under an

1 Eight Factor Analysis. I believe it was published
2 in 2022.

3 Q And peer review, that said peer review
4 is kind of the standard that you would work with
5 and that's generally what you could, was that the
6 accepted methodology of them for analyzing and
7 qualifying the validity of research?

8 A Yes, I would say that that's the general
9 gold standard for what constitutes the research,
10 a published research paper.

11 Q And when you're evaluating these things
12 as part of your positions, do you look for errors
13 in the papers?

14 A I do. I tend to be a little bit,
15 scrutinize the papers a little bit more if I'm
16 skeptical of their findings, but I absolutely read
17 through papers that I cite.

18 Q But generally in the, in your
19 experience, there's established standards and
20 generally accepted methodologies that are applied?

21 A That's correct, yes.

22 Q And you applied those yourself?

23 A That's correct, yes.

24 Q Were you ever, did you ever not apply
25 those?

1 A Not to my knowledge.

2 Q Now I see you were a Project Manager and
3 Clinical Liaison; Misuse, Abuse, and Diversion
4 Drug Event Reporting System, MADDERS at Analgesic
5 Solutions, LLC. What is Analgesic Solutions, LLC?

6 A Analgesic Solutions, LLC was a company
7 that I worked for after graduating with my
8 bachelor's from the University of Virginia up in
9 the Boston area.

10 And the company was founded and this was
11 a small company that was founded to improve the
12 quality of analgesic clinical trials of pain
13 medications.

14 And the product that I was in charge of
15 was this, the MADDERS system, which was what you
16 just stated, the Misuse, Abuse, and Diversion Drug
17 Event Reporting System, which was designed by
18 myself and the owner of the company, Dr. Nathaniel
19 Katz, to capture, evaluate and report instances of
20 misuse, abuse and diversion of investigational
21 drugs.

22 So let's say a new opioid or a new
23 chemical entity that was being looked at for pain
24 relief, we would implement this MADDERS system and
25 the clinical trials of it to assess misuse, abuse

1 and diversion of those new unapproved
2 investigational drugs.

3 Q Would you call this kind of an emerging
4 drug threat?

5 A I'm sorry, I don't know if I understand
6 the question.

7 Q Well I, I asked if you determined or you
8 assessed whether there were, you know, the
9 likelihood that there is a new threat emerging from
10 drugs based upon your analysis of diversion,
11 misuse?

12 A That's correct. We would provide
13 essentially an abridged threat analysis on these
14 investigational drugs to determine if they posed
15 a threat to public health if they were to be
16 approved let's say as a pain medication.

17 Q And in your analysis here, did you, did
18 you look at only scheduled drugs?

19 A Most of the drugs that I was evaluating
20 with the MADDERS system were unscheduled or
21 uncontrolled at the time because they were
22 investigational drugs.

23 That was part of the reason that we were
24 monitoring them is to see if that would later be
25 necessary.

1 Q So as part of your duties, you were
2 tasked with monitoring and evaluating whether
3 there is misuse, diversion of non-scheduled drugs.

4 A That's correct.

5 Q Thank you. What is the adjudication
6 committee at Analgesic Solutions?

7 A So the way that the MADDERS system would
8 work is as I'm sure some of, you know, large Phase
9 III clinical trials are run at multiple sites.

10 We would train site staff who were
11 running the study on various ways to identify
12 misuse, abuse and diversion. We would train them
13 on how to write up a narrative and collect
14 information around instances where they suspected
15 any of a number of triggering events as we called
16 them.

17 And I would collect those reports from
18 the sites and bring them to an adjudication
19 committee that I had convened of key opinion
20 leaders and experts in the field of addiction
21 medicine.

22 I would convene the adjudication
23 committee maybe once or twice a month to go over
24 any reports that we had received from the sites,
25 any narratives and reports from the sites of

1 misuse, abuse and different potentially diversion
2 related activities.

3 And then I would gather their opinions
4 and make a judgment on whether or not that report
5 from the site truly constituted an instances of
6 misuse, abuse or diversion.

7 Q So you were working with your team then
8 looking at clinical research if something was being
9 inappropriately diverted, inappropriately used,
10 that's what your team would sort of meet, collect
11 on and provide an opinion on whether it was
12 improper. Is that --

13 A That's correct. And then those
14 results would eventually be written up for
15 submission with the new drug application to both
16 the FDA and I believe the DEA.

17 Q So these reports that you would
18 generate these -- I see it says clinical trial
19 safety monitoring pharmacovigilance of use
20 liability assessments and outcomes. And these you
21 reported to the FDA?

22 A That's correct. Yes, we reported them
23 to our clients, which wrote them up in their NDAs,
24 documents that are submitted to the FDA and DEA.

25 Q I see here it says you published

1 manuscripts on clinical abuse liability, clinical
2 trial design for peer review journals, present
3 findings for trial safety monitoring and
4 international scientific conferences. And that
5 was for psychoactive substances typically?

6 A Yes, I believe one of the papers that
7 we published on clinical abuse liability was on an
8 investigational opioid drug developed by Nektar
9 Pharmaceuticals.

10 And we actually did find several
11 instances of abuse and diversion in those trials,
12 which is why we published the data. And then I had
13 also presented much of the data that I collected
14 with the MADDERS system that international
15 conferences and other scientific meetings.

16 Q And what was the result of your work?
17 Did you have any accomplishments, successes of
18 providing this liability, abuse liability data. I
19 see here it says you submitted with -- what is this
20 drug, Epidiolex?

21 A Yes, actually so that I would say was
22 one of the greater successes of the MADDERS system
23 while I worked there. Epidiolex otherwise known
24 as cannabidiol, CBD, was being developed by GW at
25 the time and we had implemented the MADDERS system

1 in their trials to demonstrate that CBD had little
2 to no abuse liability, which it does not.

3 And that was actually a success because
4 of the negative result. We didn't find any
5 instances of abuse or diversion of CBD that was put
6 into there, that was reported to the client.

7 And that their drug was eventually
8 approved a year or so later with the inclusion of
9 some of our negative data from the MADDERS showing
10 a lack of abuse potential.

11 Q When you were working in your
12 evaluation compliance capacity there, was
13 cannabidiol -- what Schedule was that?

14 A The status of CBD is a little convoluted
15 over the past several years. CBD I believe was at
16 one point considered a Schedule I substance as a
17 component of cannabis.

18 The Farm Bill from 2016 I believe it
19 was, a U.S. Agriculture Bill, reclassified
20 hemp-derived CBD as an unscheduled substance. I
21 don't really know that the specifics of the
22 legislative ins and outs of CBD's controlled
23 status, but at the time it was considered to be
24 noncontrolled if it was from hemp.

25 But it had previously been considered

1 to be a Schedule I substance as a component of
2 marijuana or cannabis if you will.

3 Q So basically you, part of your
4 experience involved looking at a substance that was
5 previously Schedule I and Schedule V now?

6 A That's correct. Actually, yes, that's
7 correct.

8 Q And you also worked as an associate
9 product manager, it says MADDERS at Analgesic
10 Solutions, LLC.

11 A Yes, the following few positions on my
12 CV are simply the previous positions that I held
13 before being promoted and taking over various
14 aspects of the company to manage.

15 Q Okay. Well we need to know what you did
16 there and what your responsibilities were.

17 A Certainly.

18 Q What was your obligations under the
19 MADDERS system? What was your employment duties?

20 A Prior to managing the MADDERS, when I
21 was an associate, I would essentially do all of the
22 activities that are required to implement the
23 system so flying to sites, training site personnel
24 in how to spot misuse, abuse and diversion-related
25 events.

1 Collecting those narratives and
2 reports, convening the adjudication committees,
3 helping to do data analysis on those MADDERS
4 reports and data, helping to draft up the
5 manuscripts, things of that nature.

6 It was more of an assistant role, but
7 essentially all the same duties I had as a manager.

8 Q And so it was kind of an establishing
9 the methods and procedures to establish the
10 validity or compliance?

11 A Yes, that's correct.

12 Q What is KOLs? I see up here identified
13 and liaised with KOLs.

14 A It's an acronym for Key Opinion Leader
15 so a doctor, researcher, physician who is
16 considered to be an expert in their field by their
17 field.

18 Q So your work, a Key Opinion Leader, that
19 would be kind of the expert in the field on that?

20 A Yes, an expert from the field, yes.

21 Q And you liaison with them, worked with
22 them and they approved your methodology?

23 A Yes, I would say that they approved of
24 the methodologies. Some of them were involved in
25 our Scientific Advisory Board as well whose purpose

1 was to review the validity of the methods.

2 Q And you also looks like trained
3 clinical site personnel in compliance?

4 A I did, yes.

5 Q What is the accurate paying reporter
6 and placebo response reduction?

7 A Those were earlier products developed
8 by Analgesic Solutions to improve the validity and
9 the accuracy of the pain reports that we, that
10 subjects in clinical trials would give to site
11 personnels.

12 So, you know, early on we were working
13 on some Phase IV efficacy and surveillance trials
14 that were actually mandated after many of the
15 Purdue and OxyContin lawsuits.

16 And those were developed to improve the
17 reports that patients were giving as patients
18 sometimes, or subjects are sometimes not the most
19 well-versed in how to report their pain on the
20 scales that are used in clinical trials.

21 Q What's a focused analgesics selection
22 testing device?

23 A That was a device that is related to
24 those two trainings that would be placed on a
25 subject's forearm. It would heat up. It had a

1 thermal component, would heat up on their forearm
2 to a painful degree, various different settings of
3 painful degrees.

4 And it was used to train subjects and
5 patients on how to accurately feel and report their
6 pain. So let's say if it heats up to 100 degrees
7 Fahrenheit that might be a 2 out of 10.

8 If the device heated up to 150 degrees
9 Fahrenheit for a second, you know, we were trying
10 to get them to report that accurately or see if they
11 could report it accurately. That was what the
12 device was used for.

13 Q Okay, so it's a device used to evaluate
14 pain?

15 A Yes.

16 MS. ATTANASIO: Objection, Your Honor.
17 Can we restrict the questions of these to this
18 matter? We're kind of going outside the scope here
19 about what his expertise is.

20 MR. RUSH: Your --

21 MS. ATTANASIO: About these different
22 things.

23 JUDGE SOEFFING: I'll give some
24 latitude because he is being offered -- I assume
25 this is a lead up an offering him as an expert

1 witness?

2 MR. RUSH: Absolutely, Your Honor.
3 We're trying to establish that he has the
4 qualifications to represent himself as an expert
5 to this court and we need to explain what those
6 qualifications are.

7 JUDGE SOEFFING: Sure. I'll overrule
8 the objection. I will say that we are spending a
9 lot of time on this. So to the extent that it's
10 not specific to what he's being offered an expert
11 in, I think that would yield us some time savings.

12 MR. RUSH: Understood, Your Honor.

13 JUDGE SOEFFING: Let me ask since we
14 have this little break here, Dr., again what is your
15 current title since you've left Hopkins at the new
16 job?

17 THE WITNESS: I'm the Senior Manager of
18 Clinical Development.

19 JUDGE SOEFFING: Okay. And the name
20 of the company again?

21 THE WITNESS: DeFloria Biosciences.

22 JUDGE SOEFFING: Can you spell that
23 please?

24 THE WITNESS: D-E-F-L-O-R-I-A,
25 Biosciences.

1 JUDGE SOEFFING: Okay and where's --

2 THE WITNESS: And again, they're in
3 Littleton, Colorado outside of Denver. I don't
4 know if I could give you the street address off the
5 top of my head, but again, I should state that I'm
6 here as a private citizen and not as an employee
7 of them.

8 JUDGE SOEFFING: Do you work in
9 Littleton, Colorado or you work remotely?

10 THE WITNESS: I work remotely at the
11 moment.

12 JUDGE SOEFFING: Okay, thank you. Go
13 ahead, Mr. Rush.

14 BY MR. RUSH:

15 Q Thank you, Your Honor. Would your
16 undergraduate research assistant position entail
17 cocaine self-administration? Please tell me
18 about what that --.

19 A Certainly.

20 Q Briefly.

21 A Yes, that was when I was an
22 undergraduate. It was my first introduction to
23 research. I worked with Dr. Wendy Lynch, who was
24 a well-renowned psychostimulant and monoamine
25 researcher.

1 And I was an undergraduate laboratory
2 assistant, running cocaine self-administration
3 studies with rats, not assessing abuse potential,
4 but assessing actually treatments for substance
5 abuse disorder and stimulant use disorder.

6 Q Okay, thank you. Have you published
7 any academic papers?

8 A I have published many academic papers,
9 yes.

10 Q Approximately how many?

11 A Approximately 12 to 16. I haven't
12 counted recently. There's several that are being
13 reviewed.

14 Q Understood. And those were peer
15 reviewed publications?

16 A That's correct, yes. Looks to be about
17 15.

18 MR. RUSH: Your Honor, we would like to
19 move that Dr. Elder be certified as an expert in
20 pharmacology, chemistry, substance abuse, and
21 compliance.

22 JUDGE SOEFFING: All right.

23 MR. RUSH: Regulatory compliance.

24 JUDGE SOEFFING: So that's different
25 than what was put in the prehearing statement. Can

1 you give me that again?

2 MR. RUSH: Pharmacology, chemistry,
3 substance abuse liability and regulatory
4 compliance.

5 JUDGE SOEFFING: Pharmacology,
6 chemistry, substance abuse liability, and
7 regulatory compliance?

8 MR. RUSH: Yes, Your Honor.

9 JUDGE SOEFFING: Okay. In the
10 Supplemental Prehearing Statement, it stated he
11 was going to be offered as an expert in the study
12 of respiratory depression and substance use
13 disorders.

14 Specially, the use of monoamines
15 including psychedelics as modulators of
16 respiratory depression. Do you not wish to enter
17 him as an expert in that field or as this
18 designation?

19 MR. RUSH: I would add that to the
20 designation that we are seeking. I just want, what
21 I'm trying to do is I'm trying to be broad because
22 it's -- or at least I'm trying to capture a
23 definition that reflects what he's truly an expert
24 of.

25 And not have it put into a very sort of

1 narrow -- that's kind of pedantically limited
2 structure based upon verbiage.

3 JUDGE SOEFFING: Well that is the
4 purpose of the prehearing statements is to state
5 what the person is going to be offered as an expert
6 in and you're talking about different categories
7 of science than what was disclosed in the
8 Prehearing Statement.

9 MR. RUSH: I guess I would, let me look
10 at his what the supplemental statement, but the --

11 JUDGE SOEFFING: The Supplemental
12 Prehearing Statement.

13 MR. RUSH: Yes.

14 JUDGE SOEFFING: Let me ask Ms.
15 Attanasio, what the Government's view is if you're
16 willing to stipulate to him being an expert in these
17 fields or what's the Government's position?

18 MS. ATTANASIO: No, Your Honor. We
19 would object to that because we've had no notice
20 of this and they've had months to tell us or to
21 change, make a motion about changing his expertise
22 here.

23 JUDGE SOEFFING: Okay. What about,
24 what's your position or would you like to conduct
25 voir dire on the disclosed subject matter for which

1 he was to be proposed as an expert in?

2 MS. ATTANASIO: Oh, we would voir dire
3 that.

4 JUDGE SOEFFING: Okay. All right,
5 well you know, I don't think there was sufficient
6 notice to the Government of these other areas in
7 which you're now proposing to have him admitted as
8 an expert in.

9 So we will stick what was disclosed in
10 the Supplemental Prehearing Statement. Mr. Rush,
11 I assume you still want to offer him as an expert
12 in that?

13 MR. RUSH: Well, yes. I believe that
14 the respiratory depression disease fall under the
15 category of pharmacology so we would expert in
16 pharmacology also.

17 And you know, it's my understanding
18 that the purpose of this is to provide notice to
19 the Government that they're not surprised and they
20 were adequately able to prepare.

21 And the Federal Rules of Civil
22 Procedure are more flexible here. It seems that
23 there's, based upon what was in the, you know, our
24 first description of what Dr. Elder would testify,
25 our initial Prehearing Statement explained to the

1 Government what this, you know, reflecting what his
2 actual experience and expertise is and provided
3 them with notice.

4 There's not a surprise that's occurring
5 based upon what's been provided to them between his
6 resume, the description in our initial Prehearing
7 Statement as to what he would testify to and then
8 the Supplemental one is the supplemental. It's
9 additional to --.

10 JUDGE SOEFFING: Right. Well, the
11 subject matter certainly that was disclosed to the
12 Government, you know, he can testify to, but I do
13 think it is a bit of surprise.

14 It's a surprise to me that you're
15 listing, that what you're offering him as an expert
16 in initially here is completely different than what
17 was put in the Supplemental Prehearing Statement.

18 There's no mention of pharmacology,
19 chemistry. There was a discussion about substance
20 use disorder, but there's no mention of regulatory
21 compliance.

22 So I think, you know, if you want to
23 stick with what you have in Supplemental, I'll
24 allow the Government to conduct voir dire and then,
25 you know, I'll make a ruling.

1 MR. RUSH: Well I --

2 JUDGE SOEFFING: It's not going to
3 affect, you know, if it's been disclosed he can talk
4 about it through subject matters, but I'm not going
5 to designate him as an expert in something that the
6 Government was not given prior notice about.

7 MR. RUSH: All right, yes, well that
8 would be he can testify to the issues on his
9 personal knowledge and experience, but the -- so
10 what exactly is the --

11 JUDGE SOEFFING: Well what I have and
12 what was written in the Supplemental Prehearing
13 Statement is that he would be offered as an expert
14 in the study of respiratory depression and
15 substance use disorders, specifically the use of
16 monoamines including psychedelics as modulators of
17 respiratory depression.

18 MR. RUSH: May --

19 JUDGE SOEFFING: Is that what you wish
20 to enter?

21 MR. RUSH: May I confer with my --

22 JUDGE SOEFFING: Sure.

23 MR. RUSH: -- co-counsel, Your Honor?

24 JUDGE SOEFFING: Sure.

25 MR. RUSH: Thank you.

1 JUDGE SOEFFING: And let me just add,
2 Mr. Rush, this was discussed at the first
3 Prehearing Conference over the summer when we
4 discussed the parties' Prehearing Statements and
5 at that point, none of the proposed witnesses for
6 the Petitioners were disclosed or offered as expert
7 witnesses.

8 And we discussed that and that's why in
9 the Supplemental that the Petitioners filed, that
10 Supplemental Prehearing Statement identified each
11 of the witnesses as an expert in that particular
12 area, which are very specific and highly technical.

13 So I think there's been, there
14 certainly was a lot of discussion about this in the
15 prehearing proceedings and ample opportunity for
16 the Petitioners to think about exactly what they
17 wanted to offer these witnesses as experts in so
18 here we have to say.

19 MR. RUSH: All right, Your Honor. I
20 would just like to as he here will testify as an
21 expert in say respiratory depression substance use
22 disorders specifically the use of monoamines,
23 including psychedelics as modulators of
24 respiratory depression.

25 And it would be my understanding that

1 is pharmacology, but and, but so we will, we will
2 accept your, the previous --

3 JUDGE SOEFFING: Okay, well I will now
4 ask the Government if they want to stipulate to
5 pharmacology or not based on that description, but
6 so you'll offer him as an expert in what was
7 disclosed in the Supplemental Prehearing Statement
8 with potentially pharmacology being added to that
9 if the Government is agreeable.

10 MR. RUSH: Yes, Your Honor.

11 JUDGE SOEFFING: Okay. All right, Ms.
12 Attanasio, you may conduct voir dire now or we can
13 break for lunch and you conduct it when we come
14 back.

15 MS. ATTANASIO: We can break for lunch.

16 JUDGE SOEFFING: Okay. Let's go ahead
17 and we'll break for lunch and we will return in one
18 hour. We're off the record.

19 (Whereupon, the above-entitled matter
20 went off the record at 12:26 p.m. and resumed at
21 1:38 p.m.)

22 JUDGE SOEFFING: Okay, we are back on
23 the record, Dr. Elder is on the stand, Dr. I remind
24 you you are still under oath, and Ms. Attanasio you
25 may conduct your voir dire.

1 MS. ATTANASIO: Thank you, Your Honor.
2 Good afternoon, Dr. Elder.

3 THE WITNESS: Good afternoon.

4 BY MS. ATTANASIO:

5 Q So I believe on direct you briefly
6 mentioned respiratory depression. What is
7 respiratory depression?

8 A Respiratory depression refers to the
9 slowing of breathing induced by disease or drug.

10 Q What kind of drugs cause respiratory
11 depression?

12 A All manners of drugs can cause
13 respiratory depression in various assays, but most
14 commonly opioids such as fentanyl and oxycodone,
15 those are typically what's held up as an example
16 of respiratory depression, but many different
17 drugs, alcohol included, can depress respiration.

18 Q So I believe you mentioned respiratory
19 depression earlier, you were talking about your
20 dissertation. Can you go into a little more detail
21 about what your dissertation was?

22 A Sure thing. So I spent several years
23 in a pre-clinical laboratory working with mice and
24 rats. The dissertation work I did was looking at
25 fentanyl specifically, fentanyl's depression of

1 respiration that typically leads to fatal
2 overdoses in humans. My dissertation work was
3 predicated on a finding of mine early in my research
4 where I saw that combinations of fentanyl with
5 psychostimulant drugs like methamphetamine,
6 amphetamine, cocaine, tended to have a very
7 interesting interaction whereby higher doses
8 reverse that respiratory depression and lower
9 doses actually exacerbated it.

10 And so my dissertation work focused on
11 looking at the various monoamines, so dopamine,
12 norepinephrine, and serotonin receptor targets of
13 amphetamines to determine which of those were
14 contributing to this bidirectional effect that I
15 saw. Over the course of that research and what
16 that research included was looking at numerous
17 agonists of monoamine receptors, including DOI as
18 an agonist of 5-HT2A to determine what their
19 influence was on respiration and behavior and if
20 they could reverse fentanyl induced depression,
21 and that was the dissertation work that I did.

22 Q Have you studied any other
23 psychedelics, specifically as modulators of
24 respiratory depression?

25 A As modulators of respiratory

1 depression? None that I would say are pure
2 psychedelics if you will. MDMA is somewhere in
3 between, it's an amphetamine and it has some
4 psychedelic mechanisms of action but I wouldn't
5 call it a psychedelic, it's more of an entactogen.

6 Q Do you still have Petitioner's Exhibit
7 74 in front of you?

8 A I do.

9 Q I want to turn to page three, where we
10 talk about your publications. Specifically can
11 you talk about the serotonergic psychedelic
12 modulation of opioid reward and behavior?

13 A Yes, that's a review manuscript that I
14 put together with Dr. Jaster kind of combining some
15 of the findings that we -- some of the results that
16 we obtained during our graduate work as well as a
17 review of some of the literature on how psychedelic
18 5-HT_{2A} agonists modulate opioid reward, so the
19 reinforcing effects of opioids, and how
20 psychedelics interact with respiratory depression
21 to ameliorate that effect, as well as an in depth
22 mechanistic discussion of how psychedelics
23 activate the 5-HT_{2A} receptor, the circuits that they
24 activate, the regions of the brain that are
25 impacted by psychedelics and things of that nature.

1 That paper was submitted, it's under review, it's
2 currently, I don't believe published yet.

3 Q What experience do you have in
4 substance use disorders?

5 A My entire research career has
6 essentially revolved around substance use disorder
7 and substance abuse. So my first research
8 experience at the University of Virginia with Dr.
9 Wendy Lynch was looking at treatments for stimulant
10 use disorder, SUD, in rats who are
11 self-administering cocaine. I previously
12 described my experience looking at misuse, abuse,
13 and diversion of investigational new drugs, both
14 scheduled and unscheduled. The T-32 training
15 grant from NIDA that I obtained my PhD on that I
16 was funded by was granted by NIDA, the National
17 Institute of Drug Abuse, and I believe the title
18 of it is Pharmacology of Drug Abuse. So my entire
19 PhD training revolved around substance use
20 disorders and drug abuse, psychoactive drugs.

21 MS. ATTANASIO: Just one moment, Your
22 Honor. Looking back at your paper that you said
23 has not been published yet that you were working
24 on with Dr. Jaster, can the Witness be shown
25 Petitioner's Exhibit 17?

1 THE WITNESS: Thank you.

2 BY MS. ATTANASIO:

3 Q Is that exhibit from the paper you were
4 discussing before?

5 A This looks to be a figure from some of
6 Dr. Jaster's work on extinction of oxy preference
7 in male and female mice.

8 Q Yes, but is that part of the paper we
9 were discussing before about the --

10 A It's part of the results that are
11 included in the paper, I'm not sure if this figure
12 finally made it into the paper, the final version
13 of the paper.

14 Q Okay.

15 A Yeah. They tend to be edited after
16 peer review, so.

17 MS. ATTANASIO: Your Honor, the
18 Government doesn't object to Dr. Elder being an
19 expert, but only in what was put in the supplemental
20 prehearing statement, respiratory depression and
21 substance abuse disorder, specifically the use of
22 monoamines including psychedelics as modulators of
23 respiratory depression.

24 JUDGE SOEFFING: Okay, all right,
25 thank you Ms. Attanasio. Mr. Rush, do you still

1 wish to offer him as an expert in additional areas
2 besides what the Government is not objecting to?

3 MR. RUSH: While we believe he does
4 have expertise in that, we'll agree to that.

5 JUDGE SOEFFING: Okay, so we'll stick
6 with what he was testifying as an expert in, in the
7 Petitioner's supplemental prehearing statement.
8 So the Petitioners have offered Dr. Elder as an
9 expert in the study of respiratory depression and
10 substance use disorders, specifically the use of
11 monoamines, including psychedelics, as modulators
12 of respiratory depression. In the absence of any
13 objection by the Government, the tribunal accepts
14 the Witness as an expert in that area. And you may
15 ask your next question, Mr. Rush.

16 MR. RUSH: Thank you, Your Honor, if I
17 may have one moment, please. Would you describe
18 the classes of drugs you studied and which of those
19 you have the most pharmacological knowledge of?

20 THE WITNESS: Certainly. I've spoke a
21 little bit about my dissertation work and the
22 research that I did in undergrad and in the years
23 following my undergraduate studies. I would say
24 that the vast majority of my work in graduate school
25 with animals was done with opioid agonists,

1 psychostimulants such as amphetamines, and also
2 psychedelics, I spent at least two out of the three
3 rotations I did as a student rotating through labs
4 working with various psychedelic compounds under
5 Dr. Steve Negus and Dr. Jaster's lab as well.
6 Although I do have experience with most classes of
7 abused drugs I would say, it's just that
8 psychostimulants, opioids, and psychedelics tend
9 to be the central ones. I currently work
10 extensively with cannabinoids, although those are
11 scheduled and unscheduled.

12 BY MR. RUSH:

13 Q Okay. When you say a psychedelic drug,
14 is there a defined list of drugs that are
15 psychedelics, or can it mean many things?

16 A It really depends on who you ask.
17 There are multiple different definitions of a
18 psychedelic in pharmacology. The definition that
19 many people accept and one that I typically
20 subscribe to is psychedelics must activate the
21 5-HT_{2A} receptor or 5-HT₂ subtypes in order to
22 produce the psychedelic action. I mentioned
23 before things like MDMA act as an amphetamine, but
24 they also do have effects at 5-HT₂, which makes them
25 somewhere in between, they kind of have a unique

1 mechanism of action. Some people would call MDMA
2 a psychedelic and others would not. Some people
3 would also lump things like ketamine, NMDA
4 antagonists into the broader classification of
5 psychedelics, ketamine and GCP, but I personally
6 tend to subscribe to the 5-HT2 theory.

7 Q But there are people who are recognized
8 experts also who would call something as ketamine
9 to be a psychedelic?

10 A Yes, that's definitely not a settled
11 issue, there's many different drugs with various
12 mechanisms of action that experts, people with PhDs
13 who study this field might consider psychedelic
14 drugs. Another way I've seen them classified are
15 prototypical or classical psychedelics, and then
16 psychedelics as a whole, so prototypical
17 psychedelics like the LDS, psilocybin, mescaline,
18 whereas ketamine might just fall under the greater
19 classification of psychedelic or hallucinogen.

20 Q Those psychedelics, do they encompass
21 only scheduled drugs or do they also encompass
22 unscheduled drugs potentially?

23 A They could potentially encompass
24 unscheduled drugs in things like dextromethorphan,
25 DXM, it's an NMDA antagonist with other

1 serotonergic effects, if taken at the right dose
2 it can produce dissociative and some might call
3 hallucinogenic psychedelic effects.

4 Q Now these monoamines, what is a
5 monoamine?

6 A The monoamines, at least in the way that
7 I'm referencing them in my publications and on my
8 CV are considered to be dopamine, serotonin,
9 norepinephrine, adrenaline could also be
10 considered a monoamine, as could others, but the
11 three primary monoamines in the central nervous
12 system that mediate behavior, addiction, things
13 like that are dopamine, norepinephrine, and
14 serotonin, or at least that was my focus.

15 Q Okay, so the drugs that effect
16 serotonin -- I'm trying to understand this because
17 it's fairly complex for a layperson. So this
18 monoamine, so a drug that effects serotonin or
19 dopamine, that's a monoamine potentially?

20 A Yes, that would be a monoaminergic
21 drug, yes.

22 Q Okay.

23 A So psychedelics would be considered
24 monoaminergic drugs, or an agonist of a monoamine
25 receptor, if you will.

1 Q So if I understand correctly, it sounds
2 like that monoamine class of drugs is a fairly broad
3 class of drugs.

4 A Yes, it's very broad.

5 Q Okay, thank you. And in your personal
6 experience, in your professional experiences as
7 you testified, you do have experience with
8 assessing the diversion of controlled substances?

9 A I do, yes.

10 Q And for monitoring for these what you
11 typically see as problematic behavior, yeah,
12 noncompliance?

13 A That's correct.

14 JUDGE SOEFFING: So Mr. Rush, less
15 leading.

16 MR. RUSH: Yes, Your Honor. Do you
17 have knowledge of the acquisition of DOI for
18 research?

19 THE WITNESS: I do, yes, I've acquired
20 DOI previously for my studies, my research.

21 BY MR. RUSH:

22 Q How is DOI typically acquired?

23 A When used in a legitimate purpose, as
24 it usually is in the laboratory, we simply reach
25 out to a chemical supplier such as Sigma-Aldrich

1 or Cayman Chemical that we have a prior
2 registration with. Most of the companies that
3 provide scheduled and unscheduled compounds for
4 research tend to have us registered with them, and
5 then you simply just order it to the lab like
6 another research material. They tend to be quite
7 expensive as they are right now, but I've acquired
8 them through these commercial suppliers
9 previously, yes.

10 Q You stated that part of your
11 experiences analyzing illicit use and diversion
12 from a compliance -- have you see acquisition of
13 this from any non-regulated chemical companies?

14 A So as part of my work, both on my
15 dissertation with the respiratory depression and
16 in other surveillance work I've had to look
17 through, I've done research on the availability of
18 various compounds to the general public, research
19 compounds or research chemicals through vendors
20 that may or may not be legitimate. I personally
21 have never come across DOI from any of these vendors
22 that would sell to the general public, it's just
23 not something that seems to be widely available.

24 Now, I can't say if it's available in
25 other black market sources, but I've never seen --

1 it doesn't seem that DOI is widely available to the
2 general public, I would personally say, and I
3 haven't seen it diverted from the lab or heard of
4 anyone ever asking to buy it or take it out of the
5 lab. There's not a lot of interest in it, I guess
6 I'll put it that way, when it comes to diversion.

7 Q Have you even seen one instance of
8 illicit offers of sale of DOI?

9 A I don't believe I have.

10 Q In your review of medical literature,
11 scientific research literature, have you
12 encountered any information regarding that there
13 is human use of DOI?

14 A In the medical and scientific
15 literature, I actually looked last night, I don't
16 believe that there are any case reports of human
17 use of DOI published in peer review journals.
18 There are obviously forums and online drug
19 discussions where people claim to have taken it,
20 but I've never seen a case report or a
21 hospitalization report or anything of that nature
22 published in a medical journal to support humans
23 taking DOI of their own initiative.

24 Q Now you've testified that you have
25 extensive experience in evaluating and critiquing

1 the legitimacy of research and the validity of
2 research, if I'm correct.

3 MS. ATTANASIO: Objection, Your Honor,
4 that's not his expertise.

5 JUDGE SOEFFING: Sustained.

6 MR. RUSH: You've commented that you
7 have experience evaluating, rendering part of your
8 -- it's like the psychedelic review and some of
9 these other plans you work on for peer review
10 publications and analyzing these, would evidence
11 from one of these social forums generally be
12 considered the type of evidence that would be in
13 one of those type of publications or as valid
14 evidence?

15 THE WITNESS: Typically those would be
16 considered anecdotal and potentially spurious.
17 I've seen them published as a part of, I don't know,
18 a narrative, I guess, to say -- they can be included
19 as certain types of data but with caveats and
20 limitations, but no, you would never be able to
21 publish those because they're uncorroborated
22 reports, anyone can write anything they want on the
23 internet. So they can be collected and published
24 as part of a larger study, but the accuracy and
25 validity of that information typically requires

1 limitations and stipulations.

2 BY MR. RUSH:

3 Q So this anecdotal social media forum
4 type of evidence, is there any verification process
5 in that, if it would be offered?

6 A No, there's no way to verify if people's
7 posts on Reddit or Bluelight or any of these other
8 sites is accurate or if this person took the drug
9 that they're claiming to have taken. Any number
10 of things could be incorrect about that, which is
11 why they're not considered to be reputable
12 scientific information. They might be used to
13 provide color or background for an actual study,
14 but they wouldn't be considered evidence.

15 Q Would Erowid be an example of one of
16 these types of sites?

17 A It would, yes.

18 Q Would Reddit?

19 A Reddit would be, yes.

20 Q Would the comments on Facebook?

21 MS. ATTANASIO: Objection, Your Honor,
22 we're still going outside of his expertise.

23 JUDGE SOEFFING: Overruled.

24 THE WITNESS: I guess you could
25 consider a comment on Facebook to be a forum, a post

1 about drug use on a forum, it wouldn't be typical,
2 and I don't know if you could really -- if you read
3 a comment on Facebook about somebody taking DOI,
4 it doesn't have face validity to me.

5 MR. RUSH: What would you view as
6 valid, verifiable evidence of the use of DOI?

7 THE WITNESS: Verifiable evidence to
8 me would be a report from an emergency department
9 of someone reporting in of a drug testing center
10 reporting finding DOI in a blood or urine sample,
11 a study that's done, a survey even of psychedelic
12 users that they brought it could be used as
13 evidence, but there's many different types of
14 evidence that could corroborate human use of DOI
15 and there really is not any. A case report even
16 of someone just of medical personnel encountering
17 someone intoxicated on DOI would be good evidence
18 of that.

19 BY MR. RUSH:

20 Q Have you encountered any incident of
21 that?

22 A Just did a search last night on PubMed
23 and nothing came up.

24 Q Thank you. What has been your
25 experience with epidemiology of drug overdoses?

1 A So in order to -- the background for my
2 dissertation work on fentanyl induced respiratory
3 depression necessarily required me to do an in
4 depth analysis of overdose deaths, the
5 epidemiology of overdose deaths in poly-drug use,
6 the prevalence of drug use in the United States,
7 the types of drugs, so I have extensive experience
8 researching epidemiological topics, especially as
9 they relate to overdose. And when I was -- in
10 several aspects of my career I've had to do
11 epidemiological work as both background rationale
12 and justification for some of the studies that
13 we've run. So I'm fairly familiar with the
14 epidemiology of drug overdoses.

15 Q And in doing that work, what did you
16 learn about illicit and grey market drugs for your
17 research?

18 MS. ATTANASIO: Objection Your Honor,
19 he's not an epidemiologist, or at least he wasn't
20 offered as one as an expert.

21 JUDGE SOEFFING: Well he's not been
22 qualified as an expert in epidemiology, yes, but
23 to the extent that he has worked in that area or
24 published, I think he can comment and discuss what
25 work he has done in the area, so overruled.

1 THE WITNESS: I believe the question
2 was about my knowledge of illicit and grey market
3 substances, is that correct?

4 MR. RUSH: Yes.

5 THE WITNESS: As part of my research,
6 my background research and rationale research for
7 the fentanyl overdose and respiratory depression
8 work, I did an extensive and exhaustive search of
9 -- I don't know how to put it, grey market vendors
10 of various chemicals and drugs, so things like
11 fentanyl analogs, other opioid analogs like
12 nitazenes, also psychostimulants and various
13 psychedelics that are offered by grey market
14 vendors, so I had a pretty in depth knowledge of
15 which drugs were available, which drugs were
16 currently being used on the grey market by those
17 that use novel chemicals, it allowed me to get a
18 fairly clear picture of what is available to buy
19 to the general public.

20 BY MR. RUSH:

21 Q And when you analyze this research that
22 you conducted, you looked at different classes of
23 drugs?

24 A I did, it was in order to evaluate a
25 vendor of these grey market, illicit but analog

1 chemicals, you necessarily had to go through their
2 whole catalog, which showed me the types of
3 offerings that these vendors had, and I ran into
4 dozens of different chemicals that were offered
5 over the years, between 2019 and 2023. I never
6 once came across a vendor offering DOI in that time,
7 but you know, I don't know if there's anything else
8 to say on that point, yeah.

9 Q Were there different classes of drugs
10 that were more popular or less popular with these
11 vendors?

12 A Oh absolutely. The novel
13 benzodiazepines and novel fentanyl analogs and
14 opioid analogs were by far the most popular and most
15 dangerous drugs that were being offered, whereas
16 most vendors carried a smaller number of
17 psychedelic drugs or psychedelic adjacent drugs
18 that seemed to be less popular and less discussed
19 on forms and things of that nature.

20 Q What type of psychedelic drugs did you
21 encounter with these vendors?

22 A All classes of psychedelic drugs, so
23 modified analogs of LSD, tryptamines, base
24 tryptamines and substituted ones, substituted
25 phenethylamines that are illegal in this country

1 but not in others, various classes.

2 Q You're going to have to help me out a
3 little, I don't know what a substituted tryptamine
4 is. So give us a few examples of what type of drugs
5 those are?

6 A Sure thing. So these grey market
7 vendors would offer things like
8 4-hydroxy-methyl-ethyltryptamine, which is
9 similar to psilocybin but is unscheduled, or they
10 would offer something like LSD, 1 butyl LSD, which
11 has a butoxy group on it or butynol group on it,
12 excuse me, rendering it not LSD but a prodrug of
13 it, things of that nature.

14 Q Did you come across these, I've seen
15 them referred to as DOx class of compounds? First,
16 let me make sure I understand what DOx as it's
17 referenced means.

18 A Sure thing. I believe the terminology
19 DOx was coined by Dr. Shulgin, referring to the
20 dimethoxy nature of the series of amphetamines, so
21 two methoxy groups on it, di, the D, oxy, O, and
22 then the final substituent on the molecule is the
23 x, right, and that's either B or I or C, to denote
24 various homologues of the series.

25 Q And when you looked at these illicit

1 drug vendors, was that class of drug a very popular
2 class of drug among psychedelic drugs for sale, or
3 less popular than the other psychedelic drugs that
4 are there?

5 A They're exceedingly rare, some of them
6 would be available every so often, but they're a
7 rare class of drugs because they're not popular
8 recreationally due to the duration of their onset,
9 their duration of effects, their general
10 unpleasantness, but that's me opining a bit on
11 their effects, they just don't seem to be very
12 popular with the vendors so not many of them carry
13 any of the DOx series. If they can at all, many
14 are scheduled as we've spoken about in court
15 previously.

16 Q And your research looking at substance
17 abuse, what features have you found to be common
18 in drugs that have a high potential for abuse?

19 A So generally in the field, drugs of
20 abuse and drugs with an addictive nature -- I'll
21 stick with drugs of abuse for now. Drugs with a
22 high potential for abuse tend to share some common
23 core features, specifically a rapid onset of
24 action, many of them involve effects on the
25 dopamine system to produce their reinforcing,

1 rewarding, and euphoric effects, as well as a quick
2 offset of action and many other features. I think
3 really what's core to most abusable drugs is
4 effects on certain neurotransmitter systems like
5 the opioid system specifically, the mesolimbic
6 dopamine system, the GABAergic system, and their
7 pharmacokinetics, so the speed of onset, the time
8 to peak effect and then the duration of peak effect
9 and the time, how long it takes to offset, so the
10 half-life of the drug. Those are common things,
11 shorter pharmacokinetics, more condensed
12 pharmacokinetics are more typically seen in drugs
13 with a high potential for abuse, things like heroin
14 or cocaine or other drugs that engender addiction
15 and are abused.

16 Q Do you find these sort of
17 characteristics to be present in DOI?

18 A No, that's one of the reasons I believe
19 that the DOx series is not very popular, it lacks
20 those characteristics specifically, no effect on
21 the mesolimbic dopamine system in the way that
22 addictive drugs do, an extremely protracted onset
23 and duration of action that people find -- that
24 reports tend to say is extremely unpleasant, as
25 actually the opening statement that the Government

1 made included a quote from Dr. Shulgin himself that
2 stated that the effects were not very pleasant.

3 Q And DOC would also be a drug that had
4 the same --

5 A Yes, they're quite similar in their
6 pharmacology and their pharmacokinetics and
7 pharmacodynamics. So the time course of their
8 effects and the type of their effects.

9 Q How prevalent in your research did you
10 find abuse of Schedule I psychedelics to be in the
11 U.S.?

12 A When I was looking through the
13 epidemiology of drug overdoses and ER admissions,
14 ER presentations, psychedelics drugs were among
15 the least prevalent drugs in ER admissions and not
16 present in almost any overdoses, a very small
17 number compared to other classes of drugs. They
18 make up a very small proportion of drug abuse
19 related to mortality and injury.

20 Q When you say overdose of a psychedelic,
21 would that necessarily mean death?

22 A An overdose is not necessarily fatal,
23 no. For example --

24 Q Oh, sorry.

25 A Just to clarify, if you will, that an

1 overdose on a psychedelic such as psilocybin ,a
2 Schedule I psychedelic, might result in some
3 psychiatric symptoms and general disorientation,
4 loss of coordination, but very rarely, if ever,
5 life-threatening symptoms. Might require
6 monitoring, but not life-threatening.

7 Q And in your experience, does this tend
8 to be a permanent type of injury?

9 A I don't know if I can speak to the
10 permanence of the psychiatric effects of
11 psychiatric drugs, they tend to resolve when
12 treated correctly. I know there can be lasting
13 unpleasant memories and maybe comfortability with
14 those memories, and in some cases people might
15 describe it as trauma, but there are few reports
16 of lasting injury and disability from psychedelic
17 use or over dosage. I'm not saying it can't
18 happen, but I'm not an expert on the long term
19 toxicology of psychedelic overdose.

20 Q Okay. These adverse effects that
21 you've described that sometimes can be impactful
22 as you described if I understand, in your review
23 of the literature have you found any evidence that
24 they sometimes actually can have a beneficial
25 effect?

1 A Certainly, I think that's why many of
2 us are here, the long term effects of psychedelics
3 are being studied and have been studied for the
4 treatment of various psychiatric morbidities.
5 It's been shown in the literature through gold
6 standard double-blind placebo control trials that
7 psychedelics can have positive effects long term,
8 that's correct.

9 Q Do you think, is it your understanding,
10 what might be described in some contexts as an
11 adverse event may be in the context of psychedelics
12 may have a different sort of outcome or

13 A There are published reports
14 of people having challenging experiences on
15 psychedelics that they later come to feel were
16 instrumental in their growth in moving past certain
17 psychiatric difficulties. Let's say someone has
18 a very difficult trip on a psychedelic, they have
19 a very difficult experience, it's very unpleasant
20 for them in the moment, they're scared or anxious
21 and really having a difficult time with it. It's
22 been reported many times that maybe weeks or months
23 down the line that person may come to feel that that
24 experience was while very negative and
25 uncomfortable it helped them to get over some sort

1 of difficulty either psychological or otherwise.

2 Q You indicated that you worked on new
3 drug applications and you have an understanding of
4 these, I guess these adverse events with a
5 scheduled drug in one context may be viewed as an
6 adverse event but possibly could have a different
7 broader meaning?

8 A I'm not sure I understand the question.

9 Q I'm sorry, I'll try to rephrase it
10 better. I guess I'm trying to understand here that
11 I see lists of harms that are cited and drugs
12 sometimes have negative effects, even prescription
13 drugs, and that sometimes there might be negative
14 effects, but there may be an overall net positive,
15 I guess that's my question, is have you seen
16 evidenced of that?

17 A Yes, when you're developing a drug
18 there's necessarily a risk benefit, or benefit to
19 risk assessment in evaluation to determine if the
20 benefits outweigh the risks. There's obviously
21 benefits of DOI that we're still discovering and
22 these psychedelic drugs that we're still
23 researching. I'd say that that the risks are
24 comparatively to other drugs, many drugs that we
25 tolerate the risks of for their benefits are

1 comparatively quite small, actually. The
2 toxicity of psychedelics and DOI, DOC, is minimal
3 compared to other commonly abused or commonly used
4 therapeutics, I would say.

5 Q How frequent is it to find death from
6 these classical psychedelics?

7 A It's exceedingly rare for someone to
8 die primarily because of the use of a psychedelic
9 drug.

10 Q In your survey of all the data and
11 literature, have you seen incidents where people
12 who overdose use more than one drug?

13 A Yeah, polysubstance use I would say is
14 the rule rather than the exception when it comes
15 to drug abuse, at least with substance abuse
16 disorders, that was a part of my dissertation work
17 was looking at psychostimulant and opioid co-use,
18 and I would say that co-use or poly drug use is quite
19 common.

20 Q So a person who overdoses maybe using
21 a psychedelic and a different drug, is that
22 correct?

23 A That's correct, and typically a medical
24 examiner, when they would go to report the cause
25 of death would indicate what the primary cause of

1 death was. Let's say that there was fentanyl and
2 psilocybin in someone's system, a good medical
3 examiner would report on the death certificate that
4 it was a death caused by fentanyl or primarily
5 attributable to respiratory depression from
6 fentanyl and then note that there was psilocybin
7 found in the system. This is just a scenario I'm,
8 you know, creating here, but that's typically how
9 that's done. So yes, you could find a psychedelic
10 amongst several drugs that someone had consumed who
11 had fatally overdosed, but they typically are not
12 determined to be the primary cause of death.

13 Q So if the person's abusing something
14 like say amphetamines or something and a classical
15 psychedelic, it's more likely that it would be not
16 the psychedelic?

17 A That's correct, it's more likely that
18 the other drug is the primary contributor, yes.

19 Q And sometimes when statistics are
20 gathered, is there a potential that those two drugs
21 could be conflated and not distinguished which one
22 had the greater likelihood of resulting in death?

23 MS. ATTANASIO: Objection Your Honor,
24 I think we're going farther outside his expertise
25 at this point.

1 JUDGE SOEFFING: I think we are
2 straying away from that, there's also a lot of
3 leading going on here. So I'm going to sustain the
4 objection.

5 MR. RUSH: What drugs have you seen
6 with similar pharmacology to DOI?

7 THE WITNESS: Let's see, there are, I
8 mean we've already discussed previously in the
9 hearing some Schedule I psychedelic drugs that
10 share commonalities with DOI.

11 JUDGE SOEFFING: So I'm only
12 interested in your testimony, not what anybody else
13 has said in the hearing, just what you want to
14 testify to in terms of the answer to that question.

15 THE WITNESS: Thank you for the
16 direction. So again, as I said, DOI shares core
17 features with certain Schedule I drugs such as the
18 classical psychedelics LSD or psilocybin, but it
19 also is different from those Schedule I psychedelic
20 compounds in the sense that it's very selective for
21 receptor subtype. There are other 5-HT_{2A} agonists
22 that are not scheduled, not considered abusable,
23 and actually I think the drug lorcaserin is an
24 agonist of 5-HT_{2C} receptors and can cause
25 hallucinogenic effects at a certain dose, and that

1 was an approved therapeutic drug, I'm not sure if
2 it was withdrawn for other reasons, but it was an
3 approved drug used to treat obesity.

4 MR. RUSH: Do you know if that was in
5 one of the classes of scheduling?

6 THE WITNESS: You know, I do believe it
7 was intended to be scheduled and a lower schedule,
8 IV or maybe III, but I do not recall the specific
9 schedule. I do know drugs like lisuride activate
10 5-HT2A in a non-hallucinogenic way, completely
11 unscheduled drug there as well.

12 BY MR. RUSH:

13 Q Have you found similar pharmacology in
14 any scheduled substances?

15 A To DOI?

16 Q Yeah, a difference, a non-Schedule I,
17 I guess is what I'm asking, if there's -- yeah.

18 A Like I said, drugs like lorcaserin can
19 activate some 5-HT2 receptors. I'd honestly have
20 to think and reference various classes of drugs,
21 but there are many drugs that activate 5-HT2
22 receptors that are approved and scheduled in
23 schedules other than Schedule I.

24 Q Now you've worked on designing drug
25 studies, is that correct? Or research studies?

1 A That is correct, yes.

2 Q Why is DOI important in research?

3 A So DOI has been important in research
4 for roughly four decades because of its incredible
5 selectivity for these 5-HT2 receptor subtypes,
6 5-HT2A, 5-HT2C, and to a lesser extent 5-HT2B I
7 believe. Its selectivity for those receptors
8 means that it's a very accurate tool for assessing
9 the effects of those receptors, and specifically
10 how they're activated to -- receptors can be
11 activated in different ways, right?

12 I mentioned lisuride as a 5-HT2A
13 agonist drug that doesn't cause hallucinogenic
14 effects. Serotonin in our bodies doesn't cause
15 psychedelic or hallucinogenic effects, so DOI
16 being an unscheduled, available, and selective
17 compound for these receptors has been extremely
18 important for determining how those receptors are
19 activated to produce psychedelic effects, and the
20 specific contributions of that receptor subtype,
21 whereas drugs like psilocybin, LSD, mescaline,
22 dimethyltryptamine are much more promiscuous and
23 hit numerous receptor subtypes. So DOI has been
24 instrumental for teasing apart the differential
25 contributions of the different receptors to

1 psychedelic effects.

2 Q So does DOI act differently than those
3 other psychedelic drugs?

4 A So I almost went down that kind of line
5 of thought in your previous question. DOI is quite
6 different from those classical psychedelics in the
7 sense that it has no affinity for 5-HT1A as LSD and
8 psilocybin and MDMA do and has very little affinity
9 for dopamine or other monoaminergic -- so it's very
10 selective for this one receptor, so it's very
11 different from other psychedelic drugs which tend
12 to be promiscuous, they bind with a lot of different
13 sites and cause a very complex array of effects,
14 whereas DOI is very selective and a little less
15 promiscuous, a lot less promiscuous in its binding,
16 so it acts differently.

17 Q In your understanding of the available
18 evidence, have you -- I'm sorry, one second,
19 present my question. That difference in the
20 receptors, the way it's targeted is that it's
21 specific, and you indicated that these other
22 psychedelic drugs are more I believe you said
23 promiscuous with the other receptors. Since DOI
24 is specific or more specific it seems to the 5-HT2A
25 receptor, is it likely then that it would have

1 different pharmacological effects on the person?

2 MS. ATTANASIO: Objection, Your Honor,
3 outside his expertise.

4 MR. RUSH: Your Honor, he's testified
5 this is a -- he's commented on monoamines and he
6 would comment specifically on substance abuse and
7 monoamines.

8 JUDGE SOEFFING: So I'll overrule the
9 objection, I do think we are kind of getting outside
10 what was disclosed in the prehearing statement too,
11 I think as I'm looking through it, we've covered
12 most of what's in there, but I'll overrule the
13 objection and allow you to continue.

14 MR. RUSH: We also -- just because Dr.
15 Carbonaro's certification as an expert, she was
16 allowed to opine on things that were --

17 JUDGE SOEFFING: I'll give you some
18 leeway.

19 MR. RUSH: Okay, thank you Your Honor.

20 THE WITNESS: I can answer that
21 question then, if that's allowed?

22 JUDGE SOEFFING: Yes.

23 THE WITNESS: It would be likely that
24 the effects would differ from those more
25 promiscuous serotonergic agonists in their

1 subjective character and pharmacological effects,
2 correct.

3 MR. RUSH: So it's just not possible to
4 say that because this is in the same class that it
5 would have the same effects, likely?

6 THE WITNESS: No, just as it would be
7 incorrect to say that any drug that -- any
8 psychostimulant is the same because they all are
9 indirect agonists of monoamines by releasing them
10 or inhibiting their reuptake. Methamphetamine is
11 quite different from phentermine, which are both
12 approved drugs, they're very different but their
13 core mechanisms of action are exceedingly similar,
14 they're essentially the same.

15 BY MR. RUSH:

16 Q What are like, those drugs, what's a
17 risk of those?

18 A What type of risks?

19 Q I guess like what would if it was your
20 greatest danger with those type of drugs that you
21 just referred to?

22 A The psychostimulants can be addictive,
23 they can be lethal in overdose, they can cause
24 psychosis. There are a number of toxicities
25 related to psychostimulant use, abuse, and

1 addiction. I mean, you could also look at opioid
2 drugs, many of them share the same core common
3 pharmacology of activating u-opioid receptors,
4 some like heroin, Schedule I, some u-opioid
5 agonists, they all share the same one mechanism of
6 action.

7 Like codeine and certain preparations
8 is a schedule 5 drug, dextromethorphan, an
9 unscheduled drug, also has a metabolite that is a
10 u-opioid agonist. So just having the same
11 mechanism of action doesn't necessarily mean that
12 the effects or the level of the effects are the same
13 or that the character or quality reinforcing
14 nature, desirability, just having that same
15 mechanism of action can be altered in many
16 different ways, as the opioid and psychostimulant
17 examples kind of illustrate.

18 Q When you're looking at research then,
19 would you tell me what in vitro research is?

20 A In vitro research tends to be with
21 cells, it means in glass, essentially, it's not in
22 whole animals.

23 Q And how about in vivo?

24 A In vivo means research with live, whole
25 animals.

1 Q And to assess the pharmacological
2 effect of a substance, which one would be more
3 determinative?

4 MS. ATTANASIO: Objection Your Honor,
5 we're still talking about pharmacology here and
6 that is very broad compared to what he's been put
7 in as an expert.

8 JUDGE SOEFFING: Yeah, I'm not seeing
9 where you're going with this Mr. Rush, I think we're
10 way off what was disclosed in the prehearing
11 statement and what he's been admitted as an expert
12 in.

13 MR. RUSH: I guess what I'm trying to
14 get at is these mechanisms I guess, he talked about
15 respiratory depression through monoamines, things
16 like that, I'm trying to understand the mechanisms
17 of the different drugs with substance abuse, and
18 so many substances are also monoamines as he
19 described, so I'm trying to figure out I guess what
20 the risk is, things like cardiac risk. You know,
21 is there a cardiac risk with DOI that's equivalent
22 to these other drugs that frequently cause
23 overdoses?

24 JUDGE SOEFFING: Yes?

25 MS. ATTANASIO: Your Honor, I mean,

1 what he's trying to figure out isn't necessarily
2 relevant to what's going on in this case.

3 JUDGE SOEFFING: Yeah, I'm not -- can
4 you show me in the prehearing statement where
5 you're talking about that? Because I'm not sure
6 what it relates to.

7 MR. RUSH: Give me one second to
8 review, please, Your Honor. I guess I'm looking
9 to investigate abuse liability as it was described
10 in the -- can I borrow this for a second? In the
11 prehearing statement we identified he would
12 testify that there's very few verified
13 documentations of individuals taking substances,
14 he will testify to give the nature of the drug and
15 its pharmacological effects, its self-limiting
16 nature, its structural aspects relating to
17 mescaline or DOM, duration, and how these qualities
18 sufficiently separated to make abuse potential
19 comparisons impractical.

20 JUDGE SOEFFING: I think he's covered
21 most of that, I didn't hear anything about, you were
22 just talking about cardiac.

23 MR. RUSH: Well I guess --

24 JUDGE SOEFFING: So there's nothing
25 there about --

1 MR. RUSH: Well the -- I guess I was
2 trying to get to the pharmacological effects. I
3 mean we're trying to find out whether at the core
4 whether this is dangerous and how dangerous it is,
5 and I'm trying to figure out what the
6 pharmacological effects are, how dangerous it is,
7 as part of the factors in our eight factor analysis,
8 and trying to ascertain is this dangerous, and if
9 it is dangerous, how dangerous is it?

10 JUDGE SOEFFING: Well you can ask a
11 couple more questions, thought I think you need to
12 wrap it up and move on.

13 MR. RUSH: Understood Your Honor.

14 JUDGE SOEFFING: So I'll overrule the
15 objection and I'll allow limited additional
16 questions on this.

17 MR. RUSH: I'll move on to implications
18 with research, potentially as we said he will
19 testify on the negative impacts potentially on
20 research. In your experience in reviewing,
21 designing, assisting with research protocols, do
22 you have input into selecting which substances
23 might be used in those studies?

24 THE WITNESS: If I'm understanding the
25 question correctly, you're asking whether or not

1 the scheduling status of a research tool has any
2 bearing on whether or not I use it in my research
3 and if it makes it more difficult, is that what
4 you're asking?

5 BY MR. RUSH:

6 Q Yeah, that would be a fair assessment.

7 A I think that it's pretty fair to say
8 that yes, the scheduling status of a drug
9 absolutely has bearing on which drugs you choose
10 and have access to for your research, just due to
11 the onerous regulatory, financial, availability
12 issues, there are many different hurdles to go
13 through when you work with Schedule I drugs, and
14 I know that some might say that they're not there
15 but they definitely tend to make you shy away from
16 using Schedule I drugs in your research unless you
17 are a dedicated lab to using Schedule I drugs, as
18 I was in one, my advisor, Dr. Patrick Beardsley,
19 had a Schedule I license, conducted heroin research
20 for many, many years, did work with fentanyl
21 analogs and fentanyl, many of which were placed
22 into Schedule I during my work in the lab on
23 respiratory depression, which was, I got to see
24 firsthand, very onerous to deal with the
25 collecting, measuring, and reverse distributing

1 all of these chemicals that were not Schedule I that
2 came in, and scheduled halfway through our
3 research. I got to see the whole process of that
4 and it was quite onerous, and the infrastructure
5 to handle Schedule I drugs is quite onerous, so I
6 chose not to use Schedule I drugs in my dissertation
7 work precisely for many of those reasons.

8 Q Have you seen instances where people
9 may opt for a different drug because of the cost
10 factors?

11 A Absolutely, it's one of the reasons
12 that people have opted to use DOI, but I've seen
13 it elsewhere as well. I used for example oxycodone
14 many times in place of heroin in respiratory
15 depression and other behavioral assays because
16 heroin was just too difficult and expensive to
17 obtain for the lab, and oxycodone was similar
18 enough.

19 Q And it's more difficult to acquire and
20 work with a Schedule I substance from what I
21 understand you saying, so do you believe if DOI was
22 added to Schedule I it would be more difficult to
23 work with?

24 A Absolutely, there's no doubt. I think
25 that the amount of research with DOI would fall off

1 considerably until some other unscheduled
2 psychedelic was validated for many of those assays,
3 at which point that might be scheduled too.

4 Q In your review of the evidence in
5 research that is occurring out there, what type of
6 research have you found DOI to be involved in, used
7 for?

8 A I actually think that's another really
9 important part of keeping a drug like DOI
10 unscheduled. The research on DOI is quite
11 diverse, right, it doesn't just relate to treating
12 psychiatric disorders. There's recently been a
13 body of evidence that's been gathered on the
14 anti-inflammatory effects of DOI that would have
15 never have been discovered if it was a Schedule I
16 drug, you don't kind of go looking around for other
17 interesting effects with precious Schedule I
18 research materials, so that entire
19 anti-inflammatory line of research on
20 phenethylamine psychedelic was spurred by the
21 availability of DOI in many different labs, and
22 labs that would not have the Schedule I license.
23 So if you're looking at other body systems other
24 than the central nervous system, as I have, I've
25 been focused on the central nervous system so my

1 labs had Schedule I through 5 licenses, but a
2 pulmonary lab, a cardiac lab, labs with other
3 focuses wouldn't have those licenses and it would
4 limit the scope of research that could be done with
5 DOI. So I guess that would be my answer.

6 Q Do I understand you then correctly that
7 research with a Schedule I drug tends to be very,
8 looking for one specific area, not more general?

9 A That's correct, you have to submit your
10 proposal for why you want to use that Schedule I
11 drug to the DEA and if it seems frivolous or if it
12 seems like too far out there that won't be approved.
13 So yes, research with Schedule I drugs is very
14 directed and targeted, it's less exploratory.

15 Q What is mechanistic research?

16 A Mechanistic research can mean a whole
17 bunch of things depending on the level that you're
18 talking about. Mechanistic research in terms of
19 brain circuits, so neurological circuits involved,
20 in some drugs' action the cellular mechanism is
21 involved, the receptor mechanism is involved,
22 there's many different levels of mechanistic
23 research.

24 Q Would it be research to design a
25 specific drug class for treatment?

1 A Oh yes, structure activity
2 relationship, SAR research is important for
3 medicinal chemistry and the design of new and
4 improved drugs. Like I mentioned before, there's
5 many drugs that are slightly modified versions of
6 others that are improved versions.

7 Q Just general fundamental basic
8 research in understanding these systems, how they
9 work, would that be mechanistic research?

10 MS. ATTANASIO: Objection, Your Honor.
11 Again, where are we going with this? We're still
12 outside his expertise.

13 JUDGE SOEFFING: Yeah I'm not sure, and
14 you're asking a lot of leading questions, I'm not
15 going to be able to give much weight to it anyway
16 because you're asking leading questions that
17 suggest the answer.

18 MR. RUSH: Okay.

19 JUDGE SOEFFING: So I'll sustain the
20 objection, you can ask your next question.

21 MR. RUSH: Okay. Could I have a second
22 to confer with my counsel?

23 JUDGE SOEFFING: Sure.

24 MR. RUSH: What is reverse distribution?

25 THE WITNES: reverse distribution of a

1 drug is when a lab has to send back their controlled
2 substance for the DEA for destruction, or usually
3 destruction not redistribution, but you don't just
4 get to dispose of controlled compounds however you
5 choose, there's a formal and lengthy reverse
6 distribution process to divest yourself of
7 controlled substances as a lab or as a researcher.

8 BY MR. RUSH:

9 Q And have you experienced that with when
10 a drug switches to a Schedule I status?

11 A I have, when my laboratory was
12 researching a series of fentanyl analogs, like I
13 said before, they were scheduled in the middle of
14 that process and we had to account for all of them,
15 the amounts of all of them, post facto, and then
16 reverse distribute them back to the DEA once we were
17 done using them or could no longer use them because
18 of the protocol change. The same thing happened
19 when one of my advisors retired and the Schedule
20 I license was under his name, many of the Schedule
21 I and Schedule II drugs that were registered to him
22 had to be reverse distributed, and after a 45 year
23 career in research there was a lot, there were many
24 drugs to be sent back to the DEA, it was a many month
25 process reverse distributing them.

1 Q And what happened to the research when
2 that occurred?

3 A That didn't impact the research that
4 had already been done, but it definitely had a
5 cooling effect on any of using the fentanyl analogs
6 in any future research, just due to the
7 administrative difficulties.

8 MR. RUSH: That's all the questions I
9 have, Your Honor.

10 JUDGE SOEFFING: Thank you Mr. Rush. Ms.
11 Attanasio, do you have a cross examination?

12 MS. ATTANASIO: Yes Your Honor.

13 JUDGE SOEFFING: How long do you think
14 that would be?

15 MS. ATTANASIO: Longer than 10 minutes.

16 JUDGE SOEFFING: Okay. Why don't we
17 go ahead and break for the day since we need to end
18 at 3:00. So Dr. Elder, you're dismissed from the
19 stand for today, you are technically still on the
20 stand, I'm going to direct you not to discuss your
21 testimony with anybody until we resume tomorrow,
22 and we'll be back tomorrow at 9:00 a.m. We are off
23 the record.

24 (Whereupon, the above-entitled matter
25 went off the record at 2:50 p.m.)

A			
A-T-T-A-N-A-S-I-O			
706:17			
a.m 605:13 608:2 663:6			
663:10 680:7,8			
699:19,22 704:2,3			
713:18,19 785:22			
abilities 616:14			
ability 635:13 646:6,15			
655:16 657:19 696:20			
696:21 698:11 701:19			
able 625:13 627:2 635:7			
639:4 640:13,18			
650:4 655:23 656:8			
656:16 657:22 660:16			
671:21 672:2 675:21			
678:2,18 679:7,18			
698:19 702:2 737:20			
754:20 783:15			
above-entitled 605:13			
680:6 704:1 713:17			
741:19 785:24			
above-referred 633:18			
636:24 706:24			
abridged 723:13			
absence 636:21 706:21			
747:12			
absolutely 631:25			
663:1 707:9 708:17			
709:2 710:22 712:17			
713:7 715:17 721:16			
732:2 759:12 779:9			
780:11,24			
abusable 762:3 769:22			
abuse 615:1 712:6			
719:5,8,9 722:3,16,20			
722:25 724:12 725:1			
725:6 726:1,7,11,18			
727:2,5,10 728:24			
734:3,5,20 735:3,6			
745:7,12,17,18,20			
746:21 761:17,18,20			
761:21,22 762:13			
763:10,18 767:15,15			
773:6 774:25 776:17			
777:9,18			
abused 748:7 762:15			
767:3			
abusing 768:13			
academia 711:12			
academic 612:21 616:3			
659:18 734:7,8			
accept 651:23 741:2			
748:19			
accepted 685:23 686:9			
721:6,20			
accepts 747:13			
access 674:25 699:2			
	779:10		
	accidentally 687:5		
	accomplish 656:9,9		
	accomplishing 661:23		
	accomplishments		
	726:17		
	account 784:14		
	accredited 707:20		
	accuracy 730:9 754:24		
	accurate 629:21 636:6		
	696:6 705:21,24		
	715:22 730:5 755:8		
	771:8		
	accurately 731:5,10,11		
	acknowledge 681:21		
	686:11		
	acquire 658:25 667:13		
	780:19		
	acquired 667:11 751:19		
	751:22 752:7		
	acquiring 655:25		
	658:24 688:11		
	acquisition 751:17		
	752:12		
	acronym 729:14		
	act 635:2 648:12 748:23		
	772:2		
	acting 645:10		
	action 642:19 645:9		
	648:10 744:4 748:22		
	749:1,12 761:24		
	762:2,23 774:13		
	775:6,11,15 782:20		
	actions 622:17,18		
	activate 648:13 744:23		
	744:24 748:20 770:9		
	770:19,21		
	activated 771:10,11,19		
	activating 775:3		
	activation 687:24		
	activators 635:25		
	637:25		
	activities 701:11 725:2		
	728:22		
	activity 783:1		
	acts 635:11 772:16		
	actual 623:5 642:4		
	648:2 664:11 738:2		
	755:13		
	add 671:13 678:21		
	689:20 735:19 740:1		
	added 625:2 669:7,9,11		
	669:13,25 670:19		
	741:8 780:22		
	addiction 615:1 724:20		
	750:12 762:14 775:1		
	addictive 761:20		
	762:22 774:22		
	adding 621:21		
	additional 647:15 738:9		
	747:1 778:15		
	address 733:4		
	addressing 686:12		
	adequately 737:20		
	Adesnik 688:21,23,24		
	688:25 689:6,8		
	adjacent 759:17		
	adjudication 724:5,18		
	724:22 729:2		
	adjust 713:5		
	administer 637:24		
	639:8 675:6 687:10		
	administered 637:6		
	639:9 693:8 715:25		
	administering 621:18		
	administration 605:2		
	606:5 701:5		
	administrations 673:22		
	administrative 605:16		
	666:15,25 668:8,16		
	678:12 785:7		
	admissions 763:13,15		
	admit 632:1 636:14		
	admitted 629:2 662:20		
	737:7 776:11		
	adrenaline 750:9		
	advance 655:7		
	advances 719:1		
	advancing 610:5		
	adverse 764:20 765:11		
	766:4,6		
	advisor 711:22 779:18		
	advisors 690:5 784:19		
	Advisory 668:11		
	671:15,19,24 729:25		
	advocate 720:23		
	affect 655:15 665:24		
	682:8 698:10 739:3		
	affiliated 655:21 660:17		
	678:23 692:19 700:9		
	affinity 772:7,8		
	affirm 704:14		
	afternoon 742:2,3		
	age 650:20		
	agencies 703:1 716:9		
	ago 709:25 710:1,4		
	agonism 628:21		
	agonist 628:20 682:15		
	682:17 683:4 685:19		
	743:18 750:24 769:24		
	771:13 775:10		
	agonists 636:1 637:6		
	685:16 743:17 744:18		
	747:25 769:21 773:25		
	774:9 775:5		
	agree 623:4 657:12		
	681:5 747:4		
	agreeable 741:9		
	Agriculture 727:19		
	ahead 663:13 680:3		
	733:13 741:16 785:17		
	aided 714:20		
	aids 662:13		
	aim 635:24		
	AL-34662 685:19		
	ALAINA 606:22		
	alcohol 742:17		
	Aldrich 690:13		
	Alexis 606:4 607:8		
	706:16		
	alive 650:19 699:5		
	allodynia 636:1 637:10		
	637:12,15,21 638:25		
	639:7 640:4 646:6		
	allow 639:22 665:10		
	666:7,24 667:6		
	670:12 671:13 677:23		
	698:6,7 738:24		
	773:13 778:15		
	allowed 613:10 652:9		
	652:17 699:9 758:17		
	773:16,21		
	allows 676:6 698:5		
	alpha-Methyl-5-HT		
	684:20,24		
	alter 635:3		
	alteration 672:8		
	altered 775:15		
	alternative 659:2		
	702:16		
	alters 619:15,17 648:18		
	alumni 711:17,22,25		
	amazingly 675:16		
	ameliorate 744:21		
	amount 641:7,9 642:9		
	642:11,17,25 649:19		
	654:11 670:25 675:2		
	675:3,5,6 699:4		
	712:13 780:25		
	amounts 784:15		
	amphetamine 743:6		
	744:3 748:23		
	amphetamines 743:13		
	748:1 760:20 768:14		
	ample 740:15		
	analgesic 722:4,5,6,12		
	724:6 728:9 730:8		
	analgesics 730:21		
	analog 758:25		
	analogs 712:21 714:8,8		
	717:12 758:11,11		
	759:13,14,23 779:21		
	784:12 785:5		
	analysis 652:20 709:3		

714:17 716:21 717:18
 719:17,19,23 721:1
 723:10,13,17 729:3
 757:4 778:7
analytical 714:10
analyze 658:13 709:1
 710:20 720:3 758:21
analyzed 712:24
analyzing 697:12 721:6
 752:11 754:10
Andrea 688:22
anecdotal 754:16 755:3
animal 622:13 642:12
 642:13 653:11 691:17
 691:18 696:24 699:4
animal's 642:21 649:24
 650:5
animals 621:19 639:6,6
 640:3 642:15,24
 643:2,4 644:20
 646:22 649:1,21,25
 650:2,5,9,19 653:6,6
 675:7 687:12 698:23
 699:1,16 747:25
 775:22,25
animals' 639:10
answer 609:25 652:21
 666:8 668:5 679:14
 681:9 690:3 769:14
 773:20 782:5 783:17
answered 665:20,22
 666:6
antagonist 645:8,22
 683:9 749:25
antagonists 645:15
 749:4
anthropomorphize
 650:7
anti 644:19
anti-inflammatory
 781:14,19
anti-pain 609:13 635:8
 635:10 643:7 695:22
Antiallodynic 637:5
anticipate 651:18
 652:25
anxious 765:20
anybody 769:12 785:21
anyway 783:15
apart 771:24
apparently 609:20
 614:20
APPEARANCES 606:1
appears 615:3,6
applicant's 664:12
application 664:10
 665:1,12 671:14
 725:15

applications 671:17
 714:23 766:3
applied 692:7 719:20
 721:20,22
apply 620:16 647:25
 650:3 665:3,6 721:24
applying 665:16 692:10
approval 638:11 668:14
 671:6,6,22,23 672:1
 673:7 691:14,25
 719:22
approve 672:22 716:21
approved 668:20
 672:19 710:15 715:5
 723:16 727:8 729:22
 729:23 770:1,3,22
 774:12 782:12
approximately 620:8
 669:10 734:10,11
area 628:15 637:18
 639:20 722:9 740:12
 747:14 757:23,25
 782:8
areas 737:6 747:1
Arlington 605:12
Army 605:11
array 772:13
article 607:7,7 629:14
 629:18,22,25 630:1
 630:10,11,16,17,20
 632:8,17,22 633:1
 635:23 636:3,5,7,9
 637:4 638:4,10,16,17
 639:15,17 683:14
 719:16 720:1,5,21,22
articles 632:19,21
 719:15,16 720:10,14
articles' 632:15
Arts 707:10
ascertain 778:8
aside 708:17
asked 611:24 665:19,22
 666:5 694:21 696:7
 700:2 723:7
asking 623:13 753:4
 770:17 778:25 779:4
 783:14,16
aspect 710:19
aspects 728:14 757:10
 777:16
assault 627:9
assays 742:13 780:15
 781:2
assertion 623:11
assess 608:19 722:25
 776:1
assessed 723:8
assessing 641:4 734:3

734:4 751:8 771:8
assessment 696:6
 766:19 779:6
assessments 725:20
assistant 617:1 729:6
 733:16 734:2
assisting 778:21
associate 728:8,21
associated 641:18
 708:11
Association 638:12
assume 680:1 687:10
 691:24 731:24 737:11
assumed 704:22
attaining 688:8
Attanasio 606:4 607:8
 706:9,13,16,16
 731:16,21 736:15,18
 737:2 741:12,15,24
 742:1,4 745:21 746:2
 746:17,25 754:3
 755:21 757:18 768:23
 773:2 776:4,25
 783:10 785:11,12,15
attempting 703:2
attempts 702:23
attention 628:23 635:18
attorney 703:14
attractive 622:7
attributable 768:5
August 684:13
authored 612:8 716:24
authorization 672:1
authorized 661:7
authors 630:18 631:1
 631:11 635:24 639:5
 682:20 683:5,11
 687:24
availability 712:20
 713:2 752:17 779:11
 781:21
available 659:5 752:23
 752:24 753:1 758:15
 758:18 761:6 771:16
 772:17
avenue 661:22
awake 621:18
award 611:6 613:5,8
awarded 661:17 693:20
awardees 660:4
aware 619:13 649:18
 690:17
axes 642:5,7
axis 642:6,8 644:5,5,13
 644:14,15
ayahuasca 619:18

B

B 606:4 634:18 760:23
bachelor's 708:18
 722:8
Bachelors 707:10
back 608:3 668:13
 671:12,25 672:10
 680:9 698:1,5,7 704:4
 713:20 719:21 741:14
 741:22 745:22 784:1
 784:16,24 785:22
background 634:5
 669:18 670:18 707:7
 715:18 755:13 757:1
 757:11 758:6
backup 674:23
backyard 624:12
balance 696:17
bar 644:22 645:5,18
bars 643:19 644:3
 645:1,3,5,12
base 759:23
based 615:5 621:7
 625:12 646:9 666:1,4
 666:9 667:21 680:20
 680:24 681:1,19
 720:21 723:10 736:2
 737:23 738:5 741:5
basic 608:22 783:7
basically 647:17 654:7
 683:3 691:19 728:3
basics 708:19,22
Bautista 617:1 690:7
Beardsley 779:18
bearing 779:2,9
began 616:20,24
 618:14,20 619:7
 620:9 707:11
beginning 618:22
 642:14
begun 618:14
behalf 606:2,9,14
 709:20
behaving 621:19
behavior 622:16 647:5
 711:15 743:19 744:12
 750:12 751:11
behavioral 621:20
 641:17 642:25 709:12
 709:13 711:8,18
 717:11 780:15
behaviors 641:18 648:3
 648:5,18
believe 624:14 633:3
 636:12 666:3 680:19
 688:24 690:20 692:4
 711:25 721:1 725:16
 726:6 727:15,18
 737:13 742:5,18

745:2,17 747:3 753:9
 753:16 758:1 760:18
 762:18 770:6 771:7
 772:22 780:21
believes 639:23
beneficial 662:17
 764:24
benefit 656:17 696:2
 766:18,18
benefits 766:20,21,25
benign 637:13
benzodiazepines
 759:13
Berkeley 651:2,4,10
 655:18 656:1,8,10
 658:22 659:1,14,17
 659:20,21,22,23
 660:1,3,13 666:11
 667:11 668:10 669:5
 671:7,10 672:2 688:8
 688:11,21,22 690:6
best 621:2 661:22
 696:21 706:1
better 631:14,23 670:5
 684:24 698:5,8
 713:10 766:10
Beyer 688:23
beyond 623:2 653:18
bias 622:7 711:14
bidirectional 743:14
Bill 727:18,19
bind 772:12
binding 628:6 772:15
binds 648:14
biochemistry 708:21
Biological 617:4
biology 614:12 643:9
 646:2 647:23 650:18
 695:5,6 707:10
 708:18,20
Biosciences 709:20
 732:21,25
bit 630:3 631:6 643:21
 659:16 667:3 675:14
 700:2 705:22 713:5
 713:12 721:14,15
 738:13 747:21 761:10
black 634:3 644:22
 645:2,5,18 752:25
blacker 634:4
blind 622:20
blocks 645:8
blood 756:10
blown 634:19
Bluelight 755:7
board 662:22 716:7
 729:25
boards 716:6

bodies 771:14
body 622:13 627:1,10
 628:2 647:1 691:19
 708:13 781:13,23
borrow 777:10
Boston 722:9
bother 686:20
bottom 642:20 684:23
bought 714:9
Boulevard 606:11
box 634:19 704:23
brain 610:6 622:6,7,9
 635:15 744:24 782:19
break 637:8,9 643:20
 663:7 680:4 697:8
 732:14 741:13,15,17
 785:17
breaking 624:2
breaks 691:11 697:3
 699:9
breathing 613:10
 689:20 742:9
breed 650:19
BRETT 606:10
brett@brettphelpsla...
 606:12
briefly 733:20 742:5
bring 611:14,17 632:17
 654:10 710:12 724:18
broad 624:7 643:23
 677:14 735:21 751:2
 751:4 776:6
broader 625:11,14
 653:25 749:4 766:7
broadly 670:7
brought 756:12
buildings 660:5
bunch 782:17
bureaucracy 663:15
 664:3 698:3
burn 637:17 697:12
burned 637:18
burning 650:8
burnt 696:20,20
butoxy 760:11
butyl 760:10
butynol 760:11
buy 753:4 758:18

C

C 760:23
Cal 659:21
caliber 654:12,13
calibrated 641:6
California 669:18
 671:15,19,24
call 637:15 644:24
 653:6 659:20 685:11

704:8,11 723:3 744:5
 749:1,8 750:2
called 616:12 622:6
 627:4 628:9 634:5
 637:20 638:5,18
 645:7 676:6,24
 685:19 704:21 724:15
Calls 667:25
can't 752:24 764:17
canal 637:25
cannabidiol 726:24
 727:13
cannabinoid 714:7,8
 718:5
cannabinoids 712:7,21
 717:12 748:10
cannabis 711:23 712:8
 727:17 728:2
capacity 727:12
capsaicin-induced
 683:17
capture 722:19 735:22
Carbonara 671:16
Carbonaro 606:21
 664:9 711:25,25
Carbonaro's 773:15
cardiac 776:20,21
 777:22 782:2
care 691:18 699:15
career 616:10,16 652:6
 652:7,14 656:7
 679:22 745:5 757:10
 784:23
carried 759:16
carry 656:11 761:12
carrying 651:17,18
 671:2
cart 678:22
case 657:2,6 753:16,20
 756:15 777:2
cases 764:14
catalog 759:2
categories 736:6
category 737:15
cause 656:8 679:20
 685:17 687:25 742:10
 742:12 767:24,25
 768:12 769:24 771:13
 771:14 772:13 774:23
 776:22
caused 622:17,18
 768:4
causes 649:19,22
caveats 754:19
Cayman 676:17,18,21
 676:22,25 752:1
CBD 726:24 727:1,5,14
 727:15,20

CBD's 727:22
cells 628:1 635:11
 653:20,22 775:21
cellular 628:7 648:4
 686:3 708:19 782:20
center 756:9
central 622:1,2,5,17
 748:9 750:11 781:24
 781:25
certain 654:11 718:1
 754:19 762:4 765:16
 769:17,25 775:7
certainly 614:25 615:11
 624:4 664:13 668:4
 711:20 716:16 717:3
 720:5 728:17 733:19
 738:11 740:14 747:20
 765:1
certificate 707:15 768:3
certification 773:15
certified 734:19
chain 675:8
challenging 765:14
change 635:13 642:22
 646:23,24 647:2
 649:24 736:21 784:18
changed 702:8
changes 621:19 622:16
 635:12 647:4,5 648:1
 648:5,14 700:14,19
changing 628:6 736:21
channels 678:19
character 774:1 775:13
characteristics 762:17
 762:20
characterization 648:6
 664:15 673:7
characterize 648:3
characterizing 653:5
charge 661:3 722:14
chart 684:23
check 669:19 670:19
chemical 621:18 627:1
 675:23 678:22 679:7
 713:25 722:23 751:25
 752:1,13
chemicals 676:17,18
 676:23 677:8,12
 678:2,9,18 714:10
 752:19 758:10,17
 759:1,4 780:1
chemist 624:12
chemistry 621:3 708:21
 714:10 734:20 735:2
 735:6 738:19 783:3
Chief 606:5
chloroamphetamine
 605:7

choose 779:9 784:5
chose 780:6
circle 668:13 671:25
circles 634:13 642:23
circuits 648:1 744:23
 782:19,19
citation 694:23
citations 682:22
cite 721:17
cited 636:10 682:12
 683:14 684:4,15
 694:22 720:7 766:11
cites 687:23
citing 687:24
citizen 733:6
Civil 737:21
civilians 691:22
claim 753:19
claiming 755:9
clarify 678:9 763:25
class 751:2,3 760:15
 761:1,2,7 774:4
 782:25
classes 747:18 748:6
 758:22 759:9,22
 760:1 763:17 770:5
 770:20
classical 749:15 767:6
 768:14 769:18 772:6
classification 663:24
 749:4,19
classified 749:14
clear 668:9,12 758:18
clearly 634:23
clerk 606:22 629:1
 663:2
client 727:6
clients 725:23
clinical 710:10,12
 714:22,23 715:3,4,11
 716:25 717:11 722:3
 722:12,25 724:9
 725:8,18 726:1,1,7
 730:3,10,20 732:18
close 609:20 617:23
 622:25 693:4
closely 617:24 653:11
closer 713:6
club 619:4,7
co-counsel 739:23
co-use 767:17,18
cocaine 733:17 734:2
 743:6 745:11 762:14
codeine 775:7
cognitive 627:8
coined 760:19
collaborate 654:23
 655:6 656:13

collaborative 655:10
colleagues 655:18
 656:3 666:11,22
 715:19
collect 724:13,17
 725:10
collected 648:9 726:13
 754:23
collecting 729:1 779:25
color 755:13
Colorado 733:3,9
column 682:14 683:16
combinations 743:4
combining 744:14
come 615:22 656:24
 698:5,7 704:13
 741:13 752:21 760:14
 765:15,23
comes 646:17 675:9
 697:15 753:6 767:14
comfortability 764:13
coming 680:20
comment 720:13
 755:25 756:3 757:24
 773:6
commented 754:6
 773:5
comments 755:20
commercial 752:8
commitment 698:9
committee 691:20
 724:6,19,23
committees 729:2
common 616:9,15
 619:3 718:7 761:17
 761:22 762:10 767:19
 775:2
commonalities 769:10
commonly 742:14
 767:3,3
Commonwealth 707:16
communicate 689:18
 700:14,18,22 702:12
 702:15,23,25 717:8
communicated 671:3
 701:1,4
communicates 676:8
communication 719:13
communications 700:3
community 620:1
 695:12 713:2
community's 621:13,25
companies 675:20
 678:10 679:7 752:2
 752:13
company 676:16,18,23
 677:3,4,14 710:11
 722:6,10,11,18

728:14 732:20
comparable 676:25
comparatively 766:24
 767:1
compare 673:8
compared 763:17 767:3
 776:6
compares 649:14
comparisons 777:19
competencies 707:5
complete 650:11
 658:25 692:19
completed 613:22
 618:18 709:10
completely 738:16
 770:10
complex 662:15 750:17
 772:13
compliance 710:19
 727:12 729:10 730:3
 734:21,23 735:4,7
 738:21 752:12
complicated 673:14
 695:6,7
comply 672:5
component 626:24
 627:7,8,13,15 651:5
 727:17 728:1 731:1
components 626:23
 710:16
composition 714:1
compound 771:17
compounds 637:24
 639:8 713:1 748:4
 752:3,18,19 760:15
 769:20 784:4
comprehensive 717:5
concentration 714:11
concern 610:22 611:2
conclusion 703:15
conclusions 639:11,23
 657:10
condensed 762:11
conductive 661:23
conduct 608:6 680:1,11
 682:2 694:5 698:16
 701:19 712:12 736:24
 738:24 741:12,13,25
conducted 627:21
 630:20 641:24 698:23
 714:17 717:19,20
 718:1 758:22 779:19
conducting 626:9
 648:25 703:22 712:10
 717:14,15 718:12
confer 739:21 783:22
Conference 740:3
conferences 726:4,15

confers 635:12
confidently 711:14
confirmed 676:13
conflated 768:21
confusing 609:24
connected 646:25
connection 635:9
consequence 622:16
consequences 659:9
consider 664:14 749:13
 755:25
considerably 781:1
considered 619:23
 681:7,11 685:5
 711:15 727:16,23,25
 729:16 750:8,10,23
 754:12,16 755:11,14
 769:22
consistency 639:24
consists 691:22
constituted 725:5
constitutes 721:9
constraints 702:4
consult 667:8
consultant 720:23
consulted 667:10
consumed 768:10
consuming 673:14
consumption 714:14
contact 627:1
content 718:16
contents 607:1 629:17
 632:8 636:2 712:24
context 616:2 619:19
 620:6,24 622:20
 625:14 626:19 628:7
 653:23 654:2 681:13
 765:11 766:5
contexts 765:10
contextual 625:11
continuation 670:12
continue 651:16 657:20
 659:7 663:9 665:8,11
 702:2 773:13
continues 695:11
contributed 688:18
contributing 621:13,24
 621:24 623:20 743:14
contributions 771:20
 771:25
contributor 768:18
control 672:6,21 694:9
 765:6
controlled 605:5
 608:13 609:4 615:10
 661:7 684:10 710:24
 715:16,25 727:22
 751:8 784:1,4,7

conundrum 695:15
convene 724:22
convened 724:19
convening 729:2
conversation 627:18
conversations 667:2
convoluted 727:14
cooling 785:5
coordination 764:4
copy 611:11,14
cord 610:7
core 608:21 710:16
 761:23 762:3 769:16
 774:13 775:2 778:3
corner 638:9
correct 609:15 610:11
 610:14,20 611:9,17
 611:21 612:3,10,16
 612:22 613:19 660:11
 661:13 680:22 681:22
 681:24 682:2,16
 684:2,7,11 685:1
 686:9 690:4,14,22
 692:7 696:9,11,13
 705:20 706:4 707:23
 707:24 708:6 718:14
 719:7 721:21,23
 723:12 724:4 725:13
 725:22 728:6,7
 729:11 734:16 751:13
 754:2 758:3 765:8
 767:22,23 768:17
 770:25 771:1 774:2
 782:9
correctly 751:1 764:12
 778:25 782:6
correspondence
 617:23 689:5
corroborate 756:14
cost 780:9
counsel 606:5,9 704:21
 705:6 783:22
counted 734:12
country 621:2 711:16
 759:25
couple 778:11
course 617:12 691:7
 708:14 743:15 763:7
courses 708:20,23
 709:2,4
coursework 708:16
court 624:4 638:6
 640:19,19 662:17
 664:14 732:5 761:14
court's 652:8
cover 633:4
covered 646:10 665:10
 670:7 718:21 773:11

777:20
create 653:25
creating 768:8
creation 686:7
credentials 676:7,8
 679:4,17,19
credibility 679:21
critical 716:24
critiquing 753:25
cross 607:2 634:12
 785:11
cross-examination
 680:1,12,13
current 610:11 618:6
 623:22 624:6 646:11
 659:13 669:25 680:24
 681:2,7,11,19 685:10
 685:14 692:13 709:9
 710:8 711:3,4 717:8
 718:24 719:5 732:15
currently 620:4 648:11
 653:2,5 655:20,24
 658:19 660:10 669:22
 685:23 686:8 692:14
 709:17,19 711:4
 745:2 748:9 758:16
custody 675:9
cutting 618:6
CV 610:17,19 612:18
 618:19 661:16 693:6
 705:16,17 708:9
 728:12 750:8

D

D 760:21
D-E-F-L-O-R-I-A 732:24
damage 639:3
dampened 635:15
danger 774:20
dangerous 759:15
 778:4,4,6,8,9,9
dark 634:16 645:5
data 621:6 640:11,14
 641:21 643:3 645:9
 646:4,5,10 658:13
 685:3 697:12 708:25
 709:1,3 715:21
 726:12,13,18 727:9
 729:3,4 754:19
 767:10
date 618:8 681:3
 705:23
day 608:17 614:9
 617:19 658:6,9
 690:21 691:5,8 696:8
 696:15,15,19 699:3,7
 699:25 701:14,14
 705:8 785:17

day-to-day 701:11
days 637:19 696:18
DEA 660:11 664:2,3
 668:12 670:6,9,10
 671:16,17,23 672:20
 689:9,10,13,16
 690:17 692:7,9,10
 702:19,24 715:6
 716:7 725:16,24
 782:11 784:2,16,24
DEA's 694:8
deal 701:18 779:24
dealing 613:4 698:3
death 763:21 767:5,25
 768:1,3,4,12,22
deaths 757:4,5
decades 771:4
decide 621:9
decided 661:21
decrease 695:2
dedicated 659:24
 779:17
deeper 695:22
defended 708:2,3,5
defined 748:14
definitely 749:10
 779:15 785:4
definition 681:6,10
 735:23 748:18
definitions 748:17
DeFloria 709:19 732:21
degree 731:2
degrees 707:8,22 731:3
 731:6,8
deliver 638:2 641:7,12
 650:4
delivering 686:15
delivers 641:8
demonstrate 631:3
 647:23 664:7 678:10
 727:1
demonstrates 685:3
demonstrating 641:18
 695:8
denote 760:23
Denver 606:17 733:3
DEO 689:6
department 605:1
 673:19 756:8
departments 655:3
depending 635:11
 671:8 705:23 782:17
depends 677:13 748:16
depress 742:17
depression 708:11
 735:12,16 737:14
 739:14,17 740:21,24
 742:6,7,8,11,13,16,19

742:25 743:8,20,24
 744:1,20 746:20,23
 747:9,12 752:15
 757:3 758:7 768:5
 776:15 779:23 780:15
depth 744:21 757:4
 758:14
derail 656:7 691:9
describe 617:15,25
 618:5 663:15 707:8
 712:2 747:17 764:15
described 624:15
 745:12 764:21,22
 765:10 776:19 777:9
description 643:23
 737:24 738:6 741:5
design 726:2 782:24
 783:3
designate 624:22
 625:24 739:5
designated 624:18,25
 625:22
designation 644:4
 654:10 735:18,20
designed 722:17
designing 710:17
 770:24 778:21
desirability 775:14
destruction 784:2,3
detail 742:20
detailed 669:24 670:22
 671:1 697:6
detection 626:24
determination 716:3
determinative 776:3
determine 611:20
 714:10 723:14 743:13
 743:18 766:19
determined 695:4
 723:7 768:12
determining 712:20
 714:13 771:18
develop 638:25 639:3
 648:7 710:11 712:11
developed 639:7
 653:10 726:8,24
 730:7,16
developing 618:20
 766:17
development 695:24
 710:11,12,24 732:18
deviation 658:6
device 730:22,23 731:8
 731:12,13
dextromethorphan
 749:24 775:8
di 760:21
diagonally 634:4

Diana 617:1 690:7
didn't 777:21 785:3
die 767:8
differ 773:24
difference 644:20
 697:25 770:16 772:19
different 626:23 635:25
 639:8 647:21 648:3
 648:20 655:2,3,3
 668:15 674:1 702:3
 725:1 731:2,21
 734:24 736:6 738:16
 742:16 748:17 749:11
 756:13 758:22 759:4
 759:9 765:12 766:6
 767:21 769:19 771:11
 771:25 772:6,11,12
 773:1 774:11,12
 775:16 776:17 779:12
 780:9 781:21 782:22
differential 771:24
differently 772:2,16
difficult 659:3 716:10
 765:18,19,21 779:3
 780:16,19,22
difficulties 615:7 688:8
 765:17 785:7
difficulty 713:12 766:1
diligence 715:12
dilute 687:11
dimethoxy 760:20
dimethyltryptamine
 771:22
dire 608:6,8 615:24
 626:9 736:25 737:2
 738:24 741:12,25
direct 607:2 626:16
 648:9 703:13 705:12
 742:5 785:20
directed 782:14
direction 769:16
directly 624:1 635:2
 638:1 648:12 674:21
 675:9
disability 764:16
disclosed 663:18 665:4
 670:2 736:7,25 737:9
 738:11 739:3 740:6
 741:7 773:10 776:10
discovered 781:15
discovering 766:21
discuss 619:4 684:21
 703:13 757:24 785:20
discussed 647:18,23
 673:15 684:19 740:2
 740:4,8 759:18 769:8
discussing 626:19
 746:4,9

discussion 632:8 644:2
 652:5 688:2 700:22
 738:19 740:14 744:22
discussions 689:14
 753:19
disease 737:14 742:9
dismissed 785:18
disorder 734:5,5
 738:20 745:6,10
 746:21
disorders 735:13
 739:15 740:22 745:4
 745:20 747:10 767:16
 781:12
disorientation 764:3
dispose 784:4
disrupt 655:16
disruption 659:9
dissertation 708:1,8
 742:20,21,24 743:2
 743:10,21 747:21
 752:15 757:2 767:16
 780:6
dissociative 750:2
distinguished 768:21
distribute 784:16
distributed 784:22
distributing 779:25
 784:25
distribution 630:22
 783:24,25 784:6
diverse 781:11
diversion 672:6,21
 674:12 722:3,16,20
 723:1,10 724:3,12
 725:1,6 726:11 727:5
 745:13 751:8 752:11
 753:6
diversion-related
 728:24
diverted 725:9 753:3
divest 784:6
division 654:7,8
DOC 605:7 615:8,15
 763:3 767:2
Docket 605:5
doctor 613:17 641:14
 729:15
doctors 640:15 641:11
document 629:11,20
 631:24 632:12 633:9
 633:19 635:20 636:5
 636:25 639:25 640:7
 705:15 706:25
documentation 710:14
 714:22,24 715:3,8
 716:18
documentations

777:13
documenting 715:9
documents 633:5
 667:12 716:5 725:24
doesn't 679:11 746:18
 753:1 756:4 771:13
 771:14 775:11 781:11
DOI 605:6 608:18,20
 609:3,8,9,13 610:19
 610:23 611:3,22
 612:5,9,12 613:10,16
 614:18 615:8,8,15
 619:19 621:6,10,14
 621:17,22 622:1,2,13
 622:17 623:16 626:19
 628:6,13,17,19
 634:24 635:2,6,11
 639:9,9 640:3 642:19
 642:24 643:4,7,11
 644:4,5,17,18,21,22
 645:2,10,19 646:5,12
 646:14,21 647:25
 648:4,5,9,12,13,18,20
 648:21,22,25 649:2,5
 649:7,8,11,23 650:1,9
 652:16 653:5,12
 654:21 655:12,14,18
 655:22 658:18 661:24
 673:24 674:5,12,16
 674:18,18,20,21,24
 675:1,2,3,5,6,7,8,10
 675:12,16,20,22
 676:20,22,23 677:16
 679:7,18,20 682:16
 682:17 683:10,16,18
 683:19 684:10,16
 685:22 686:1,2,8,13
 686:18,18,22 687:3,5
 687:6,10,11,13 688:3
 688:4 690:13 691:25
 694:6,9,23 695:2
 700:20,24 701:16
 702:3,11,15 743:17
 751:17,20,22 752:21
 753:1,8,13,17,23
 756:3,6,10,14,17
 759:6 762:17 766:21
 767:2 769:6,10,16
 770:15 771:2,3,15,23
 772:2,5,14,23 776:21
 780:12,21,25 781:6,9
 781:10,14,21 782:5
DOI's 622:17,18 628:21
 645:8
doing 620:5 624:12
 627:24 647:14,19
 650:15 657:20 658:2
 658:3 678:24 686:20

689:15 695:16 697:16
 698:15 699:25 701:8
 701:9 712:3 757:15
dollars 693:5
DOM 777:17
don't 745:2 753:9,15
 754:17 756:2 758:9
 759:7 760:3 761:11
 764:9 781:16 784:3
 785:16
dopamine 743:11 750:8
 750:13,19 761:25
 762:6,21 772:9
dorsal 634:5,7,12,22
 683:17,20
dosage 649:14,18,21
 764:17
dosages 648:25 649:14
dose 642:19 649:2,3
 714:12 750:1 769:25
doses 743:7,9
double-blind 765:6
doubt 780:24
DOx 760:15,16,19
 761:13 762:19
dozens 759:4
Dr 606:14 608:4,5,10,12
 610:3 616:1 617:1,1
 618:11 620:15 623:14
 623:23 624:17 626:4
 626:18 633:21 635:17
 637:4 652:5 657:1
 659:13 663:24 664:8
 665:15 666:1 671:16
 673:24 677:25 680:10
 680:15 688:21,21
 689:6,8,10,12 690:7,7
 691:13 694:21 703:11
 704:11,12,18 711:25
 720:22 722:18 732:14
 733:23 734:19 737:24
 741:23,23 742:2
 744:14 745:8,24
 746:6,18 747:8 748:5
 748:5 760:19 763:1
 773:14 779:18 785:18
draft 729:4
drafted 705:17
drawing 662:21
dream 654:25
Drive 605:11 606:6
drives 644:23 648:4
drug 605:2 606:5,9
 615:1,1 623:23 624:6
 646:1 710:15,24
 712:13,16 714:23
 719:20 720:23 722:4
 722:16 723:4 725:15

726:8,20 727:7 742:9
 745:17,18,20 748:13
 750:18,21 753:18
 755:8 756:1,9,25
 757:6,14 761:1,1,2
 762:10 763:3,13,18
 766:3,5,17 767:9,12
 767:15,18,21 768:18
 769:23 770:1,3,11,24
 771:13 774:7 775:8,9
 777:14 779:8 780:9
 781:9,16 782:7,11,25
 784:1,10
drugs 638:2 677:10,12
 710:12 712:6 714:18
 715:7,9,23 718:1,7
 719:25 722:21 723:2
 723:10,14,18,19,22
 724:3 742:10,12,17
 743:5 745:13,20
 747:18 748:7,14
 749:11,14,21,22,24
 750:15,24 751:2,3
 757:7,16 758:10,15
 758:15,23 759:9,15
 759:17,17,20,22
 760:4 761:2,3,7,18,19
 761:20,21,21 762:3
 762:12,14,22 763:14
 763:15,17 764:11
 766:11,13,22,24,24
 768:10,20 769:5,9,17
 770:9,18,20,21
 771:21 772:3,11,22
 774:12,16,20 775:2
 776:17,22 779:9,13
 779:16,17 780:5,6
 782:13,20 783:4,5
 784:21,24
due 652:19 715:12
 761:8 779:10 785:6
duly 704:22
duration 699:6,11
 761:8,9 762:8,23
 777:17
duties 667:2 724:1
 728:19 729:7
DXM 749:25

E

E 605:16
E-L-D-E-R 705:4
earlier 730:7 742:19
early 730:12 743:3
earned 707:17
easel 662:11,13
easier 627:18
easy 664:9

edge 618:7 660:8
edited 746:15
educate 718:10,11
educating 618:12
education 709:1
educational 707:7
effect 612:9 622:13
 637:5 644:6,16,17,22
 644:24 645:17 646:22
 652:6 684:19 743:14
 744:21 750:15 762:8
 762:8,20 764:25
 776:2 785:5
effects 611:20 612:5
 613:23,25 614:17,21
 621:14,22 622:1,2,23
 623:12,20 626:5
 635:24 643:7 646:12
 647:25 653:5,12
 687:6 744:19 748:24
 750:1,3,18 761:9,11
 761:24 762:1,4 763:2
 763:8,8 764:10,20
 765:2,7 766:12,14
 769:25 771:9,14,15
 771:19 772:1,13
 773:1,24 774:1,5
 775:12,12 777:15
 778:2,6 781:14,17
efficacy 730:13
effort 619:25
efforts 694:9
eight 610:14 615:5
 623:18 652:20 693:8
 719:17,19,23 721:1
 778:7
either 618:11 620:17
 658:23 689:15 695:13
 760:23 766:1
Elder 607:3 704:11,12
 704:18,20 705:3
 734:19 737:24 741:23
 742:2 746:18 747:8
 785:18
electrophysiology
 616:25 617:6
elements 625:10
elicit 642:11,17,25
Ellen 617:1 690:7
else's 661:8
elucidate 668:14
emblem 638:8
emergency 674:23
 756:8
emerging 723:3,9
emotional 627:7,12,14
employed 709:18,19
employee 733:6

employment 709:15
 710:3,9 728:19
encompass 749:20,21
 749:23
encounter 759:21
encountered 753:12
 756:20
encountering 756:16
Enforcement 605:2
 606:5
engaging 613:21
engender 762:14
enhances 683:18,22,25
ensure 674:12 715:3
ensuring 715:20
entactogen 744:5
entail 714:25 733:16
entailed 714:3 717:2
enter 735:16 739:20
entered 706:6
entire 622:13 656:7
 699:6 745:5,18
 781:18
entirely 669:1
entity 722:23
epidemiological 757:8
 757:11
epidemiologist 757:19
epidemiology 756:25
 757:5,14,22 763:13
Epidiolex 726:20,23
equipment 677:11
equivalent 776:21
ER 763:13,14,15
Erowid 755:15
errors 721:12
especially 757:8
ESQ 606:3,4,4,10,15
essentially 683:18
 710:16 715:12 718:24
 719:12,22 723:13
 728:21 729:7 745:6
 774:14 775:21
EST 605:13
establish 729:9 732:3
established 679:11
 721:19
establishing 678:15
 729:8
esteemed 621:1
estimate 617:7 650:14
ethical 691:21
euphoric 762:1
evaluate 641:14 691:20
 708:25 715:14 722:19
 731:13 758:24
evaluated 720:13,16,18
evaluating 720:25

721:11 723:19 724:2
 753:25 754:7
evaluation 709:5
 727:12 766:19
event 722:4,17 765:11
 766:6
events 724:15 728:25
 766:4
eventually 725:14
 727:7
everybody 662:25
evidence 623:19 629:2
 630:20 631:23 633:19
 636:25 646:14 648:8
 648:15,17 652:9,10
 706:6,25 754:10,12
 754:14 755:4,14
 756:6,7,13,14,17
 764:23 772:18 781:4
 781:13
evidenced 766:16
exacerbated 743:9
exact 630:22 631:7
 646:22 670:23,24
exactly 630:23 631:12
 647:24 674:17 707:4
 739:10 740:16
examination 626:16
 694:19 703:22 705:12
 785:11
examined 704:23
examiner 767:24 768:3
example 641:12 650:2
 655:5 698:22 700:23
 714:4 717:15 718:4
 742:15 755:15 763:23
 780:13
examples 760:4 775:17
exceedingly 761:5
 767:7 774:13
exception 767:14
exchange 633:9
excluded 633:5
excuse 760:12
excused 703:12
exert 653:12
exhaustive 758:8
exhibit 610:17 628:25
 629:2 632:2 633:13
 633:16,20 635:18
 636:15,19,22 637:1
 643:14 662:20 680:16
 680:17 684:4 687:22
 687:23 705:10 706:6
 706:19,22 707:1
 744:6 745:25 746:3
EXHIBITS 607:5
exists 674:23

expected 632:18
expensive 752:7
 780:16
experience 627:11
 639:2 640:11 672:24
 697:22 707:5 713:24
 721:19 728:4 738:2
 739:9 745:3,8,12
 748:6 751:6,7 753:25
 754:7 756:25 757:7
 764:7 765:19,24
 778:20
experienced 637:17
 784:9
experiences 751:6
 752:11 765:14
experiencing 619:25
experiment 631:1 658:9
 658:10,12 675:4
 685:2 691:25
experimental 614:3
 669:24 695:8
experiments 608:23
 614:5 617:6 621:10
 622:14 631:2,6
 640:16 641:10,16,20
 644:4 645:6,14
 647:22 648:11,19
 649:25 650:3,22
 653:10,24 655:8,12
 655:17,24 658:2
 670:24 671:2 675:6
 675:25 686:18 687:9
 694:6 695:4 696:21
 697:5,6,9,16 698:23
 699:18,23,25 701:14
 701:20 702:2,16
expert 606:21,22
 613:22 614:2,13,20
 614:25 615:9,11,14
 615:18 624:15,18,19
 624:23,23,25 625:3,4
 625:7,9,22,24 626:4,7
 626:14 632:23 639:15
 639:18 664:3 729:16
 729:19,20 731:25
 732:4,10 734:19
 735:11,17,23 736:5
 736:16 737:1,8,11,15
 738:15 739:5,13
 740:6,11,21 741:6
 746:19 747:1,6,9,14
 757:20,22 764:18
 773:15 776:7,11
expertise 614:14
 623:24 624:3,9
 649:17 731:19 736:21
 738:2 747:4 754:4

755:22 768:24 773:3
 783:12
experts 617:21 620:7
 724:20 740:17 749:8
 749:12
expire 651:21,23
expires 651:5,20
 656:10 658:22
explain 616:1 628:17
 631:19 633:25 634:25
 635:9 641:1 643:21
 655:1 660:14 674:14
 675:14 695:3 696:14
 698:18 700:7 712:15
 717:1 732:5
explained 737:25
explaining 719:17,23
exploratory 782:14
explore 665:11 667:6
exploring 662:1
expose 687:5
express 631:12
expressed 630:21
 631:4 646:13
expressing 634:23
expression 629:15
 630:18,22 634:17
extensive 624:11
 753:25 757:7 758:8
extensively 648:3
 748:10
extent 665:10 732:9
 757:23 771:6
extinction 746:6
extra 692:23
extramural 692:23
 693:4
extremely 762:22,24
 771:17

F

face 615:8 627:6 696:24
 756:4
Facebook 755:20,25
 756:3
facilitates 683:16,19
 684:1
fact 615:16 621:17
 625:18 631:3 643:11
 652:19 694:24 696:17
facto 784:15
factor 610:14 615:5
 623:18,21 652:20
 719:17,19,19,23
 721:1 778:7
factors 623:18,18 624:2
 624:5 625:10 686:12
 778:7 780:10

Fahrenheit 731:7,9
fair 610:3,18 613:18
 628:20 633:12 696:4
 779:6,7
fairly 750:17 751:2
 757:13 758:18
fall 737:14 749:18
 780:25
familiar 620:15 629:17
 636:2 639:19,21
 649:13 660:6 662:2
 664:11 668:19 676:16
 710:23 757:13
familiarity 662:5
familiarize 718:5
far 621:23 627:20
 645:19,23 648:9
 673:16 693:5 759:14
 782:12
Farm 727:18
farther 768:24
fatal 743:1 763:22
fatally 768:11
FDA 715:5 719:22
 725:16,21,24
features 761:17,23
 762:2 769:17
Federal 737:21
feel 626:11 627:8,9
 650:6,8,9 654:1
 689:20 731:5 765:15
 765:23
fellow 611:6 711:7
 714:16
fellows 612:19,20
fellowship 613:5
 620:17 651:3,5
 692:25 693:19 700:4
felt 719:14
female 746:7
fentanyl 742:14,25
 743:4,20 757:2 758:7
 758:11 759:13 768:1
 768:4,6 779:20,21
 784:12 785:5
fentanyl's 742:25
field 617:3 618:13,24
 619:6 620:3,8,11
 623:24 624:9,15
 625:13,25 626:8
 630:8 649:8 667:16
 716:25 718:25 724:20
 729:16,17,19,20
 735:17 749:13 761:19
fields 628:14 736:17
figure 631:17,20 632:20
 634:1 640:9 642:2,5
 643:5,17,23 644:1

659:2,6 674:8 746:5
 746:11 776:19 777:1
 778:5
figures 640:8 646:10
filament 641:4,6,8
filaments 641:11,15
filed 657:2 740:9
filing 657:17
fill 647:17,20
final 668:14 672:1,17
 746:12 760:22
finally 746:12
financial 658:17,20
 779:11
find 609:23 632:7
 639:20 659:11 663:21
 696:5 726:10 727:4
 762:16,23 763:10
 767:5 768:9 778:3
finding 743:3 756:10
findings 655:7 721:16
 726:3 744:15
fine 713:15
fingerprints 669:17
 670:18
finish 650:14
first 616:20 618:14,20
 626:23 629:24,25
 637:10 643:22 653:13
 668:9 669:5 674:15
 692:20 704:22,25
 705:2 707:11 714:4
 717:3 733:22 737:24
 740:2 745:7 760:15
firsthand 779:24
five 614:8 617:12
 643:17
flasks 677:10
flexible 737:22
fluorescent 634:20
flying 728:23
focus 750:14
focused 609:9 622:5
 730:21 743:10 781:25
focuses 782:3
follow 617:23 623:7
 697:7
following 643:4 667:21
 728:11 747:23
follows 639:20 704:23
force 641:7,9 642:10,11
 642:12,17,25 643:2
forces 641:12
forearm 730:25 731:1
forecast 664:4
forego 698:15
foreign 669:1
foremost 617:21

674:16
formal 618:25 784:5
formally 618:12
formed 676:11
forms 759:19
forth 671:12
forum 755:3,25 756:1
forums 753:18 754:11
forward 671:21
found 640:2,10 648:12
648:17,19,21 687:24
761:17 764:23 768:7
770:13 781:6
foundation 667:4
founded 722:10,11
four 631:16 633:22
643:13 771:4
fraction 660:6
France 681:24 682:3
FRANK 606:3
free 699:2
frequent 767:5
frequently 776:22
Frey 641:3
frivolous 782:11
front 610:18 629:7,21
636:6 744:7
full 612:5 613:24
614:17 622:22 623:12
707:4
fully 717:24 719:21
function 628:7 631:14
635:3 646:24 647:24
648:15
functions 628:3,4
fund 621:2,9 700:10
fundamental 610:5
783:7
funded 657:8 745:16
funders 702:13
funding 612:20 613:9
620:23 651:2,4,8,14
654:11 656:5,10
658:19,21 659:2
661:21 703:1
funds 692:23 693:4
funny 620:20
further 651:13 667:6
679:23 696:1 703:4
703:10
future 608:24 609:24
647:12 652:15 655:11
785:6

G

GABAergic 762:6
ganglia 634:6,8,13,23
gap 647:20

gather 725:3
gathered 655:18 656:2
666:10 768:20 781:13
GCP 749:5
general 629:24 665:23
669:9 671:1 672:23
708:18 714:14 721:8
752:18,22 753:2
758:19 761:9 764:3
782:8 783:7
generally 612:25 619:5
649:10 711:11 721:5
721:18,20 754:11
761:19
generate 725:18
gentle 637:13,20
getting 623:2 668:19
673:7 773:9
giant 632:19 659:21
gist 719:25
give 616:13 622:12
625:5,11 629:24
631:13 643:22 647:5
670:4 690:2 698:14
698:22 701:7 704:16
708:15 714:3 730:10
731:23 733:4 735:1
760:4 773:17 777:7
777:14 783:15
given 613:8 646:22
652:18 656:4 739:6
gives 625:9 637:14,22
giving 730:17
glass 775:21
GLEASON 606:22
629:4
go 612:3 624:10 643:13
663:13 671:12 674:2
674:4 680:3 681:8,12
692:3 699:4,7,15
703:18 710:25 714:6
720:14 724:23 733:12
741:16 742:20 759:1
767:24 779:12 781:16
785:17
goal 656:12
goals 661:24
goes 651:13,22 663:16
675:8
going 615:3,4,7,14
616:14 619:9 623:12
623:25 625:5,24
626:18 632:17,20,23
632:25 633:10 637:23
643:20 652:2,5,9
653:1 654:4 656:16
656:23 662:21 663:3
664:6,20 668:3

678:18 680:1 688:4
690:24 691:2 692:22
692:25 707:3 719:18
731:18 735:11 736:5
739:2,4 755:22 760:2
768:24 769:3,3 776:9
777:2 783:11,15
785:20
gold 641:4 721:9 765:5
Gomez 688:22 689:2,3
689:10,12
good 608:3,10,11
656:20 703:20 705:8
742:2,3 756:17 768:2
Gosh 617:10
Government's 606:21
Government 606:2
623:13 626:6,8 632:9
632:18 694:21 696:7
700:2 706:12 737:6
737:19 738:1,12,24
739:6 741:4,9 746:18
747:2,13 762:25
Government's 610:1
626:13 632:24 633:15
664:15 711:24 736:15
736:17
graduate 619:2 698:22
711:2 744:16 747:24
graduating 707:13
722:7
grams 642:9,18,22
grant 613:4,10,11,15
620:17,18,22,24
621:5,5,6,11 647:15
651:9,13 658:24
694:7 700:4 702:12
716:17 745:15
granted 654:9 745:16
granting 701:10 702:18
703:1
grants 611:2 616:11,12
616:13 624:10 692:15
716:17
graph 640:12,16 642:20
644:11,18,18,23
645:2
gray 611:6 645:5
692:25 693:11,18
701:5
great 618:4 620:20,21
675:17
greater 726:22 749:18
768:22
greatest 774:20
grey 757:16 758:2,9,13
758:16,25 760:6
Griffiths 711:20

gross 673:10
groundbreaking 619:5
656:24
group 644:3 691:19
712:10 716:14 760:11
760:11
groups 619:14,16 716:9
760:21
growth 765:16
guess 624:22 685:11
697:1 736:9 753:5
754:18 755:24 766:4
766:10,15 770:17
774:19 776:13,14,19
777:8,23 778:1 782:5
GW 726:24

H

H 611:6
H-A-R-R-I-S-O-N 705:3
half 608:18 613:18,21
614:10 615:3 710:1
half-life 762:10
halfway 780:2
hallucinations 649:20
685:12,15,17
hallucinogen 749:19
hallucinogenic 687:3
720:3 750:3 769:25
771:13,15
hallucinogens 615:1,2
hampered 694:2
hand 674:21 704:14
handle 780:5
handling 687:4 704:5
706:12
Hannah 611:6 692:25
693:11,18 701:5
happen 614:11 656:21
674:15 764:18
happened 784:18 785:1
happening 619:12
631:19 659:22,23
661:3,10
happenings 718:25
happens 647:24
hard 697:11
harder 696:5
harm 652:10 688:2
690:22 696:5
harmful 687:1
harms 766:11
Harrison 607:3 704:11
704:20 705:3
haven't 753:3
he's 757:19,21 773:4,5
776:6,11 777:1,20
head 619:20 649:22

733:5
health 653:16 656:14
 696:2,5 723:15
hear 777:21
heard 659:19,20 664:8
 664:18 753:3
hearing 605:13 652:17
 703:15 707:6 769:9
 769:13
hearsay 666:17,19,24
 666:24 667:25
heart 695:15
heat 650:4,6 682:24
 730:25 731:1
heated 731:8
heats 731:6
held 728:12 742:15
help 641:20 710:11
 760:2
helped 712:11 765:25
helpful 662:7
helping 624:4 729:3,4
hemp 727:24
hemp-derived 727:20
Henningfield 720:22
heroin 717:16,19
 762:13 775:4 779:19
 780:14,16
hey 744:23
HHMI 620:17,18,24
 621:1,4,11,11 651:12
 660:4,4
HHS 715:5 716:7
high 630:6,8 638:7
 654:11,13 761:18,22
 762:13
higher 640:24 644:7,8
 743:7
highest 654:8
highly 624:13,14
 628:19 647:1 740:12
Hillel 688:21
hindered 694:2
historical 618:3
history 618:1
hit 771:23
HMMI 701:1,2
hold 609:19 640:24,25
 666:19 713:11
holding 641:1
homologues 760:24
honestly 672:6 770:19
Honor 614:24 623:1,11
 626:2,15 631:25
 632:6 633:7,21 634:2
 636:13 637:3 639:14
 640:10 642:4 652:4
 657:9,17 662:14

663:17 666:16 670:1
 670:14 679:10,24
 694:13 703:5,21
 704:7,10 705:7 706:5
 706:10,13 707:2
 731:16 732:2,12
 733:15 734:18 735:8
 736:18 739:23 740:19
 741:10 742:1 745:22
 746:17 747:16 751:16
 754:3 755:21 757:18
 768:23 773:2,4,19
 776:4,25 777:8
 778:13 783:10 785:9
 785:12
HONORABLE 605:16
Hopkins 709:11,15,24
 711:7,10,18 712:3,4
 714:16 717:4 732:15
horizontal 642:6
horn 683:18,20
hospitalization 753:21
Hot 606:11
hour 741:18
hours 617:7 643:8,10
 643:12 658:3 699:23
Howard 611:7 692:16
 693:15,22,23 694:1
Hughes 611:7 692:16
 693:15,22,23 694:1
human 627:21 641:13
 691:7 709:13 711:15
 712:5,11 717:11
 753:13,16 756:14
humanity 656:16
humans 608:25 619:15
 627:8,15,25 628:8
 634:7 639:2 641:5,11
 641:24 647:13 653:16
 654:2,19 655:8,12
 743:2 753:22
hurdles 666:15 668:8
 668:16 779:12
hurt 626:25
hyperalgesia 682:25
hypersensitive 637:19

I

I'd 766:23 770:19
I'll 753:6 761:20 766:9
 773:8,12,17 778:14
 778:15,17 783:19
I'm 746:11 750:7,16
 754:2 757:13 764:17
 764:18 766:8,9,10
 768:7 769:3,11 770:1
 770:17 772:18 773:11
 776:8,13,16,19 777:3

777:5,8 778:5,24
 783:13,14 785:20
I've 747:20 749:14
 751:19 752:7,16,17
 752:25 753:20 754:17
 757:10 760:14 780:12
 781:24
IACUC 661:4,5 669:8
 671:5,6,14 691:14,16
 691:17,19,25
idea 685:22 686:1
Ideally 655:4
ideas 618:15,21 651:25
 652:1
identification 628:24
 632:2 633:14 636:15
 636:20 706:20
identified 632:2 636:14
 643:21 729:12 740:10
 777:11
identify 635:22 705:14
 706:15 714:1 724:11
identifying 719:10
identity 631:7
II 784:21
III 710:13 724:9 770:8
illegal 759:25
illicit 714:17 752:11
 753:8 757:16 758:2
 758:25 760:25
illustrate 775:17
imagine 637:16 690:19
immense 660:7
impact 653:16 656:14
 664:25 665:9 670:5
 696:16 697:22 698:21
 785:3
impacted 643:2 701:19
 744:25
impactful 764:21
impacting 664:19
impacts 658:17,20
 663:20 670:10 698:19
 778:19
implement 722:24
 728:22
implemented 726:25
implications 778:17
important 619:22 620:1
 620:5 625:6 626:22
 631:4 634:11,14
 640:12 645:11 646:1
 647:8,9,11 653:21,23
 657:17 695:14,18
 697:17,19 771:2,3,18
 781:9 783:2
impractical 777:19
improper 725:12

improve 616:14 722:11
 730:8,16
improved 783:4,6
inability 656:14
inactive 719:24
inappropriately 725:9,9
incident 756:20
incidents 767:11
include 670:21,23
 692:20
included 621:5,10
 742:17 743:16 746:11
 754:18 763:1
includes 631:24
including 710:17
 735:15 739:16 740:23
 743:17 746:22 747:11
inclusion 727:8
incorrect 755:10 774:7
increases 683:4 687:22
 694:24
incredible 771:4
incredibly 617:2 619:24
 621:1 659:3
independently 716:24
indicate 767:25
indicated 719:5 766:2
 772:21
indicates 713:23
indication 632:16
indirect 774:9
individuals 679:17
 777:13
induced 682:25 742:9
 743:20 757:2
industry 709:16
inert 719:25
infer 646:5
inferences 635:4
inferred 646:3
influence 743:19
inform 608:24 647:12
 653:18
informally 618:12
information 624:3
 631:7,10 634:10,15
 635:5,13 655:17
 656:1 664:13 678:1,4
 724:14 753:12 754:25
 755:12
informed 693:25 694:4
infrastructure 780:4
infrequently 671:20
inhibiting 774:10
initial 737:25 738:6
initially 661:12,14
 738:16
initiative 753:23

inject 687:12
injection 682:15
injury 638:24 763:19
 764:8,16
innervate 634:10
 638:21
input 778:22
inquire 705:6
inquiries 626:10
inquiry 667:21
ins 727:22
insight 686:6
insights 686:3
inspect 672:20
install 672:9
instance 753:7
instances 695:21,21
 722:19 724:14 725:5
 726:11 727:5 780:8
institute 611:7 659:21
 660:9 661:17 691:17
 691:18 692:16,17,18
 692:24 693:11,11,14
 693:15,23 694:1,1
 700:23 745:17
institution 612:21
 659:14
Institutional 716:6
institutions 701:11
 702:19 720:20
instructed 687:3
instrumental 765:16
 771:24
intellectually 614:8
intended 770:7
intensely 650:10
intensity 644:16
intentionally 661:14
interact 744:20
interaction 743:7
interconnected 647:2
interest 753:5
interested 630:18
 769:12
interesting 743:7
 781:17
international 638:11
 726:4,14
internet 754:23
interpretation 643:3
 645:21 650:7 684:2
interrupt 663:13
intoxicated 756:17
intraperitoneally
 687:16
Intrathecal 637:23
intrathecally 637:5
 687:14,15

intricately 631:2
introduction 733:22
invested 656:18
investigate 777:9
investigational 714:23
 722:20 723:2,14,22
 726:8 745:13
investigator 621:4
 661:1,2 690:10
 716:17
investigators 660:4
involve 644:5 719:5,9
 761:24
involved 673:15,22
 701:4 710:8 712:19
 728:4 729:24 781:6
 782:19,21,21
involving 715:15
iodoamphetamine
 605:6
IRB 714:24 716:7
isn't 777:1
issue 625:16 633:4
 749:11
issues 719:2 739:8
 779:12
it'd 631:23
it's 640:17 660:19
 717:21 744:3,5 745:1
 745:1 746:10 748:7
 749:25 750:17 751:4
 752:22,24 754:8
 760:16 765:5,19,21
 767:7 768:15,17
 769:20 771:8 772:9
 772:10,20,20 774:3
 775:21 779:7 780:11
 780:19 782:14
itch 614:6 617:5 634:11
IV 730:13 770:8

J

Jack 720:22
Janine 688:23
Japan 684:7
Jaster 606:22 744:14
 745:24
Jaster's 746:6 748:5
job 651:23 658:24,25
 659:11,11 701:25
 702:1 710:17 711:4
 732:16
John 711:10,17 712:3
 714:16
Johns 709:11,14,24
 711:7 717:4
Johnson 711:21
journal 607:7 619:3,7

630:1,4,5,6 638:5,7
 638:12 753:22
journals 630:8 720:19
 726:2 753:17
journey 664:2
Judge 605:16 608:3
 609:19,22 615:19,22
 623:4,8 624:17,21
 625:16 626:3 629:1,5
 631:22 632:4,10
 633:2,8,13 636:16,19
 639:17 640:20,23
 652:12 657:14 662:10
 662:18,24 663:2,9,12
 664:23 665:21 666:7
 666:19,23 667:5
 668:2,23 670:3
 677:23 679:13,25
 680:3,9 681:8 694:14
 694:18 703:6,9,11,17
 703:20,23,25 704:4,8
 704:12,24 705:5
 706:7,11,14,18
 709:23 710:2,5 713:4
 713:8,11,15,20
 731:23 732:7,13,19
 732:22 733:1,8,12
 734:22,24 735:5,9
 736:3,11,14,23 737:4
 738:10 739:2,11,19
 739:22,24 740:1
 741:3,11,16,22
 746:24 747:5 751:14
 754:5 755:23 757:21
 769:1,11 773:8,17,22
 776:8,24 777:3,20,24
 778:10,14 783:13,19
 783:23 785:10,13,16
judgment 725:4
jumps 643:1
junior 616:8
JUSTICE 605:1
justification 757:12

K

Katz 722:19
KAYLA 606:4
keep 627:18 640:19
 674:24
keeping 781:9
ketamine 749:3,5,8,18
ketanserin 645:7,7
 683:2
key 674:22,23 724:19
 729:14,18
kilogram 649:3
kind 631:6 634:3
 643:23 647:19 648:8

648:17,25 662:8
 674:1,11 700:5 721:4
 723:3 729:8,19
 731:18 736:1 742:10
 744:14 748:25 772:4
 773:9 775:17 781:16
kinds 654:14
knew 657:5,8
knot 638:20,22
know 612:5 613:24
 614:17 620:8 632:23
 632:24 646:13,18
 649:6 663:6,7 674:17
 679:1,1,2,11 683:1
 687:2 697:3 702:6
 709:5 711:13 723:5,8
 724:8 727:21 728:15
 730:12 731:9 733:4
 737:5,17,23 738:1,12
 738:22,25 739:3
 754:17 756:2 758:9
 759:7,7 760:3 764:9
 764:12 768:8 770:4,6
 770:9 776:20 779:14
knowing 687:6
knowledge 617:25
 618:3,5 623:22 624:6
 646:20 647:7,9
 677:21 678:17,20
 679:6,16 689:8,12
 703:3 706:1 722:1
 739:9 747:19 751:17
 758:2,14
known 619:3 621:1
 622:24 623:14 630:24
 694:8 726:23
knows 672:7 679:14
 700:23
KOLs 729:12,13
KREINHEDER 606:4

L

L 606:4
lab 617:8 619:7 651:15
 651:25 653:14 658:2
 660:12 661:1,2,3,9,18
 662:4 664:19 669:22
 669:22 672:8 673:2
 673:18 674:11,16,21
 676:2,14 678:13
 688:22,23 689:5
 696:9,18 697:24
 698:1,3,8,10,16,19,20
 699:7,18,21,25
 701:12,18 714:9
 748:5 752:5 753:3,5
 779:17,22 780:17
 782:2,2 784:1,7

lab's 669:11,13,25
670:19 675:21
labeled 714:7
laboratory 617:4
655:20 658:7 660:22
668:20 672:5,25
712:5,11 715:11,25
718:12 734:1 742:23
751:24 784:11
laboratory's 669:7
labs 660:5,12,15,17
661:11 676:4 678:12
697:21 711:16 748:3
781:21,22 782:1,2
lack 647:7,9 727:10
lacking 646:16
lacks 762:19
Lammel 689:3,4
language 616:9,11
large 717:5,8 724:8
larger 754:24
Las 606:12
lasting 764:12,16
late 659:4
latency 682:24
latest 618:9
latitude 731:24
Laureate 621:3
Laureates 659:25 660:1
law 605:16 606:11,16
606:22 663:2
laws 682:3
lawsuits 730:15
lay 667:3 719:18
layman's 683:21
layperson 750:17
LDS 749:17
lead 731:25
Leader 729:14,18
leaders 724:20
leading 617:21 620:7
623:14 660:8,9
668:22 751:15 769:3
783:14,16
leads 637:15 743:1
learn 616:7 757:16
learned 694:10 708:19
learner 616:5
learning 616:5
leave 709:24
leeway 625:9 694:5
773:18
left 638:9 645:20 651:7
651:8 709:14 732:15
left-hand 684:23
leg 638:21,25
legal 624:19 657:10
719:2

legislative 727:22
legitimacy 715:15
720:17 754:1
legitimate 751:23
752:20
length 634:8
lengthy 784:5
lesser 771:6
let's 655:22 663:9
681:12 710:25 718:15
722:22 723:16 731:6
741:16
Let's 765:17 768:1
769:7
lethal 774:23
letter 673:8
letting 702:6
level 645:21 653:18
660:2 663:15 775:12
782:17
levels 666:14 667:24
668:8,9 716:11
782:22
leverage 628:8 654:1
695:23
liability 719:6,8,9
725:20 726:1,7,18,18
727:2 735:3,6 777:9
liaised 729:13
liaison 722:3 729:21
license 655:21 656:1
660:11,21 661:19,20
662:3 663:16 664:16
665:16,17 667:12,13
668:18 702:20,24
703:2 779:19 781:22
784:20
licenses 660:15 782:1,3
licensing 667:9
life-threatening 764:5,6
lifelong 616:5
ligation 637:7 638:3,19
642:15 653:8
light 647:15
likelihood 723:9 768:22
limine 633:3,4 652:19
limit 782:4
limitations 754:20
755:1
limited 736:1 778:15
line 642:20 663:4
765:23 772:4 781:19
lines 645:20
list 632:15 748:14
listed 716:23
listing 738:15
lists 766:11
lisuride 770:9 771:12

literally 622:11
literature 617:16
618:23 649:4,12
716:25 717:6 718:3,5
744:17 753:10,11,15
764:23 765:5 767:11
little 630:3 631:6 638:8
638:20 640:24 642:18
643:21 659:16 675:14
705:22 713:5,12
721:14,15 727:1,14
732:14 742:20 747:21
760:3 772:8,14
Littleton 733:3,9
live 634:9 775:24
LLC 722:5,5,6 728:10
locations 713:2 714:6
lock 686:18
lockbox 674:22,22,25
675:1
locked 675:9
log 675:21 679:2
long 614:12 618:11
622:4,21 653:15
672:7 690:24 694:8
699:23 762:9 764:18
765:2,7 785:13
longer 656:25 674:7
684:25 784:17 785:15
look 610:16 618:19
642:8,14 680:15
683:13 684:18,22
721:12 723:18 736:9
752:16 775:1
looked 722:23 753:15
758:22 760:25
looking 641:6 644:10
644:15 667:8 702:1
715:24 717:10 725:8
728:4 742:24 743:11
743:16 745:9,12,22
761:16 763:12 767:17
773:11 775:18 777:8
781:16,23 782:8
looks 630:11 679:2
713:24 719:4 730:2
734:16 746:5
lorcaserin 769:23
770:18
lose 656:6 679:21
losing 658:14
loss 764:4
lost 641:13
lot 619:12 620:2,4,5
625:18 643:19 659:24
668:3 680:19 688:2
732:9 740:14 753:5
769:2 772:12,15

783:14 784:23
lots 624:7
loud 713:14
low 642:18
lower 743:8 770:7
LSD 759:23 760:10,10
760:12 769:18 771:21
772:7
lump 749:3
Lumpkin 617:2 690:8
lunch 741:13,15,17
Lynch 733:23 745:9

M

M 606:21,22
MADDERS 722:4,15,24
723:20 724:7 726:14
726:22,25 727:9
728:9,19,20 729:3
magnitude 644:16,21
maintained 617:22
majority 712:5 747:24
making 684:10 696:4
male 746:7
mammals 628:4 634:6
653:25
manage 701:11 728:14
manager 688:22 710:10
722:2 728:9 729:7
732:17
managing 728:20
mandated 730:14
manipulate 653:23
manipulations 653:7
Mann 606:3 608:6,9
610:2,9 614:24
615:19 623:1 632:4,6
632:13 633:7,12
636:16,18 639:14
652:4 657:9 663:17
663:22 665:19 666:5
666:16,21 667:25
668:22 670:1 677:20
679:10,25 680:2,11
680:14 681:12,14,17
694:12,15 703:7,8,10
706:7
manner 656:10 675:24
676:1,15
manners 742:12
manuscript 744:13
manuscripts 726:1
729:5
marijuana 728:2
Marine 617:4
marked 628:24 633:14
636:20 643:16 706:19
market 752:25 757:16

758:2,9,13,16,25
760:6
mate 699:8
material 752:6
materially 706:3
materials 781:18
matriculating 707:16
Matt 711:21
matter 605:4,13 680:6
704:1 713:17 731:18
736:25 738:11 741:19
785:24
matters 739:4
maximum 644:6
MDL 645:16
MDMA 613:9,14 619:14
619:16 661:13,15,18
662:2 700:20,25
719:20,21 744:2
748:23 749:1 772:8
mean 626:20 635:10
645:25 657:7,8
658:21 659:20 660:23
682:19 683:21,24
708:17 712:16 714:2
715:17 720:5,9,17
748:15 763:21 769:8
775:1,11 776:25
778:3 782:16
meaning 766:7
means 616:2,4 630:7
635:1,2,6 637:8,9,23
638:10 642:12 643:1
645:22 646:1 648:13
656:15,16 683:25
695:22 697:18 712:22
717:2 760:17 771:8
775:21,24
meant 699:1 719:19
measure 675:5
measurements 672:6
672:22
measures 674:11
measuring 779:25
mechanical 641:7
648:22 682:25
mechanism 645:24
659:3 749:1 775:5,11
775:15 782:20,21
mechanisms 648:5
708:12 744:4 749:12
774:13 776:14,16
mechanistic 744:22
782:15,16,18,22
783:9
media 755:3
mediate 750:12
medical 611:7 640:15

654:17,23 655:5
656:13 685:23 686:9
692:16 693:15 753:10
753:14,22 756:16
767:23 768:2
medication 723:16
medications 722:13
medicinal 783:3
medicine 628:16
695:25 709:12 724:21
Medicines 711:18
meet 725:10
meetings 726:15
meets 671:7,20
member 660:25
memories 764:13,14
mention 689:3,4 738:18
738:20
mentioned 610:19
661:5 686:17 742:6
742:18 748:22 771:12
783:4
mentored 661:1
mescaline 749:17
771:21 777:17
mesolimbic 762:5,21
messy 695:6,7
met 617:20
metabolite 775:9
methamphetamine
743:5 774:10
methodologies 721:20
729:24
methodology 708:25
721:6 729:22
methods 729:9 730:1
methoxy 760:21
mic 609:20
mice 634:7 708:12
742:23 746:7
micromanaging 701:14
microphone 713:5
middle 620:5 784:13
midst 623:14
Miller 613:5 661:16
692:15,18,24 693:10
693:14,25 700:23
milligram 649:3
million 693:5,7
mine 743:3
minimal 659:5 767:2
minor 658:6
minute 664:18 700:6
minutes 680:4 785:15
mischaracterization
614:14,22 673:11
mischaracterize 614:15
685:21

missing 646:19 690:21
691:8 706:3
misuse 722:3,16,20,25
723:11 724:3,12
725:1,6 728:24
745:12
model 638:3 639:1
646:7,16
models 608:23 619:17
648:21 653:11
modification 672:5
modifications 672:12
672:17,18,21,25
673:2
modified 759:23 783:5
modulate 744:18
modulation 708:10
744:12
modulators 735:15
739:16 740:23 743:23
743:25 746:22 747:11
molecular 686:3
molecule 683:23
760:22
molecules 628:2,3,5,6
647:10 653:20,22
moment 610:2 636:18
694:12,17 733:11
745:21 747:17 765:20
momentum 656:5
Monday 699:8,8
money 616:13 692:12
monitoring 723:24
724:2 725:19 726:3
751:10 764:6
monoamine 733:24
743:17 750:5,10,18
750:19,24 751:2
monoaminergic 708:12
718:7 750:20,24
772:9
monoamines 735:14
739:16 740:22 743:11
746:22 747:11 750:4
750:6,11 773:5,7
774:9 776:15,18
month 709:25 710:1
724:23 784:24
months 664:11 669:10
669:20,20 670:16
671:9,18,18 672:14
736:20 765:22
morbidity 765:4
morning 608:10,11
663:7 680:4
Morrisette 606:6
mortality 763:19
motion 633:3,4 652:19

736:21
motioning 663:3
move 632:1 636:14
657:11 668:10 671:21
674:10 684:4 718:15
734:19 778:12,17
moving 765:16
MRKD 607:5
multiple 688:17 716:11
724:9 748:17
mundane 664:9
mystery 695:11

N

name 630:6,7 638:7
688:14,23 693:19
704:25,25 705:2,3
732:19 784:20
names 632:15
narrative 724:13 754:18
narratives 724:25 729:1
narrow 650:21 736:1
Nathaniel 722:18
National 745:16
nature 719:3 729:5
744:25 753:21 759:19
760:13,20 761:20
775:14 777:14,16
Navy 605:11
NDAs 725:23
necessarily 652:13
681:2 682:19 683:24
702:14 757:3 759:1
763:21,22 766:18
775:11 777:1
necessary 667:13
723:25
need 615:17 624:22
625:3 646:21 648:7
650:16,22 654:13
655:25 656:9 658:10
658:11,23,25 660:25
661:4,6,6 662:9,24
664:24 665:8 668:9
669:6,17,23 670:5,9
670:20,22,23 672:4
672:19 673:17 678:3
691:11 696:22,25
697:2 702:7,14
728:15 732:5 778:11
785:17
needed 628:17 650:14
699:2 710:14 719:14
719:14
needs 625:21 654:10
669:24 671:3 672:20
677:9
negative 727:4,9

765:24 766:12,13
778:19
negatively 696:16
neglect 622:9
Negus 748:5
neither 689:18
Nektar 726:8
nerve 637:7 638:3,18
638:23,24 639:2
642:15 653:8
nerves 638:20
nervous 610:7 622:1,3
622:5,10,18,19 695:9
750:11 781:24,25
net 766:14
network 647:2
neural 648:1
neurochemical 621:14
621:22
neurological 782:19
neurons 614:6 617:5
629:16 630:19,21,23
630:25,25 631:4,5,8,9
631:10 634:9,14,22
635:3,15 646:14,23
646:25 647:4,25
648:10,12,14
neuropathic 638:3
639:3 663:25
neuropharmacology
708:21
neuroscience 608:22
614:3 619:6 630:2,7,9
647:22 650:24
neuroscientist 659:12
neurotransmitter 762:4
never 673:1 684:19
698:14,15 752:21,25
753:20 754:20 759:5
781:15
new 680:21 710:3
714:23 719:1,2,24
722:22,22 723:1,9
725:15 732:15 745:13
766:2 783:3
NIDA 745:15,16
night 753:15 756:22
nine 643:1 671:18
nitazenes 758:12
NM 606:12
NMDA 749:3,25
Nobel 621:3 659:25
660:1
nociception 627:4,12
627:15,19
nociceptive 627:17
non-controlled 609:7
685:5,8

non-hallucinogenic
770:10
non-regulated 752:13
non-Schedule 770:16
non-scheduled 724:3
noncompliance 751:12
noncontrolled 727:24
norepinephrine 743:12
750:9,13
normally 637:13
Northeastern 707:15
notable 711:17
note 675:2 684:6,18
768:6
noteworthy 642:3
643:6,9,10
notice 605:13 632:11
632:25 633:9 736:19
737:6,18 738:3 739:6
noticed 612:18 632:9
notoriously 671:20
novel 647:10,11 648:7
686:3,7 719:24
758:17 759:12,13
November 605:10
number 623:21 628:25
633:14 635:18 636:20
642:12 644:7,8 693:2
724:15 755:9 759:16
763:17 774:24
numerous 743:16
771:23

O

O 760:21
oath 608:5 680:11
741:24
obesity 770:3
object 652:7,10 736:19
746:18
objected 626:7
objecting 747:2
objection 623:1,9
626:13 632:5,10
633:10,15 636:17,18
636:21 639:14 640:1
652:13,21 657:9,15
663:17 665:12,19
666:5 667:6,25
668:22 677:20 679:10
706:8,9,19,21 731:16
732:8 747:13 754:3
755:21 757:18 768:23
769:4 773:2,9,13
776:4 778:15 783:10
783:20
obligations 728:18
obtain 662:3 665:17

780:17
obtained 707:14 744:16
745:15
obtaining 663:16
702:19
obvious 653:9
obviously 639:24 716:5
753:18 766:20
occur 688:3
occurred 785:2
occurring 619:5 674:13
738:4 781:5
offer 737:11 740:17
741:6 747:1 760:7,10
offered 614:20 615:12
615:16 626:4 631:23
633:15 636:21 706:20
731:24 732:10 735:11
736:5 739:13 740:6
747:8 755:5 757:20
758:13 759:4,15
offering 731:25 738:15
759:6
offerings 759:3
offers 753:8
Office 606:5,11,16
officially 700:21
offset 762:2,9
Ofentimes 658:9
Oh 682:6 711:6 713:7
713:10 716:16 737:2
759:12 763:24 783:1
okay 609:21 611:8
616:18 618:23 619:21
623:6,10 624:21
626:3 629:5 638:15
640:23 643:19 645:1
646:3 649:13,18,23
657:16 662:6,18,24
663:2,8,11,12 667:7
668:7 669:4 673:3,6
678:17 679:25 681:21
682:10,18 683:7
684:3 685:4,7,20
686:5,11,23 687:21
688:1 689:6,14 690:5
691:5,16 692:2,12
693:10,13,16,21,25
694:14,18 700:16
702:1,6 703:9,20,23
704:8,12 706:11,14
706:18 709:4 710:2,5
713:20 714:15,20
716:14,23 720:2
728:15 731:13 732:19
733:1,12 734:6 735:9
736:23 737:4 741:3
741:11,16,22 746:14

746:24 747:5 748:13
750:15,22 751:5
764:20 773:19 783:18
783:21 785:16
once 660:19,20 669:13
670:17 671:7,10,23
724:23 759:6 784:16
onerous 779:11,24
780:4,5
ones 634:16 645:3
718:2 748:9 759:24
ongoing 611:9 712:19
online 713:3 718:19
753:18
onset 761:8,23 762:7
762:22
open 675:1
opening 762:25
opine 625:9 718:3
720:9 773:16
opined 720:13
opines 717:17
opining 761:10
opinion 724:19 725:11
729:14,18
opinions 623:5 625:12
725:3
opioid 722:22 726:8
744:12,18 747:25
758:11 759:14 762:5
767:17 775:1,16
Opioid-Induced 708:10
opioids 742:14 744:19
748:8
opportunities 659:5
opportunity 613:15
654:23 700:14 740:15
opt 780:9
opted 780:12
options 674:1
order 652:19 674:16
675:12,22 676:10,14
676:22,23 677:16
678:2,4,9,18 679:7,18
679:19 748:21 752:5
757:1 758:24
ordered 674:18,19
676:20 690:13
ordering 675:16,21
676:2,4 677:17
organ 622:7 634:6,9
organizations 671:22
700:8,10
original 624:25 700:24
outcome 765:12
outcomes 725:20
outline 697:6
outlining 720:24

outs 727:22
outside 649:17 670:1
 698:15,20 712:10
 731:18 733:3 755:22
 768:24 773:3,9
 783:12
outweigh 766:20
oval 634:3,5
overall 717:22 766:14
overdose 757:4,5,9
 758:7 763:20,22
 764:1,19 767:12
 774:23
overdosed 768:11
overdoses 743:2
 756:25 757:14 763:13
 763:16 767:20 776:23
overlooked 622:21
overnight 614:11
overreach 665:4
overrule 633:10 639:25
 652:12,21 667:5
 732:7 773:8,12
 778:14
overruled 666:7 668:2
 668:23 670:13 679:13
 755:23 757:25
overview 708:16
owner 722:18
oxy 746:6 760:21
oxycodone 742:14
 780:13,17
OxyContin 730:15

P

P 683:20,23
P-R-O-C-E-E-D-I-N-G-S
 608:1
p.m 699:19,22 741:20
 741:21 785:25
page 612:20 631:16,17
 633:22 636:10 640:6
 643:13 682:14 683:13
 684:18,22 744:9
pain 614:6 617:5
 619:17,19 626:19,20
 626:21,21 627:5,6,8,9
 627:11,12,19 628:7
 628:18 629:15 630:19
 630:25 631:5,9,15
 634:11,15 635:3,7,13
 635:16 637:14,15,22
 638:3,6,12,14 639:1,3
 639:10 641:5,18
 642:13,16 643:4,12
 644:8,19 645:11
 646:12,14,15,23
 647:12,13 648:10,12

648:14,18,20,22,23
 649:8,24 650:1
 653:11,12,21,23,24
 654:1 663:25 683:4
 683:10,18,22,24,25
 684:16,25 686:1,4
 687:22,25 694:24
 695:2,10,10,23
 722:12,23 723:16
 730:9,19 731:6,14
painful 627:3 631:10
 637:14 639:1 640:4
 731:2,3
pairs 634:7
panel 634:2,4,18,20
 668:11 671:15,19,24
paper 637:21 639:9,12
 639:13 640:2 717:6,8
 719:25 720:24 721:10
 745:1,22 746:3,8,11
 746:12,13
papers 612:8 617:18,19
 619:7 694:22 719:2
 720:3 721:13,15,17
 726:6 734:7,8
paragraph 683:12
parking 659:24
part 618:25 633:8 644:1
 652:20 658:23 667:2
 675:18 707:25 709:1
 714:4,16 717:18
 721:12 723:23 724:1
 728:3 746:8,10
 752:10,14 754:7,17
 754:24 758:5 767:16
 778:7 781:9
participants 627:21
participating 701:6
particular 612:9 623:24
 624:8 625:6,15
 632:17,21 639:21
 650:14 651:9,19
 652:1 659:18 682:12
 688:17 701:2 740:11
parties' 740:4
party 610:1,1
passed 663:24
path 652:6,14
pathways 647:11
patients 730:17,17
 731:5
Patrick 779:18
PAUL 605:16
paw 650:5 682:24
paying 730:5
peak 762:8,8
pedantically 736:1
peer 612:12 620:25

718:3 720:7,18,24
 721:3,3 726:2 734:14
 746:16 753:17 754:9
peers 621:11
pen 640:17
penalty 704:15
people 616:6,8 619:4
 619:18 620:4,12
 621:4 622:8 630:24
 639:2 640:13 656:15
 658:5 659:20 660:23
 661:4,6 673:18
 688:16,17,18,20
 691:19 697:15 701:2
 716:15,20 717:18,20
 717:25 718:9 748:19
 749:1,2,7,12 753:19
 762:23 764:14 765:14
 767:11 780:8,12
people's 625:19
people's 755:6
perceived 615:7
percent 644:25
perception 612:6,10
 613:24,25 614:18,22
 616:19,21 617:9,17
 618:2,4,7 619:11,15
 619:17 622:24 623:15
 626:6 627:17 653:21
perceptions 611:21
perceptually 627:10
perform 608:22 616:13
 631:2 638:22 639:5
 640:15 641:15 650:21
 650:22 655:17,23
 658:12 661:17 672:4
 675:4,25 696:21,22
performed 645:6
 678:13 684:24 697:13
performing 614:5
 622:14 647:21 651:16
performs 660:3
period 684:25
peripheral 610:7 622:3
 622:10,19 682:15
perjury 704:15
permanence 764:10
permanent 764:8
permitted 666:25
persist 643:8
person 661:2 717:17
 736:5 755:8 765:23
 767:20 773:1
person's 768:13
personal 739:9 751:5
personally 749:5
 752:20 753:2
personnel 728:23 730:3

756:16
personnels 730:11
petition 657:17
petitioner 607:6 657:2
 677:24
Petitioner's 606:22
 633:13,16,20 636:19
 636:22 637:1 680:17
 706:19,22 707:1
Petitioner's 744:6
 745:25 747:7
Petitioners 626:4
 704:10 740:6,9,16
 747:8
Petitions 704:21
Ph.D 699:7,11 707:17
 707:25 708:20
Pharmaceuticals 726:9
pharmacodynamics
 708:23 763:7
pharmacokinetics
 708:22 762:7,11,12
 763:6
pharmacological
 623:19 747:19 773:1
 774:1 776:1 777:15
 778:2,6
pharmacology 707:18
 709:13,13 711:8,16
 711:19 715:18 717:1
 717:11 734:20 735:2
 735:5 737:15,16
 738:18 741:1,5,8
 745:18 748:18 763:6
 769:6 770:13 775:3
 776:5
pharmacovigilance
 725:19
Phase 710:13 724:8
 730:13
PhD 618:16,18 745:15
 745:19
PhDs 749:12
Phelps 606:10,11
 615:20,21,25 616:17
 623:6,10 624:21
 625:8 626:2,15,17
 629:7,10 631:22,25
 633:21,24 636:13
 637:2 640:5,25
 641:22 642:1 652:24
 657:11,16,24 661:25
 662:11,14,21 663:1,5
 663:11,14,20 664:5
 665:15 666:1,18
 667:3,7,14 668:4,6,17
 668:25 669:3 670:14
 672:10,15 677:22,25

678:5 679:23 694:15
694:16,20 703:4,7,17
phenethylamine
781:20
phenethylamines
759:25
phenomenon 627:2
637:12,17 639:4
647:16 648:16
phentermine 774:11
physical 626:24 627:1
627:4,9,16 672:4,8,12
672:17,18,20,25
673:1
physician 729:15
physiological 642:19
phytochemicals 712:7
717:13
PI 716:17
picture 634:17 758:18
pieces 646:9
piggyback 660:16,18
660:23 661:8
pinching 638:24
pivoted 661:24
place 620:16 660:20
672:19 674:21 780:14
placebo 730:6 765:6
placed 655:14 662:25
673:24 674:5,17
702:11 730:24 779:21
Placement 605:5
places 662:16 693:10
plan 651:22 661:10,11
661:12 699:13
plane 642:6,7
planet 696:25
planned 653:2 691:12
planning 609:10,12
662:13,19
plans 697:6,7 754:9
plant 712:8
platform 676:5
pleasant 763:2
please 633:25 688:15
704:13,13,25 705:9
705:14 706:14 707:8
708:15 712:2,15
717:1 732:23 733:17
747:17 777:8
Plethysmography
708:13
plus 671:18 692:22
693:1,3
podium 615:23
point 622:22 632:1
672:11 685:22 694:3
701:16,17 727:16

740:5 759:8 768:25
781:3
poke 641:16
pokes 641:8
poking 641:14
policy 606:9,9 720:23
poly 767:18
poly-drug 757:5
polysubstance 767:13
popular 711:12 759:10
759:10,14,18 761:1,3
761:7,12 762:19
population 631:8
populations 631:9,12
631:13
portion 692:21
posed 723:14
position 615:20 652:8
684:16 709:9 711:1,9
714:17 718:10,16
733:16 736:17,24
positions 721:12
728:11,12
positive 765:7 766:14
possibility 655:11,13
689:19
possible 644:6 656:6
774:3
possibly 689:15 766:6
post 755:25 784:15
post-baccalaureate
707:14
post-doc 709:11 712:4
post-doctoral 709:11
711:7
postdoc 659:4
postdoctoral 612:21
613:5 618:17
posted 694:11
posts 755:7
potential 608:24 609:13
659:8 712:6 719:2
727:10 734:3 761:18
761:22 762:13 768:20
777:18
potentially 627:25
647:12 658:18 715:16
725:1 741:8 749:22
749:23 750:19 754:16
778:18,19
practice 718:7
pre-clinical 742:23
pre-hearing 625:1
626:1 632:7,14
636:11 663:18 665:5
670:8
precious 781:17
precisely 780:7

predicated 743:3
predict 609:16,24
prefer 698:12
preference 746:6
prehearing 665:14
734:25 735:10 736:4
736:8,12 737:10,25
738:6,17 739:12
740:3,4,10,15 741:7
746:20 747:7 773:10
776:10 777:4,11
preliminary 621:6,10
premise 608:23
preparation 658:11
preparations 775:7
prepare 701:23 737:20
prepared 618:17
705:19
preparing 617:4
prescription 766:12
present 606:20 640:18
669:18 707:6 726:2
762:17 763:16 772:19
presentations 763:14
presented 629:20
652:17 726:13
preserved 628:4
prestigious 624:10
pretty 620:10 677:14
758:14 779:7
prevalence 757:6
prevalent 763:9,15
previous 644:17,18,23
653:8 710:25 711:9
728:12 741:2 772:5
previously 649:16
662:20 673:15 718:6
727:25 728:5 745:11
751:20 752:9 761:15
769:8
price 678:21
primarily 609:9 610:10
712:7 767:8 768:4
primary 750:11 767:25
768:12,18
principal 661:1,2 690:9
716:16
prior 615:6 618:24
711:2,3,3 728:20
739:6 752:1
private 709:15 733:6
Prize 621:3
pro-pain 695:21
probably 614:8 618:20
620:12,13 637:16
653:13 671:4 693:4
probe 653:11
problem 623:6 632:14

663:14 687:7
problematic 751:11
procedure 642:16
737:22
procedures 729:9
proceeding 624:19
652:11
proceedings 666:25
673:16 701:6,24
702:7 740:15
process 619:1,6 620:16
624:11 627:3 655:25
656:3 662:2,5,7,15
664:10,12 665:1,6,13
666:2,10 668:19
669:1,12,19 673:9,11
673:13,22 675:11
676:10 678:14 688:11
688:19 692:3,10
710:13 716:10 720:25
755:4 780:3 784:6,14
784:25
processes 669:21
processing 627:5
prodrug 760:12
produce 685:12,14
748:22 750:2 761:25
771:19
product 691:9 713:25
722:14 728:9
products 712:23 714:7
714:9,11 730:7
professional 659:9
667:2 751:6
profile 630:6,8 638:7
program 697:8 712:1
progress 620:3 650:12
project 611:8,25 614:7
615:4 620:10 651:12
690:22 691:10 722:2
projects 650:24 653:13
697:11,13 712:18,25
717:3
promiscuous 771:22
772:12,15,15,23
773:25
promising 621:7,8
promoted 728:13
pronounce 683:1
proper 632:11 687:4
properties 609:13
621:20 635:8,10,16
644:19 645:11
proportion 763:18
proposal 611:12 618:25
620:19,24 661:15,16
661:17 700:24 782:10
proposed 624:16 625:2

625:25 626:11 636:10
663:23 694:11 737:1
740:5
proposing 618:15
670:24 715:10 737:7
protocol 611:15 661:5
661:6 669:8,9,11,14
669:24,25 670:19,20
671:4,14 784:18
protocols 660:20
670:22 689:21 691:21
714:24 715:13 778:21
prototypical 749:15,16
protracted 762:22
proved 715:23
provide 622:20 648:6
648:21,22 664:13
675:20 677:15 678:1
678:3 700:11,13
705:8 708:1 723:12
725:11 737:18 752:3
755:13
provided 738:2,5
provides 624:8 640:3
651:14 676:19
providing 624:4 726:18
psilocybin 619:8,18
667:20 749:17 760:9
764:1 768:2,6 769:18
771:21 772:8
psychedelic 608:15
619:23 649:11 711:21
712:9,25 714:8
718:17,18,23,25
719:1,12,24 720:6
744:4,5,11,17 748:4
748:13,18,22 749:2,9
749:13,19 750:3
754:8 756:11 759:17
759:17,20,22 761:2,3
763:20 764:1,2,16,19
765:18 766:22 767:8
767:21 768:9,15,16
769:9,19 771:15,19
772:1,3,11,22 781:2
781:20
psychedelics 609:2
611:20 613:6,23
614:19,21,25 618:13
618:16,21,24 619:10
620:2,6 622:4,23
626:5 628:13 653:19
667:16 720:25 735:15
739:16 740:23 743:23
744:2,20,22,25
746:22 747:11 748:2
748:8,15,20 749:5,15
749:16,17,20 750:23

758:13 763:10,14
765:2,7,11,15 767:2,6
769:18 772:6
psychiatric 764:3,10,11
765:4,17 781:12
psychoactive 621:17
726:5 745:20
psychological 766:1
psychometric 715:19
psychosis 774:24
psychostimulant
733:24 743:5 767:17
774:8,25 775:16
psychostimulants
748:1,8 758:12
774:22
public 653:16 656:14
696:2,5 712:21
714:14 718:20 719:13
719:18 723:15 752:18
752:22 753:2 758:19
publication 639:22
718:19
publications 610:22
614:13 734:15 744:10
750:7 754:10,13
publish 712:12 718:2
754:21
published 607:7 612:15
615:2 629:25 630:1
630:10,11 638:4,5
717:7 719:2 720:7,19
720:22,24 721:1,10
725:25 726:7,12
734:6,8 745:2,23
753:17,22 754:17,23
757:24 765:13
PubMed 756:22
pulmonary 782:2
pulse 650:4
purchase 714:6
Purchasing 712:23
Purdue 730:15
pure 744:1
purpose 608:19 678:11
715:1,13 719:11
729:25 736:4 737:18
751:23
purposes 615:18
624:24 628:24 632:2
636:15 640:22
pursuant 605:13
pursue 655:8 702:17
pursuing 651:25
661:22 674:7
pushing 697:10
put 625:14 632:25
662:12 727:5 734:25

735:25 738:17 744:14
746:19 753:6 758:9
776:6
putting 662:19
puzzle 632:19

Q

qualification 626:7
qualifications 623:5
675:18 676:13 706:2
707:5 732:4,6
qualified 623:3 624:14
757:22
qualifies 613:22 614:2
qualify 615:13,17 654:9
qualifying 626:12 721:7
qualities 777:17
quality 696:22 720:17
722:12 775:13
quarter 671:7 693:4
Quartz 676:6
question 609:23 620:21
620:21 652:23 657:15
665:25 668:5 681:18
696:10 697:1 717:25
723:6 747:15 758:1
766:8,15 769:14
772:5,19 773:21
778:25 783:20
questioning 663:4
670:12
questions 609:25
623:11 671:11,12
679:24 703:5 731:17
778:11,16 783:14,16
785:8
quick 762:1
quite 622:10 656:6
710:22 752:6 763:5
767:1,18 772:5
774:11 780:4,5
781:10
quote 763:1
quoting 682:13

R

R1 651:15 654:4,6,10
654:15,22 656:12
radiant 682:24
raise 704:13
raised 633:3
Ramos 606:14 607:3
608:4,5,10,12 610:3
616:1 618:11 620:15
623:14,23 624:17
626:4,18 628:25
633:22 635:17 637:4
657:1 659:13 665:15

666:1 673:24 678:1
680:10,15 691:13
694:21 703:11
Ramos' 652:5 663:24
ran 759:3
randomly 714:5
range 641:12
rapid 761:23
rare 761:5,7 767:7
rarely 764:4
rat 683:17,20
rat's 638:21
rate 652:18
ratio 713:2
rationale 757:11 758:6
rats 637:6 638:2,18,24
734:3 742:24 745:10
Raul 606:14 607:3
re-cross 703:7
reach 639:11 751:24
read 617:18 625:18
632:18 713:24 721:16
756:2
readership 718:20
reading 612:19 614:4
617:19 618:20
reagent 687:4
reagents 676:14,19
677:5,6
reality 674:9
realize 686:8 687:21
really 616:15 619:3
625:17,20 634:16
660:7 665:7 679:4,11
684:19 686:12 695:6
695:15 697:11 699:20
727:21 748:16 756:2
756:15 762:3 765:21
781:8
reask 665:25
reason 615:13 625:6
702:22 723:23
reasons 626:8 762:18
770:2 780:7,11
recall 619:22 680:23
696:10 770:8
recalling 619:20
RECD 607:5
receive 612:19,20
616:12 620:23 625:4
625:22 626:11 639:2
650:1,5,9 672:1
675:24 699:2
received 633:16,19
636:21,25 642:24
671:21,23 674:20
692:12,14 693:5
706:21,25 707:10,22

724:24
receptor 628:20,21
 629:15 630:21 631:3
 631:12,15 634:18,21
 634:24 635:25 637:25
 645:4,8,9,10,16,17
 646:8,13 648:14
 682:17 687:25 708:12
 743:12 744:23 748:21
 750:25 769:21 771:5
 771:20,23 772:10,25
 782:21
receptors 610:5 630:19
 743:17 769:24 770:19
 770:22 771:7,9,10,17
 771:18,25 772:20,23
 775:3
recharge 698:5,7
reclassified 727:19
recognize 624:23 625:4
 625:7 626:13 627:3
 629:11 635:20
recognized 624:15,19
 632:22 638:13 649:20
 749:7
record 608:4 633:16
 636:22 641:16 652:8
 675:4 680:5,7,10
 703:25 704:2,4 705:1
 706:15,22 713:16,18
 713:21 741:18,20,23
 785:23,25
recorded 674:17
 675:10
recording 621:19
 642:10
recovered 639:6
recreational 679:8,18
 679:20
recreationally 761:8
RECROSS 607:2
Reddit 755:7,18,19
redirect 607:2 694:15
 694:19
redistribution 784:3
reduced 652:18 683:10
reducer 686:1
reduces 682:23 684:16
reduction 730:6
refer 616:9 637:11
reference 705:9 770:20
referenced 760:17
referencing 750:7
referred 760:15 774:21
referring 642:9 682:20
 683:6,11 760:19
refers 742:8
refine 665:22

reflected 717:22
reflecting 738:1
reflects 735:23
refocus 613:16
regarded 711:11,11
regarding 619:10
 623:22 624:6 646:12
 648:18 673:25 689:5
 708:14,25 753:12
regards 623:17
regions 744:24
registered 678:22
 752:4 784:21
registration 660:22
 664:24 665:3,9,13
 669:23 670:6,9,11
 674:8 682:1,7 688:9
 688:12 689:7,9,11,13
 690:18 692:7,10
 752:2
registrations 689:16
regular 701:7
regulations 710:23
regulatory 710:14
 714:21 715:2 734:23
 735:3,7 738:20
 779:11
reinforcing 744:19
 761:25 775:13
relate 625:10 658:19
 686:13 757:9 781:11
related 648:9 654:3
 664:5 694:6 712:5
 717:12 725:2 730:23
 763:19 774:25
relates 649:6 777:6
relating 777:16
relationship 660:14
 675:19 676:11 678:15
 700:8 783:2
relative 644:23
release 683:17,20
releasing 774:9
relevant 623:17 644:2
 645:4,23 647:8,10
 652:11 657:13 664:13
 664:22 667:12 717:21
 777:2
reliability 667:1
relief 640:3 648:22,23
 722:24
relieve 639:10 643:11
 646:6,15 648:20
 653:24
relieving 635:16 645:11
 653:12 684:25
remaining 651:1
remind 608:5 638:6

680:10 741:23
remotely 733:9,10
rendering 716:2 754:7
 760:12
renowned 617:3
repeat 652:22
rephrase 657:15 677:19
 677:24,25 766:9
report 681:22 702:8
 722:19 725:4 730:19
 731:5,10,11 753:20
 753:21 756:8,15
 767:24 768:3
reported 725:21,22
 727:6 765:22
reporter 713:13 730:5
reporting 722:4,17
 756:9,10
reports 700:11 724:17
 724:24,25 725:17
 729:2,4 730:9,17
 753:16 754:22 762:24
 764:15 765:13
represent 732:4
representation 629:21
 636:6
representative 620:11
represented 640:12,16
representing 709:21
reputable 720:20
 755:11
require 672:8 764:5
required 642:11,17,25
 682:2 698:24 728:22
 757:3
requirement 670:10
requires 754:25
research 607:7 608:16
 608:21,22,24 609:9
 610:11 611:2,12,15
 613:4,5,16 615:2,10
 615:11,16 617:9
 618:7,15,18,21,25
 619:5,9,14,16,23
 620:2,19,23 621:12
 622:5,12 623:15
 625:15,17,19,21
 627:15 628:9,12,22
 629:14 635:23 639:19
 651:15,17,17,19,25
 652:2,10,15 653:1,3,4
 653:16,17,18,19
 654:6,8,14,17,22
 655:6,9,11 656:7,24
 658:25 659:21 660:5
 660:8,9 661:3,9,9,10
 661:11,15,18 663:21
 663:24 664:7,16,20

664:25 665:9,18,24
 668:11 669:8,11,13
 669:25 670:7,11,19
 671:15,19,24 672:24
 674:2 675:19,21,22
 676:19 678:11 680:20
 680:21,25 681:1,19
 682:2,8 685:10 688:3
 688:4 689:16 690:21
 690:24 691:8,9,10
 692:13 694:2,23
 695:1,14,16 696:15
 696:16 697:4 698:2
 700:10,15 701:8
 702:8 707:12 709:6
 710:17,20 711:8,10
 711:13,19 714:15,22
 715:13,15 717:6,19
 717:21 718:1,13
 720:8,15,18 721:7,9
 721:10 725:8 733:16
 733:23 743:3,15,16
 745:5,7 747:22
 751:18,20 752:4,6,17
 752:18,19 753:11
 754:1,2 757:17 758:5
 758:6,6,21 761:16
 763:9 770:25 771:2,3
 775:18,19,20,24
 778:18,20,21 779:1,2
 779:10,16,19 780:3
 780:25 781:5,6,10,18
 781:19 782:4,7,13,15
 782:16,18,23,24
 783:2,8,9 784:23
 785:1,3,6
researched 720:10
researcher 664:11
 669:6 711:21 729:15
 733:25 784:7
researchers 638:17
 654:24 656:13 667:15
 667:19 711:23 720:20
researching 614:19
 757:8 766:23 784:12
resolve 764:11
respect 622:4 651:2
respiration 742:17
 743:1,19
respiratory 708:10
 735:12,16 737:14
 739:14,17 740:21,24
 742:6,7,8,10,13,16,18
 743:8,24,25 744:20
 746:20,23 747:9,12
 752:15 757:2 758:7
 768:5 776:15 779:23
 780:14

Respondent's 680:16
response 641:17
 642:11,17,21 643:1
 644:8 649:22,24
 650:1 730:6
responsibilities 728:16
responsible 701:13
 716:2,4
rest 696:25 697:3,8
 698:1
restful 698:4,6
restrict 717:23 731:17
restricted 717:18 718:2
restriction 698:24
result 642:4 686:6
 726:16 727:4 764:2
resulting 768:22
results 648:8 695:8
 697:13 725:14 744:15
 746:10
resume 607:8 707:3
 713:23 738:6 785:21
resumed 680:7 704:2
 713:18 741:20
retail 712:22 714:6
retired 701:3 784:19
return 741:17
reuptake 774:10
reveal 631:6 647:10
 686:3
reverse 743:8,20
 779:25 783:24,25
 784:5,16,22,25
review 617:16 618:24
 619:7 620:16 621:4,6
 624:11 639:24 671:9
 716:6,18 717:5,8,16
 718:4,17,18,24
 719:12 720:6 721:3,3
 726:2 730:1 744:13
 744:17 745:1 746:16
 753:10,17 754:8,9
 764:22 777:8 781:4
reviewed 612:13
 620:25 621:11 625:19
 671:10 716:5,8 718:3
 720:7,19,24 734:13
 734:15
reviewing 714:21
 718:24 778:20
reviews 671:17 716:24
 717:15
revitalized 619:25
revolve 685:25
revolved 745:6,19
revolving 685:22
reward 744:12,18
rewarding 762:1

rhythm 658:8
Richmond 707:17
right 609:1,25 610:2
 611:11,19 619:20
 620:2 622:12,15
 627:22 629:3 633:10
 644:3,11 645:13,18
 645:19,20,23 650:18
 650:20 651:13 653:4
 657:2 659:14 668:21
 674:2 678:8 680:9,24
 681:2 682:10,21
 688:1 690:9,12,20
 691:8 693:13 694:12
 696:12 697:15 702:1
 702:4,9 703:11
 704:14 706:5 710:25
 718:15 734:22 737:4
 738:10 739:7 740:19
 741:11 746:24 750:1
 752:7 760:23 771:11
 781:11
rise 637:22 647:5
risk 715:24 766:18,19
 774:17 776:20,20,21
risks 714:1 766:20,23
 766:25 774:18
Robert 606:15,16
rodent 608:23 619:17
 646:6,16 648:21
rodents 628:5 639:4
 641:5,16 649:12
 687:10
Roland 711:20
role 702:19 729:6
room 613:10 689:20
root 634:5,8,13,22
rotating 748:3
rotations 748:3
roughly 709:25 771:4
rrush@rrushlaw.com
 606:18
rule 767:14
rulemaking 694:11
Rules 737:21
ruling 738:25
run 634:8 651:24
 658:12 724:9 757:13
running 634:3 642:6,7
 642:20 644:5 653:14
 715:4,6 724:11 734:2
Rush 606:15,16 703:19
 703:21,24 704:5,7,10
 705:7,13 706:5 707:2
 707:19 709:22 710:7
 713:4,7,10,22 731:20
 732:2,12 733:13,14
 734:18,23 735:2,8,19

736:9,13 737:10,13
 739:1,7,18,21,23,25
 740:2,19 741:10
 746:25 747:3,15,16
 748:12 751:14,16,21
 754:6 755:2 756:5,19
 758:4,20 769:5 770:4
 770:12 773:4,14,19
 774:3,15 776:9,13
 777:7,23 778:1,13,17
 779:5 783:18,21,24
 784:8 785:8,10
Ryan 711:21

S

safe 672:9 691:24 692:6
 715:5
safety 714:1,13 715:9
 715:12,24 725:19
 726:3
salary 692:20,25
sale 753:8 761:2
saline 650:5 687:11
sample 756:10
samples 617:4
SAR 783:2
Saturday 699:10
savings 732:11
saw 644:18 743:4,15
saying 614:12 623:7
 624:2 627:18,19
 683:18,19 764:17
 780:21
says 663:22 682:13,15
 682:23 683:3 714:20
 725:18,25 726:19
 728:9
scale 660:7
scales 647:22 730:20
scared 765:20
scattered 660:2
scenario 768:7
schedule 605:8 608:13
 655:14,19,21,23
 656:1 660:10,19,21
 660:22,24 661:19
 662:3 663:16,23
 664:15 665:16,17
 668:18 669:6,15,23
 670:21,25 671:13
 673:24 674:5,6,8
 682:1,5 684:10 688:3
 688:5,9,11 690:17
 698:25 699:19,22
 702:11,15 703:2
 715:7 717:16 727:13
 727:16 728:1,5,5
 763:10 764:2 769:9

769:17,19 770:7,9,23
 775:4,8 779:13,16,17
 779:19,22 780:1,5,6
 780:20,22 781:15,17
 781:22 782:1,7,10,13
 784:10,19,20,21
scheduled 609:4 615:9
 655:19 669:16 674:6
 686:14 701:17 713:1
 715:9,21 723:18
 745:14 748:11 749:21
 752:3 761:14 766:5
 769:22 770:7,14,22
 780:2 781:3 784:13
schedules 605:5
 770:23
scheduling 615:9,15
 652:7 656:7 658:18
 666:2 770:5 779:1,8
school 619:2 709:12
 711:2,18 747:24
science 606:9 614:10
 614:11 616:9,14
 617:22 622:6 630:5
 656:22 659:22,23
 660:3,5,7 679:22
 681:16 717:9,22
 718:17,18,23,25
 719:1,12 720:6 736:7
sciences 660:2
scientific 616:16 620:1
 621:13,25 623:19,22
 624:6 629:14 649:4
 660:8,21 675:20
 676:7,8,9 677:4,6,11
 678:11,15,20 679:3
 679:17,19 686:15
 695:4,12 711:13
 716:25 719:13 720:7
 726:4,15 729:25
 753:11,14 755:12
scientist 616:4 621:8
 668:9 675:17 677:9
 678:25 697:16 700:9
scientist's 658:8
scientists 612:25 617:2
 620:20 621:1,2 622:3
 626:22 628:10 637:10
 638:1,13 640:15
 654:12 655:3,6
 667:11 676:19 677:5
 679:19 688:10 691:22
scope 649:17 670:2
 731:18 782:4
scrutinize 721:15
search 717:6 756:22
 758:8
seated 704:24

second 609:19 629:1
644:2 682:13 683:16
692:21 703:8 713:11
731:9 772:18 777:7
777:10 783:21
section 634:12 651:12
sector 711:12
see 615:13 622:16
631:17 632:13,18
634:2,13,16,18
640:20 641:2,17
642:5,21,24 643:16
644:19 652:2 656:23
662:11,25 663:22
664:25 665:7,13
678:21 679:4 709:8
713:23 716:23 718:16
719:4 722:2 723:24
725:18,25 726:19
729:12 731:10 751:11
752:12 766:11 769:7
779:23 780:3
seeing 624:22 625:21
634:12,20 776:8
seeking 735:20
seen 714:20 749:14
752:25 753:3,7,20
754:17 760:14 762:12
766:15 767:11 769:5
780:8,12
selected 714:5
selecting 778:22
selection 730:21
selective 769:20 771:16
772:10,14
selectivity 771:5,7
self-administering
745:11
self-administration
649:15 733:17 734:2
self-limiting 777:15
sell 752:22
sells 677:4
seminar 619:3
send 664:9 784:1
senior 616:7 710:10
716:15,20 732:17
sensation 641:13 650:9
sense 769:20 772:7
Sensible 606:9
sensitive 650:6
sensory 634:14
sent 714:9 784:24
sentence 683:8
separated 777:18
series 760:20,24
761:13 762:19 784:12
serotonergic 744:11

750:1 773:25
serotonin 610:4,4
629:15 630:19 634:24
635:25 637:6,24
646:7 685:16,18
695:7,9,20 743:12
750:8,14,16,18
771:14
set 641:11 658:10,15,16
663:8
setting 658:8 716:1
settings 731:2
settled 749:10
share 761:22 769:10
775:2,5
shares 769:16
shed 647:15
shops 714:5
shorter 762:11
show 650:1 664:6,20
777:4
showed 759:2
showing 644:7,21,22
645:2,10,17,19 727:9
shown 633:25 644:13
745:24 765:5
shows 643:24 684:23
Shulgin 760:19 763:1
shut 688:4 694:2
shy 779:15
side 644:11 645:18
715:20
Sigma 690:13
Sigma-Aldrich 676:24
676:25 677:3,17
690:15,16,17 751:25
signal 635:14 647:3,3
683:24 695:9,10
signals 646:24
signed 657:1
significance 634:25
significant 698:21
712:12
significantly 656:21
664:1,7 665:17
682:23 688:18 696:23
similar 620:13 641:15
641:23 655:12 661:13
712:25 760:9 763:5
769:6 770:13 774:13
780:17
simple 675:17 719:18
719:18
simply 728:12 751:24
752:5
simulates 638:24
single 676:10 696:8,14
696:15

sir 609:6 610:8,12,15
610:21 611:10,18,22
612:1,4,7,23 613:13
613:20 614:1 621:15
624:20 629:9 630:17
633:23 668:6 677:1
680:2 685:6,13,18
686:10,19,25 687:8
687:18,20 690:15,23
691:4,15 693:24
695:17 696:3
site 724:10 725:5
728:23 730:3,10
sites 724:9,18,24,25
728:23 755:8,16
772:13
sitting 657:25
six 650:24 669:20
670:16 710:4
size 640:17 644:24
skeptical 721:16
skin 634:10
slanting 645:20
slightly 783:5
slow 614:11,12 650:18
650:23 656:22 669:12
671:20 697:12
slowing 742:9
small 638:21 640:17
641:8,9 650:4 722:11
763:16,18 767:1
smaller 630:5 634:13
638:6 642:12 668:15
759:16
smoke 714:5
social 754:11 755:3
SOEFFING 605:16
608:3 609:19,22
615:19,22 623:4,8
624:17,21 625:16
626:3 629:1,5 631:22
632:4,10 633:2,8,13
636:16,19 639:17
640:20,23 652:12
657:14 662:10,18,24
663:2,9,12 664:23
665:21 666:7,19,23
667:5 668:2,23 670:3
677:23 679:13,25
680:3,9 681:8 694:14
694:18 703:6,9,11,17
703:20,23,25 704:4,8
704:12,24 705:5
706:7,11,14,18
709:23 710:2,5 713:4
713:8,11,15,20
731:23 732:7,13,19
732:22 733:1,8,12

734:22,24 735:5,9
736:3,11,14,23 737:4
738:10 739:2,11,19
739:22,24 740:1
741:3,11,16,22
746:24 747:5 751:14
754:5 755:23 757:21
769:1,11 773:8,17,22
776:8,24 777:3,20,24
778:10,14 783:13,19
783:23 785:10,13,16
solution 687:12
Solutions 722:5,5,6
724:6 728:10 730:8
solve 632:19
somatosensation
614:5 616:24 617:18
617:20,21 618:10
620:3,6 648:4
somatosensory 611:21
612:6,10 613:23,25
614:18,21 616:19,20
617:9,16 618:1,4,7
619:11 622:23 623:15
626:6 634:22 637:11
somebody 679:6 756:3
someone's 768:2
sorry 609:22 611:24
644:15 663:13 678:8
690:16 723:5 763:24
766:9 772:18
sort 708:24 725:10
735:25 762:16 765:12
765:25
sorts 717:21
sounds 625:20 667:1
673:10 751:1
sources 752:25
South 606:17
SP 683:17
speak 639:17,25 659:16
673:3 678:16 764:9
speaking 656:2 713:9
speaks 639:16 643:11
special 628:22 659:24
Specially 735:14
specialty 612:9
specific 628:13,19
637:11 641:7 649:10
653:7 665:25 667:19
677:13 699:3,3
732:10 740:12 770:8
771:20 772:21,24,24
782:8,25
specifically 625:11
637:24 639:8 640:8
644:10 649:8 652:16
654:3 661:4 664:6,16

665:1 666:20 667:18
 668:18 670:4 677:12
 717:10 739:15 740:22
 742:25 743:23 744:10
 746:21 747:10 761:23
 762:5,20 771:9 773:6
specifics 665:12
 727:21
speculation 668:1
speed 762:7
spell 705:1 732:22
spend 658:3 664:19
 668:3 698:10 699:24
spending 732:8
spent 614:2 617:8
 696:8 698:1,2 742:22
 748:2
spinal 610:6 637:25
spine 634:9 638:2
spoke 747:20
spoken 665:23 688:16
 688:17 692:9 761:14
sponsors 700:4
sports 654:7
spot 622:20 728:24
spots 660:1
Springfield 606:6
Springs 606:11
spurious 754:16
spurred 781:20
SSDP 628:25
staff 674:20 678:13
 724:10
stage 616:10,16 659:4
stamp 638:11
stand 608:4 691:16
 704:13 741:23 785:19
 785:20
standard 641:4 649:3,7
 699:18,21 720:14,15
 721:4,9 765:6
standards 691:21 709:5
 721:19
standing 657:5,12
 659:18
standpoint 664:12
stands 654:6
start 631:24 651:6
 668:10 674:7 675:11
started 620:13
state 620:1 623:22
 624:5 646:11 668:11
 669:17 679:14 698:8
 704:25 717:9 733:5
 736:4
stated 626:9 652:18
 680:19 696:11 722:16
 735:10 752:10 763:2

statement 625:1 626:1
 632:7,15 636:11
 663:19,21 665:5,14
 670:8 734:25 735:10
 736:8,10,12 737:10
 737:25 738:7,17
 739:13 740:10 741:7
 746:20 747:7 762:25
 773:10 776:11 777:4
 777:11
statements 736:4 740:4
States 605:1 651:16
 654:9 682:5,7 684:10
 757:6
stating 680:23
statistics 709:3 768:19
status 727:14,23 779:1
 779:8 784:10
stay 659:1
stays 642:22
step 669:5 672:17
steps 653:9 662:8,16
 662:22 667:23 668:15
 669:4 670:16 673:25
 674:14 697:14
Steve 748:5
stick 623:4 737:9
 738:23 747:5 761:21
stimulant 734:5 745:9
Stimulants 708:11
stimulations 682:25
stimulus 626:24 627:2
 627:3,16 637:12
 640:4 650:3
stipulate 736:16 741:4
stipulations 694:7
 755:1
stop 662:10
straying 769:2
streamlined 676:15
street 606:16 733:4
strict 675:8
structural 777:16
structure 697:2,21,24
 736:2 783:1
structured 624:13
 691:12
student 698:22 748:3
Students 606:9
studied 743:22 747:18
 765:3,3
studies 616:23 618:18
 620:9 639:20 641:23
 648:24 649:7,8,15
 660:24 661:13 680:21
 685:4,9,14 687:25
 710:20 712:6 713:25
 714:22 715:4,6,11

717:7 734:3 747:23
 751:20 757:12 770:25
 770:25 778:23
study 610:4 613:8,9,17
 613:18,22 618:1,3,15
 622:8,8,9 623:24
 624:10 626:5,19,20
 627:14,19,20 628:18
 638:12,14 639:4
 645:24 649:4,11
 653:8 681:22 682:12
 684:6 687:23 714:4
 724:11 735:11 739:14
 747:9 749:13 754:24
 755:13 756:11
studying 613:14 616:18
 616:20,24 618:12
 619:18 654:21
stuff 628:10
stunt 665:17
stunted 656:22 664:1,8
 664:17 696:23
subject 736:25 738:11
 739:4
subject's 730:25
subjective 774:1
subjects 730:10,18
 731:4
submission 716:19
 725:15
submit 620:19,22 671:5
 671:14 782:9
submitted 671:8 705:23
 716:8,12 719:22
 725:24 726:19 745:1
submitting 714:21
subscribe 748:20 749:6
substance 608:13
 615:10 623:23 624:7
 655:20 660:19,25
 669:7 674:6 683:20
 683:23 684:11 717:16
 717:17 727:16,20
 728:1,4 734:4,20
 735:3,6,12 738:19
 739:15 740:21 745:4
 745:6,7,19 746:21
 747:10 761:16 767:15
 773:6 776:2,17
 780:20 784:2
substances 605:5
 609:5,8 661:7 669:16
 669:16 670:21,25
 671:13 672:3 685:5,8
 685:11,12,13 710:24
 715:16,21 720:4
 726:5 751:8 758:3
 770:14 776:18 777:13

778:22 784:7
substituent 760:22
substituted 759:24,24
 760:3
subtype 769:21 771:20
subtypes 748:21 771:5
 771:23
success 727:3
successes 726:17,22
successfully 708:5
 710:15
SUD 745:10
sufficient 667:1 737:5
sufficiently 777:18
suggest 783:17
Suite 606:17
summarize 630:15
 638:15 670:15 717:7
summary 625:23
 636:10
summer 740:3
Sunday 699:10
supervised 716:20
supplement 681:9
supplemental 625:2,25
 735:10 736:10,11
 737:10 738:8,8,17,23
 739:12 740:9,10
 741:7 746:19 747:7
supplier 751:25
suppliers 752:8
support 659:6 673:18
 673:21 678:13 684:15
 753:22
supported 692:15
sure 609:16 625:3
 674:15 713:7 717:24
 724:8 732:7 739:22
 739:24 742:22 746:11
 760:6,16,18 766:8
 770:1 777:5 783:13
 783:23
surgery 638:21 639:5,7
surprise 738:4,13,14
surprised 737:19
surrender 669:17
surrendered 670:18
surrounding 710:23
surveillance 712:13,14
 712:16 713:25 730:13
 752:16
survey 756:11 767:10
suspected 724:14
sustain 623:8 626:12
 657:14 665:11 769:3
 783:19
sustained 665:24
 677:23 754:5

swear 704:14
switched 700:20
switches 784:10
sworn 704:22
symptoms 764:3,5
system 610:7 622:1,3,6
 622:10,18,19 659:17
 675:22 676:3,4 695:9
 722:4,15,17,24
 723:20 724:7 726:14
 726:22,25 728:19,23
 750:12 761:25 762:5
 762:6,6,21 768:2,7
 781:24,25
systemically 687:17
systems 762:4 781:23
 783:8

T

T 606:15,16
T-32 745:14
T.J 606:22
taboo 619:24
tagging 634:21
take 631:2 632:21,23
 638:18 650:24 653:2
 653:9 656:3,21,25
 658:7 661:20 662:3
 665:2 666:3,12
 667:22 671:3 672:7
 672:10,19 673:25
 674:12,15 675:2,2
 680:4 686:24 697:3
 698:11 699:9,15
 701:18 753:4
taken 662:9,16 691:5
 701:24 709:4 750:1
 753:19 755:9
takes 614:11 620:16
 658:11,13 664:21
 669:10,19 762:9
talk 612:25 625:20
 640:8,11 739:3
 744:10,11
talked 625:17 644:17
 654:4 670:4 688:7,10
 689:17 691:13 776:14
talking 613:11 625:15
 631:24 652:14 662:12
 670:8 682:4 719:1
 736:6 742:19 776:5
 777:5,22 782:18
tamper 686:21
target 634:24 645:15,16
targeted 772:20 782:14
targets 743:12
tasked 715:20 724:2
tasks 678:13

teaching 616:25
team 699:8 725:7,10
teasing 771:24
technical 657:12
 713:12 740:12
technically 785:19
technique 638:1,18,19
 640:13
techniques 614:4
 615:12 687:4
tell 613:17,21 614:1
 617:10 630:3 635:6
 702:14 733:17 736:20
 775:19
telling 614:16
tend 721:14 746:15
 748:8 749:6 752:4,6
 761:22 762:24 764:7
 764:11 772:11 779:15
tended 743:6
tends 775:20 782:7
term 653:15 657:12
 764:18 765:2,7
terminology 760:18
terms 665:6,23 683:21
 684:25 719:18 769:14
 782:18
test 610:14 615:5
 715:10
tested 608:15
testified 614:17 649:16
 664:24 666:21 671:16
 704:23 751:7 753:24
 773:4
testify 609:10,12 610:3
 610:10,13 615:4,5,7
 615:14 623:12 632:25
 639:19,22 663:23
 665:2 737:24 738:7
 738:12 739:8 740:20
 769:14 777:12,14
 778:19
testifying 609:14,18
 623:25 624:1 657:10
 747:6
testimony 615:6,18
 624:3,16,24 625:5,23
 626:11 664:8 666:24
 685:20,24,25 686:2
 690:21 692:5 703:12
 703:13 704:15 705:9
 769:12 785:21
testing 609:1,7 611:19
 715:10 730:22 756:9
tests 698:16
thank 610:16 615:19
 629:5 631:16 633:21
 635:19 637:3 640:6

657:16 667:7 670:14
 673:23 679:23 684:3
 688:1 694:13,14
 703:4,6,10,12,16
 705:5,7,8,11 706:18
 707:2 709:8 710:5
 713:9 716:14 718:15
 720:2 724:5 733:12
 733:15 734:6 739:25
 742:1 746:1,25
 747:16 751:5 756:24
 769:15 773:19 785:10
that's 660:18 744:13
 749:10 750:19 751:13
 754:4 756:11 760:23
 761:10 762:18 765:1
 765:8 766:15 767:23
 768:8,9,17 773:21
 776:21 781:8,13
 782:9 785:8
theory 749:6
therapeutic 770:1
therapeutics 767:4
therapies 608:25
 647:13 648:7 686:7
 695:24
therapy 608:20
there's 749:11 753:5
 755:6 756:13 759:7
 766:18,20 769:2
 770:17 777:12,24
 780:24 781:12 782:22
 783:4 784:5
Theresa 606:21 711:24
thermal 627:2 648:23
 650:3 731:1
they're 754:21 755:9,11
 761:5,6,7 763:5
 765:20 771:10 774:12
 774:14 779:14
thing 658:9,21 669:14
 670:17 681:16 742:22
 760:6,18 784:18
things 624:13 668:19
 672:9 677:7,14 695:3
 698:11 699:14 710:18
 710:20 715:20 719:3
 721:11 729:5 731:22
 744:25 748:15,23
 749:3,24 750:12
 755:10 758:10 759:19
 760:7,13 762:10,13
 773:16 776:15,20
 782:17
think 610:24 614:16
 617:8 618:14,18
 621:7,8 623:2,10
 625:16 626:21 631:22

652:13 657:13 659:19
 662:7,17 663:5
 664:23 665:3,9,21,23
 669:15 670:7 671:7
 672:18 679:11 685:24
 688:23 693:6 696:6
 697:15,18 698:1
 700:21 701:3 732:11
 737:5 738:13,22
 740:13,16 757:24
 762:2 765:1,9 768:24
 769:1,23 770:20
 773:9,11 776:9
 777:20 778:11 779:7
 780:24 781:8 785:13
thinking 614:7 663:7
 697:14,17
thinks 615:8,15
third-party 676:5
thought 670:23 772:5
 778:11
thoughtful 697:20,23
thoughts 627:11
thousands 617:11,12
threat 723:4,9,13,15
three 640:7 642:18,22
 645:12 646:9,10
 650:24 658:10 661:21
 664:10 669:10,20
 671:9,17 688:19
 744:9 748:2 750:11
threshold 642:8
Thursday 605:10
tie 638:20,22
till 663:10
time 614:12 622:4
 626:14 628:11 632:11
 632:20 636:13 642:16
 643:10 650:21 651:1
 656:20 658:11,13
 661:23 663:8 664:21
 668:3 673:14 684:25
 691:6 697:18,21,24
 697:25 698:2,10,11
 699:3,4,19 701:17,24
 702:3 705:8 712:18
 723:21 726:25 727:23
 732:9,11 759:6 762:7
 762:9 763:7 765:21
timeline 620:14 650:13
 654:3 655:15 656:4
 672:11
timely 656:9 675:24,25
times 674:18 697:10,11
 765:22 780:14
title 637:3 708:9 732:15
 745:17
today 609:11,18 615:18

619:10,13 644:2
 657:21 658:1 705:9
 709:21 785:19
told 666:22
tolerate 766:25
tomorrow 655:22
 785:21,22
tool 628:22 640:14,17
 641:19,22 771:8
 779:1
tools 640:18 677:8
top 612:19 619:20
 631:17 638:8 711:15
 711:23 733:5
topic 674:11 708:7
 717:9
topics 620:9 718:12,21
 718:23 719:5 757:8
totally 655:16
touch 614:6 617:5
 619:15,19 634:11
 637:13,14,15,20,22
 641:5,13
touching 638:25
toxicities 774:24
toxicity 767:2
toxicological 715:21
toxicology 707:18
 715:18 764:19
train 724:10,12 731:4
trained 616:6 708:24
 730:2
training 612:22,24
 613:2 614:3 616:2,6
 616:10,12,15 708:14
 709:11 728:23 745:14
 745:19
trainings 730:24
trajectory 652:15
transformation 627:16
transition 618:17
 651:24 658:23 662:1
translate 627:25
translational 628:9,12
transmit 631:5,10
 634:10 635:13,15
 646:25 647:3
transmitting 634:15
trauma 764:15
treat 770:3
treated 644:20 764:12
treating 781:11
treatment 642:24 643:4
 647:13 664:1 765:4
 782:25
treatments 734:4 745:9
trial 725:18 726:2,3
trials 710:13,18 712:11

715:3 722:12,25
 724:9 726:11 727:1
 730:10,13,20 765:6
tribunal 633:6 747:13
triggering 724:15
trip 765:18
true 682:12
truly 725:5 735:23
truth 704:16,16,17
try 620:22 631:11 659:1
 766:9
trying 614:15 619:14,16
 622:15 623:7 632:6
 632:20 648:6 731:9
 732:3 735:21,21,22
 750:16 766:10 776:13
 776:16,19 777:1
 778:2,3,5,8
tryptamine 760:3
tryptamines 759:23,24
turn 628:23 631:16
 635:17 640:6 744:9
turns 656:19
twice 724:23
twitch 649:22
two 608:18 611:25
 612:2,20 614:9
 620:12 626:23 640:9
 642:2,5 643:5,8,10
 645:5 648:20 650:16
 650:17 651:7,8,11,19
 651:21,22 653:1
 656:4,5 658:22,22
 669:21 670:16 688:16
 688:17 690:25 691:1
 691:2 692:15,19
 693:10 696:8 700:8
 712:17 730:24 748:2
 760:21 768:20
two-thirds 682:14
type 619:3 653:6
 708:16 712:2 718:21
 754:12,13 755:4
 759:20 760:4 763:8
 764:8 774:18,20
 781:5
types 641:23 647:21
 648:20 754:19 755:16
 756:13 757:7 759:2
typical 716:13 756:1
typically 718:9,11
 720:18 726:5 742:15
 743:1 748:19 751:11
 751:22 754:15,25
 762:12 767:23 768:8
 768:11

U

u-opioid 775:3,4,10
U.S. 727:19 763:11
UC 659:14,17,17,19,21
 659:22,23 660:1,3,12
 667:11 668:10 669:5
 671:6,10 672:2 688:7
 688:10,21,22
ultimately 647:4 653:15
 656:12
unable 656:11 659:10
unapproved 723:1
uncomfortable 765:25
uncommon 650:23
uncontrolled 723:21
uncorroborated 754:21
undergrad 747:22
undergraduate 708:18
 733:16,22 734:1
 747:23
underlies 640:14
underlying 646:2
understand 619:14,16
 622:15 624:5 626:22
 628:5 633:7 635:24
 640:13 641:20 646:21
 652:4,8 653:22 658:5
 695:19,20 704:5
 709:22 717:24 723:5
 750:16 751:1 760:16
 764:22 766:8,10
 776:16 780:21 782:6
understanding 610:6
 618:6 621:14,22,25
 623:21 625:12 628:8
 631:11,13,14 646:11
 646:20 647:11 653:9
 653:20,25 654:1
 662:8,15 663:25
 666:2,9 670:5 671:2
 677:2 686:4,16
 688:19 695:23,24
 696:1 707:4 737:17
 740:25 765:9 766:3
 772:17 778:24 783:8
understandings 618:9
understood 624:8
 625:13 626:2,15
 673:8 732:12 734:14
 778:13
undertake 628:3
undertaken 708:15
undertook 712:25
 717:4 718:4
unfamiliar 682:3
unique 748:25
unit 642:8 655:6,7
 709:13 711:8,10,19
United 605:1 651:16

654:9 682:4,7 684:10
 757:6
universities 654:15,22
 655:2 691:20 707:20
university 651:15,23,24
 654:4,8,10,12 655:5
 658:24 668:13 671:25
 673:19 675:19 678:23
 707:11,13,17 709:12
 711:18 722:8 745:8
University's 711:7
unpleasant 762:24
 764:13 765:19
unpleasantness 761:10
unpublished 648:15
unscheduled 713:1
 723:20 727:20 745:14
 748:11 749:22,24
 752:3 760:9 770:11
 771:16 775:9 781:1
 781:10
unusual 699:24 700:1
update 670:20
updates 700:13 701:8,9
upload 676:7
urine 756:10
use 608:19 616:15
 633:17 636:23 637:11
 638:1 640:15 660:24
 661:22 663:3 671:1
 675:5 676:5 679:8,18
 679:20 685:23 686:9
 691:17,18,25 706:23
 714:17 725:19 734:5
 735:12,14 738:20
 739:15,15 740:21,22
 745:4,6,10,19 746:21
 747:10,10 752:11
 753:13,17 756:1,6,14
 757:5,6 758:17
 764:17 767:8,12,13
 767:18 774:25 779:2
 780:6,12 782:10
 784:17
users 661:7 756:12
usually 751:24 784:2

V

V 715:7 728:5
VA 606:6
vacation 691:6
vacuum 647:1
valid 754:13 756:6
validate 630:24
validated 781:2
validity 721:7 729:10
 730:1,8 754:1,25
 756:4

Vandrey 711:22
variety 718:11
various 712:20 714:5,8
 716:6 724:11 728:13
 731:2 742:13 743:11
 748:4 749:11 752:18
 758:10,12 760:1,24
 765:4 770:20
vast 747:24
VCU 707:16
Vegas 606:12
vendor 678:16 758:25
 759:6
vendors 676:9,12,15
 678:21 752:19,21
 758:9,14 759:3,11,16
 759:21 760:7 761:1
 761:12
verbiage 736:2
verifiable 756:6,7
verification 755:4
verified 676:13 777:12
verify 677:17 755:6
version 634:19 714:18
 746:12
versions 783:5,6
versus 698:2
vertical 642:7 644:14
vertically 644:6
veterinarians 691:23
view 736:15 756:5
viewed 716:15 766:5
Virginia 605:12 707:11
 707:14,16 722:8
 745:8
visual 662:8,12,15
visualization 640:21
vitro 775:19,20
vivo 708:19 775:23,24
voir 608:6,8 615:24
 626:9 736:25 737:2
 738:24 741:12,25
Von 641:3

W

W 606:3
wait 650:20
walk 662:6,22 707:3
walking 673:23
want 610:16 620:22
 657:19,21,22,23
 665:7,22 678:4,7
 685:21 686:21 735:20
 737:11 738:22 741:4
 744:9 754:22 769:13
 782:10
wanted 661:14 699:14
 740:17

wasn't 625:1 716:16
wasn't 757:19
water 698:24 699:2,3,5
way 621:20 623:2
 648:18 653:17,18
 659:6 670:1 682:14
 686:22 700:12 724:7
 749:14 750:6 753:6
 755:6 762:21 770:10
 772:20 776:10
ways 724:11 771:11
 775:16
we'll 741:17
we're 608:3 613:11
 616:6 623:2 626:18
 639:4 643:20 644:10
 646:16 650:4 651:6
 652:5,13 664:2 668:2
 669:20 670:1,16
 671:18 672:13 703:25
 707:3 713:12,16
 714:15 731:18 732:3
 741:18
we've 646:10 659:19,20
 664:8 670:15 674:18
 701:23 736:19
we'll 747:4,5 785:22
we're 755:22 766:21,22
 768:24 776:5,9 778:3
 783:11
we've 757:13 761:14
 769:8 773:11
websites 679:3
week 658:3 699:12
weekend 699:4,12,15
weekends 699:13
weeks 658:7,10,14
 671:4 710:4 765:22
weigh 664:14
weight 652:18 783:15
well-renowned 733:24
well-versed 730:19
Wendy 733:23 745:9
went 680:7 704:2
 713:18 714:5 741:20
 772:4 785:25
what's 742:15 762:3
 773:12 774:16 777:2
white 634:19 642:23
 645:6
who've 718:1
widely 752:23 753:1
wild 653:6
willing 736:16
window 653:1
windows 650:21
wish 735:16 739:19
 747:1

withdrawal 682:24
withdrawn 770:2
WITNES 783:25
witness 607:2 608:7
 609:21,23 610:8
 614:24 615:17 623:2
 624:20,23,24,25
 625:3,4,24 626:10,12
 629:9 632:16,20
 633:23 639:15,15,18
 640:2,21 641:3,25
 652:22 657:19 666:4
 666:9 667:10 668:5,7
 668:24 669:2 670:15
 672:13 677:20 678:3
 679:16,24 681:10,13
 681:15 703:5,16,18
 703:24 704:6,9,13,21
 704:23 705:2,11
 706:12 707:9 709:25
 710:4,6 711:24
 713:14 732:1,17,21
 732:24 733:2,10
 742:3 745:24 746:1
 747:14,20 751:19
 754:15 755:24 756:7
 758:1,5 769:7,15
 770:6 773:20,23
 774:6 778:24
witnesses 740:5,7,11
 740:17
won't 782:12
word 616:15 637:10,10
 683:1 684:1
words 668:20 683:3
 686:2
work 612:12 613:1
 617:24 620:5 621:23
 627:24 630:24 647:14
 647:19 650:11,14
 655:15 656:17,18
 657:20,22 658:15
 659:7 661:19 669:6
 672:2 674:7,9 675:1
 677:9 680:20 681:19
 696:17 699:12 700:24
 701:8 708:15,20
 712:3,5,13,14,16
 716:14 719:11,24
 721:4 724:8 726:16
 729:18 733:8,9,10
 742:24 743:2,10,21
 744:16 746:6 747:21
 747:24 748:9 752:14
 752:16 754:9 757:2
 757:11,15,25 758:8
 767:16 779:13,20,22
 780:7,20,23 783:9

worked 608:12 617:3
 655:4 674:25 709:8
 718:6 722:7 726:23
 728:8 729:21 733:23
 757:23 766:2 770:24
working 608:17 611:23
 611:25 614:9 616:25
 617:8 622:14,19
 628:10 647:17 648:2
 654:12 655:4,24
 659:11 661:24 667:15
 667:19 669:15 695:1
 696:8,19 699:17
 712:9 714:15 725:7
 727:11 730:12 742:23
 745:23 748:4
works 615:2 664:3
 675:15 679:12,14
 681:16 695:23 696:2
 699:20 700:8
world 616:3 638:13
 659:18 711:16,23
worried 686:23
worth 658:14
wouldn't 677:21 679:1
 687:7 717:23,25
wouldn't 744:4 755:14
 756:1 782:3
wrap 778:12
write 620:23 632:22
 669:23 671:4 717:4
 724:13 754:22
writer 718:17
writing 618:14 714:21
 716:4
written 671:5 720:11
 725:14 739:12
wrote 612:18 621:5
 661:15 716:7 719:15
 719:16 720:6,24
 725:23

X

x 642:6 643:22 760:23

Y

Y 642:7,8 643:22 644:5
 644:13,15
yeah 609:21,21 619:12
 644:12,15 645:3
 648:11 659:10 661:8
 666:23,23 746:15
 751:11 759:8 767:13
 770:16,17 776:8
 777:3 779:6 783:13
year 618:16 621:3
 653:1 656:4,4 661:20
 666:3,12 667:22

692:20,21 693:1
696:18 709:10 727:8
784:22

Yearly 701:9

years 608:18 611:25
612:2 614:3,8,10
617:13,22 620:12
650:16,17,25 651:7,8
651:11,19,21,23
656:5 658:22,22
659:12 661:21 681:14
681:15 690:25 691:1
691:3 692:19 693:9
696:8 727:15 742:22
747:22 759:5 779:20

yesterday 615:6 647:23
661:5 671:16

yield 732:11

you're 760:2 766:17
775:18 776:9 777:5
778:25 779:4 781:23
782:17 783:14,16
785:18

you've 753:24 754:6
764:21 770:24

Z

zero 642:16
zoom 700:5

0

1

1 654:6,7 682:14 760:10
1.5 693:6
1:38 741:21
10 614:2 659:12 731:7
785:15
10:20 663:6
10:44 680:7
10:45 663:10
100 731:6
11:06 680:8
11:36 704:2
11:37 704:3
11:47 713:18
11:48 713:19
12 659:25 672:13
699:23 734:11
12-hour 699:25
12:26 741:20
120,000 692:22
14 605:10
140,000 692:24 693:1
15 659:25 680:4 681:14
681:15 734:17
150 731:8
16 734:11

17 745:25
17th 606:16
1917 606:11

2

2 623:18,18 624:2
625:10 635:25 637:6
637:24 731:7
2,5-dimethoxy-4- 605:6
605:7
2:50 785:25
20,000 692:23
2000 684:13
2009 607:7 630:12,13
681:22
201 606:18
2016 707:11 727:18
2019 614:6 616:21,22
616:24 617:20 759:5
2020 618:21
2021 618:22
2022 613:12 721:2
2023 759:5
2024 605:10
2025 613:12 651:6
2027 651:5 658:23
22152 606:6
24-24 605:6
2800 606:17
2A 628:20,21 629:15
630:19 631:12,15
634:18,21,24 645:4,8
645:10,15,16 646:7
646:13 648:14 682:17
683:4 685:16,18
687:25

3

3 623:18,21 624:2
625:10 684:18,22
3:00 785:18
31 634:7 636:10
362-7908 606:7
365 696:18

4

4-hydroxy-methyl-et...
760:8
40 620:25
40,000 693:3
425-5129 606:13
45 784:22

5

5 775:8 782:1
5-HT1A 772:7
5-HT2 748:21,24 749:6
770:19,21 771:5

5-HT2A 743:18 744:18
744:23 748:21 769:21
770:10 771:6,12
772:24

5-HT2B 771:6

5-HT2C 769:24 771:6

5:00 699:19,22

50 607:7 635:18 636:15
636:20,22 637:1
684:4 687:22,23

505 606:13

571 606:7

5HT2AR 682:15

6

6 683:13
60 644:24
600 606:16
628 607:3
635 607:7,7
638 607:7,7
65 607:7 628:25 632:3
633:14,16,20 680:16
682 607:3
696 607:3

7

700 605:11
707 607:3
708 607:8,8
74 607:8 705:10 706:6
706:20,22 707:1
744:7
759-1493 606:18

8

80,000 693:1
80202 606:17
81 610:17 629:2
8701 606:6
87701 606:12

9

9:00 605:13 699:19,21
785:22
9:03 608:2

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Schedules of Controlled Substances

Before: US Drug Enforcement Administration

Date: 11-14-24

Place: Arlington, Virginia

was duly recorded and accurately transcribed under
my direction; further, that said transcript is a
true and accurate complete record of the
proceedings.



Court Reporter

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1716 14TH ST., N.W., STE. 200

WASHINGTON, D.C. 20009-7831

(202) 234-4433

www.nealrgross.com