From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 31 Jan 2020 10:53:30 +0000
To: Conrad, Patricia (NIH/NIAID) [E]
Subject: FW: Radio Interview Request_tbs eFM, Seoul, South Korea

Let us discuss

From: This Morning <efmthismorning@gmail.com>
Sent: Friday, January 31, 2020 4:03 AM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)>
Subject: Radio Interview Request_tbs eFM, Seoul, South Korea

Dear Dr. Anthony Fauci,

Hello, my name is Ajin Oh, and I am a writer for TBS eFM's "This Morning" English radio program in Seoul, Korea.

We would like to request a phone interview to hear about how Gilead is assessing the potential use of Ebola drug as treatment for the novel coronavirus

We are hoping to do this interview at **8:00 PM local time in Maryland on Saturday February 1st.**

The interview will last for about 10 minutes, and we will send you a list of potential questions after receiving your confirmation.

If you're available for the interview, please kindly provide us with the phone number we'll be using to call you for the interview and a back-up number.

I look forward to hearing from you soon. Thank you in advance for your time.

Best Regards,
Ajin Oh

--
This Morning with Alex Jensen
tbs eFM 101.3 MHz, Seoul
https://tbs.seoul.kr/cont/eFM/ThisMorning/introduction/introduction.do
http://twitter.com/efmthismorning
http://www.facebook.com/efmthismorning
M : (b) (6) (Kyungmi Choi)
(b) (6) (Myungju Lee)
(b) (6) (Ajin Oh)
==========

tbs eFM (101.3 MHz) is the first all-English radio station in Seoul, and "This Morning" is a current affairs program that airs live from 7:00-9:00 AM (GMT+9) five days a week.

We have had numerous outstanding guests on our program, including Richard Thaler (Economist, Winner of 2017 Nobel Economics Prize), Slavoj Žižek (Philosopher & Cultural Critic), Noam Chomsky(MIT Linguist & Philosopher), Angus Deaton (leading microeconomist), Julian Assange (founder of Wikileaks), Malcolm Gladwell (Author of Tipping Point & Outliers), Jeremy Rifkin (Economic and social theorist), Ruud Lubbers (former Prime Minister of the Netherlands), John Bolton (former US Ambassador to the UN), Joseph S. Nye (former US Assistant Secretary of Defense), Francis Fukuyama (Political Scientist & Author), Jared Diamond (Author of "Guns, Germs, and Steel), Richard Jones (Deputy Executive Director of IEA), Achim Steiner (Executive Director of the UN Environment Program), Yvo de Boer (former executive secretary of UN Framework Convention on Climate Change), John Naisbitt (Futurologist & Author of "Megatrends"), George Whitesides (CEO of Virgin Galactic), Yao Ming (Former NBA player), Park Ji-Sung (Football player), Michelle Rhee (former Chancellor of the District of Columbia Public Schools system), Chang-rae Lee (Author of "The Surrendered" & Professor of creative writing at Princeton University) and many others.

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Sun, 26 Jan 2020 22:41:36 +0000
To: Conrad, Patricia (NIH/NIAID) [E]
Subject: RE: NPR HIT TOMORROW MOVED FROM 5:35 AM TO 7:05 AM ET

OK

From: Conrad, Patricia (NIH/NIAID) [E] (b) (6)>
Sent: Sunday, January 26, 2020 5:40 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)>
Cc: Awwad, David (NIH/NIAID) [C] (b) (6)>; Barasch, Kimberly (NIH/NIAID) [C] (b) (6)
Subject: NPR HIT TOMORROW MOVED FROM 5:35 AM TO 7:05 AM ET

TEST WILL BE AT 6:55 AM ET WITH DAVID AWWAD

From: Clare Lombardo <CLombardo@npr.org>
Sent: Sunday, January 26, 2020 4:56 PM
To: Awwad, David (NIH/NIAID) [C] <(b) (6)>
Cc: Simone Popperl <SPopperl@npr.org>; Conrad, Patricia (NIH/NIAID) [E] (b) (6)>; Matt Kwong <MKwong@npr.org>; Miranda Kennedy <MKennedy@npr.org>; Jacob Conrad <JConrad@npr.org>; Vince Pearson <vpearson@npr.org>; Alicia Montgomery <AMontgomery@npr.org>; Barry Gordemer <BGordemer@npr.org>; Barasch, Kimberly (NIH/NIAID) [C] <(b) (6)>; Routh, Jennifer (NIH/NIAID) [E] (b) (6)>; Oplinger, Anne (NIH/NIAID) [E] (b) (6)>; Stover, Kathy (NIH/NIAID) [E] (b) (6)>
Subject: RE: interview with Dr Fauci

Great.

Then, as you know, the sign-in is (b) (4) and the password is (b) (4). Dr. Fauci will start a recording with the app and hold the phone up to his ear as he speaks on his landline during his live interview.

As Simone said below, our 24/7 phone is 202-513-2158 if any issues come up. Otherwise, our team will reach you and Dr. Fauci at 6:55 a.m. tomorrow on his work landline.

Thanks again for taking the time and your help coordinating.

Best,
Clare

From: Awwad, David (NIH/NIAID) [C] (b) (6)>
Sent: Sunday, January 26, 2020 4:44 PM
To: Clare Lombardo <CLombardo@npr.org>
Cc: Simone Popperl <SPopperl@npr.org>; Conrad, Patricia (NIH/NIAID) [E] (b) (6)>;

Matt Kwong <MKwong@npr.org>; Miranda Kennedy <MKennedy@npr.org>; Jacob Conrad <JConrad@npr.org>; Vince Pearson <vpearson@npr.org>; Alicia Montgomery <AMontgomery@npr.org>; Barry Gordemer <BGordemer@npr.org>; Barasch, Kimberly (NIH/NIAID) [C] (b) (6)>; Routh, Jennifer (NIH/NIAID) [E] (b) (6)>; Oplinger, Anne (NIH/NIAID) [E] (b) (6)>; Stover, Kathy (NIH/NIAID) [E] (b) (6)
Subject: Re: interview with Dr Fauci

I have done this many times before.

Sent from my iPhone

On Jan 26, 2020, at 4:37 PM, Clare Lombardo <CLombardo@npr.org> wrote:

Thanks for confirming, David. Has one of our producers already walked you through it? If not, I'll give you a call and give you a rundown so that you're all set up tomorrow. I'm attaching instructions for the app to this email, which would be good to have handy just in case. Let me know if there's a good number to reach you.

Thanks!

Clare
<image001.gif>
Clare Lombardo | NPR | clombardo@npr.org | **P** 202.513.2608

From: Awwad, David (NIH/NIAID) [C] (b) (6)>
Sent: Sunday, January 26, 2020 4:33 PM
To: Simone Popperl <SPopperl@npr.org>
Cc: Conrad, Patricia (NIH/NIAID) [E] (b) (6); Matt Kwong <MKwong@npr.org>; Clare Lombardo <CLombardo@npr.org>; Miranda Kennedy <MKennedy@npr.org>; Jacob Conrad <JConrad@npr.org>; Vince Pearson <vpearson@npr.org>; Alicia Montgomery <AMontgomery@npr.org>; Barry Gordemer <BGordemer@npr.org>; Barasch, Kimberly (NIH/NIAID) [C] (b) (6)>; Routh, Jennifer (NIH/NIAID) [E] (b) (6)>; Oplinger, Anne (NIH/NIAID) [E] <(b) (6)>; Stover, Kathy (NIH/NIAID) [E] (b) (6)>
Subject: Re: interview with Dr Fauci

The app is already installed.

Sent from my iPhone

On Jan 26, 2020, at 4:29 PM, Simone Popperl <SPopperl@npr.org> wrote:

Thanks very much. Per below, the live hit will be at 7:07 AM ET and last for 5 minutes. We would need to get Dr. Fauci on the line by 6:55 AM ET to confirm the connection is stable.

One of my colleagues will be in touch with David Awwad shortly to set up the app.

Our 24-hour line is 202-513-2158 – that will allow us to transfer you directly into the booth if there are any issues.

Simone

From: Conrad, Patricia (NIH/NIAID) [E] (b) (6)
Sent: Sunday, January 26, 2020 4:25 PM
To: Simone Popperl <SPopperl@npr.org>
Cc: Matt Kwong <MKwong@npr.org>; Clare Lombardo <CLombardo@npr.org>; Miranda Kennedy <MKennedy@npr.org>; Jacob Conrad <JConrad@npr.org>; Vince Pearson <vpearson@npr.org>; Alicia Montgomery <AMontgomery@npr.org>; Barry Gordemer <BGordemer@npr.org>; Barasch, Kimberly (NIH/NIAID) [C] (b) (6); Routh, Jennifer (NIH/NIAID) [E] (b) (6); Oplinger, Anne (NIH/NIAID) [E] (b) (6) Stover, Kathy (NIH/NIAID) [E] (b) (6)>; Awwad, David (NIH/NIAID) [C] (b) (6)>
Subject: Re: interview with Dr Fauci

Yes we can do app for 7 am ET live hit. Pls confirm that the live hit will be right at 7:00 am ET.

David Awwad cc'd here will handle the connection and app. Pls feel free to coordinate with him directly and pls cc all of us.

Pls also provide your control room number for any issues. Thank you

Sent from my iPhone

On Jan 26, 2020, at 4:20 PM, Simone Popperl <SPopperl@npr.org> wrote:

Confirmed. I am looping in our swing and overnight teams so you will be able to easily be in touch with them if anything changes.

Did Nina review the possibility of having Dr. Fauci download NPR's propriety app Report-It on his cell phone to record a high quality version of his site of the conversation for us to use in subsequent feeds? One of our producers could walk your team through it this evening. It will take less than 5 minutes of your time.

Feel free to reply all to this message or give us a call anytime on 202-513-2158 with questions.

From: Conrad, Patricia (NIH/NIAID) [E] <(b) (6)>
Sent: Sunday, January 26, 2020 3:43 PM
To: Simone Popperl <SPopperl@npr.org>
Cc: Barasch, Kimberly (NIH/NIAID) [C] (b) (6)>; Routh, Jennifer (NIH/NIAID) [E] (b) (6)>; Oplinger, Anne (NIH/NIAID) [E] (b) (6)>; Stover, Kathy (NIH/NIAID) [E] (b) (6)>
Subject: Re: interview with Dr Fauci

Hi and yes we can move the hit to 7:00 am ET. But we need to change the number- he will now do from his landline number at work - please call us at 7:00 am at (b) (6). Thank you.

Sent from my iPhone

On Jan 26, 2020, at 2:42 PM, Simone Popperl <SPopperl@npr.org> wrote:

Yes, Nina was coordinating on Friday for the 5:35 am time, but with news we want to move him to 7 AM ET. Nina is not on shift today, so I have taken over all of her bookings.

From: Conrad, Patricia (NIH/NIAID) [E] (b) (6)>
Sent: Sunday, January 26, 2020 2:41 PM
To: Simone Popperl <SPopperl@npr.org>
Subject: Re: interview with Dr Fauci

I was working with Nina Kravinsky for the 535 am ET hit. Pls advise

Sent from my iPhone

On Jan 26, 2020, at 2:29 PM, Conrad, Patricia (NIH/NIAID) [E] <(b) (6)> wrote:

Is your request in addition to the morning edition request we have for 535 am tomorrow? Or are you asking for us to move the 525 am to 7:00 am ET?

Sent from my iPhone

On Jan 26, 2020, at 2:23 PM, Simone Popperl <SPopperl@npr.org> wrote:

Hi Patricia,

Thanks so much for the quick chat by phone just now – following up by email as you suggested.

We would love it if Dr. Fauci could join Morning Edition tomorrow at 7 AM ET. He would be speaking with Rachel Martin. The exact hit time would be 7:07 AM, but we'd want to have him on the line by 6:55 AM ET just to make sure the connection is stable. Our line desk number is 202-513-2158. We would plan to call him on his landline, with the cell as a backup.

He can give us a call anytime at 202-513-2158 – that's our 24 hour line.

Looking forward to hearing from you when you are able to confirm!

Simone

From: Conrad, Patricia (NIH/NIAID) [E] <(b) (6)>
Sent: Friday, January 24, 2020 4:27 PM
To: Nina Kravinsky <NKravinsky@npr.org>
Cc: Denise Couture <DCouture@npr.org>; Gail Austin <GAustin@npr.org>; Simone Popperl <SPopperl@npr.org>; Matt Kwong <MKwong@npr.org>; Clare Lombardo <CLombardo@npr.org>; Jacob Conrad <JConrad@npr.org>; Vince Pearson <vpearson@npr.org>
Subject: Re: interview with Dr Fauci

That is a landline. Backup would be his cell at (b) (6)

And we would want your control room number for him to call you Thanks.

Sent from my iPhone

On Jan 24, 2020, at 4:21 PM, Nina Kravinsky <NKravinsky@npr.org> wrote:

Thanks again for helping us coordinate! Just want to confirm that the (b) (6) is a landline. If it's a cell, the Sunday team will likely coordinate with you all about downloading an app to assure good audio quality.

If it's a landline, we should be good to go.

Nina

From: Conrad, Patricia (NIH/NIAID) [E] <(b) (6)
Sent: Friday, January 24, 2020 3:45 PM
To: Denise Couture <DCouture@npr.org>; Nina Kravinsky <NKravinsky@npr.org>
Cc: ME-DC <ME-DC@npr.org>
Subject: RE: interview with Dr Fauci

Perfect- I will be on email and my cell is (b) (6)

Patricia L. Conrad
Public Health Analyst and
Special Assistant to the Director
National Institute of Allergy and Infectious Diseases
The National Institutes of Health
31 Center Drive, MSC 2520 - Room 7A03
Bethesda, Maryland 20892
(b) (6)
301-496-4409 fax

From: Denise Couture <DCouture@npr.org>
Sent: Friday, January 24, 2020 3:41 PM
To: Conrad, Patricia (NIH/NIAID) [E] (b) (6); Nina Kravinsky <NKravinsky@npr.org>
Cc: ME-DC <ME-DC@npr.org>
Subject: RE: interview with Dr Fauci

Hi Pat,

I hope all's well with you. I'm at Morning Edition now. Glad to see you and Dr. Fauci are still a team!

As for Monday, we are confirmed for Monday, but as for "firm" (as in 100 percent), we're as firm as we (NPR daily news programs) ever are with any guest on a Friday afternoon for a Monday show. If something huge happens over the weekend, the schedule could get scrambled.

If anything changes over the weekend, our Sunday team will reach out.

Have a terrific weekend,

Denise
(formerly Diane Rehm Show and 1A)

<image001.jpg>
Denise Couture | Senior Editor | **morning edition** | dcouture@npr.org | desk 202-513-2517 | cell (b) (6)
NPR reaches almost 40 million listeners on more than 1,000 radio stations across the United States.

From: Conrad, Patricia (NIH/NIAID) [E] (b) (6)
Sent: Friday, January 24, 2020 3:26 PM
To: Nina Kravinsky <NKravinsky@npr.org>
Cc: ME-DC <ME-DC@npr.org>
Subject: RE: interview with Dr Fauci

Just to be clear – we are firm for this right? You will call him at (b) (6) a few minutes before 5:34 am ET?

Patricia L. Conrad
Public Health Analyst and
Special Assistant to the Director
National Institute of Allergy and Infectious Diseases
The National Institutes of Health
31 Center Drive, MSC 2520 - Room 7A03
Bethesda, Maryland 20892
(b) (6)
301-496-4409 fax

From: Nina Kravinsky <NKravinsky@npr.org>
Sent: Friday, January 24, 2020 11:50 AM
To: Conrad, Patricia (NIH/NIAID) [E] (b) (6)>
Cc: Barasch, Kimberly (NIH/NIAID) [C] (b) (6); Pekoc, Ken (NIH/NIAID) [E] (b) (6)>; ME-DC <ME-DC@npr.org>
Subject: RE: interview with Dr Fauci

Hi Patricia,

Thanks so much. I'm looping in my colleagues who will be handling this over the weekend. Please **reply all** with any updates. Someone from the team will be in touch either this afternoon or on Sunday to confirm details.

Thanks again,
Nina

From: Conrad, Patricia (NIH/NIAID) [E] <(b) (6)>
Sent: Friday, January 24, 2020 11:41 AM
To: Nina Kravinsky <NKravinsky@npr.org>
Cc: Barasch, Kimberly (NIH/NIAID) [C] (b) (6); Pekoc, Ken (NIH/NIAID) [E] <(b) (6)
Subject: interview with Dr Fauci

Dr. Fauci can be available for your interview as per below - LIVE HIT at 5:34 am ET

Dr. Fauci would do this by phone – please call him at (b) (6) with back cell (b) (6)

Please confirm hit time and please send us your Monday morning control room number and contact info as well. Thank you

Organization: NPR's Morning Edition
Producer: Nina Kravinsky
Phone #(s): (b) (6), nkravinsky@npr.org
Subject: Wuhan coronavirus
Deadline: today for coordination
Spokesperson: NIAID Director Anthony S. Fauci, by phone
Expected place of publication: radio, online
Expected date of publication/airing: Monday, Jan. 27
Expected prominence: Morning Edition

Patricia L. Conrad
Public Health Analyst and
Special Assistant to the Director
National Institute of Allergy and Infectious Diseases
The National Institutes of Health
31 Center Drive, MSC 2520 - Room 7A03
Bethesda, Maryland 20892
(b) (6)
301-496-4409 fax

<Report_IT_FTP.pdf>

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Mon, 20 Jan 2020 20:11:26 +0000
To: Routh, Jennifer (NIH/NIAID) [E]
Cc: Conrad, Patricia (NIH/NIAID) [E]
Subject: FW: Dr. Fauci & novel coronavirus

Jennifer:
Thanks for the note. Please thank Kristen Nordlund for her note. My discussion in the CBS interview was very much in line with the CDC talking points. It was the kind of interview where they will probably use less than30 seconds of a discussions that took 5 minutes. Please get the clip when it is available.
Best,
Tony

From: Conrad, Patricia (NIH/NIAID) [E] (b) (6)
Sent: Monday, January 20, 2020 2:03 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)>
Subject: Fwd: Dr. Fauci & novel coronavirus

Sent from my iPhone

Begin forwarded message:

From: "Routh, Jennifer (NIH/NIAID) [E]" (b) (6)>
Date: January 20, 2020 at 2:02:39 PM EST
To: "Nordlund, Kristen (CDC/DDID/NCIRD/OD)" (b) (6), "Stover, Kathy (NIH/NIAID) [E]" (b) (6) "Fritz, Craig (NIH/OD) [E]" (b) (6)>
Cc: "Billet, Courtney (NIH/NIAID) [E]" (b) (6), "Conrad, Patricia (NIH/NIAID) [E]" (b) (6)>
Subject: Re: Dr. Fauci & novel coronavirus

Thanks, Kristen. I am cc'ing other colleagues for awareness, and we will pass these along to Dr. Fauci.

From: Nordlund, Kristen (CDC/DDID/NCIRD/OD) (b) (6)>
Sent: Monday, January 20, 2020 1:54 PM
To: Stover, Kathy (NIH/NIAID) [E]; Routh, Jennifer (NIH/NIAID) [E]; Fritz, Craig (NIH/OD) [E]
Subject: Dr. Fauci & novel coronavirus

Hi Kathy, Jennifer, and Craig,

Apologies for casting a wide net – especially on a holiday. I work in the communications office at CDC handling the response to the 2019 novel coronavirus outbreak. I understand Dr. Fauci is doing some on camera interviews this afternoon – CBS reached out to us a few hours ago and then just said they'd gotten

Dr. Fauci. I just wanted to make sure he has out latest talking points and reinforced our position to lean forward on this issue. I've included some main points below:

- This is a rapidly evolving situation and new information is coming in each day. Our recommendations will evolve as the situation changes.
- We are preparing across the public health and health care system to prevent, detect, and respond to this novel coronavirus. The earlier we detect a case, the better we can protect the public and the more we can understand about this virus, and its risk for spread.
- At this point, early detection provides an important strategy for prevention. Whether or not a case is discovered , the risks and efforts of leaning forward are far less than the consequences of deploying these strategies too late.
- As we learn more about the newly emerging virus, the federal government will adjust its screening and response procedures appropriately. However, based on the information we have today, we believe the current risk from this virus to the general public is low.

Additionally, if he would like to speak with our team working on this or Dr. Messonnier, who is helping lead out response, I'm happy to help set that up.

Thanks,
Kristen

Kristen Nordlund
CDC Public Affairs
p. (b) (6) | c. (b) (6) | e. (b) (6)

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 29 Jan 2020 03:30:48 +0000
To: Cassetti, Cristina (NIH/NIAID) [E]
Subject: FW: Interferons for coronaviruses?
Attachments: JAMA-SARS-IFN.pdf, Clinical protocol for treatment of SARS with IFN.pdf, AVT-05-OA-0505-SARS-Fish.pdf

Please take a look at this and handle.

From: Young, Howard (NIH/NCI) [E] (b) (6)
Sent: Tuesday, January 28, 2020 12:43 PM
To: Cassetti, Cristina (NIH/NIAID) [E] (b) (6)>; Fauci, Anthony (NIH/NIAID) [E] (b) (6)
Subject: RE: Interferons for coronaviruses?

Thank you, they are attached. I also know the lead investigator, Dr. Fish so I can arrange contact if that is needed. Here is an additional paper as well.

Howard

From: Cassetti, Cristina (NIH/NIAID) [E] (b) (6)>
Sent: Tuesday, January 28, 2020 12:32 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)>; Young, Howard (NIH/NCI) [E] (b) (6)
Subject: RE: Interferons for coronaviruses?

Dear Dr. Young,

Can you please send me the attachments? I will pass them along to our staff involved in the response.

Thank you,

Cristina

Cristina Cassetti, Ph.D.
Deputy Director
Division of Microbiology and Infectious Diseases
National Institute of Allergy and Infectious Diseases, NIH
5601 Fishers Lane, Room 7G51
Rockville, MD 20852

Tel: (b) (6)
(b) (6)

Administrative Assistant:
Ms. Roshawn Treadwell-Hyde
Tel: (b) (6)
(b) (6)

From: Fauci, Anthony (NIH/NIAID) [E] (b) (6)
Sent: Tuesday, January 28, 2020 12:29 PM
To: Young, Howard (NIH/NCI) [E] (b) (6)>
Cc: Cassetti, Cristina (NIH/NIAID) [E] <(b) (6)>
Subject: Re: Interferons for coronaviruses?
Importance: High

Howard:
Thanks for sending this.
Best,
Tony

On Jan 28, 2020, at 12:08 PM, Young, Howard (NIH/NCI) [E] (b) (6)> wrote:

Dear Dr. Fauci,

I just wanted to pass along a clinical protocol approved in Canada for the use of interferon in the treatment of SARS. I have also attached the JAMA paper describing the trial. Perhaps it might be considered in this new outbreak?

Sincerely,
Howard Young

Howard A. Young, Ph.D.
Center for Cancer Research
NCI at Frederick
Frederick, MD 21702
Tel: (b) (6)
Email: (b) (6)

<Clinical protocol for treatment of SARS with IFN.pdf>
<JAMA-SARS-IFN.pdf>

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 23 Jan 2020 22:13:39 +0000
To: (b) (6) (NIH/CC/BEP) [E]
Subject: RE: Online First: Fauci on Coronavirus, Improving the Residency Match, and more

I worked on it all day Monday, and remember that I almost erased it and David saved the day. And I also am good friends with the Editor of JAMA.

Anthony S. Fauci, MD
Director
National Institute of Allergy and Infectious Diseases
Building 31, Room 7A-03
31 Center Drive, MSC 2520
National Institutes of Health
Bethesda, MD 20892-2520
Phone: (b) (6)
FAX: (301) 496-4409
E-mail: (b) (6)

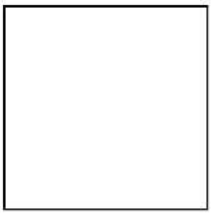
From: (b) (6) (NIH/CC/BEP) [E] (b) (6)
Sent: Thursday, January 23, 2020 3:39 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)
Subject: FW: Online First: Fauci on Coronavirus, Improving the Residency Match, and more

How were you so timely in getting this written and published?

(b) (6)
NIH Clinical Center
(b) (6)

From: JAMA <updates@jamanetwork.org>
Sent: Thursday, January 23, 2020 3:36 PM
To: (b) (6) (NIH/CC/BEP) [E] (b) (6)>
Subject: Online First: Fauci on Coronavirus, Improving the Residency Match, and more

Trouble viewing this email? Read it Online



From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 31 Jan 2020 22:50:42 +0000
To: John Timmer
Subject: RE: Delta, American, United to suspend all China mainland flights as coronavirus crisis grows

Thanks John. Watch the news and you will see what I have been doing over the past 5 days.

Anthony S. Fauci, MD
Director
National Institute of Allergy and Infectious Diseases
Building 31, Room 7A-03
31 Center Drive, MSC 2520
National Institutes of Health
Bethesda, MD 20892-2520
Phone: (b) (6)
FAX: (301) 496-4409
E-mail: (b) (6)

From: John Timmer (b) (6)
Sent: Friday, January 31, 2020 5:49 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)>
Subject: Delta, American, United to suspend all China mainland flights as coronavirus crisis grows

You probably have already seen this. American, Delta and United canceling flights to China until March 27. A week ago Sunday at Starbucks when you mentioned this virus I had hardly heard anything about it. Now there's a full blown panic.
I'm glad you're on it! John

https://www.usatoday.com/story/travel/2020/01/31/coronavirus-china-flight-ban-delta-cuts-all-flights-white-house/4620989002/

John Timmer
(b) (6)

Sent from my iPhone

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Mon, 20 Jan 2020 21:10:26 +0000
To: Mascola, John (NIH/VRC) [E]
Cc: Graham, Barney (NIH/VRC) [E]
Subject: FW: Wuhan, 2019-nCoV

John/Barney:
Before I call up Skip, [redacted] (b) (5)
Thanks,
Tony

From: Skip Virgin [redacted] (b) (6)
Sent: Monday, January 20, 2020 3:51 PM
To: Fauci, Anthony (NIH/NIAID) [E] [redacted] (b) (6) >
Subject: Wuhan, 2019-nCoV

Tony

[redacted] (b) (4)

Skip

Proc Natl Acad Sci U S A. 2015 Aug 18;112(33):10473-8. doi: 10.1073/pnas.1510199112. Epub 2015 Jul 27.

Prophylactic and postexposure efficacy of a potent human monoclonal antibody against MERS coronavirus.

Corti D[1], Zhao J[2], Pedotti M[3], Simonelli L[3], Agnihothram S[4], Fett C[4], Fernandez-Rodriguez B[3], Foglierini M[3], Agatic G[5], Vanzetta F[5], Gopal R[6], Langrish CJ[7], Barrett NA[8], Sallusto F[3], Baric RS[9], Varani L[3], Zambon M[6], Perlman S[10], Lanzavecchia A[11].

Author information

Abstract

Middle East Respiratory Syndrome (MERS) is a highly lethal pulmonary infection caused by a previously unidentified coronavirus (CoV), likely transmitted to humans by infected camels. There is no licensed vaccine or antiviral for MERS, therefore new prophylactic and therapeutic strategies to combat human infections are needed. In this study, we describe, for the first time, to our knowledge, the isolation of a potent MERS-CoV-neutralizing antibody from memory B cells of an infected individual. The antibody, named LCA60, binds to a novel site on the spike protein and potently neutralizes infection of multiple MERS-CoV isolates by interfering with the binding to the cellular receptor CD26. Importantly, using mice transduced with adenovirus expressing human CD26 and infected with MERS-CoV, we show that LCA60 can effectively protect in both prophylactic and postexposure settings. This antibody can be used for prophylaxis, for postexposure prophylaxis of individuals at risk, or for the treatment of human cases of MERS-CoV infection. The fact that it took only 4 mo from the initial screening of B cells derived from a convalescent patient for the development of a stable chinese hamster ovary (CHO) cell line producing neutralizing antibodies at more than 5 g/L provides an example of a rapid pathway toward the generation of effective antiviral therapies against emerging viruses.

J Virol. 2008 Apr;82(7):3220-35. doi: 10.1128/JVI.02377-07. Epub 2008 Jan 16.

Structural basis for potent cross-neutralizing human monoclonal antibody protection against lethal human and zoonotic severe acute respiratory syndrome coronavirus challenge.

Rockx B[1], Corti D, Donaldson E, Sheahan T, Stadler K, Lanzavecchia A, Baric R.
Author information
Abstract

Severe acute respiratory syndrome coronavirus (SARS-CoV) emerged in 2002, and detailed phylogenetic and epidemiological analyses have suggested that it originated from animals. The spike (S) glycoprotein has been identified as a major component of protective immunity, and 23 different amino acid changes were noted during the expanding epidemic. Using a panel of SARS-CoV recombinants bearing the S glycoproteins from isolates representing the zoonotic and human early, middle, and late phases of the epidemic, we identified 23 monoclonal antibodies (MAbs) with neutralizing activity against one or multiple SARS-CoV spike variants and determined the presence of at least six distinct neutralizing profiles in the SARS-CoV S glycoprotein. Four of these MAbs showed cross-neutralizing activity against all human and zoonotic S variants in vitro, and at least three of these were mapped in distinct epitopes using escape mutants, structure analyses, and competition assays. These three MAbs (S109.8, S227.14, and S230.15) were tested for use in passive vaccination studies using lethal SARS-CoV challenge models for young and senescent mice with four different homologous and heterologous SARS-CoV S variants. Both S227.14 and S230.15 completely protected young and old mice from weight loss and virus replication in the lungs for all viruses tested, while S109.8 completely protected mice from weight loss and clinical signs in the presence of viral titers. We conclude that a single human MAb can confer broad protection against lethal challenge with multiple zoonotic and human SARS-CoV isolates, and we identify a robust cocktail formulation that targets distinct epitopes and minimizes the likely generation of escape mutants.

Proc Natl Acad Sci U S A. 2007 Jul 17;104(29):12123-8. Epub 2007 Jul 9.

Potent cross-reactive neutralization of SARS coronavirus isolates by human monoclonal antibodies.

Zhu Z[1], Chakraborti S, He Y, Roberts A, Sheahan T, Xiao X, Hensley LE, Prabakaran P, Rockx B, Sidorov IA, Corti D, Vogel L, Feng Y, Kim JO, Wang LF, Baric R, Lanzavecchia A, Curtis KM, Nabel GJ, Subbarao K, Jiang S, Dimitrov DS.
Author information
Abstract

The severe acute respiratory syndrome coronavirus (SARS-CoV) caused a worldwide epidemic in late 2002/early 2003 and a second outbreak in the winter of 2003/2004 by an independent animal-to-human transmission. The GD03 strain, which was isolated from an index patient of the second outbreak, was reported to resist neutralization by the human monoclonal antibodies (hmAbs) 80R

and S3.1, which can potently neutralize isolates from the first outbreak. Here we report that two hmAbs, m396 and S230.15, potently neutralized GD03 and representative isolates from the first SARS outbreak (Urbani, Tor2) and from palm civets (SZ3, SZ16). These antibodies also protected mice challenged with the Urbani or recombinant viruses bearing the GD03 and SZ16 spike (S) glycoproteins. Both antibodies competed with the SARS-CoV receptor, ACE2, for binding to the receptor-binding domain (RBD), suggesting a mechanism of neutralization that involves interference with the SARS-CoV-ACE2 interaction. Two putative hot-spot residues in the RBD (Ile-489 and Tyr-491) were identified within the SARS-CoV spike that likely contribute to most of the m396-binding energy. Residues Ile-489 and Tyr-491 are highly conserved within the SARS-CoV spike, indicating a possible mechanism of the m396 cross-reactivity. Sequence analysis and mutagenesis data show that m396 might neutralize all zoonotic and epidemic SARS-CoV isolates with known sequences, except strains derived from bats. These antibodies exhibit cross-reactivity against isolates from the two SARS outbreaks and palm civets and could have potential applications for diagnosis, prophylaxis, and treatment of SARS-CoV infections.

Science. 2016 Aug 26;353(6302):933-6. doi: 10.1126/science.aaf1220. Epub 2016 Aug 18.

Discovery of a proteinaceous cellular receptor for a norovirus.

Orchard RC[1], Wilen CB[1], Doench JG[2], Baldridge MT[1], McCune BT[1], Lee YC[1], Lee S[1], Pruett-Miller SM[3], Nelson CA[1], Fremont DH[1], Virgin HW[4].
Author information

Abstract

Noroviruses (NoVs) are a leading cause of gastroenteritis globally, yet the host factors required for NoV infection are poorly understood. We identified host molecules that are essential for murine NoV (MNoV)-induced cell death, including CD300lf as a proteinaceous receptor. We found that CD300lf is essential for MNoV binding and replication in cell lines and primary cells. Additionally, Cd300lf(-/-) mice are resistant to MNoV infection. Expression of CD300lf in human cells breaks the species barrier that would otherwise restrict MNoV replication. The crystal structure of the CD300lf ectodomain reveals a potential ligand-binding cleft composed of residues that are critical for MNoV infection. Therefore, the presence of a proteinaceous receptor is the primary determinant of MNoV species tropism, whereas other components of cellular machinery required for NoV replication are conserved between humans and mice.

Herbert W. 'Skip' Virgin M.D., Ph.D.
Executive Vice President, Research
Chief Scientific Officer
Vir Biotechnology
499 Illinois Avenue

San Francisco CA 94158
he/him/his

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 29 Jan 2020 03:36:57 +0000
To: Cassetti, Cristina (NIH/NIAID) [E]
Subject: FW: Coronavirus Detection

Please handle. Thanks.

From: (b) (6)
Sent: Tuesday, January 28, 2020 10:56 AM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)
Subject: Coronavirus Detection

Dear Dr. Fauci,

I am a microbiologist and also write oil and climate change thrillers. My books can be seen on Google (oil thrillers) and my story ROUND AND ROUND is a climate adventure. Soon to be followed by WE'RE BACK (Old Life forms arise as the planet warms).

With regard to Corona virus I should suggest a small hand held screen at AIRPORTS AND OTHER SITES coated with immobilized corona virus antibody. The traveler will breath onto the plate . Live traveler carried virus (antigen) will bind with the antibody immediately and this can be tied into an electric signal or alarm on the small hand held device. The traveler, if positive as a possible carrier, is then detained for further examination. The screen is subsequently "hit" to heat the surface or inactivate the antigen or some other method to prepare for the the next traveler in the plane, train or ship screening process. We have the technology to do this and come up with hand devices at all major ports of entry. Cruise ship passengers and other travelers worldwide can also be screened by this device.

Suggested Name: CORONATEK

Gary Kraidman
(b) (6)
Bachelor of Science Brooklyn College
Master of Science cum laude Long Island University (Microbiology)
Rolex Award for oyster conchiolin protein in medicine and industry.
Member Mystery writers of America (political thrillers as well as climate change sci fi).

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 23 Jan 2020 22:59:12 +0000
To: Cassetti, Cristina (NIH/NIAID) [E]
Cc: Conrad, Patricia (NIH/NIAID) [E]
Subject: FW: interesting information to share

Please respond to this person. Be nice to him. He used to be in NIAID.

Anthony S. Fauci, MD
Director
National Institute of Allergy and Infectious Diseases
Building 31, Room 7A-03
31 Center Drive, MSC 2520
National Institutes of Health
Bethesda, MD 20892-2520
Phone: (b) (6)
FAX: (301) 496-4409
E-mail: (b) (6)

From: James Mond (b) (6)
Sent: Thursday, January 23, 2020 11:48 AM
To: Fauci, Anthony (NIH/NIAID) [E] < (b) (6)
Subject: interesting information to share

Hi Tony, long time no speak and I hope all is well. I am currently the chief medical officer of a company that manufacture immune globulin and hyperimmune globulins. One of the hyperimmune globulins that was recently FDA approved was manufactured from the plasma of donors who were tested to have high titer neutralizing antibodies to RSV and the IG that was made was also found to have high titer binding antibodies to multiple other respiratory viruses including Coronavirus. (b) (4)

(b) (4)

Thanks very much

Best wishes,

Jimmy

Jimmy Mond MD,PhD
Chief Scientific Officer/Chief Medical Officer
ADMA BIOLOGICS

Corporate Headquarters
465 Route 17 S
Ramsey, NJ 07446

Florida Campus
5800 Park of Commerce Blvd NW
Boca Raton, FL 33487

Direct (b) (6)
Tel: 201 478-5552
Fax: 201 478-5553
(b) (6)
www.admabiologics.com

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Sun, 26 Jan 2020 23:21:36 +0000
To: Rotrosen, Daniel (NIH/NIAID) [E];Abbey, Lillian (NIH/NIAID) [E]
Cc: Conrad, Patricia (NIH/NIAID) [E];Barasch, Kimberly (NIH/NIAID) [C];Breen, Joseph (NIH/NIAID) [E];Erbelding, Emily (NIH/NIAID) [E]
Subject: RE: Lyme responses for Todd Slotkin

Someone send the material to Dan.

From: Rotrosen, Daniel (NIH/NIAID) [E] [redacted](b) (6)>
Sent: Sunday, January 26, 2020 6:09 PM
To: Fauci, Anthony (NIH/NIAID) [E] [redacted](b) (6); Abbey, Lillian (NIH/NIAID) [E] [redacted](b) (6)>
Cc: Conrad, Patricia (NIH/NIAID) [E] [redacted](b) (6)>; Barasch, Kimberly (NIH/NIAID) [C] [redacted](b) (6)>; Breen, Joseph (NIH/NIAID) [E] [redacted](b) (6)>; Erbelding, Emily (NIH/NIAID) [E] [redacted](b) (6)>
Subject: Re: Lyme responses for Todd Slotkin

Tony,

Todd Slotkin contacted you about Lyme Disease, I gather about establishing some coalition. His connection with us on food allergy was short lived and long ago.

Glad to help in any way I can though I think DMID is working on this. I didn't receive the attachment, but gather it's something Lillian Abbey prepared and have copied her.

Dan

On Jan 26, 2020, at 5:43 PM, Fauci, Anthony (NIH/NIAID) [E] <[redacted](b) (6)> wrote:

Someone else MUST do this. I cannot do food allergy at all right now. I am drowning with coronavirus stuff. Please take me off this grid. Give it to Dan.

From: Conrad, Patricia (NIH/NIAID) [E] [redacted](b) (6)
Sent: Sunday, January 26, 2020 6:18 AM
To: Fauci, Anthony (NIH/NIAID) [E] [redacted](b) (6)>
Subject: Lyme responses for Todd Slotkin

This is not urgent but we said we would respond to Todd slotkin this week

To refresh your memory Todd Slotkin - a big financial guy in NYC wrote dan Rotrosen to connect with you on Lyme. He was involved in food allergy in the past. He is now interested in Lyme and sent

questions. Joe Breen said we should respond in writing so the attached drafts are for your approval/editing. Email chain below explains

We said we would send these and offer a follow up call with you if needed.

Happy to discuss.

Sent from my iPhone

Begin forwarded message:

From: "Abbey, Lillian (NIH/NIAID) [E]" <(b) (6)>
Date: January 21, 2020 at 4:04:07 PM EST
To: "Conrad, Patricia (NIH/NIAID) [E]" (b) (6)>
Cc: "Erbelding, Emily (NIH/NIAID) [E]" <(b) (6)>, "Marques, Adriana (NIH/NIAID) [E]" (b) (6)>, NIAID BUGS <BUGS@niaid.nih.gov>, "Miller, Katherine (NIH/NIAID) [E]" (b) (6)>
Subject: RE: on behalf of Dr. Fauci

Dear Patty,
Here is a proposed email response (first attachment) and responses to their Qs (second attachment). We've already secured input from Adriana, copied here, on the Qs and As. Please let us know if you need anything else.
Sincerely,
Lillian

From: Conrad, Patricia (NIH/NIAID) [E] (b) (6)>
Sent: Friday, January 17, 2020 2:11 PM
To: Abbey, Lillian (NIH/NIAID) [E] (b) (6)>
Cc: Erbelding, Emily (NIH/NIAID) [E] (b) (6); Breen, Joseph (NIH/NIAID) [E] (b) (6); NIAID BUGS <BUGS@niaid.nih.gov>
Subject: RE: on behalf of Dr. Fauci

Per ASF - can get the draft by COB Tuesday Jan 21? Good to know about Dr. Marques.

Thanks to all for your help with this request.

Patricia L. Conrad
Public Health Analyst and
Special Assistant to the Director
National Institute of Allergy and Infectious Diseases
The National Institutes of Health
31 Center Drive, MSC 2520 - Room 7A03

Bethesda, Maryland 20892
(b) (6)
301-496-4409 fax

From: Abbey, Lillian (NIH/NIAID) [E] (b) (6)>
Sent: Friday, January 17, 2020 1:52 PM
To: Conrad, Patricia (NIH/NIAID) [E] (b) (6)>
Cc: Erbelding, Emily (NIH/NIAID) [E] (b) (6)>; Breen, Joseph (NIH/NIAID) [E] (b) (6)>; NIAID BUGS <BUGS@niaid.nih.gov>
Subject: FW: on behalf of Dr. Fauci

Dear Patty,
We just spoke with Joe and I wanted to confirm that we are developing a response to the questions, per Joe's discussion with Dr. Fauci. When do you want the response? Assume ASAP but please advise. Also, can you please let Dr. Fauci know that Adriana Marques in our intramural program serves on the GLA Board. We will be sure to secure her input on the draft response, and may want to note this fact in the letter.
Thank you,
Lillian

From: Conrad, Patricia (NIH/NIAID) [E] (b) (6)
Sent: Friday, January 17, 2020 10:53 AM
To: Breen, Joseph (NIH/NIAID) [E] (b) (6)>
Cc: Erbelding, Emily (NIH/NIAID) [E] (b) (6)>; Barasch, Kimberly (NIH/NIAID) [C] (b) (6)>
Subject: on behalf of Dr. Fauci

Hi Joe:

Todd Slotkin contacted Dr Fauci (thru Dan Rotrosen and FARE) – please see below and attached. Dr Fauci would like to speak with you about this request. Can you please give him a call today if you can at (b) (6). He is available between 12:30 pm – 3:00 pm ET and then again between 330 pm – 5 pm ET.

Thanks..

Patricia L. Conrad
Public Health Analyst and

Special Assistant to the Director
National Institute of Allergy and Infectious Diseases
The National Institutes of Health
31 Center Drive, MSC 2520 - Room 7A03
Bethesda, Maryland 20892
(b) (6)
301-496-4409 fax

From: Todd Slotkin (b) (6)
Sent: Thursday, January 16, 2020 11:47 AM
To: Conrad, Patricia (NIH/NIAID) [E] <(b) (6)>
Cc: Robert A. Kobre <robert.kobre@credit-suisse.com>
Subject: Fauci - Lyme Disease

Patty,

Happy and healthy New Year to you and your family.

I am following up on your kind offer to assist us on Lyme Disease with Dr. Fauci. As you requested,
I have attached the specific topics that we are seeking advice on.

As way of background, I worked with Dr. Fauci on Food Allergies from 2004-15 and we made some great advancements on the strategy as well as the approach to the science. In the last few years I
have been working with Robert Kobre, Chairman of the Global Lyme Alliance (GLA)- the largest not for profit dedicated to Lyme research, education and awareness. We would appreciate the time to meet with Dr. Fauci to discuss how we can help break the bottleneck that has been holding back public and private funding of Lyme disease research. GLA has funded $10 million in research over the last five years alone and sponsored a conference at Cold Spring Harbor that included the NIH, CDC, FDA, and leading academic researchers who published a paper concluding that the current Lyme diagnostic tools as inadequate. We believe that GLA has a unique insight into Lyme disease research. Long held beliefs on the limited prevalence of the disease, limited ability for the bacteria to evade detection and limited ability for the bacteria to survive anti-biotic eradication are a few of the cornerstones that has hampered progress in the diagnosis and treatment of Lyme disease. The result is escalating incurrence rates (430,000 new cases a year in the US), and long term impact to the patients, their families and medical system; thus, we need your advice. Attached are some of the topics we would like to cover in an informal meeting with Rob Kobre, the GLA CEO, GLA
Chief Science Officer and me.

Thank you again for your time on this matter and look forward to hearing from you and Dr. Fauci.

Best,
Todd

(b) (6) (m)
212-763-1901 (o)

P.S. Robert Kobre's contact information is (b) (6) (m) and 212-325-2567 (o). His email address is robert.kobre@credit-suisse.com

Hi Todd,

Best wishes to you too. Simplest and fastest will be to connect with Tony's assistant, Patty Conrad, whom I've copied above.

If for a Lyme Disease referral best to let Patty know the patient's approximate age and location, or where easy to travel.

It's been nice to see how much FARE has grown over the years.

Best, Dan

On Dec 3, 2019, at 8:58 PM, Todd Slotkin (b) (6) > wrote:

Dan,

Hope you and your family had a great thanksgiving.

We had worked together on Food Allergies about 5-6 years ago. I need some advice from Tony Fauci on Lyme Disease. Would you have his contact information?

thanks so much,
Todd

From:	Fauci, Anthony (NIH/NIAID) [E]
Sent:	Fri, 24 Jan 2020 20:41:33 +0000
To:	Fauci, Anthony (NIH/NIAID) [E]
Subject:	HOLD - CNN International LIVE HIT: 7:00 pm ET)
Attachments:	RE: Hi Patricia, CNN International looking to interview NIAID at 6pET?

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Mon, 27 Jan 2020 19:50:07 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Awwad, David (NIH/NIAID) [C]
Subject: CNN International Corona Interview via Skype with David
Attachments: RE: Request CNN International Dr. Anthony Fauci 5pmET TAPING (SKYPE)

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Mon, 27 Jan 2020 23:24:15 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: WTOP - live hit 6:50 pm ET via Facetime
Attachments: RE: WTOP

Mike Murillo | News Anchor & Reporter
mmurillo@wtop.com | 202-895-5253 direct
Twitter: @mikemurillowtop

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Tue, 28 Jan 2020 17:08:13 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Awwad, David (NIH/NIAID) [C]
Subject: CGTN Interview Live hit via skype
Attachments: RE: Interview request: Wuhan coronavirus, CGTN TV, RE: Interview request: Wuhan coronavirus, CGTN TV

Delal Pektas
Delal.Pektas@CGTNAmerica.com
Work cell phone: (b) (6)
Personal cell phone: (b) (6)

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Tue, 28 Jan 2020 17:36:05 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: NPR On Point Radio SHow (LIVE HIT: 11:00 am - 11:20 am ET)
Attachments: FW: Interview request: On Point, Wuhan coronavirus, RE: Interview request: On Point, Wuhan coronavirus

Anna Bauman
On Point
asbauman@bu.edu
Phone: Will update
Topic: Wuhan coronavirus
Deadline: 11:00-noon 1/29

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Mon, 16 Dec 2019 21:21:16 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Bill Paul Lecture - Nussenzweig
Attachments: Re: oct 7 bill paul lecture

ASF may introduce per Auch

Dr. Michel Nussenzweig will deliver the annual Bill Paul lecture on Wednesday, October 7. The lecture will be held from 3:00 pm – 4:00 pm. Please let me know if Dr. Fauci can provide the introductory remarks at the beginning of the lecture. If so, please let me know what materials he needs and I will send to you in advance along with the Zoom link. I will share the Zoom link with the Paul family as well. Additional attendees will join via videocast.nih.gov.

I will ask Dr. Germain or Dr. Sen to moderate the Q&A at the end of the presentation.

Here's the WALS website with Dr. Nussenzweig's lecture title and summary:
https://oir.nih.gov/wals/2020-2021/human-antibody-responses-sars-covid-2

Thank you,
Jackie

Jacqueline Roberts
NIH WALS Coordinator

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 8 Jan 2020 13:47:13 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Marston, Hilary (NIH/NIAID) [E];'Catharine Paules'
Subject: Corona Editorial Discussion
Attachments: RE: Corona editorial, FW: Corona editorial

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 30 Jan 2020 18:26:07 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: CNN LIVE HIT: 5:40 pm ET on Truck at 5:30 pm ET
Attachments: RE: CNN / Sat: Dr. Fauci (5-7P)

Studio truck will arrive fauci residence at 5:15 pm

CNN DC
820 First St, NE

I will be your on-site POC:
Melissa Giaimo
(b) (6)

Hi Patty,

We just got off the phone. We are producing a special edition of Sit Room on Sat. With the CDC confirming the first human-to-human case in the US, we expect coverage of coronavirus to grow.

Can Dr. Fauci join us Sat on Sit Room? Brianna Keilar will be in for Wolf.

Best,
Melissa

MELISSA GIAIMO
Senior Editorial Producer ***"Situation Room with Wolf Blitzer"***
(b) (6) cell
+1-202-351-4406 work
melissa.giaimo@turner.com

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 30 Jan 2020 20:16:50 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: HOLD- WTOP (LIVE HIT: 7:10 pm ET)
Attachments: RE: dr fauci

Mike Jakitis 202-895-5060

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Tue, 21 Jan 2020 18:25:27 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Skype interview with Voa NEWS - Corona virus
Attachments: RE: Interview request

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 30 Jan 2020 23:13:15 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: PBS News Hour Live Hit: 6:30 pm ET
Attachments: Re: **Can we do a studio hit around 6:30 or 6:40 for PBS NewsHour

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 31 Jan 2020 17:11:30 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Interview with The Economist (print)
Attachments: Interview request (print): coronavirus vaccine development | Economist, interview with Dr. Fauci, RE: interview with Dr. Fauci

Slavea Chankova
The Economist
(b) (6) | slaveachankova@economist.com
Subject: coronavirus vaccine development
Deadline: EOB Mon, Feb 3

Hi Patty,

This reporter hopes to speak with an expert to learn more about NIH's coronavirus vaccine development plan. She specifically wants to know what improvements are being made over the vaccine development program for SARS and other coronaviruses. She has time to speak today until 1:30pm ET. She is available anytime Monday.

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 31 Jan 2020 18:47:24 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Awwad, David (NIH/NIAID) [C]
Subject: HOLD TRT News - by skype taped
Attachments: RE: Urgent Interview Request Dr Fauci, image001.jpg

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From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 31 Jan 2020 20:54:07 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: HOLD - NBC interview corona (LIVE HIT: TBD
Attachments: Re: [EXTERNAL] RE: TODAY Request Tomorrow 1/31

Clare Hiler | (b) (6)

CLARE E. HILER |
<image001.png>
NBC NEWS | 212-664-3639 | (b) (6)

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 31 Jan 2020 23:22:10 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: WH TASK FORCE Conf Call The requested participation is Task Force Member ONLY.
Attachments: DO NOT FORWARD White House Task Force on Coronavirus CONFERENCE CALL, TOMORROW, Saturday, February 1, 2020 from 4:00 - 4:30 p.m.

(U//FOUO) There will be a **White House Task Force on Coronavirus UNCLASSIFIED CONFERENCE CALL TOMORROW, Saturday, February 1, 2020,** from **4:00 – 4:30 p.m.** The requested participation is **Task Force Member ONLY.** Please confirm receipt and contact Ryan Shellooe with any additional questions at (b) (6).

In order to access the conference as a participant, dial the number below and enter the Participant Code:

Participant Dial-In: (b) (4)
Participant Code: (b) (4)

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Tue, 21 Jan 2020 20:33:28 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: WCBS Interview re Wuhan Coronavirus (5-10 minutes)
Attachments: Interview request: Wuhan coronavirus, WCBS radio, Re: Interview request: Wuhan coronavirus, WCBS radio, Re: Interview request: Wuhan coronavirus, WCBS radio

Angel Saborido
WCBS Radio
Phone: 212-524-2910
Email: asaborido@wcbs880.com
Subject: Wuhan coronavirus
Deadline: This evening (could do tomorrow if necessary)

Hi Laurie,

This radio producer would like to have Dr. Fauci call in for a live radio interview at one of the following times this evening: 4:45, 5:15, 5:45, or 6:15. If none of those times work, he'd like to do it tomorrow instead. The conversation would last between 5-10 minutes.

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Tue, 21 Jan 2020 21:00:22 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: The Morning Goods with Madelyn Woods Radio Show (LIVE HIT: 7:15 am - 7:30 am)
Attachments: FW: Interview request: Wuhan coronavirus, The Morning Goods with Madelyn Woods, RE: Wuhan interview with Dr. Fauci

Senita Brooks
The Morning Goods with Madelyne Woods (talk radio)
(b) (6)
[redacted]
Topic: Wuhan coronavirus
Deadline: 7:30 tomorrow morning

Hi Patty and Laurie,

This producer would like Dr. Fauci to participate in a live talk radio show for a 15-minute interview tomorrow morning, ideally between 7:00 and 7:30. The conversation would be general, layperson-friendly questions on the Wuhan coronavirus. Their studios are in Silver Spring, and they'd like to have Dr. Fauci come in to participate in person, but they'd be fine with a phone call instead. This would be broadcast live.

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Tue, 21 Jan 2020 22:11:25 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Awwad, David (NIH/NIAID) [C]
Subject: TRT World Turkish TV Corona Virus - Live Hit
Attachments: RE: interview request

I am reaching out to ask if Doctor Fauci can comment on First U.S. case of potentially deadly coronavirus confirmed in Washington state.
This is a request for the news hour at 7 PM or 9 PM.
Show is hosted by Sally Ayhan in our DC studio.
Waiting

STORY DETAILS:
A man in Washington state has been diagnosed with the mysterious virus, the first case reported in the United States since the pneumonia-like illness first appeared last month in the central Chinese city of Wuhan, people familiar with the investigation said.
https://www.washingtonpost.com/health/2020/01/21/coronavirus-us-case/

Serra KARACAM
Interview Producer

<image007.jpg>

TRT WORLD Channel,
1819 L Street, Suite 700
NW Washington DC, 20036
T. +1 202 800 88 04
M. (b) (6)

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Tue, 21 Jan 2020 23:04:01 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: FOX Business News Coronoa virus (LIVE HIT:12:25 pm ET)
Attachments: RE: FOX BUSINESS NETWORK GUEST REQUEST, FW: FOX BUSINESS NETWORK GUEST REQUEST

Firm for 12:25 pm Live hit

I am reaching out to see if Dr. Fauci is available to join us tomorrow between 12-1pmET on *Cavuto: Coast to Coast* on Fox Business with Neil Cavuto. We are looking to discuss drug pricing, and would love to have Dr. Fauci join us.

Please let me know if this is something we can arrange.

Best,
Kevin Fitzgerald

Kevin Fitzgerald
Booker
Fox Business - Cavuto: Coast to Coast
1211 Avenue of the Americas – 12th Floor
O: 212.601.2902
C: (b) (6)
Kevin.Fitzgerald@FoxNews.com

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 22 Jan 2020 13:43:44 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Coronavirus interview with John Catsimatidis Radio Show (taped at 5:15 pm ET)
Attachments: FW: John Catsimatidis office. , RE: John Catsimatidis office.

From: Matt (b) (6) >
Sent: Tuesday, January 21, 2020 6:47 PM
To: Barasch, Kimberly (NIH/NIAID) [C] (b) (6)
Subject: Re: John Catsimatidis office.

Kim. I'm back. Would Dr. Fauci have a few minutes this week to talk about the flu from China. Same as always 8-10 minutes on phone.
Matt Wanning
(b) (6)
New York

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 22 Jan 2020 14:19:39 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Assoc Press on Camera Coronavirus (taped at 11:10 am ET)
Attachments: Re: AP REQUEST: FAUCI INTERVIEW, RE: AP REQUEST: FAUCI INTERVIEW

Greetings Patricia,

Would Dr. Fauci be available before noon today to discuss the coronavirus? I heard him on WTOP this morning addressing a vaccine that is in the works for the virus.

Please let me know if you can you fit AP into his schedule today. Happy to book a studio link.

We appreciate the consideration.

Best,

Lisa

<image001.jpg>
Lisa Nicole Matthews
Assignment Manager, U.S. Video
Associated Press | Washington

Broadcast News Center
1100 13th Street NW
Washington, DC 20005
Office 202-641-9700
Cell (b) (6)
@lisanmatthews

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 22 Jan 2020 14:47:21 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: VRC with CNN - Corona Virus
Attachments: FW: request to visit VRC re novel coronavirus

Jen Routh coordinating

Hello – CNN has confirmed they would like to visit today. 3:30-4 laboratory filming with hand-held model and visuals (with Dr. Graham, Dr. Corbett and Dr. Fauci), then 4-4:30 conversation with Dr. Fauci.

The producer can't make it up from Atlanta so they are sending a camera person and he and potentially Elizabeth Cohen will ask Dr. Fauci questions via phone. They might be able to send a local producer. It is not ideal, but they are trying to get what they can as quickly as possible. They would still like for us to explain the vaccine design using the hand-held model and computer images, which will be filmed. They said they would potentially like to return just for b-roll in the next week or so once VRC has received Wuhan reagents.

I will get to the VRC around 3 and will be there for the full visit. My cell is (b) (6).

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 22 Jan 2020 14:40:18 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Italian TV taped hit Coronoavirus
Attachments: RE: Wuhan coronavirus, MediaSet

Maria Louisa Rossi Hawkins
Mediaset (large Italian TV media conglomerate)
(b) (6)
(b) (6)
Topic: Wuhan coronavirus
Deadline: After 3:00 today

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 22 Jan 2020 17:22:04 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Univision Corona virus interview by skype
Attachments: RE: corona virus interview with Dr. Fauci

Paola Bayron
Univision
(b) (6), pbayron@univision.com
Seeking: video Skype interview, for live broadcast
Topic: coronavirus
Deadline: 2:00 today

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 22 Jan 2020 19:30:05 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Interview with Greta Van Sustern VOA re Coronavirus
Attachments: RE: Voice of America - Plugged In with Greta Van Susteren show - TV Interview Request - Weds. Jan 29, 2019, RE: Voice of America - Plugged In with Greta Van Susteren show - TV Interview Request - Weds. Jan 29, 2019

Firm For Monday.

VOA has confirmed everything below with VideoLink.
Our control room name is VOA Control Room 53 – the number is 202-382-8053.
Elizabeth Cherneff is (b) (6) for any concerns between now and Monday.

Elizabeth here, Voice of America producer with Greta Van Susteren's show here in DC.
I am writing to extend an invitation to Dr. Anthony Fauci to join Greta for a live 1-on-1 interview on our show **next Wednesday January 29, 2019 at 10:30a EST.**
We plan to ask Dr. Fauci about the coronavirus outbreak originating in China– what do we know about it and what are the concerns about its potential threat to humans?
This interview would run about 6-8 minutes in length.
We are happy to accommodate Dr. Fauci at VOA's studios, or remotely via NIH's ReadyCam Studio, as we have in the past.

"Plugged In" is a 30-minute news magazine that airs in more than a dozen affiliates across Africa and Europe, including VOA Persian Service's 24-hour channel. The Voice of America (VOA) is a dynamic international multimedia broadcaster with service in more than 40 languages. Serving an estimated weekly global audience of more than 275 million, VOA provides news, information, and cultural programming through the Internet, mobile and social media, radio, and television. VOA is funded by the U.S. Government through the U.S. Agency for Global Media.

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 22 Jan 2020 21:07:54 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Lou Dobbs Fox Business News - Live Hit: 7:25 pm ET - Corona virus
Attachments: RE: [EXTERNAL] RE: fbn inquiry

Anne.McCarton@FOXNEWS.COM

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 23 Jan 2020 16:09:48 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Awwad, David (NIH/NIAID) [C]
Subject: FOX news radio Live hit 1:10 pm
Attachments: RE: FOX News Radio Interview Request

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 23 Jan 2020 16:51:58 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: CNBC Squawk Box Corona virus - (LIVE HIT: 7:30 am)
Attachments: RE: CNBC Squawk Box request, FW: CNBC Squawk Box request

Control room number is 201-735-4112.

LIVE HIT: 7:30 am et – 7:40 am ET

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 23 Jan 2020 17:00:35 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Awwad, David (NIH/NIAID) [C]
Subject: Cox Media Group Interview re Coronavirus (taped 2:15 pm ET)
Attachments: Re: interview request: Cox media group/ CoV

Katie Suiters
Producer
Cox Media Group Washington Bureau
Direct: (202)777-7052 | Cell: (b) (6)
katie.suiters@coxinc.com

Cox would like to send a crew to campus today around 11 a.m. for a quick on-camera interview on CoV. They would ask how concerned traveling Americans should be.

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 23 Jan 2020 20:27:12 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Corona virus briefing to Hill (w/Redfield)
Attachments: RE: URGENT: please advise - request for Member briefings on coronavirus, Update. Fwd: full bipar senate briefing tomorrow at 10:30 re: coronavirus

Friday, Jan. 24 – before 1pm

- Request from Sen. Lamar Alexander (R-TN; Chair, Senate HELP Committee) – may include other HELP Members or other Senators
- CDC and NIH participation requested; may also include NSC
- We were initially told it would be classified but now appears they will do unclassified to facilitate HHS participation

Senator Alexander is hosting a **full senate (bipar) briefing tomorrow at 10:30AM** on coronavirus in the HELP hearing room. We just go the request a few minutes ago so please help us coordinate quickly. They would like the briefers to be (1) CDC, (2) NIAID, (3) ASPR, and (4) State. I suggest that they speak in that order. Can someone from NSC/WH please loop in relevant State colleagues. This briefing will be unclassified.

Below is my suggested run of show (the topics listed below by each speaker are what they have specifically asked to hear about):

1. Senators arrive, mingle with principals and sit down
2. Dr. Redfield, 10 mins (+one SME) to provide the "here is what we know," "here is where it started," here is what it is," "here is where it is in the US," "here is what the US resources and protocols are to detect and treat," "what can we do domestically given we can't shut off a city like Wuhan"
3. Dr. Fauci, 5 mins—provide info on what NIAID is doing
4. Dr. Kadlec, 5 mins—provide info on what ASPR is doing
5. State, 5 mins—here is what China is doing that we know of
6. Approx. 30 mins of Q&A

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 24 Jan 2020 16:41:18 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Awwad, David (NIH/NIAID) [C]
Subject: NPR Morning Edition (LIVE HIT:7:05 AM WITH AWWAD AT OFFICE)
Attachments: RE: Morning edition Monday, interview with Dr Fauci, RE: interview with Dr Fauci

As Simone said below, our 24/7 phone is 202-513-2158

Reporter: Rachel Martin / Steve Inskeep
Organization: NPR's Morning Edition
Producer: Nina Kravinsky
Phone #(s): (b) (6) nkravinsky@npr.org
Subject: Wuhan coronavirus
Deadline: today for coordination
Spokesperson: NIAID Director Anthony S. Fauci, by phone
Expected place of publication: radio, online
Expected date of publication/airing: Monday, Jan. 27
Expected prominence: Morning Edition

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 24 Jan 2020 18:21:11 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Senate Approps Clerks visit to NIH
Attachments: Please advise: House Clerk Visit Feb 4 and Senate Clerk Visit Feb 21- Availability Check, RE: pelase read, RE: Confirmed 1:15pm start: Feb 21st Senate Appropriations Staff Visit, FW: senate clerks at nih tomorrow

NIH OLPA has confirmed that Dr. Fauci's slot for the Feb. 21st visit of the Senate appropriations clerks will be 1:15pm – 1:55pm (40 minutes).

National Institutes of Health

Senate Clerk Briefings

Friday, February 21st

Building 31, Conference Room 31 A, 4A53

10:00 am – 4:00 pm

Times	Event
10:00	**Clerks Arrive on Campus**
10:00 – 10:10	**Welcome** • NIH Director Francis Collins
10:10 – 10:50	**CSR Director Meet and Greet** • CSR Director Noni Byrnes
10:50 – 11:30	**NCI Update** • NCI Director Ned Sharpless
11:30 – 12:10	**NIDA Update** • NIDA Director Nora Volkow
12:10 – 12:40	**Break – Lunch**
12:40 – 1:15	**NIMHD Update** • NIMHD Director Eliseo Pérez-Stable
1:15 – 1:55	**NIAID Update** • NIAID Director Anthony Fauci
1:55 – 2:00	**Break**
2:00 – 2:20	**Non-human Primate Discussion** • Associate Director for Science Policy & Acting Chief of Staff Carrie Wolinetz
2:20 – 2:40	**Human Fetal Tissue Update** • Associate Director for Science Policy & Acting Chief of Staff Carrie Wolinetz
2:40 – 2:55	**Harassment Update** • Associate Director for Science Policy & Acting Chief of Staff Carrie Wolinetz
2:55 – 3:15	**IC Performance Assessments**

	• Principal Deputy Director Lawrence Tabak
3:15 – 3:50	**Buildings and Facilities** • Principal Deputy Director Lawrence Tabak • Deputy Director for Management Alfred Johnson • Associate Director for Budget Neil Shapiro • Associate Director for Research Facilities Dan Wheeland
3:50 – 4:00	**Clerks Depart**

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 24 Jan 2020 18:24:48 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: House Approps Clerks Visit to NIH - Working Lunch 1:20 pm - 2:00 pm
Attachments: Please advise: House Clerk Visit Feb 4 and Senate Clerk Visit Feb 21- Availability Check, FW: Draft agenda for House L-HHS Clerks visit on 2.4.2020

National Institutes of Health

House Appropriations Staff Briefings
Tuesday, February 4th
Medical Board Room
11:00 am – 4:00 pm

Times	Event
11:00	**Staff arrive on campus**
11:00 – 11:10	**Welcome**
11:10 – 11:40	***All of Us* Research Program Updates** • *All of Us* Research Program COO Stephanie Devaney
11:40 – 12:20	**Buildings and Facilities Tour** • Clinical Center CEO James Gilman • Associate Director for Research Facilities Daniel Wheeland • Associate Director for Budget Neil Shapiro
12:20 – 12:55	**Sexual Harassment/Clinical Trials** • Associate Director for Science Policy & Acting Chief of Staff Carrie Wolinetz
12:55 – 1:20	**Break/Get lunch and bring back to room**
1:20 – 2:00	**NIAID Update (Working Lunch)** • NIAID Director Anthony Fauci
2:00 – 2:30	**B&F Discussion** • Principal Deputy Director Lawrence Tabak • Associate Director for Budget Neil Shapiro • Deputy Director for Management Alfred Johnson • Associate Director for Research Facilities Daniel Wheeland • Clinical Center CEO James Gilman
2:30 – 2:50	**INCLUDE Update** • NICHD Director Diana Bianchi
2:50 – 3:20	**Foreign Influence/Conflicts of Interest** • Deputy Director for Extramural Research Michael Lauer
3:20 – 4:00	**NCI Update** • NCI Director Ned Sharpless
4:00	**Staff depart**

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Fri, 24 Jan 2020 18:57:38 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: WCBS Radio interview - Corona - LIVE HIT 6:15 pm ET
Attachments: FW: WCBS INTERVIEW REQUEST

Angel Saborido
Producer, WCBS880
212-524-2910

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Tue, 28 Jan 2020 13:39:50 +0000
To: Fauci, Anthony (NIH/NIAID) [E]
Subject: Call with Tim Kingston re: 30th Anniversary of SF AIDS Conf
Attachments: RE: 30th Anniversary of SF AIDS Conf Exhibit at SF Library organizers Rick Gerharter, Liz Highleyman and Tim Kingston, RE: 30th Anniversary of SF AIDS Conf Exhibit at SF Library organizers Rick Gerharter, Liz Highleyman and Tim Kingston, RE: PLEASE READ: 30th Anniversary of SF AIDS Conf Exhibit at SF Library organizers Rick Gerharter, Liz Highleyman and Tim Kingston, RE: PLEASE READ: 30th Anniversary of SF AIDS Conf Exhibit at SF Library organizers Rick Gerharter, Liz Highleyman and Tim Kingston

This would come under the heading of a blast from the past. I think you might remember me as that pesky reporter from SF Bay Times and SF Frontiers who did a fair bit of writing about the epidemic back in the day. Well I am currently at work on a photo exhibit being organized by photographer Rick Gerharter at the SF Library and I have been tasked with writing some of the blurbs accompanying the photos. I was hoping that we might have a chat about those days, because I want a quote from you about what the situation was at the SF AIDS conf in terms of hopefulness and lack thereof at that time and how things have changed since then. Is there a chance we could have a conversation about this at your convenience?

Ah, and the sfgov.org address, I found a different line of work than reporting (wherein I would have been on the dogfood retirement plan) and I am now a Public Defender investigator.

Looking forward to hearing from you.

All the Best, Thanks,
Tim

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 21 Nov 2019 16:05:56 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Awwad, David (NIH/NIAID) [C]
Subject: NAS meeting - Washington dc - virtual
Attachments: FW: NAS 157th Annual Meeting: April 25-28, 2020, FW: Registration Confirmed - 2020 NAS Annual Meeting, FW: NAS Annual Meeting now entirely online

TBD timing

Dear Dr. Fauci,

Based on evolving guidance from public health experts regarding the COVID-19 pandemic, the NAS Annual Meeting will now take place entirely online via webcast, webinars, and Zoom meetings. Because you had planned to attend the annual meeting in person, we are writing to let you know about the changes in plans. Please remember to cancel your hotel reservation if applicable.

Details about the online sessions and how to connect will be provided on our website and by email in the coming weeks. In the meantime, please contact us at annual@nas.edu if you have any questions. We hope to see you again in person at the 2021 annual meeting and look forward to your online participation this year.

Sincerely,
NAS Membership Office

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Sun, 3 May 2020 17:55:14 +0000
To: 'Sharpless, Ned (b) (6)';Tromberg, Bruce (NIH/NIBIB) [E]
Cc: Conrad, Patricia (NIH/NIAID) [E]
Subject: FW: 2 quick points
Attachments: covid contact tracing.pdf

Ned/Bruce:

I thought that I would pass this on to you in case you have interest. Thanks.

Best,

Tony

Anthony S. Fauci, MD
Director
National Institute of Allergy and Infectious Diseases
Building 31, Room 7A-03
31 Center Drive, MSC 2520
National Institutes of Health
Bethesda, MD 20892-2520
Phone: (b) (6)
FAX: (301) 496-4409
E-mail: (b) (6)

From: Eric Ottesen (b) (6)
Sent: Saturday, May 2, 2020 8:23 AM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)>
Subject: 2 quick points

Dear Tony,

1. I had planned to write to thank you for giving an interview (b) (6) for the Washington Post last month. Your generosity with time was 'all Tony,' and I did appreciate it. I was waiting for the chaos around you to subside before writing but.....
2. Last evening I was asked to forward the message below to you. You might already know Jack Warren, Professor of Medicine and Infectious Diseases at U. Maryland (b) (6) As his email says (b) (6) Samsung's venture capital group, which has an idea for a future, comprehensive surveillance system for COVID-19 (b) (4) . It is interesting, but all I know is what I read in the power-point attached. I cannot imagine you would have time

to look at it yourself, but perhaps it could be shared with other systems-oriented individuals working towards 'opening up' responsibly.

Pardon me for stepping out of my normal NTD 'swim lane' but I did want to help out (b) (6) and certainly nothing is more important these days than COVID-19 and the outstanding work you are doing to manage it.

All the very best,

-Eric

From: Warren, John [mailto (b) (6)
Sent: Thursday, April 30, 2020 6:52 PM
To: (b) (6)
Subject: Jack Warren

Eric

A voice from the past. Covid-19 prevented us from meeting up (b) (6) but I'm writing because it might yet bring at least the two of us together.

(b) (6) Samsung's venture capital group and his team has what I think is an incredibly useful idea for contact tracing for covid-19 as well as actually opening the economy up again. The idea is contained within the attachment.

I wonder if you still have any contacts with Anthony Fauci. Is so, could you see your way clear to forwarding the attachment to him? The group has identified some appropriate test manufacturers but is at the point where they need to know the spectrum so as to focus on the optimal ones. The thought was that Tony Fauci might be the best person to know what tests are in development stage.

What are your thoughts?

Don't worry about confidentiality; they want to widely share this idea so as to get it out as quickly as possible.

Thanks

Jack Warren MD
Professor of Medicine
Division of Infectious Diseases
University of Maryland School of Medicine
Baltimore MD 21201
(b) (6)

Product Concept
“Covid Clear”
Digital Proof of No Infection

April 2020

Masks, Contact Tracing & Immunity Passports Won't Bring the US Economy Back

- A return to normal economic activity requires **confidence that those around us are not infectious**
- A widely available vaccine and/or herd immunity could take up to **18 months, possibly longer**
- In the interim, **existing proposals will not provide the level of confidence required**
  - Masks are necessary but not sufficient
  - Contact tracing, while critical, is retrospective and does not prevent us from being exposed
  - The usefulness of immunity/antibody tests is limited
    - Only useful for those already infected (<10% in the US)
    - Not yet clear that having antibodies eliminates possibility of being infectious
  - Temp checks are helpful, but 25-50% of infectious people are asymptomatic (i.e., no fever)
- Instead, we need a **widely recognized way to certify that each of us is not currently infectious** and to use this certification as a way to safely, and confidently, go into shared spaces again.
- **We call this idea "Covid Clear"** - a portable and irrefutable proof of no infection

This is Not Complicated to Assemble - Here's What's Needed

- A **rapid, low-cost, home test** for infectiousness (testing for the virus, not antibodies)
  - High sensitivity (low percentage chance of false negatives)
  - Under 15 minutes
  - Under $20 per test
  - Self-administered twice per week via saliva or anterior nasal swab

- **Integration of the test results with a portable digital device** to irrefutably prove:
  - the test was taken by the person whose biometrics are tied to the device
  - the results have not been tampered with
  - the test was taken within the allotted timeline before the results expire and become invalid
  - the person claiming to be "safe/not infectious" is indeed who they say they are

- This is plausible **TODAY!**

First Test to be Approved in May; More to Follow

- Company 1:
  - Antigen test
  - Likely to be FDA-approved in May
  - Single-digit $ bill of materials, results in under 15 mins, 92% sensitivity
  - Results appear like a pregnancy test (colors/patterns on a test strip)
  - Currently a nasal swab but clear visibility to saliva and self administration within 6-8 weeks
- Company 2:
  - Similar technical approach as above but currently focused on antibody/immunity test
  - Would consider pursuing virus test in parallel with the right partner
  - Results appear like a pregnancy test (colors/patterns on a test strip)
  - Currently a nasal swab but clear visibility to saliva
- Investigating several others:
  - Jonathan Rothberg/Homodeus approach
  - Rutgers saliva test recently approved by FDA (not currently designed for home)
  - CRISPR approach out of UCSF
  - Initial immune response proteins at University of Colorado
  - Spectroscopy with dyes at Albany Medical Center
  - Many more in development - the US will have several viable home tests in market by Sept 1

The Missing Piece: Calling Apple, Samsung, and Google!

- Assuming one or more of these tests is FDA-approved and deployed at scale, integration of the results with a portable digital device will be critical, and we believe it is possible:
  - **Phone optical sensors** to "read" the strip test results
  - **Biometrics** to ensure the test-taker is the person whose biometrics are tied to the phone
  - **Secure enclave** to encrypt and store the results
  - **Integration with contact tracing** for further confidence: not only was the person not infected when they took the test 3 days ago, they have not been near an infectious person since

- The app would then be used to show the most recent, valid test result in order to gain access to:
  - Hospitals, Schools, Warehouses/Factories, Offices, Airplanes, Restaurants, Malls, Stadiums/Arenas, Amusement Parks, etc

- Depending on the level of confidence required in a given shared space, and the level of outbreak risk, the "scanning" may be different by venue: i.e., a visual check at a small restaurant, a QR code scan for a warehouse/office, integration with TSA Pre for flights, and a CLEAR kiosk at a stadium.

Decreases Burden on Contact Tracing; Works with Immunity Tests and Vaccines

- Contact Tracing
  - Covid Clear test results could be automatically and anonymously shared with the various contact tracing systems in development, thereby improving their accuracy and coverage

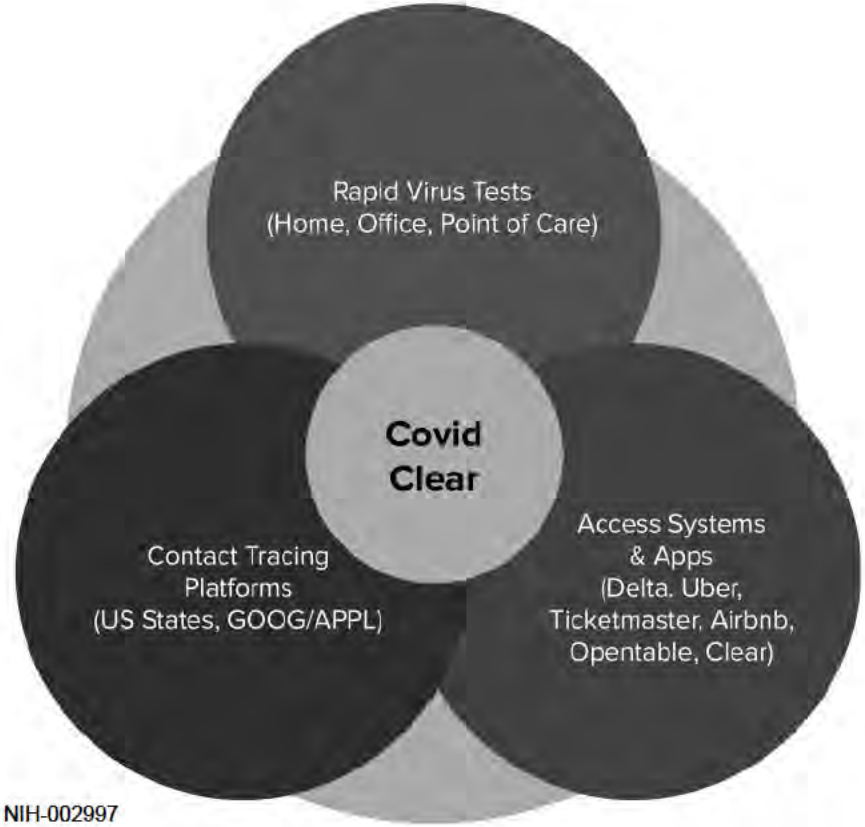
  - Also, Covid Clear should **significantly decrease the resources and time required to contact trace**, since the platform would be able to inform the contact tracers which of the people on their checklists have already tested negative

- Immunity Tests
  - As reliable immunity tests become available, **we envision integrating those test results as well**, thereby allowing people to prove that they a) have the antibodies and b) are not infectious

- Vaccines
  - Similarly, we envision a **"proof of vaccination"** to be integrated into the app

How It Works & Where it Fits

- Open Source
- Published SDKs and APIs
- Self-Sovereign Identity
- Private-by-Design
- No Infection "Confidence Score" (0-100)



NIH-002997

Who Pays? Employers & Govts Will Fund Deployment, Possibly B2C F500 Too

- Multiple types of organizations have an incentive to pay for Covid Clear
  - **Employers** who manage warehouses, factories, food processing plants, and large offices
  - **State and County Govts** who want to jumpstart their economies and need a better way to give their citizens the confidence to leave quarantine
  - Businesses whose revenue is **dependent on large public gatherings**
    - Sports leagues, mall owners/REITs, amusement park operators, etc
  - Businesses whose revenue is **dependent on people gathering in small, close quarters**
    - Airlines, restaurant chains, retail chains, etc
  - Other
    - One could even imagine a family giving Covid Clear as a gift so that a nanny or housekeeper (and their families) could be regularly tested, or grandparents buying the system for their grandchildren to feel more comfortable about family visits.

This Does Not Have to be Ubiquitous to Work. We Can Start Small.

- A school
- A hospital
- A fire station
- A police district
- A food processing plant
- A warehouse
- A factory
- A stadium
- A town

- One-off consumer use cases could also develop:
  - The Patriots (or Taylor Swift) include a test kit with every ticket they sell
  - Grandparents buy a test kit on Amazon for their son, daughter-in-law, and grandchildren
  - Delta Airlines reopens NYC-SF leg and includes a test with every itinerary
  - Marriott reopens in certain cities and includes a test kit with every reservation confirmation

- If enough of the above use cases prove successful, local and state governments would likely then subsidize the tests so that ALL businesses and organizations benefit and ALL citizens are safe.

Does the Math Work? Yes.

- Especially as costs come down with scale
- The cost of the tests today is $20-$40 per week, or roughly $1000-$2000 per year per person
- **While this is a significant amount of $, it pales in comparison to the costs of a "scared economy"**:
  - US government already sending $1200 checks to many citizens, with more to come
  - Employers actively looking to provide a safe work environment for their employees
  - The collective lost revenue per person of a "scared economy" to:
    - Airlines
    - Retail
    - Restaurants
    - Sports Leagues
    - Malls
    - Amusement Parks
    - etc.
- At scale, costs could decrease to $10-$20 per week, or roughly $500-$1000 per year per person

And the Math is Even More Compelling from a Macroeconomic Perspective

- The current "closed economy" is costing the United States between **$100B-$350B per month*** as compared to the economy before the pandemic.
- As states begin to reopen, no one knows how much the economy will improve, but a recent survey showed that 57% of US citizens are still "very" or "somewhat" concerned about being infected.**
- Optimistically, even if the "scared economy" is 50% better than the "closed economy", that's still costing the US between **$50B-$175B per month**.
- By contrast, if deployed to every single US citizen, **Covid Clear would cost roughly $27B per month.**

*"Roadmap to Pandemic Resilience" - Edmond J. Safra Center For Ethics At Harvard University 04/20/2020
**Washington Post-University of Maryland Poll, reported 04/21/2020

Another Important Consideration: Future Proofing & Pandemic Resilience

- Unfortunately, the scientific consensus is that this will not be the last pandemic of our lifetimes (whether natural or synthesized), and possibly not even the last pandemic of this decade.

- Given this, one could make the argument that the cost of **Covid Clear is also a down payment** on being prepared for those future crises:

    - Citizens will be comfortable with the idea that they will have to temporarily self-isolate until home tests become available and then will need to carry around a "proof of no infection".

    - **The infrastructure will be in place** to certify that people are not infectious throughout the country: at airports, offices, factories, warehouses, stadiums, amusement parks, etc.

- Psychologically and economically, this is critical: when the next pandemic hits, we will know we have a "proof of no infection" system already in place. This in turn will provide us with the comfort that future pandemic economic crises will not last until we develop a vaccine but instead until we have a rapid, low-cost, and high sensitivity home test - **a far easier medical problem to solve**.

Challenges and Mitigants

- Challenge: In the US, only 85% of the population has a smartphone; what about the other 15%?
  - Mitigants: The government, or businesses, may be willing to subsidize device costs. Or a cheaper, perhaps even non-digital, portable device could hold the test results.

- Challenge: The privacy implications here are enormous; people don't want their healthcare tracked
  - Mitigants: Test result data tied to identity is stored and encrypted on the phone and never leaves the phone. And any data shared with contact tracing systems is fully anonymized.

- Challenge: This is overkill - only the most vulnerable will be too scared to get back to work/life
  - Mitigants: In the US, over 50% of the population have conditions comorbid with Covid-19. And this figure does not include all of the people that they live with.

- Challenge: Liability for false negatives
  - Mitigants: Currently, test companies bear all liability. We also believe we can work with governments and employers to fully indemnify all companies involved in the product, much as the government does for vaccine manufacturers.

Next Steps / How You Can Help

- If you believe in this concept, please forward this deck onto anyone who could help refine the idea and/or help make it a reality:
    - Potential contributors to the software and app (developers, designers, etc)
    - Other manufacturers of rapid, low cost home tests for the presence of SARS-CoV-2
    - Developers of contact tracing platforms
    - Potential early customers:
        - Employers
        - Local and State Governments
        - Businesses whose revenue is dependent on large public gatherings
        - Businesses whose revenue is dependent on people gathering in small, close quarters
    - Potential advocates
        - Public health experts, epidemiologists, and medical ethicists
        - Economists
        - Healthcare, business, and political leaders on “how to reopen our economy” task forces
- Please also reach out to me directly with any thoughts/questions/concerns: guswarren@gmail.com

Thank you.

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 30 Apr 2020 21:47:05 +0000
To: (b) (6)
Subject: FW: Autopsy data supporting Remdesivir trial
Attachments: (b) (4)

Take a look at the Figures in the manuscript. (b) (5)

Anthony S. Fauci, MD
Director
National Institute of Allergy and Infectious Diseases
Building 31, Room 7A-03
31 Center Drive, MSC 2520
National Institutes of Health
Bethesda, MD 20892-2520
Phone: (b) (6)
FAX: (301) 496-4409
E-mail: (b) (6)

From: Timothy Schacker (b) (6)
Sent: Thursday, April 30, 2020 1:10 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)>
Subject: Autopsy data supporting Remdesivir trial

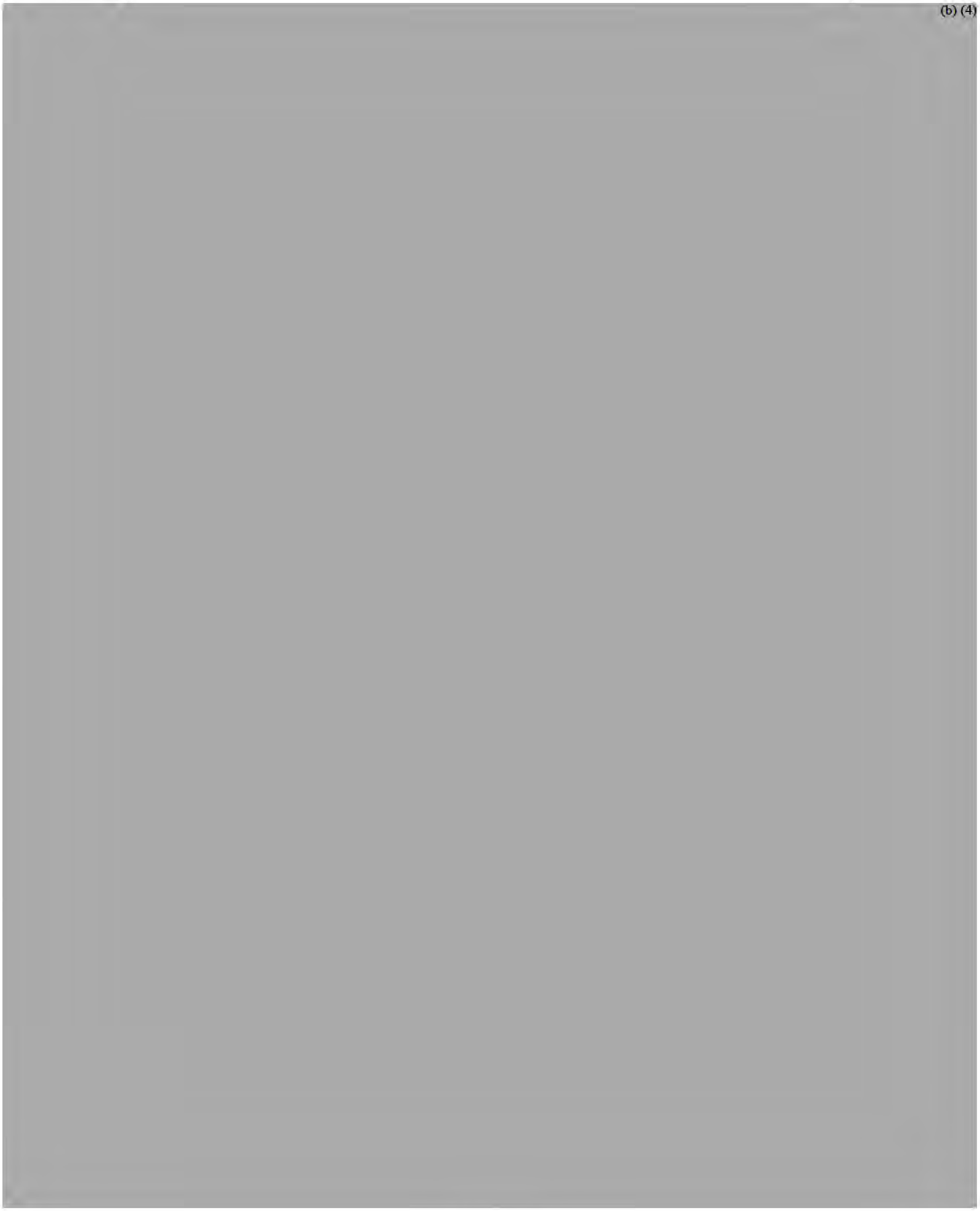
Tony,
(b) (4)

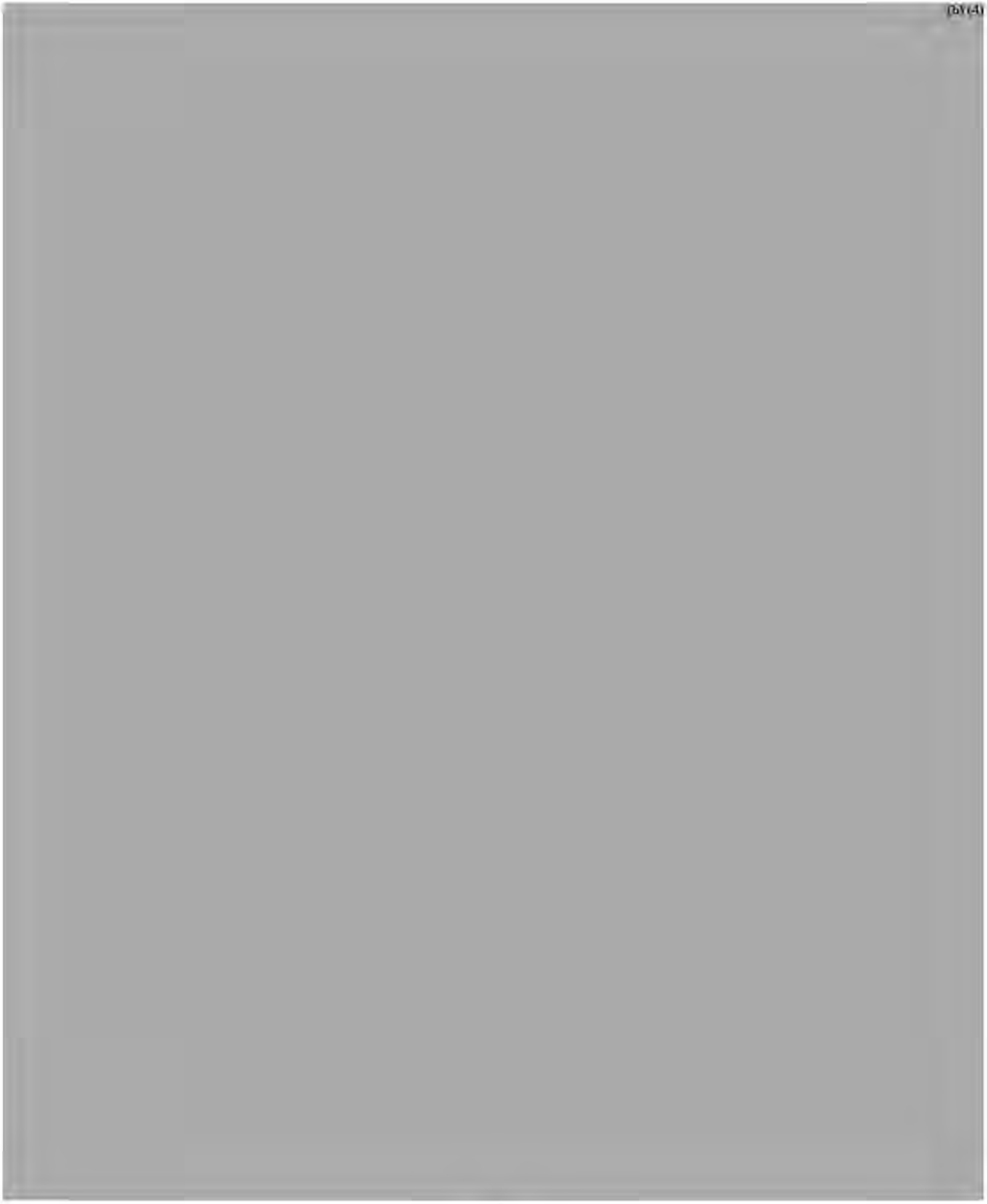
Stay well (please) and thank you for all you are doing!
Tim
Timothy Schacker, M.D.
Vice Dean for Research, Medical School
Director, Program in HIV Medicine
University of Minnesota

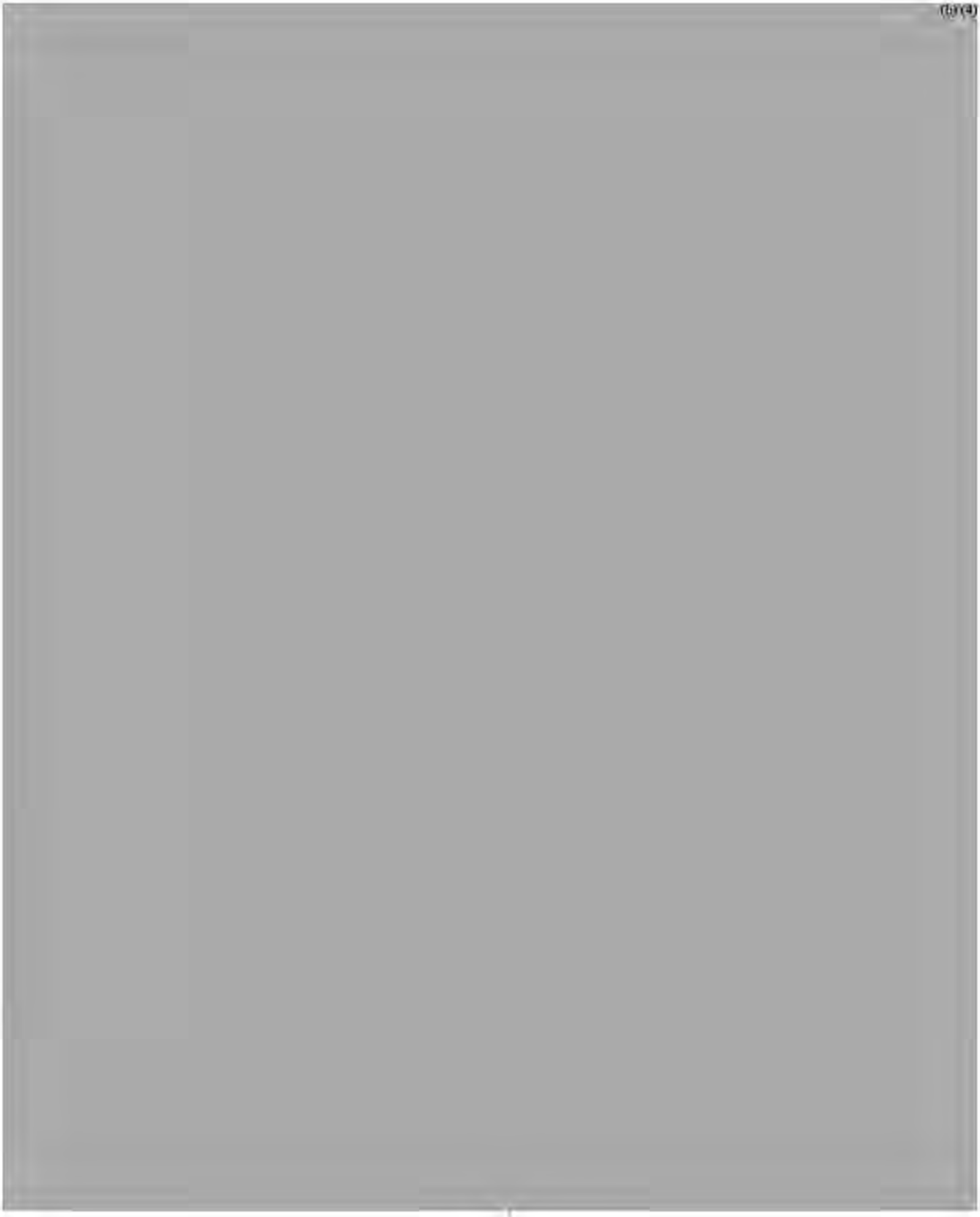
Mail:
MMC 250
420 Delaware Street SE
Minneapolis, MN 55455

FedEx/UPS:
Mayo C688
420 Delaware Street SE
Minneapolis, MN 55455

Phone: (b) (6)
Fax: 612-626-5599
email: (b) (6)



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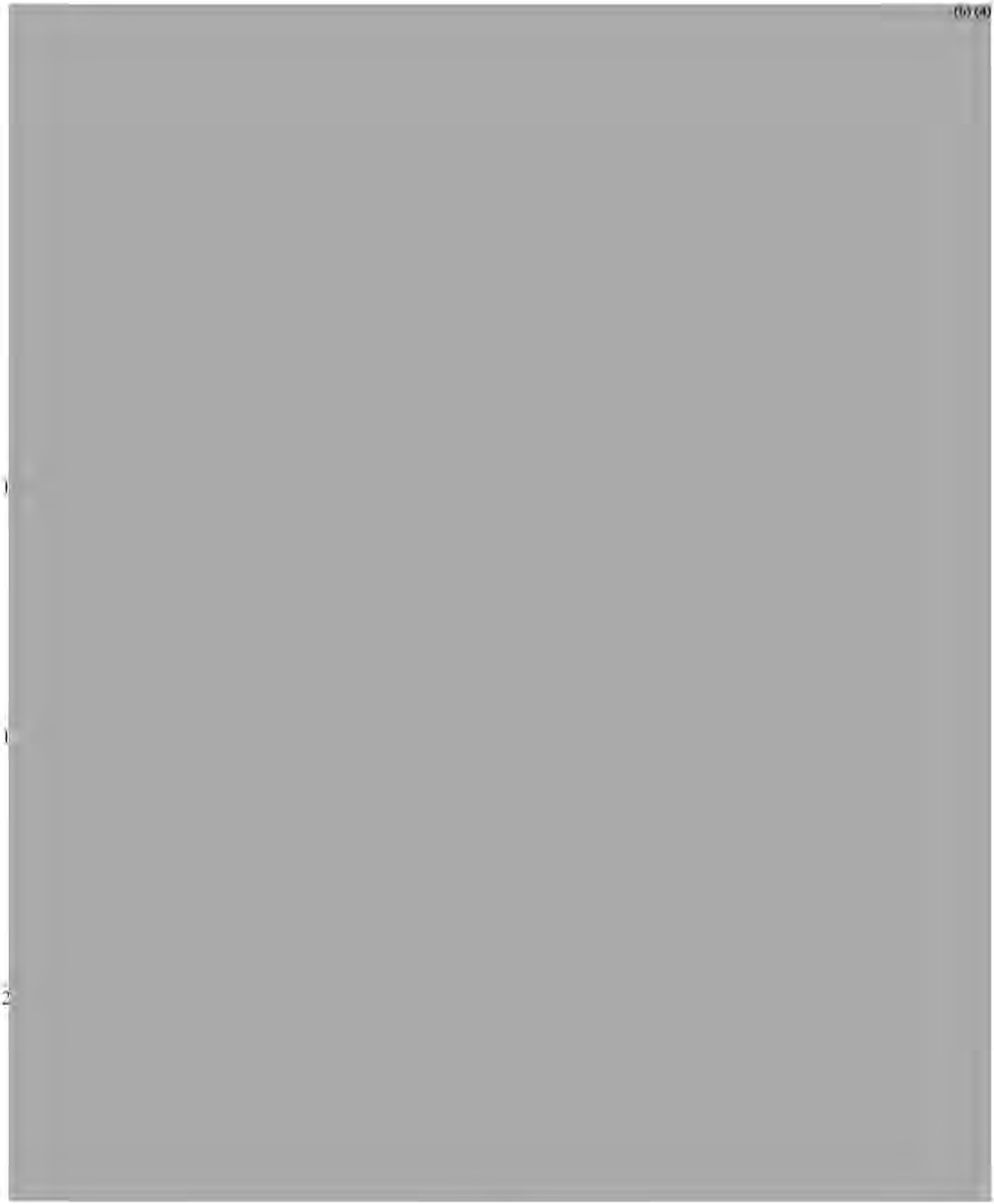
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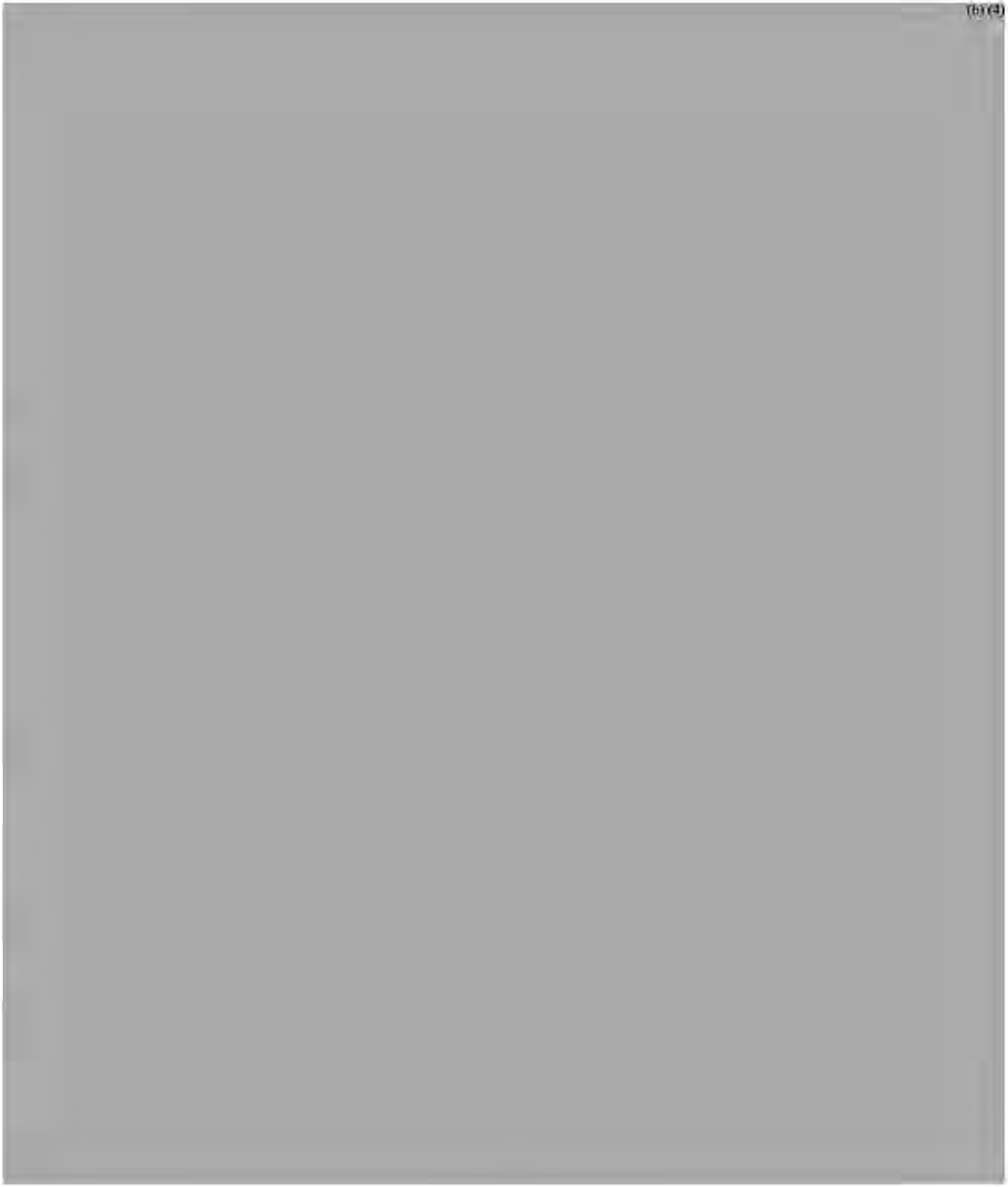
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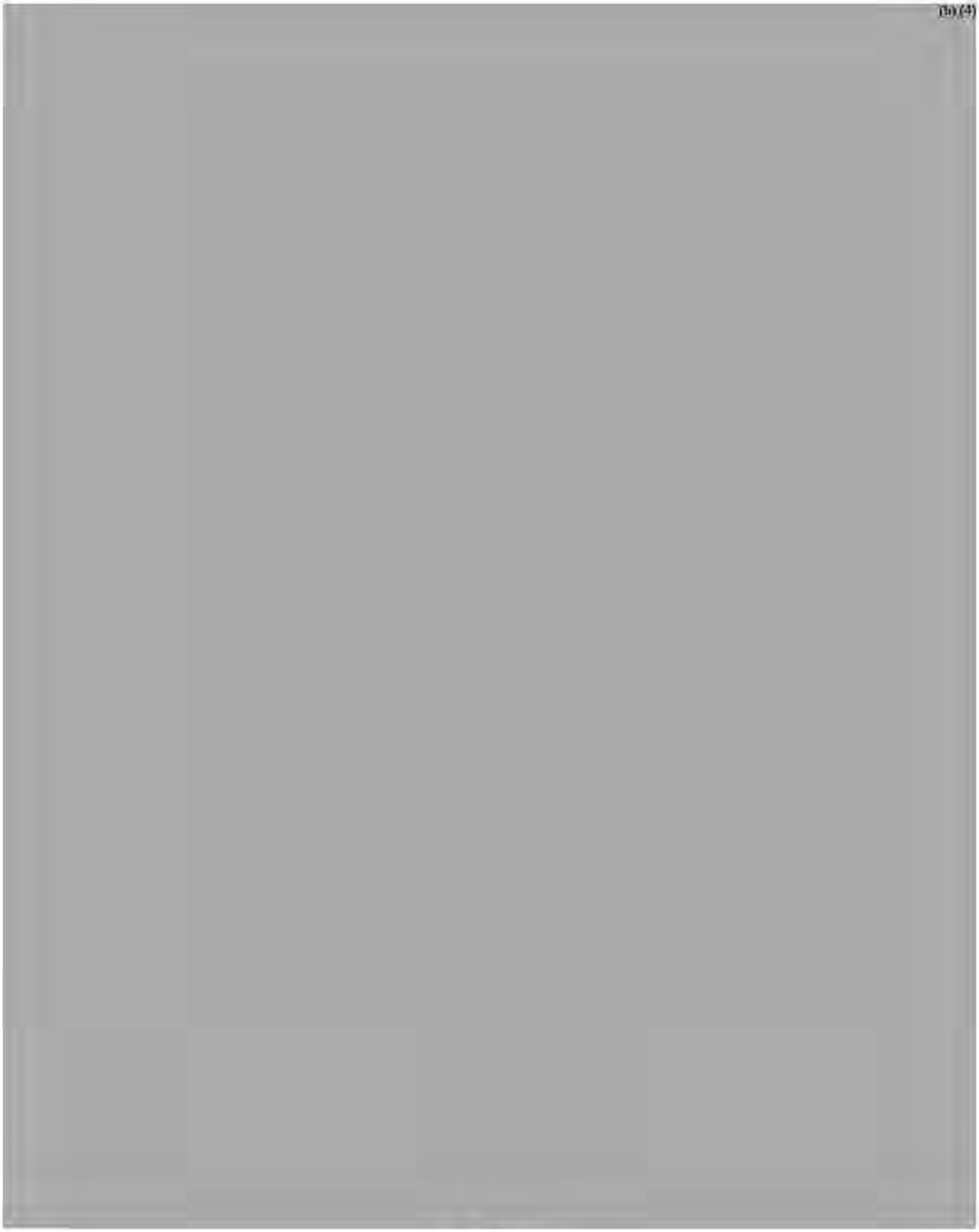
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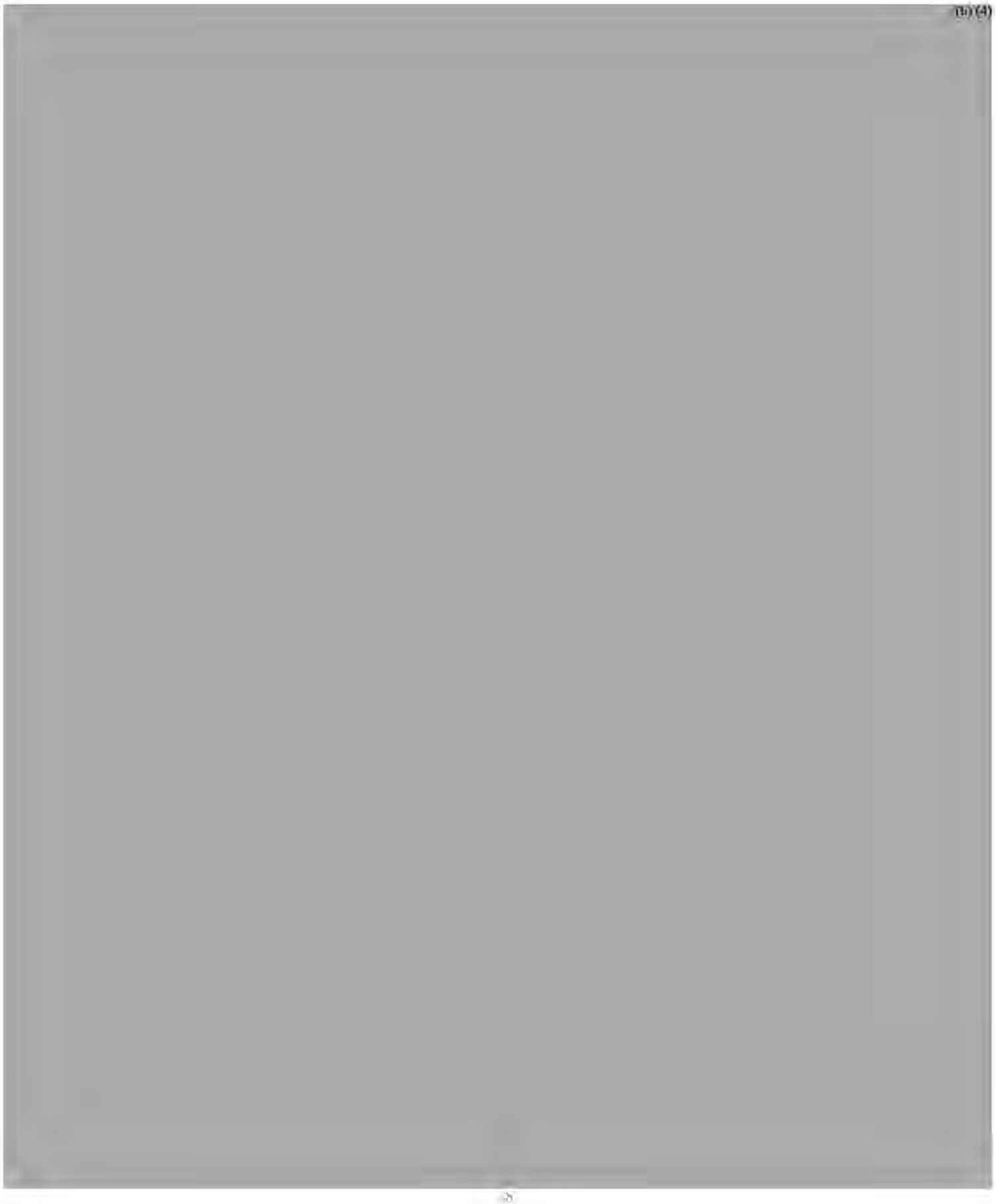
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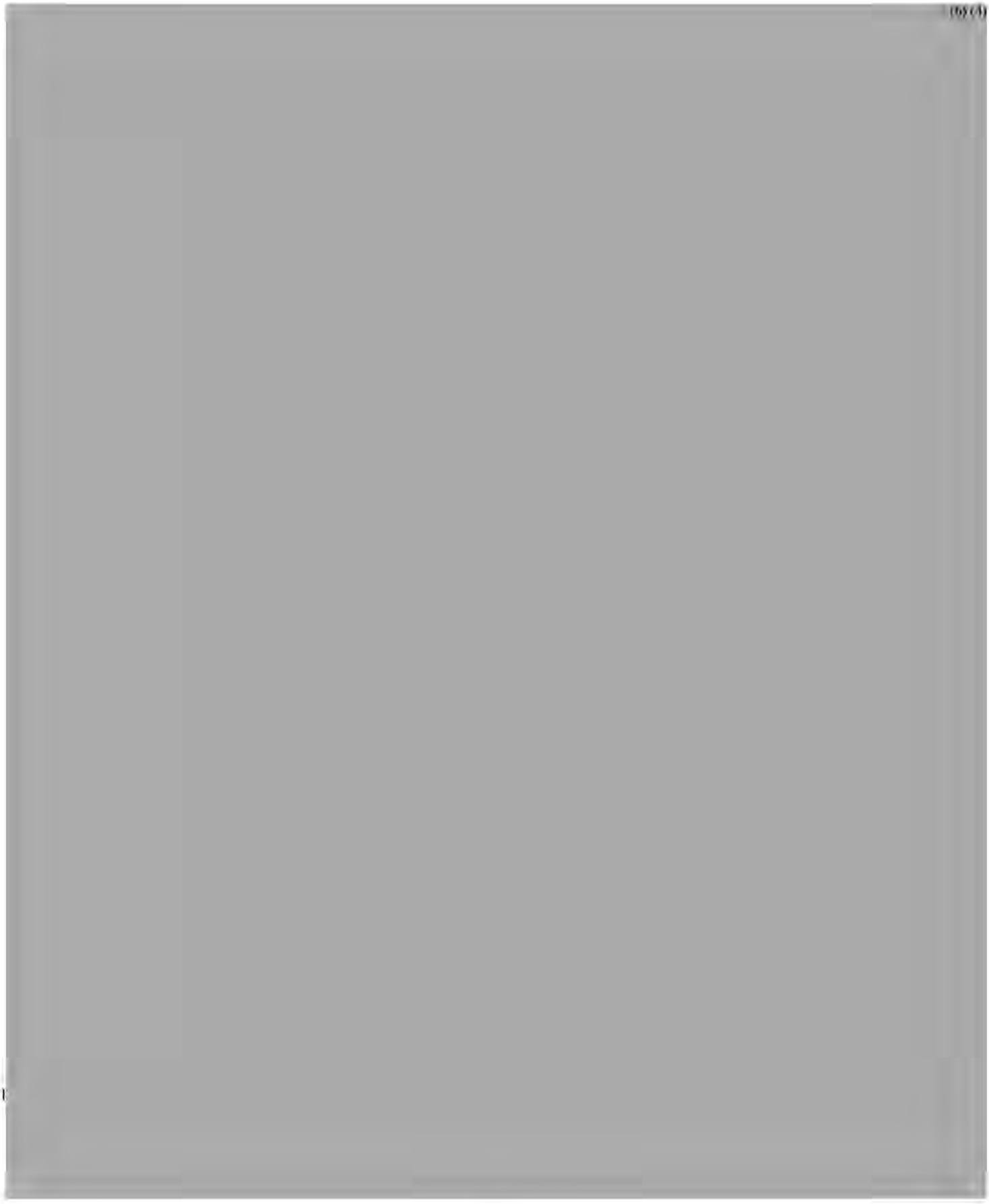

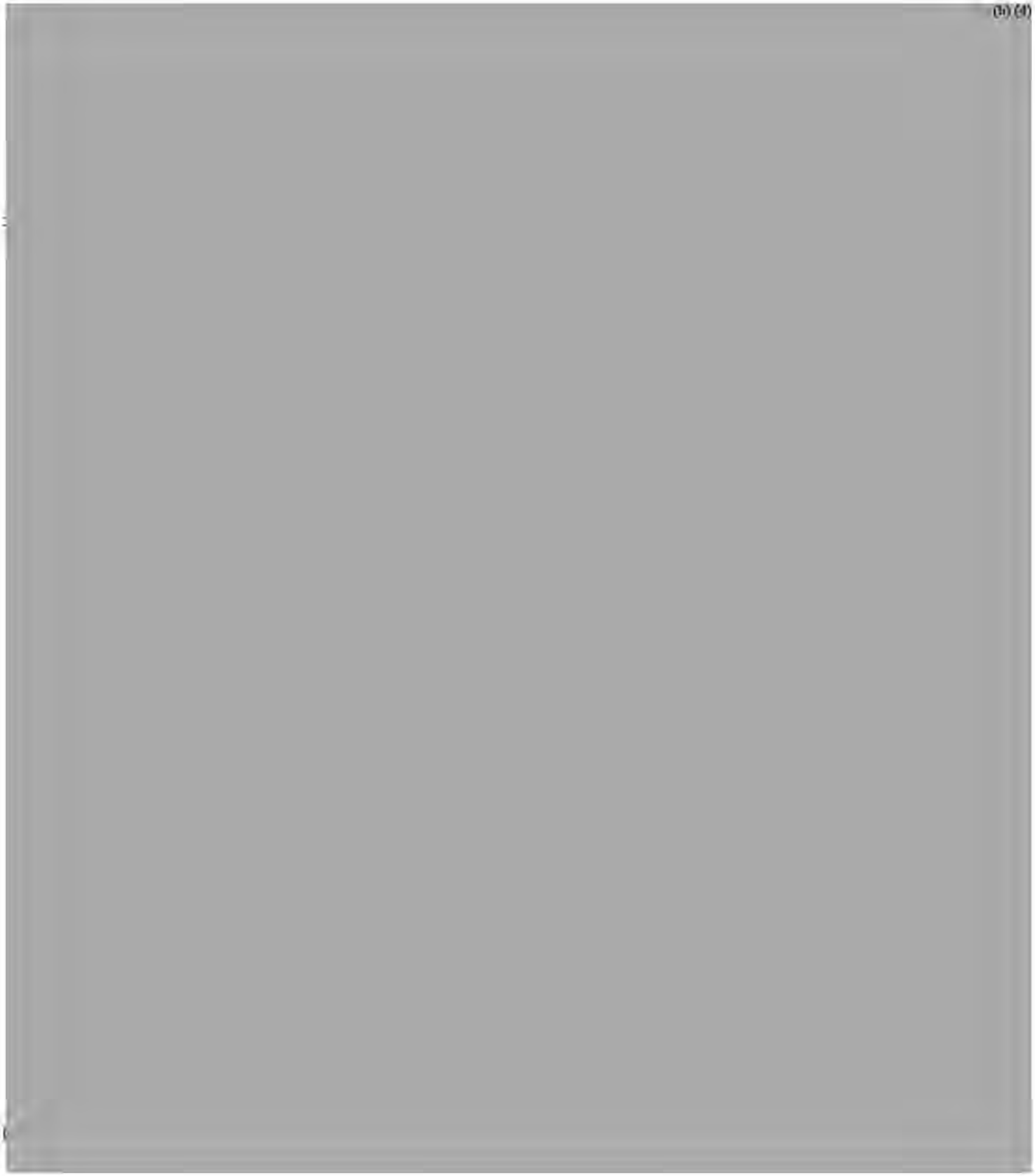

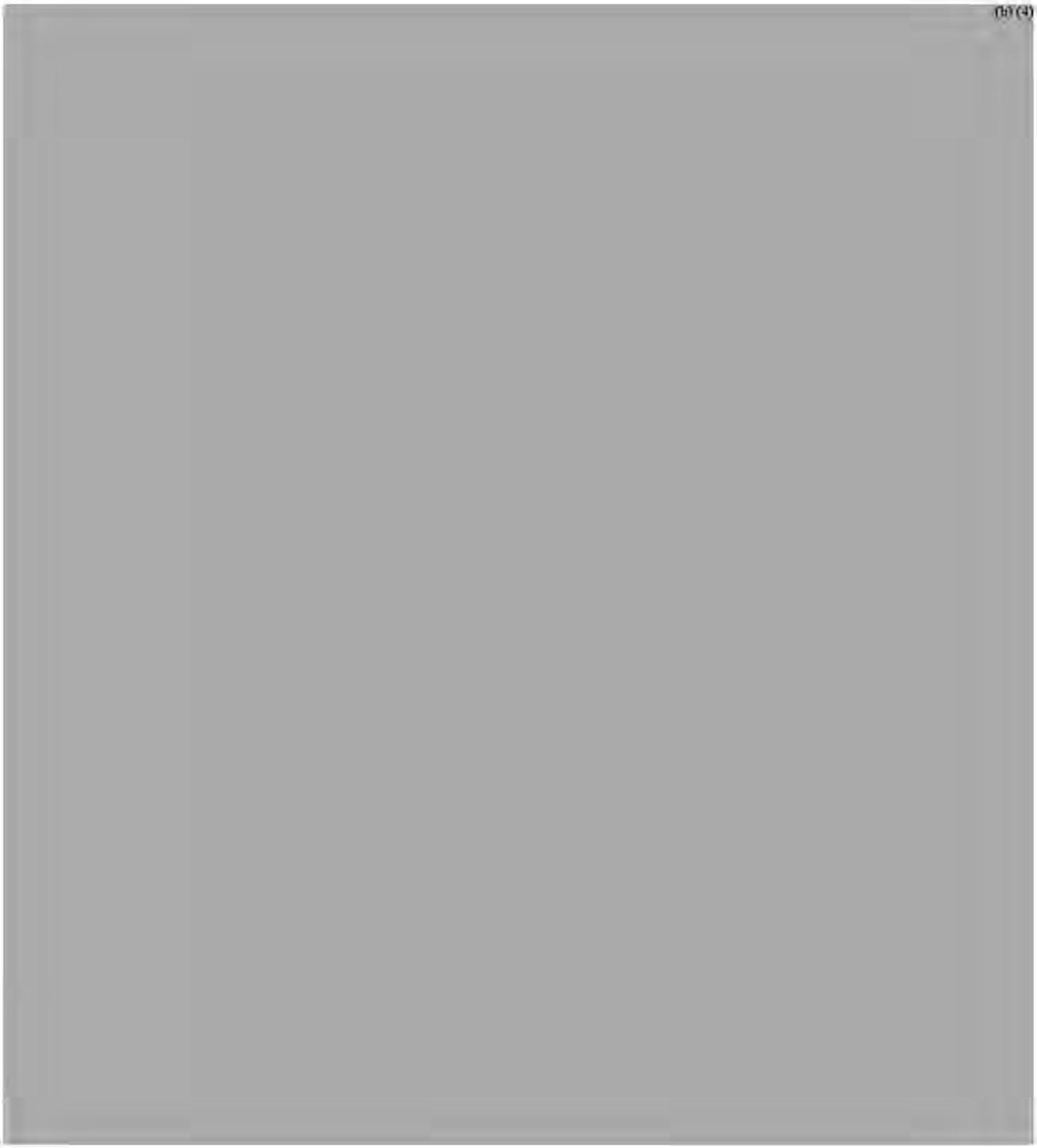
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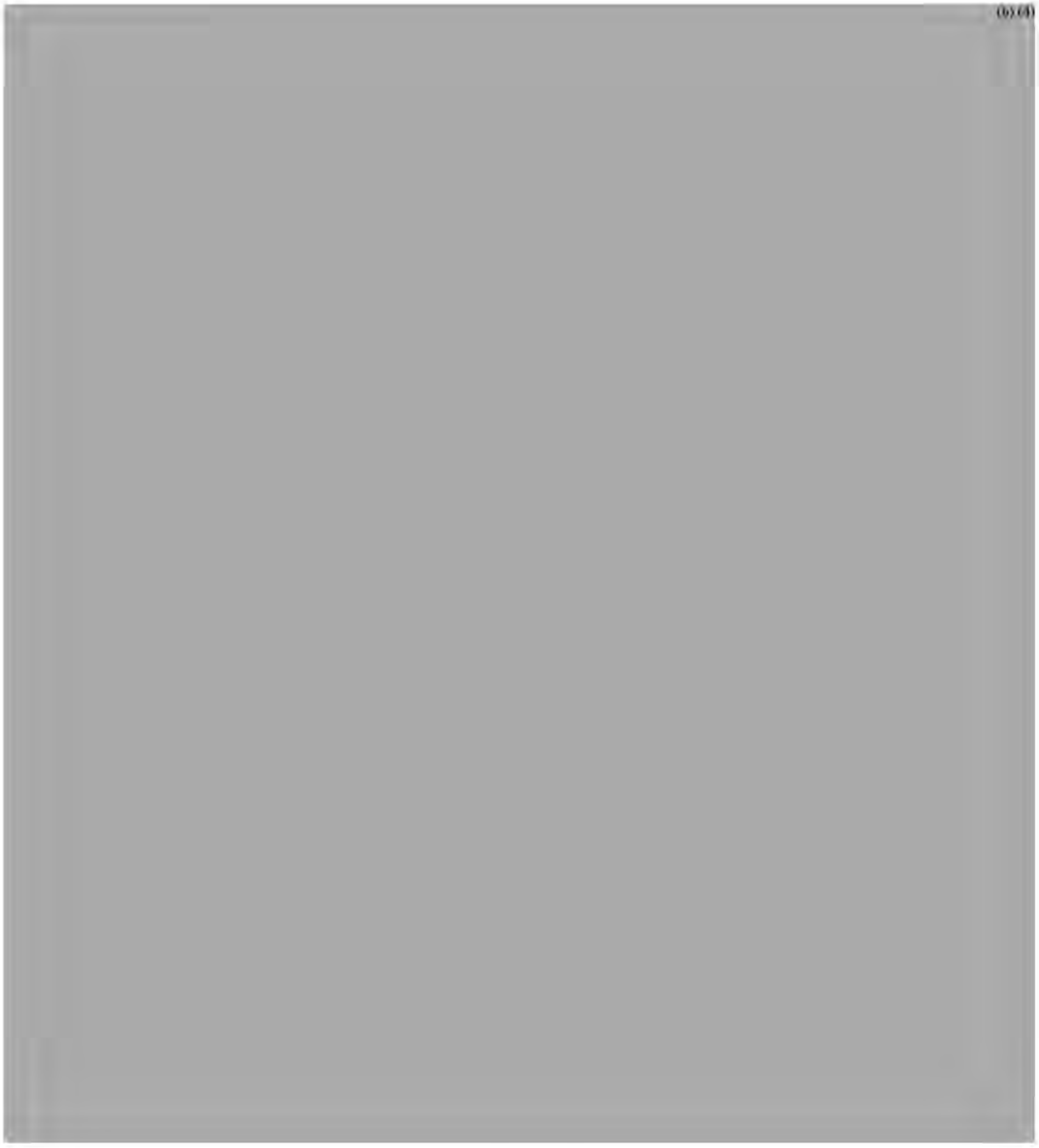

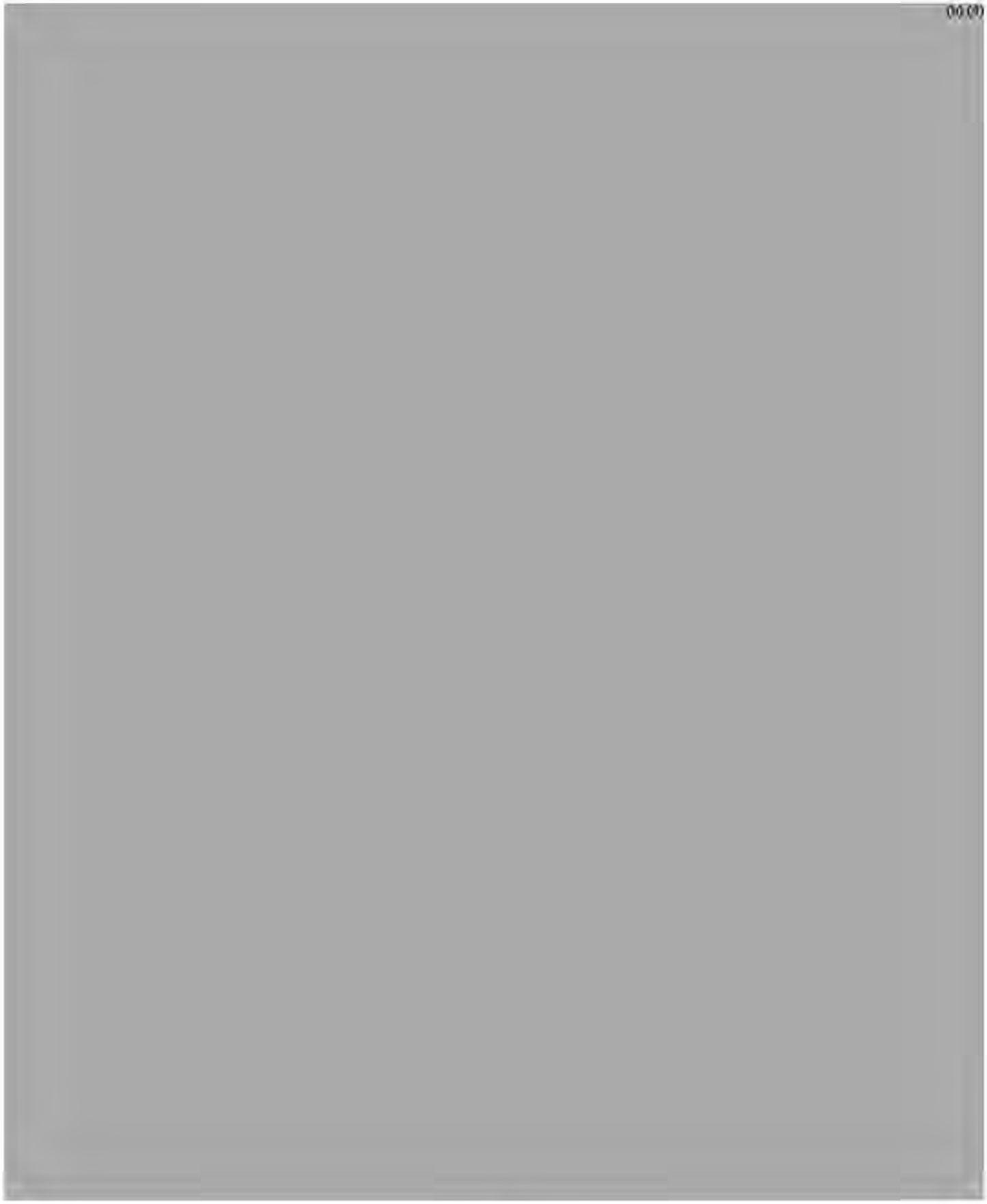

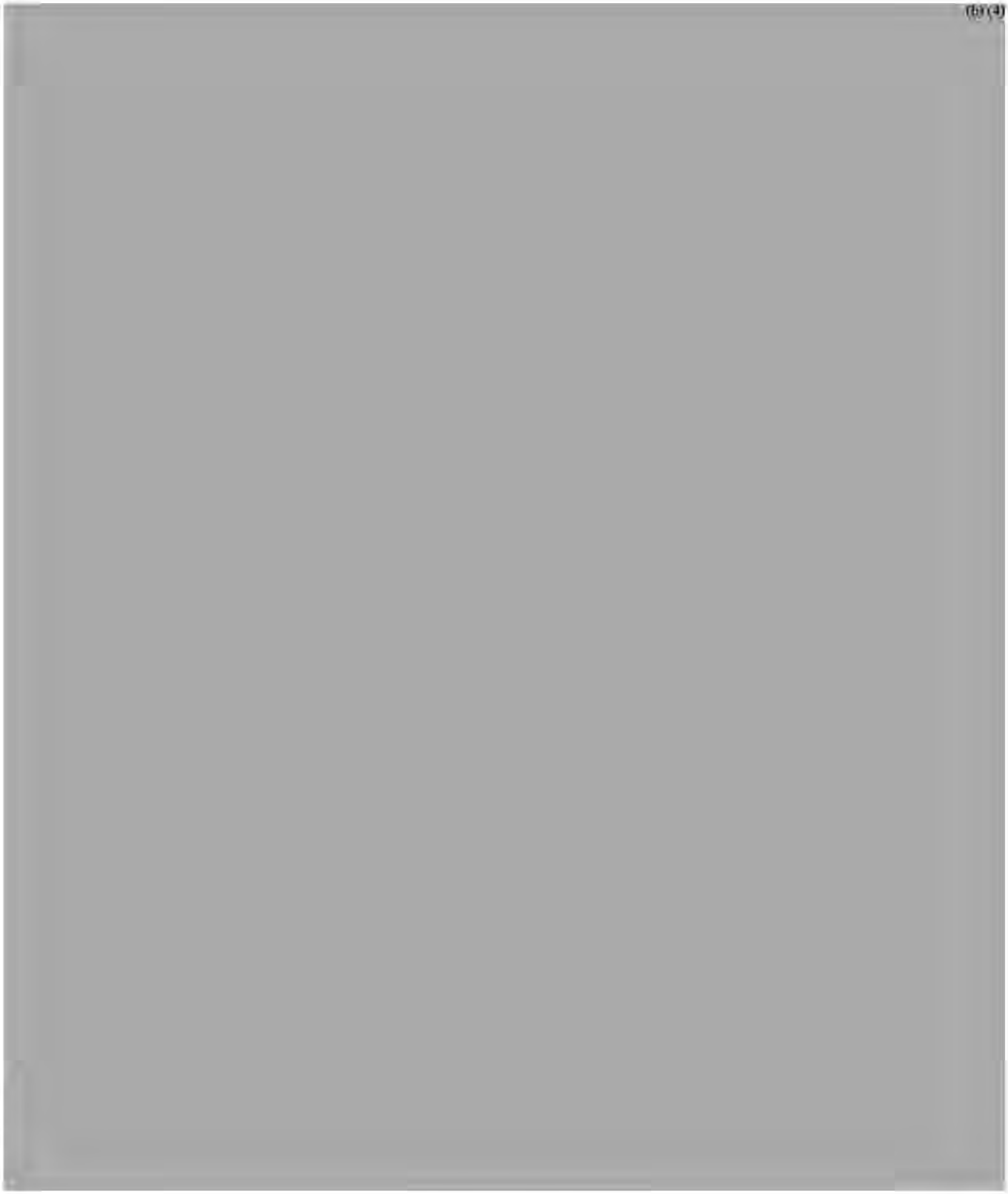
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From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Thu, 23 Apr 2020 11:54:41 +0000
To: Corey MD, Larry (b) (6);Mascola, John (NIH/VRC) [E]
Cc: Conrad, Patricia (NIH/NIAID) [E];Fauci, Anthony (NIH/NIAID) [E]
Subject: NEJM manuscript
Attachments: COVID vaccine editorial_prefinal April21_7pm fsc - with minor Fauci edits.docx

Larry/John:

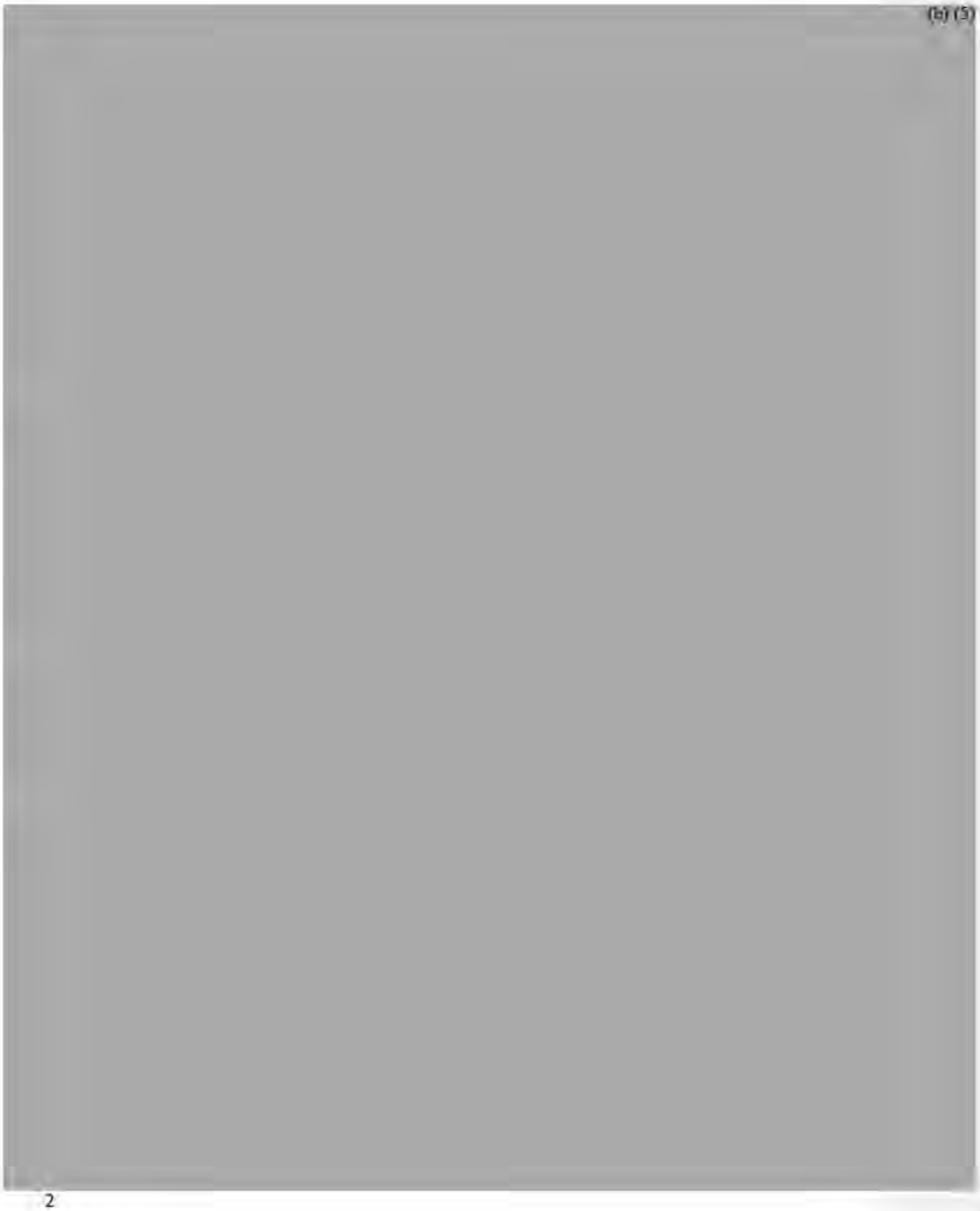
I have gone over the changes that Francis has inserted and I have edited some of them. Please accept his changes and my edits of them (or any additional edits that you have) and then it is OK to send in. Please let me know if you have any questions.

Thanks,

Tony

Anthony S. Fauci, MD
Director
National Institute of Allergy and Infectious Diseases
Building 31, Room 7A-03
31 Center Drive, MSC 2520
National Institutes of Health
Bethesda, MD 20892-2520
Phone: (b) (6)
FAX: (301) 496-4409
E-mail: (b) (6)

(b) (5)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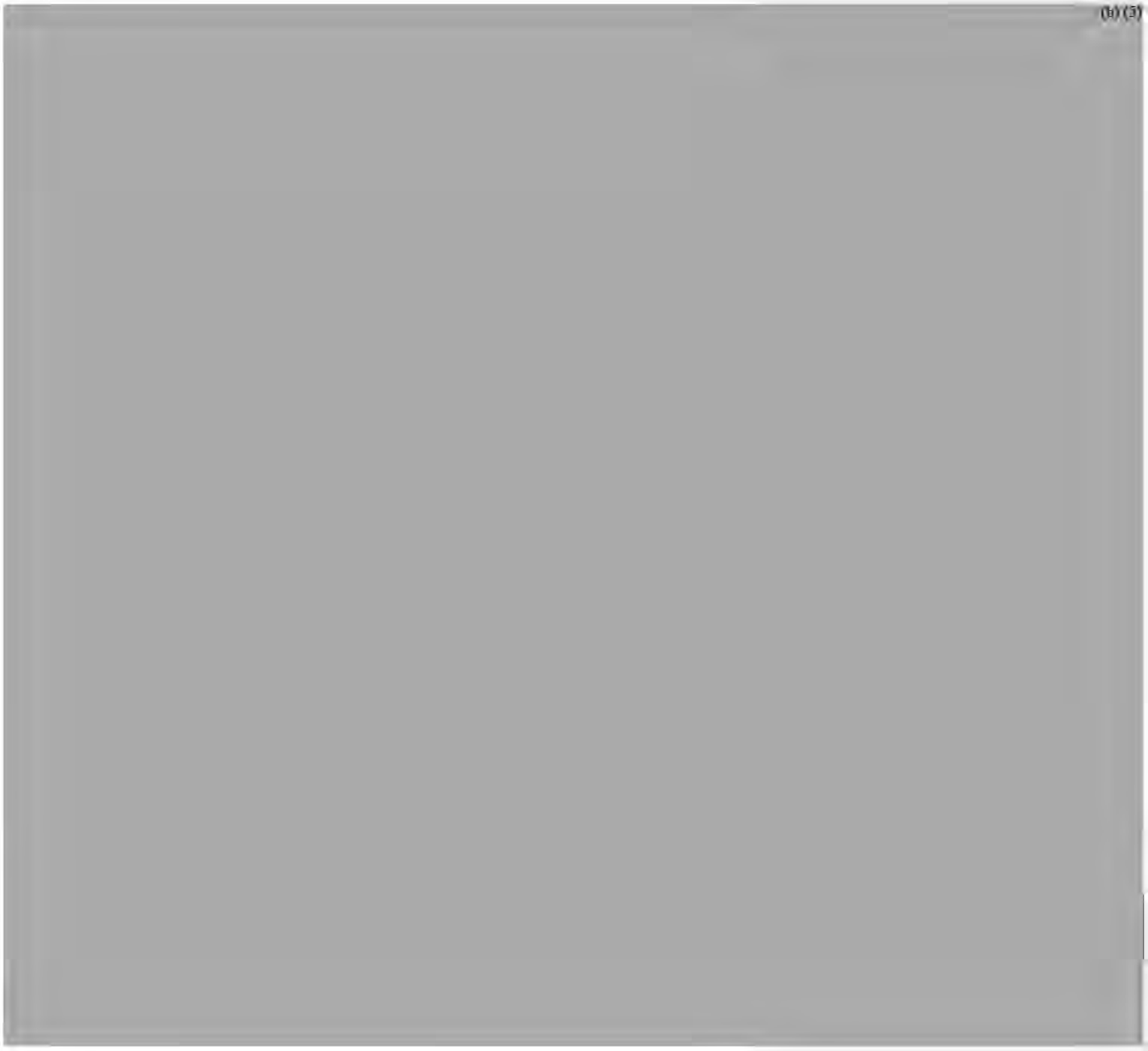
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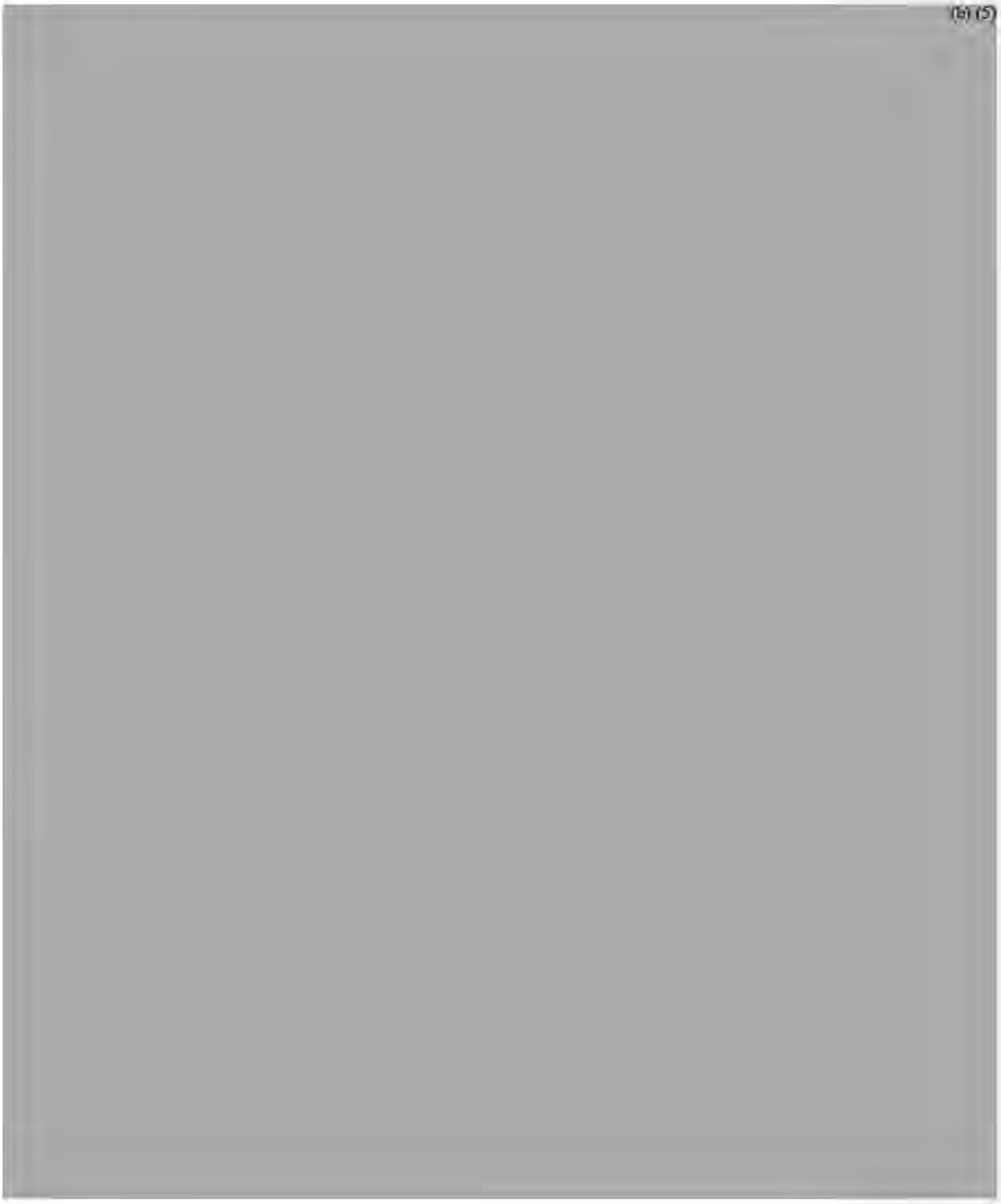
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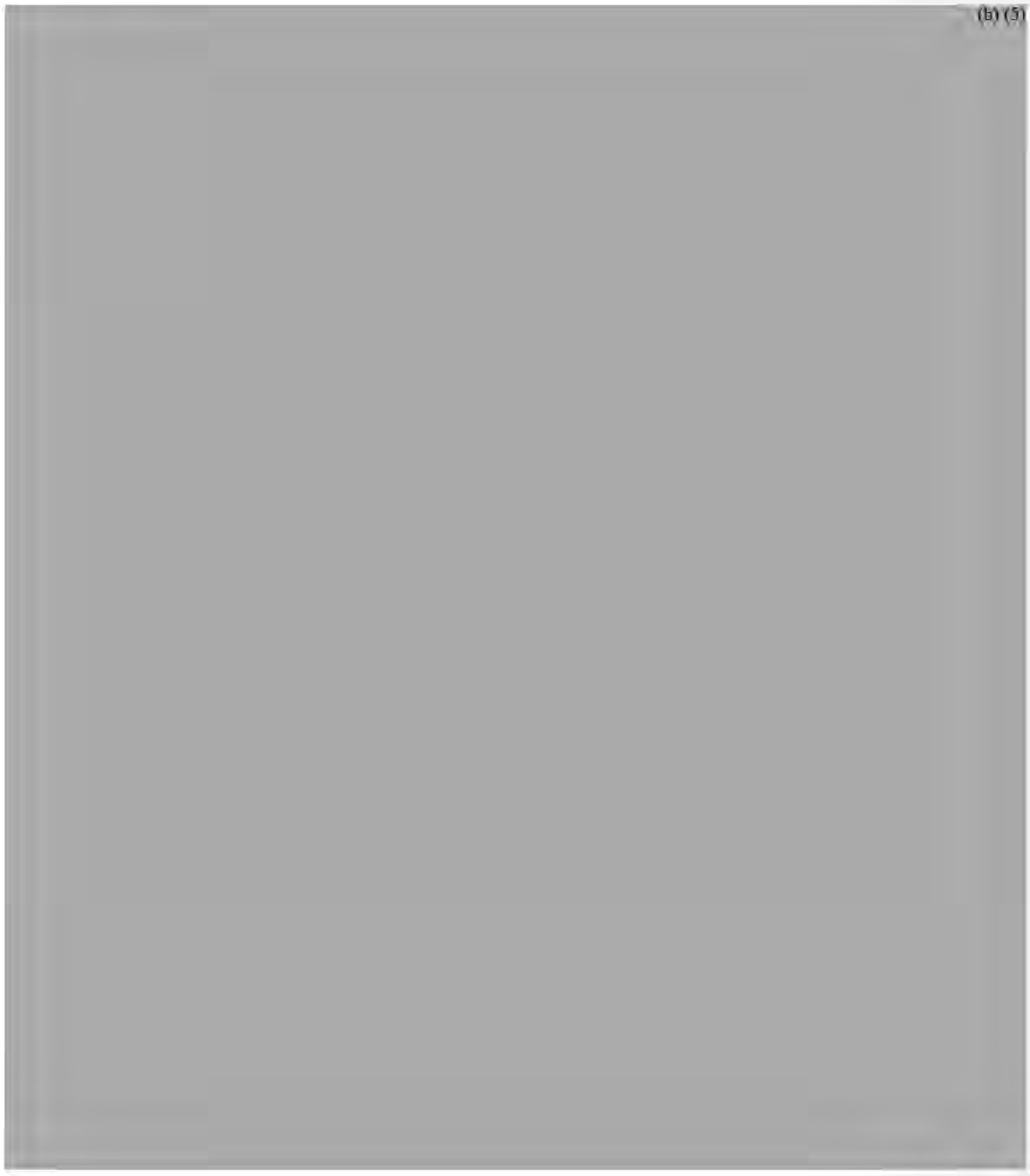
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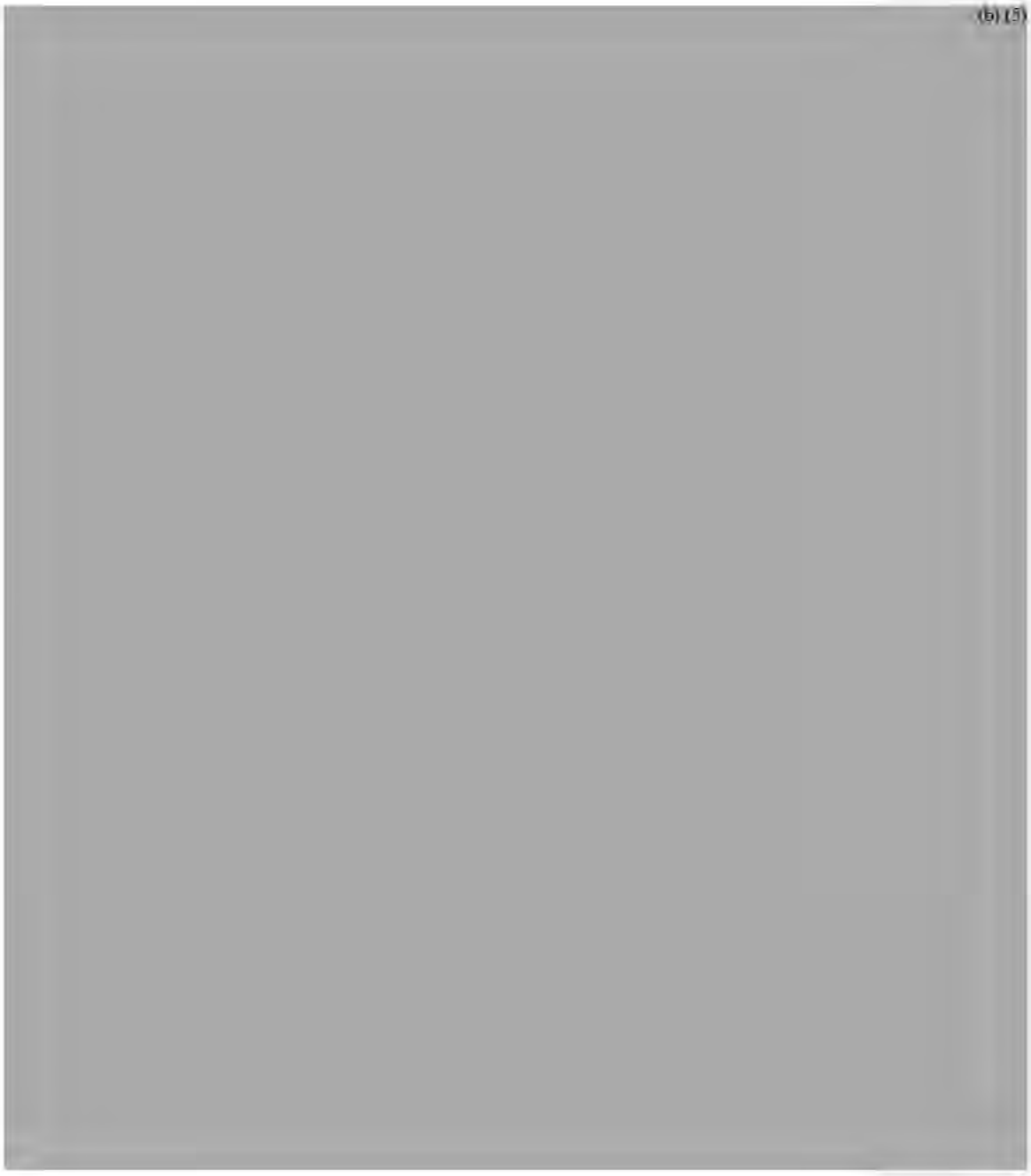
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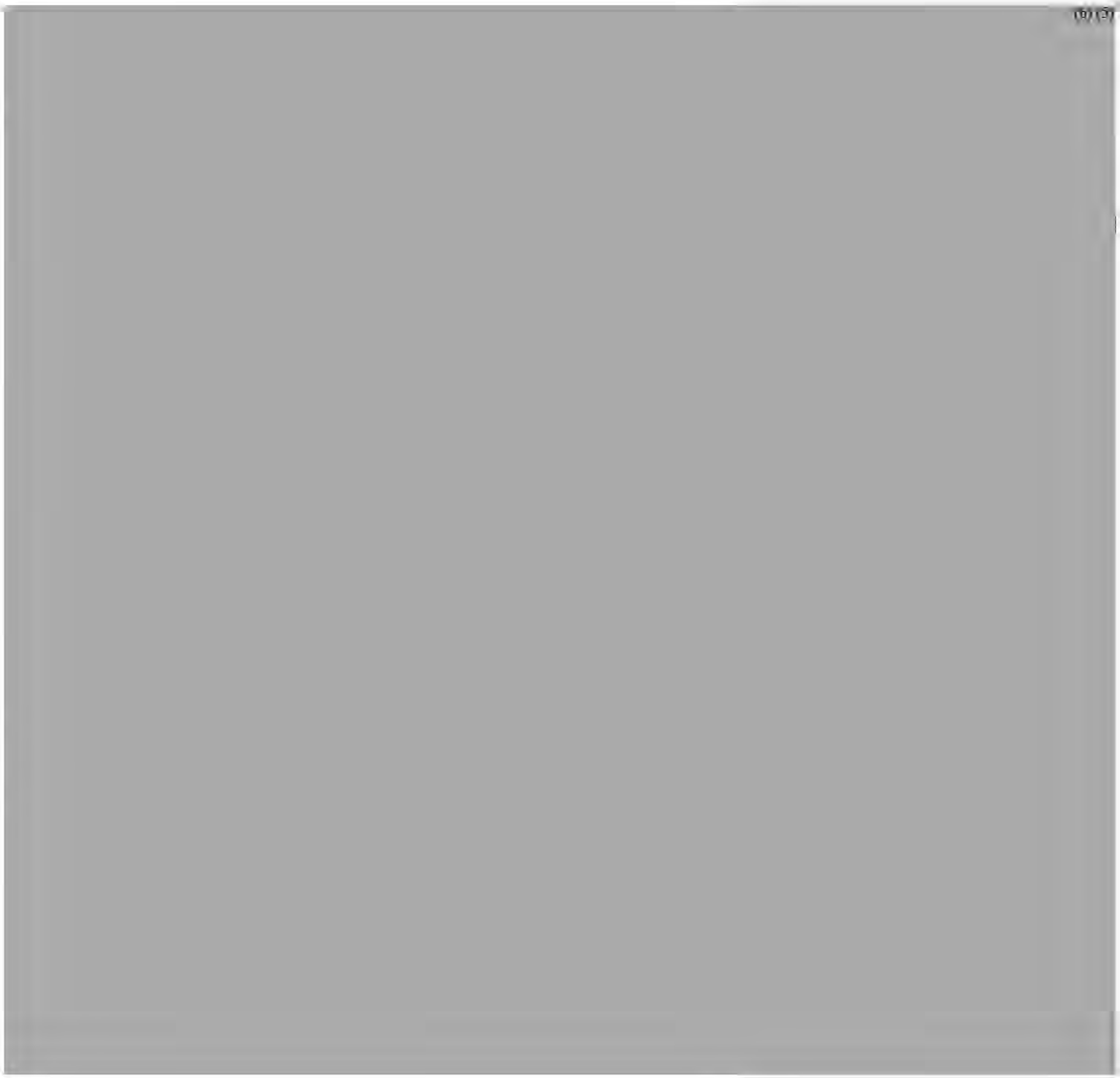

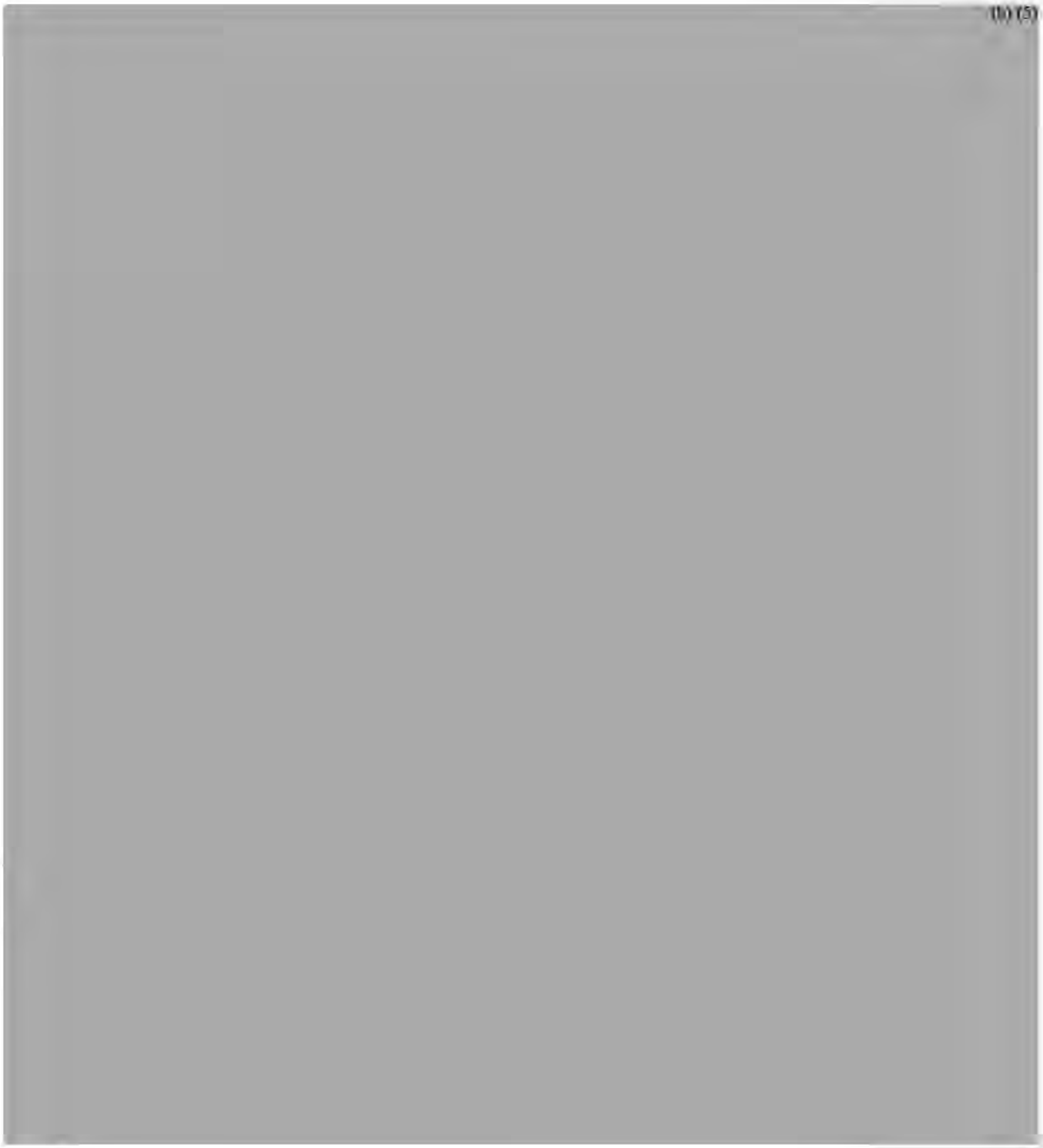
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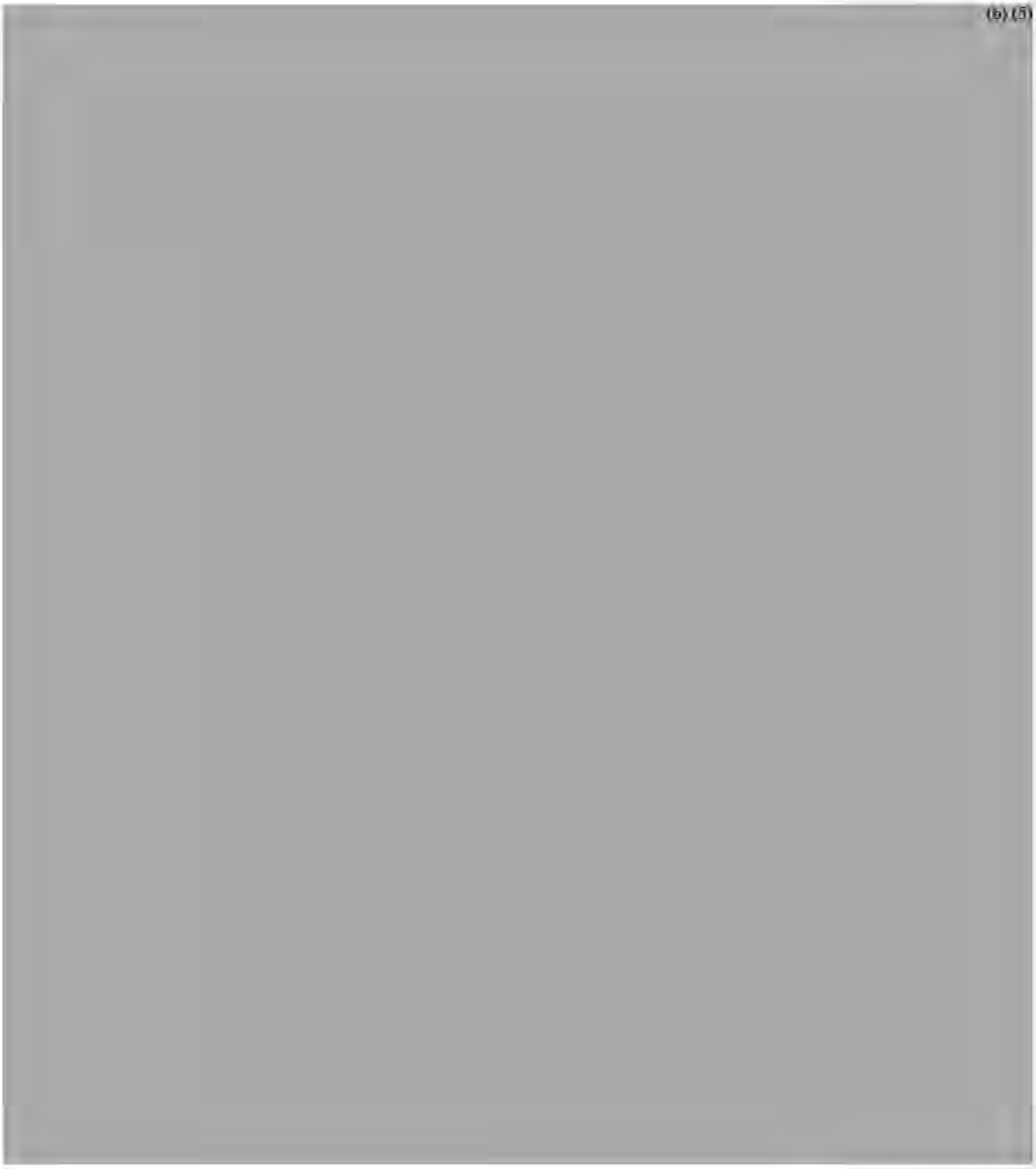
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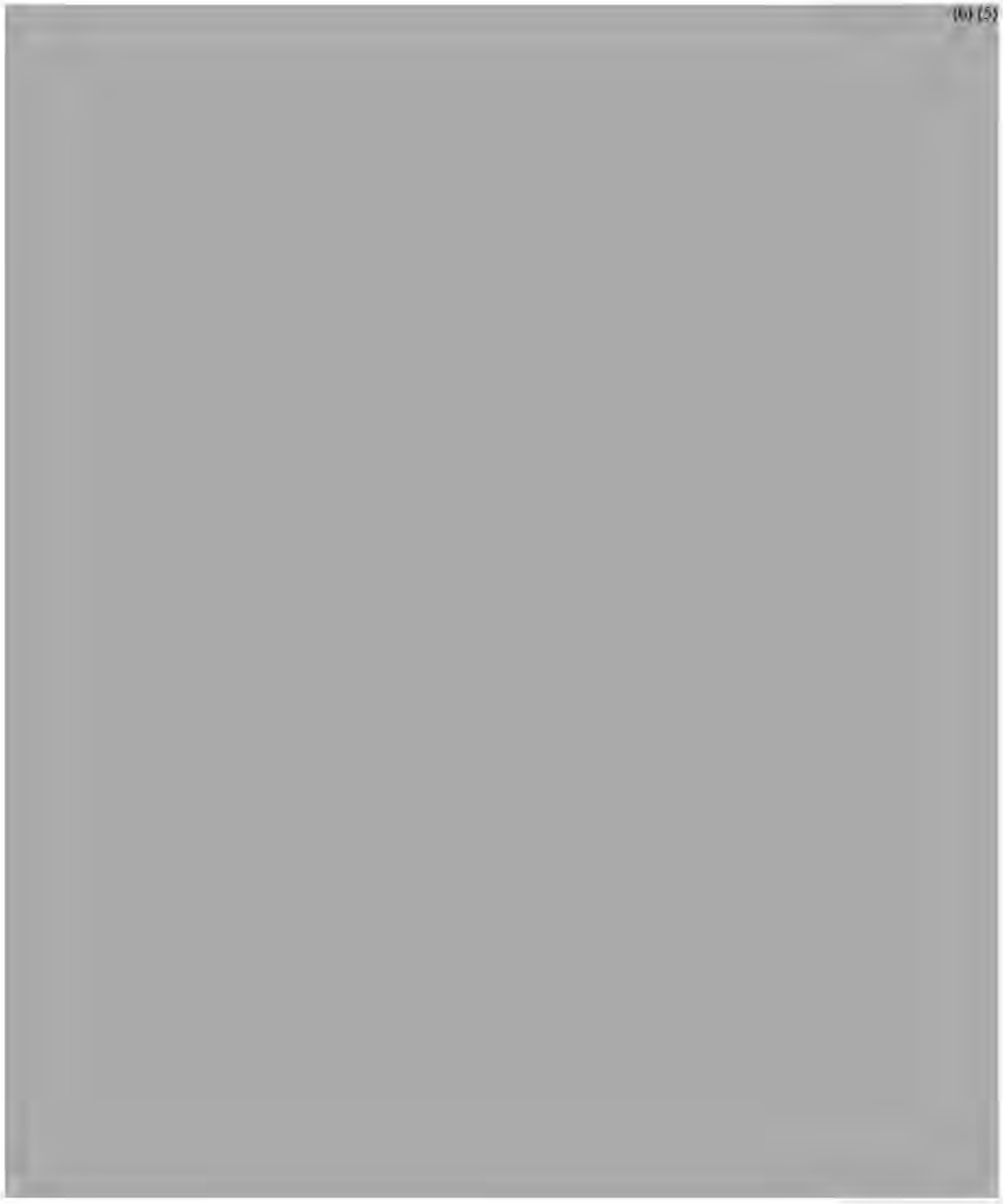
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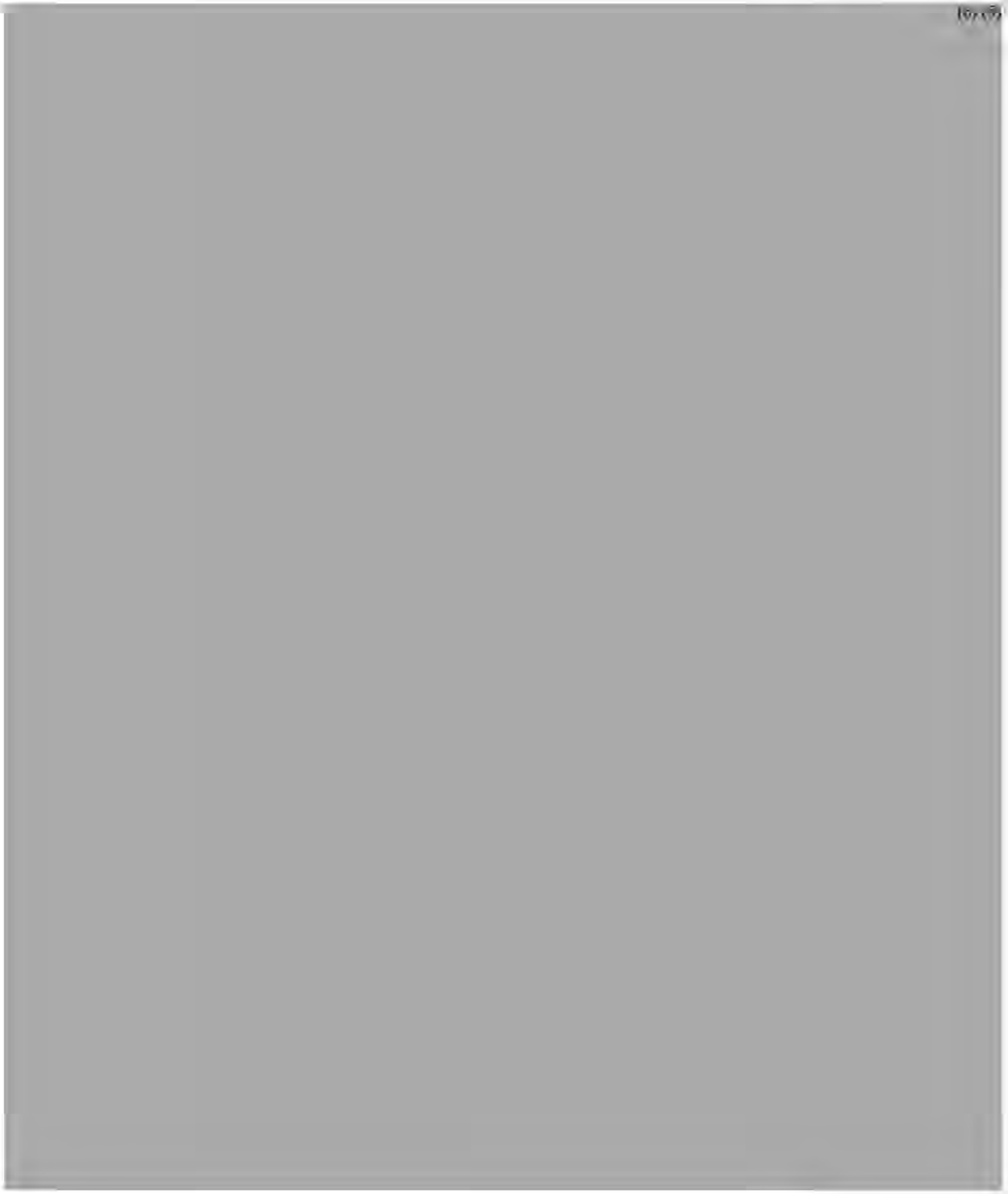

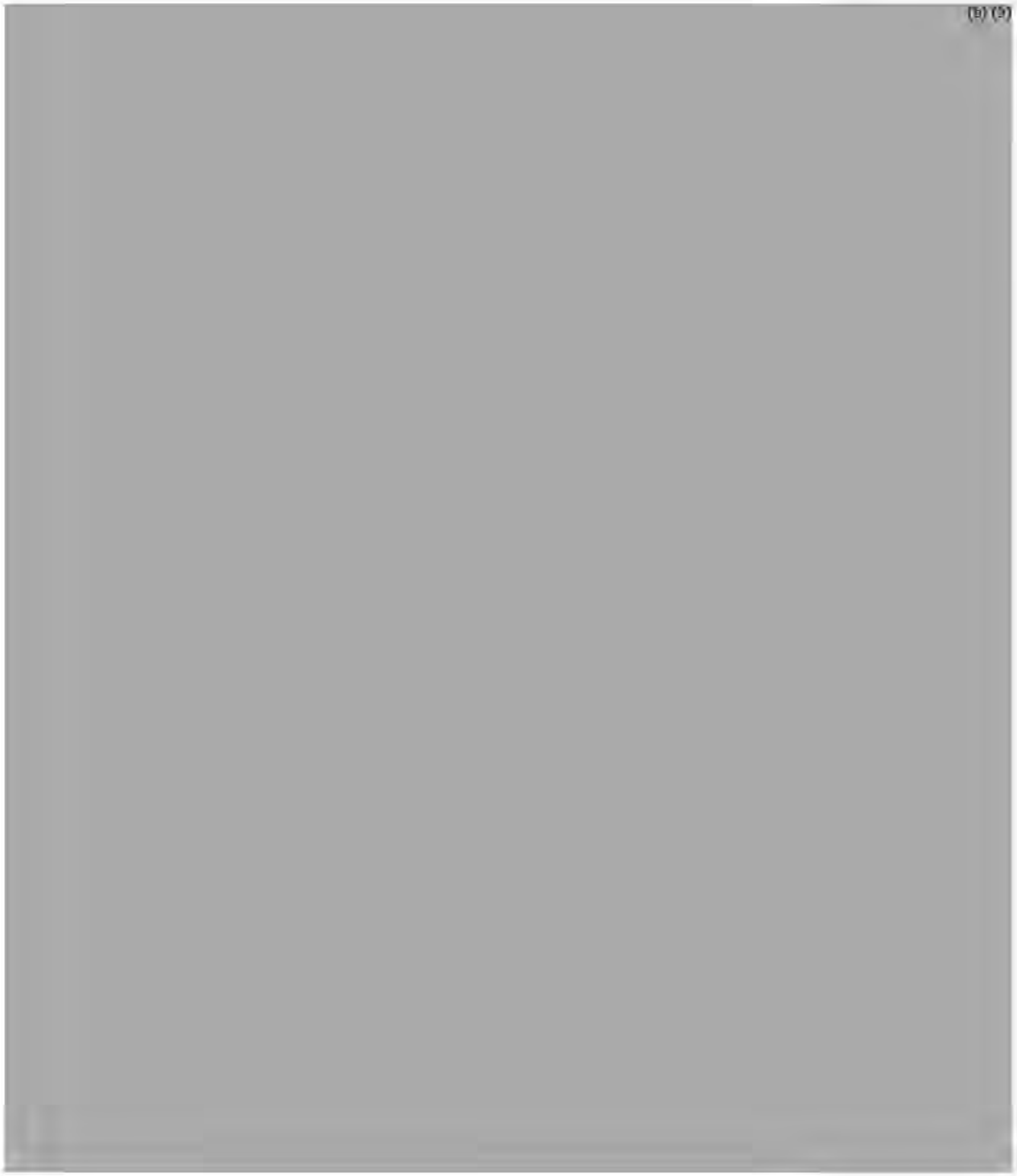
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(b)(3)

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Wed, 22 Apr 2020 00:16:44 +0000
To: Collins, Francis (NIH/OD) [E] (b) (6)
Subject: FW: For your attention
Attachments: COVAX2020 - A GLOBAL EFFORT for the ACCELERATED DEVELOPMENT, PRODUCTION and EQUITABLE ACCESS to COVID-19 VACCINES_16Apr2020_DRAFT.docx

See attachment that Hilary sent me. (b) (5)

From: Marston, Hilary (NIH/NIAID) [E] (b) (6)
Sent: Tuesday, April 21, 2020 7:44 PM
To: Fauci, Anthony (NIH/NIAID) [E] < (b) (6)
Subject: Re: For your attention

(b) (5)

From: Anthony Fauci (b) (6)>
Date: Tuesday, April 21, 2020 at 7:30 PM
To: Hilary Marston < (b) (6)v>
Subject: FW: For your attention

Have you heard of this on any of the calls where you represent me??

From: Collins, Francis (NIH/OD) [E] (b) (6)
Sent: Tuesday, April 21, 2020 7:28 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6); Lane, Cliff (NIH/NIAID) [E] (b) (6); Tabak, Lawrence (NIH/OD) [E] (b) (6)>; Freire, Maria (FNIH) [T] <mfreire@fnih.org>; Wholley, David (FNIH) [T] <dwholley@fnih.org>
Subject: FW: For your attention

Hi all,

See note below from Victor Dzau about a global effort on COVID-19. I can't tell if this is more than a fund-raising effort. I know we have Gates reps on our ACTIV working groups – has any of this plan come up, David?

Francis

From: Dzau, Victor J. <VDzau@nas.edu>
Sent: Tuesday, April 21, 2020 4:10 PM
To: Collins, Francis (NIH/OD) [E] < (b) (6)
Cc: Kanarek, Morgan <MKanarek@nas.edu>
Subject: For your attention

Dear Francis,
Congratulations on your launch of Public Private Partnership to speed COVID 19 vaccine and treatment options. This is very timely and much needed. Kudos to your leadership.
I am sure you are aware of a global coordinating effort to accelerate vaccines, diagnostics and therapeutics. I have been part of the conversation and planning along with Jeremy Farrar, Richard Hatchett, Seth Berkley, Chris Elias, Paul Stoffels etc. Recently WHO, Gates Foundation and European Commission have been leading the planning. This has advanced rapidly and is in the final stages in development that will be soon announced. It has involved European Commission, Germany, Japan, UK, Norway, France, Saudi as well as Gates Foundation, WHO, World Bank, Wellcome Trust, GAVI, Global Fund, CEPI, GPMB and private sector industry. The initiative will begin with a Pledge conference for $8B as a starting point. This will be led by President von der Leyen and is co-chaired by the above country leaders. This will occur on May 4. In addition by the end of this week or early next week there will be an announcement on the global coordinating structure with will involve Gates, WHO etc.
I am writing to be sure that you and the White House are aware of these upcoming events. Can you share this information with the White House? Besides you, who else should I share this information with? I will be happy to send you background documents if you wish.
Please call me anytime.
Best,
Victor

16 April 2020

COVAX2020 - A GLOBAL PARTNERSHIP for the ACCELERATED DEVELOPMENT, PRODUCTION and EQUITABLE ACCESS to COVID-19 VACCINES

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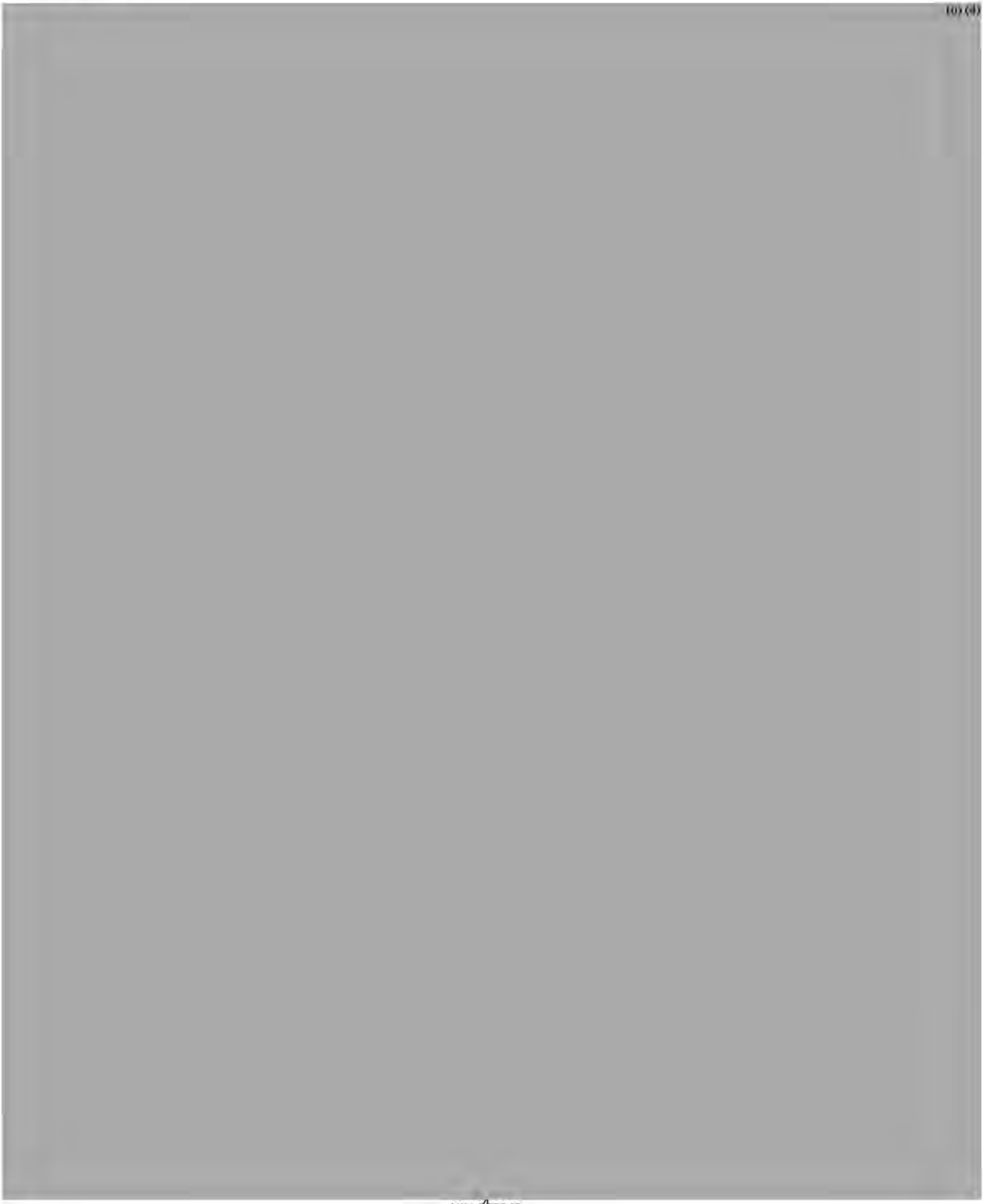


(b) (4)

[redacted]

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Tue, 21 Apr 2020 17:43:21 +0000
To: EDWARD SCOLNICK
Cc: Mascola, John (NIH/VRC) [E];Cassetti, Cristina (NIH/NIAID) [E];Marston, Hilary (NIH/NIAID) [E]
Subject: RE: for your consideration
Attachments: Scientists_to_Stop_COVID19_2020_04_15_FINAL.pdf

Ed:
Thank you for your note and for sending this. The outline that you provide is exactly in sync with what we are already doing and have definitive plans to do with regard to classic antivirals, monoclonal antibodies, and a variety of vaccine candidates. As you know, the candidate developed here at NIH in collaboration with Moderna is well into phase 1 trials and at least 2 others are entering into phase 1 trials.
Best regards,
Tony

Anthony S. Fauci, MD
Director
National Institute of Allergy and Infectious Diseases
Building 31, Room 7A-03
31 Center Drive, MSC 2520
National Institutes of Health
Bethesda, MD 20892-2520
Phone: (b) (6)
FAX: (301) 496-4409
E-mail: (b) (6)

-----Original Message-----
From: EDWARD SCOLNICK (b) (6)
Sent: Sunday, April 19, 2020 5:18 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b) (6)>
Cc: David R. Liu (b) (6); Schreiber, Stuart (b) (6); Michael Rosbash (b) (6)>; Ramnik Xavier (b) (6)
Subject: for your consideration

Tony . I hope your mail box is not so full that there is room for this. A group of concerned scientists from different parts of the country was organized to try to encapsulate and focus the national effort against Covid. This document has been shared with the White House although we are not sure if it has had any effect on their plans. It has also been shared with The Gates Foundation and a few other business and academic leaders. We think we have been fairly comprehensive in our considerations and recommendations. I hope you will find this helpful. We would greatly appreciate a conversation with you after you have had an opportunity to digest the content of the proposal. If there is anything else we can do to help you in this National emergency, we stand ready to help. When I was at Merck ,we led the successful
effort to make HIV a manageable disease and we dramatically lowered the death rate as a result of the drugs we made ,and the first triple therapy trial during the HIV pandemic. We hope we can help do the same for The Covid Pandemic Best wishes Ed scolnick

SCIENTISTS TO STOP COVID-19

April 15, 2020

We are a group of passionate citizen-scientists who offer four actionable, non-partisan proposals to produce safe and effective COVID-19 therapeutics and vaccines in the shortest possible timeframe, and to reopen our society in a manner that reduces the risk of future COVID-19 outbreaks. None of the contributors named in this proposal have any direct or known indirect financial interests in the referenced companies. Our only motivation is to help defeat the serious threat our nation and the world now faces.

The war against COVID-19 is being fought on multiple fronts: by our heroic healthcare workers on the front lines; by talented scientists in the laboratories of corporations and research institutions; by governments at the federal, state, and local levels; and by other citizens sacrificing their freedoms to limit the spread of the pandemic. Here we describe plans to develop therapeutics and vaccines, and to reopen our businesses and schools, that could be deployed in several waves.

We envision a **first wave of therapies using existing drugs** that will establish a beachhead in the fight against the virus (*testing in April-May 2020, use immediately afterwards*). A **second wave of potent new antibody drugs** developed specifically to neutralize COVID-19 offer a promising combination of speed, safety, and likelihood of being effective (*testing in June-August 2020, use afterwards*). A **third wave of vaccines for long-term victory over the virus** will offer seasonal or multi-year immunity to COVID-19 (*testing in March 2020-March 2021, use afterwards*). In parallel, **reopening of businesses and schools to restore our society and economy** (*implementation in May-June 2020, lasting until the threat has passed*) will use science-driven symptom reporting, virus testing, and personal protective gear to minimize future COVID-19 outbreaks and additional loss of life.

The four proposals that follow describe: (1) How to rapidly repurpose an antiviral drug to treat COVID-19 patients; (2) How to expedite the development of human antibody drugs to treat patients and to provide short-term protection for healthy individuals; (3) How to develop COVID-19 vaccines on an expedited time scale; and (4) How to reopen our businesses and schools in a manner that reduces the risk of future outbreaks and deaths.

It is critical that approaches to drugs, vaccines, and reopening our society be pursued and supported simultaneously. To defeat this novel coronavirus in the United States, and around the world, will require a massive and well-organized collaborative effort from government, industry, philanthropy, and citizens. It is vital that we establish these partnerships and take actions immediately.

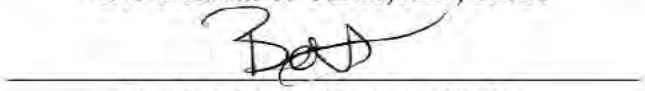
We hope these proposals will be considered with the seriousness and speed required by the current circumstances.

Sincerely yours,

Scientists to Stop COVID-19

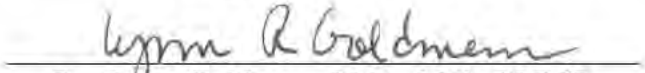
Dr. Thomas J. Cahill, MD, Ph.D.

Dr. Michael Rosbash, Ph.D.

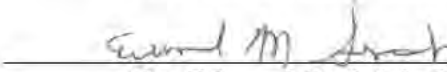


Dr. Benjamin Cravatt, Ph.D.

Dr. Stuart Schreiber, Ph.D.

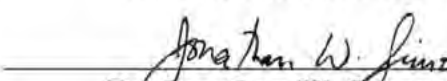


Dr. Lynn Goldman, M.D., M.S., M.P.H.

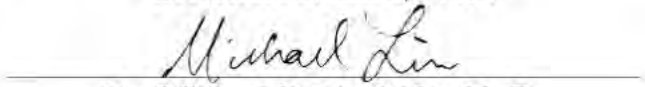


Dr. Edward Scolnick, M.D.

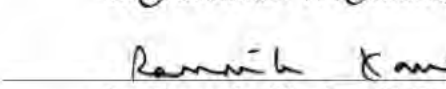
Dr. Akiko Iwasaki, Ph.D.



Dr. Jonathan W. Simons, M.D.



Dr. Michael Z. Lin, M.D., Ph.D.



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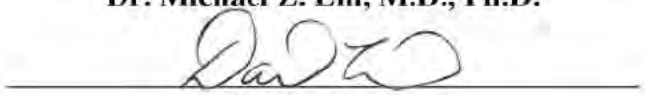
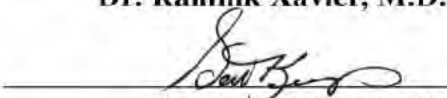


Dr. David Liu, Ph.D.



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None of the named contributors is aware of any direct financial interest in the companies mentioned herein and none receives compensation of any kind for his or her participation.

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I. FIRST WAVE: REPURPOSED DRUGS

Plan to prepare for immediate provisional use of a repurposed antiviral drug to treat COVID-19

In the immediate term, **remdesivir** has emerged as the leading candidate for an effective therapy in COVID-19. Here, we lay out the evidence for remdesivir's efficacy and safety and propose how to accelerate its approval and use to treat COVID-19.

COVID-19 is caused by the virus SARS-CoV-2. The genome of SARS-CoV-2—the genetic instructions required for its life cycle—is a single strand of RNA. A viral enzyme called **RNA replicase** must copy this strand of RNA in order for the virus to replicate. This enzyme does not exist in humans, and thus drugs that inhibit RNA replicase could effectively treat COVID-19 without harming patients**. A similar strategy of inhibiting a viral replicase was effectively used with HIV.**

As detailed below, given its favorable safety profile and preliminary evidence of efficacy, we believe it is essential to plan now to facilitate the use of remdesivir to treat COVID-19. We propose the following:

- **FDA should coordinate with Gilead**, the maker of remdesivir, to receive the results of their clinical trials as they come in, rather than wait for submission of a new drug application (NDA). NDA preparation often takes months after clinical trials are complete. FDA can dramatically shorten the process by examining the data themselves directly in real time without requiring NDA paperwork. If the results are clearly positive, then provisional approval can be granted.
- The government should take steps to **facilitate large-scale manufacturing of remdesivir** by **other U.S. drug companies** in addition to Gilead. For example, the government could identify companies with manufacturing capabilities suitable for remdesivir synthesis at scale and begin discussions with those companies to clear any regulatory hurdles needed to repurpose those capabilities for remdesivir production.
- Both of these steps are similar to what we have already recommended for monoclonal antibody therapy (see the proposal below).
- Remdesivir is being tested in multiple COVID-19 clinical trials. The drug is given intravenously, and the initial dose is 200 mg followed by 100 mg for 5-10 days. **We believe this dose may be too low and treatment should be administered earlier in symptomatic patients.** Whether higher doses could be given safely can be determined by examining the animal safety studies carried out by Gilead. If these studies do not reveal a potential safety issue at higher doses, then higher doses should be given as early as possible during infection. We speculate that the current dose is chosen because of limited supplies. We urge the government to determine the facts around this issue so optimal trial doses for efficacy can be determined.
- An inhaled form of remdesivir (instead of intravenous) is important so that treatment can be administered remotely. Government should help push this initiative through. GlaxoSmithKline (GSK) and AstraZeneca have experience in this area and might be helpful.

Below we present recent evidence from peer-reviewed publications that suggests remdesivir may turn out to be effective and safe for COVID-19. **Knowing how to most effectively and safely use remdesivir to treat COVID-19 will require properly designed randomized, controlled trials in actual patients**.

- A 2016 *Nature* article showed that **remdesivir inhibits viral RNA replicases and is safe and effective in monkeys infected with Ebola virus** (which, like SARS-CoV-2, is an RNA virus). At the highest dose of remdesivir, monkeys were *completely protected from death* caused by Ebola virus. Ebola virus infection is very rapid in Monkeys and the best results were observed when the drug was given early

after infection. **Early treatment with remdesivir, versus later in disease course, will also likely be a key determinant for success with coronavirus.**

- A 2017 *Science Translational Medicine* article showed that remdesivir was effective against coronaviruses, the family of RNA viruses to which SARS-CoV-2 belongs. Importantly, remdesivir was shown to inhibit SARS-CoV-1, whose RNA replicase is 96% identical to that of SARS-CoV-2; SARS-CoV-1 causes SARS through a process essentially identical to severe COVID-19 cases. Indeed, from a clinical perspective, SARS and COVID-19 could be considered two forms of the same disease. Remdesivir potently inhibited SARS-CoV-1 and other pathogenic coronaviruses in human lung cells with a therapeutic index of over 100, meaning that the dose required to stop the virus was at least 100 times lower than the dose required to show any toxicity to cultured human lung cells. This study also showed that remdesivir inhibited SARS-CoV-1 replication in lungs of infected mice.
- **Remdesivir has already been shown to be safe in humans**. In a trial of Ebola patients described in 2019, remdesivir did not show any noted toxicity. Safety is the primary barrier to wide use of any experimental drug, and this trial proved remdesivir can be safely used in humans (Mulangu *et al., New England Journal of Medicine* 2019).
- Remdesivir can be dosed to sufficient concentrations to have antiviral effects. In this same 2019 study, it was effective at reducing Ebola virus levels. Ebola virus is not a coronavirus, but this result demonstrates that **remdesivir can reach concentrations in humans that have an antiviral effect.**
- **We believe too low a dose of remdesivir was used in the Ebola trial. A dose of 10-20 mg/kg should be considered in the current clinical situation. We elaborate on this point later in this memo.**
- In monkeys infected with MERS virus, which is 50% identical to SARS-CoV-2, remdesivir inhibited viral replication and reduced lung damage (de Wit *et al., PNAS* 2020). Thus, **remdesivir can inhibit disease caused by a coronavirus in primates.**
- In human cells in the lab, **remdesivir inhibits replication of SARS-CoV-2**, the virus causing COVID-19. (Wang *et al. Cell Research* 2020)
- remdesivir has already been given on a compassionate use basis to many COVID-19 patients, and a case report exists (e.g., Holshue *et al., New England Journal of Medicine* 2020). No major adverse effects have been reported, suggesting that **remdesivir is safe in COVID-19 patients.**
- **These case reports emphasize that knowing how to most effectively and safely use remdesivir to treat COVID-19 will require properly designed, randomized, and controlled trials in actual patients.**

Therefore, we await the final and most important piece of information: the results of properly designed, randomized clinical trials of remdesivir in COVID-19 patients. There are over 20 such trials currently in progress worldwide. These trials will tell us how effective remdesivir is at treating COVID-19, how early in the disease remdesivir should be given, and the best dosage. The first remdesivir trial was initiated in February 2020 in China and results are expected later this month. Given the above preliminary evidence of efficacy and safety, it will be a surprise if remdesivir does not have a positive effect.

In assessing the potential widespread use of remdesivir in infected patients, certain points are critical:

1. The proper dose of the drug needs to be determined. FDA previously limited the dose based on reversible liver function tests; an increase in dose may be possible without compromising safety.

2. If scrutiny of preclinical safety data confirms that such higher doses can be used, we are optimistic that **administering the drug early in infection will be helpful**. In the *NEJM* case report, the drug was not given until day 7 of infection and seemed to already offer clinical benefit by day 8.
3. Supply of the drug is crucial. We speculate that the low dose used in the Ebola trial was chosen based upon a limited supply. The government needs to determine how quickly millions of doses can be manufactured and whether contract companies need to bolster what Gilead can do in their own manufacturing facilities. Gilead has recently released a letter underlining the limited doses that will be available. Gilead is ramping up their production capabilities. However, their estimate of how many patients can be treated will depend upon a future determination of optimal dose.

It is important to understand both the benefits and limitations of remdesivir compared to other therapeutic options, including the neutralizing human monoclonal antibodies we recommended in our first proposal. Based on the experience with Ebola (Mulangu *et al., New England Journal of Medicine* 2019), remdesivir is unlikely to be better for COVID-19 than the best monoclonal antibodies currently under development. However, monoclonal antibodies will not be available for a few more months, and for this reason we consider them part of a **second wave** of therapies entering clinical trials in the summer. A **first wave of therapies can *only* come from repurposed drugs**. Since neutralizing monoclonal antibodies function by a distinct mechanism, it is also possible that the combination of monoclonal antibodies and remdesivir will be an even more effective second wave therapy than either single agent alone.

Finally, we recognize that other repurposed drugs and drug candidates have also garnered promising data, including other antivirals such as niclosamide, favipiravir, camostat, hydroxychloroquine, and chloroquine, as well as drugs that alleviate the excessive immune responses that can cause death (inflammation blockers such as tocilizumab). In addition, novel therapeutic modalities, such as Alnylam's use of silencing RNA molecules to destroy viral RNAs that are essential to the SARS-CoV-2 life cycle, are also promising and offer unique strengths, although most novel modalities will require additional time for validation in animals before clinical trials can begin. A fairly comprehensive list of potential COVID-19 therapies is maintained by the Milken Institute: **https://milkeninstitute.org/covid-19-tracker**. **Many of our suggestions, while presented for remdesivir, are also applicable to other drug candidates**. However, prioritization may be necessary to widely deploy any repurposed drugs on a greatly accelerated time scale.

II. SECOND WAVE: ANTIBODY THERAPIES

Plan for widespread deployment of an antibody therapy and short-term vaccine by Fall 2020

American biotechnology companies have **already cloned antibodies against COVID-19** virus from recovered patients and mice with human immune systems, and determined which antibodies are especially effective at neutralizing the virus in petri dish experiments. These **monoclonal antibodies** can now be used both to **prevent** COVID-19 like a short-term vaccine, and to **treat** COVID-19 patients.

Two American companies (Regeneron Pharmaceuticals and Vir Biotechnology) are leaders in the monoclonal antibody space. Both of these companies have (1) a proven track record of developing similar therapeutics on expedited timelines (i.e., for Ebola virus); (2) development timelines for COVID-19 therapeutic candidates that are leading the industry; and (3) manufacturing capabilities to enable 100% of their production be done in the United States. Although other COVID-19 therapeutic strategies must be advanced in parallel, we consider these monoclonal antibodies to have the highest likelihood of succeeding for the following reasons.

- Antibodies can **protect** healthy critical workers, as well as "high-risk" individuals.
- Antibodies can also **treat** those already infected, as demonstrated during the Ebola outbreak.
- Human antibodies are routinely administered, for example in cancer therapy and in travel shots, and are considered **very safe**. Indeed, the antibody-containing serum of recovered COVID-19 patients is already being used to treat small numbers of critically ill patients.
- This approach has the potential to be in human clinical trials by **June**, and if expedited with assistance from the government, to be approved by **this summer or fall**—far sooner than traditional vaccine or drug development approaches. This timeline is based on the recent experience American companies have had in producing an **effective** treatment against Ebola **in record time**.

To accelerate the testing, approval, and distribution of monoclonal antibodies against COVID-19, **there must be regulatory flexibility and focused efforts to eliminate all avoidable bottlenecks** via the following steps:

- These companies will be submitting investigational new drug ("IND") applications to initiate clinical trials to the FDA in the near future. **We suggest the WH and FDA leadership work directly with these companies on a regular or daily basis.** The WH can then ensure that the FDA asks all its questions to these companies **before** receiving the IND. Standard rules are that companies must wait 30 days after submitting an IND before initiating trials. We recommend that the FDA **allow trial initiation immediately upon IND receipt** as their questions will have already been answered. *Desired timeframe: April-June 2020.*
- The FDA should allow, encourage, and facilitate the task of scaling up production of COVID-19 treatments prior to final approval; this is, of course so that treatments can be broadly available to the public the day of approval. For example, the FDA could quickly approve new or overseas plants for the production of other medicines, so that **U.S. plant can be devoted entirely to manufacturing COVID-19 treatments**. Similar manufacturing assistance should also be offered to all U.S. companies well-positioned to pursue the monoclonal antibody approach. All other rate-limiting manufacturing issues should be addressed now. If the above steps occur expeditiously, it should be possible to manufacture antibodies for COVID-19 at a scale sufficient for widespread deployment in the late summer or early fall of 2020. *Desired timeframe: June-August 2020.*

- Engage **other large U.S. biomanufacturers to contribute their capacity** to the manufacturing effort, to further expedite broad availability upon FDA approval. *Desired timeframe: June-August 2020.*\
- Clinical trials usually begin with a small safety trial in a small number of people. We suggest monoclonal antibody treatments be allowed to proceed directly to a **larger efficacy trial** (e.g., by employing dose-titration in infected individuals, etc.) with enough patients to reveal how well the antibodies work, ideally both as a treatment and as a short-term vaccine. Scientists and physicians have enough experience with other virus-neutralizing antibodies to know the dose required. Safety will be confirmed simultaneously in this efficacy trial. *Desired timeframe: June-August 2020.*
- Following a successful clinical trial, a company reports the results and formally submits a new drug application ("NDA"). FDA review of an NDA normally takes 9-12 months. Given the state of the pandemic, we recommend that the FDA communicate daily with these companies during preparation of the NDA to assure all required components are included, and then **complete the NDA review within 1 week of receipt** since its questions will have already been answered prior to submission. *Desired timeframe: August-September 2020.*
- Given the efforts outlined above to preemptively mass-produce treatment in advance of the clinical trial outcome, broad administration can begin both as a treatment (prioritizing critically ill patients) and as a short-term vaccine immediately upon FDA approval. *Desired timeframe: August-September 2020.*

Other necessary associated efforts that must be pursued in parallel:

- **Tests for viral load and for prior infection**: Ensure availability of the fastest and most reliable test for measuring the amount of virus in the blood in patients at the point of care. These tests are necessary to ascertain if the treatment is working.
- **Serological (antibody) testing:** These tests reveal if an individual was previously infected. They provide important demographic data to guide public-health policy and are especially important for determining which individuals are eligible to participate in the trials of new drug candidates.
- **Notify hospitals** where the trials will take place as soon as possible so the hospital institutional review boards ("IRBs") do not delay approval. Ensure there is no red tape at any of the above steps.

Timeline summary:

- By June 2020: investigational new drug application submitted and reviewed; efficacy clinical trials begin.
- June to August 2020: manufacturing ramp-up and antibody production for broad and nationwide administration.
- August 2020: Proof of efficacy in preventing infection and/or treating disease obtained from clinical trials; if positive, as anticipated, very rapid FDA approval of a new drug application.
- August-September 2020: widespread administration of antibodies to the American population. We believe this will make a major contribution to preventing a second wave of disease in the fall, which will impede, if not destroy, our societal and economic recovery.

III. THIRD WAVE: VACCINES

Plan for rapid development of a vaccine against COVID-19 and future pandemics

As with many other infectious disease epidemics, eventual control will require the development and implementation of an effective vaccine that can provide population-wide immunity against the pathogen. **This third wave vaccine-based approach will establish long-term victory over the virus.** Historically, the average time for new vaccine approval is six to eight years. The current unprecedented nature of the COVID-19 pandemic requires immediate and unique action. Some approaches currently being pursued include inactivated virus particles (Sinovac), recombinant proteins (Sanofi), live hybrid viruses (Janssen), and RNA-based vaccines (Moderna, CureVac, BioNTech/Pfizer, Translate/Sanofi). More examples are listed at milkeninstitute.org/covid-19-tracker. It is not known yet if vaccines will need to be seasonal, as with influenza, or will provide durable long-term immunity, as with measles. *Timeframe: testing in March 2020-March 2021, use afterwards.*

- We propose that the federal government appoint an empowered council who will work with U.S. and global stakeholders to coordinate the required development and investment actions in an efficient, time-sensitive, and non-partisan way.
- It is essential for speed, assessment of comparative clinical data and prior immunity, and manufacturing at scale that a standardized clinical assessment approach be devised and supported by key regulatory authorities.
- We propose a centralized funding source to effectively allocate resources and personnel.
- The coordination must involve the end-to-end vaccine R&D process, including the developers, regulators, funders, and global stakeholders.

The proposed centralized approach has proven effective in the past while responding to national and global emergencies. A similar approach effectively accelerated the development of a polio vaccine in the 1950s. In this celebrated case, the private National Foundation for Infantile Paralysis (later known as the March of Dimes) provided centralized funding and technical decision making to ensure the development and availability of a vaccine for what was at the time a devastating infectious disease. **The same focus is required even more acutely to confront the current pandemic.**

The effectiveness and safety of a given SARS-CoV-2 vaccine design can only be assessed by clinical study. **Given the urgency of the SARS-CoV-2 pandemic, it is essential that a standardized clinical assessment approach be devised and supported by key regulatory authorities, both for speed and to ensure the ability to assess comparative clinical data.** Such a standardized approach is intended to provide a rapid progression to clinical study in a way that will yield the relevant safety and efficacy data in as short a period as possible, allowing for potential rapid deployment.

Manufacturing investments are quite substantial and, accordingly, will likely be made by government or large funding organizations. We must focus on manufacturing an effective vaccine at a scale that will permit world-wide use. In a typical vaccine development program, investments in scale-up and manufacturing are tied to an increasing understanding of a given vaccine's clinical potential. Such a measured approach **is not viable** for SARS-CoV-2 because of the urgency. **Large at-risk development decisions will need to be made, for each individual promising vaccine candidate, well before significant clinical data become available**. However, given the scale of the at-risk investments, the number of vaccine approaches in which such investments can be made will necessarily be smaller than the much larger number of all SARS-CoV-2-related vaccine R&D efforts.

At present, the non-company funding sources for the large majority of SARS-CoV-2 vaccine efforts globally include the Coalition for Epidemic Preparedness (CEPI), the Biomedical Advanced Research and Development Authority of the U.S. government (BARDA), the Bill & Melinda Gates Foundation (BMGF), and an increasing number of sovereign country governments. CEPI (**www.CEPI.net**) is funded by the BMGF, the Wellcome Trust, and several European governments. BARDA is a part of HHS and is fully funded by the U.S. Government. BMGF is the world's largest private charity. An effort is ongoing for these three largest funders to coordinate their support in a way that will allow for efficient decision making and use of available funds for at-risk investment and development support.

Given the increasing number of stakeholders involved in the COVID-19 vaccine effort, we are concerned that the effort will become diffuse and will not achieve the level and degree of focus required for a sufficiently swift pandemic response. **To that end, unprecedented transparency and coordination are required. Coordination must involve the end-to-end vaccine R&D process, including the developers, regulators, funders, and global stakeholders.**

Such coordination requires centralized decision making to manage the activities across multiple individual promising approaches, and among the supporting functional and funding efforts—thus our recommendation to appoint an "empowered council". A prospective agreement must be established primarily among the regulators, the key funders, and key global stakeholders to ensure that the empowered individual has the authority to direct the overall enterprise. The empowered individual should have a strong technical/scientific background with direct experience in the previous development of infectious disease vaccines. Decisions and direction by this individual should be based on his/her technical and scientific judgment supported by a small group of similarly technical and experienced advisors. Such a central coordinating and decision mechanism can ensure alignment among regulatory requirements for clinical and pre-clinical evaluation of vaccine candidates and can effectively manage the large at-risk scale-up and manufacturing investments needed to ensure ready availability of a vaccine as soon as its safety and efficacy has been demonstrated. It can also manage the complexities of the multiple parallel technical approaches that will be required.

Over the years, vaccine R&D for other human and animal pathogens have led to the development of a number of different "vaccine platforms," most of which can potentially be adapted for the design of a potentially effective vaccine against SARS-CoV-2. Many organizations and companies are currently involved in designing various vaccine approaches using either internal funding or funding from various support sources (see later). Among these efforts, Moderna's RNA-based vaccine has already commenced clinical trials, and whether subjects create protective antibodies will be assessed in the next few months. However, whether this vaccine safely prevents disease may take longer to assess, and Moderna does not anticipate widespread implementation for at least 12 months. We recommend a centralized approach to manage the anticipated flow of clinical data as we evaluate the various vaccine candidates. Such a standardized approach is intended to provide a rapid progression to clinical study in a way that will yield the relevant comparative safety and efficacy data in as short a period as possible, allowing for potential rapid deployment.

IV. RESTORING OUR SOCIETY AND ECONOMY
A COVID-19 Risk Reduction Plan for Reopening Schools and Businesses

While drastic social-distancing and lock-down measures remain a necessary step to disrupt the exponential spread of COVID-19 in the United States, reopening our economy is increasingly urgent for the welfare of many Americans. In this document we propose a plan for returning people to schools and businesses in a manner that reduces the risk of future COVID-19 outbreaks and loss of life, for example from a "second wave" of the disease in the fall.

Once current social-distancing measures are lifted, the current policy of testing only symptomatic individuals cannot adequately curtail COVID-19 transmission. For example, a study of COVID transmission in Wuhan, China occurring between February 1 and March 12—when Chinese health officials were carrying out house-to-house temperature checks on the general population—found that even with such intrusive measures 86% of COVID cases were not identified, likely because the majority of infected persons had very mild symptoms.[1]

In this proposal, we describe a policy that requires individuals returning to schools and work to take three key steps: 1) to report symptoms daily before working; 2) to participate in frequent virus (PCR) testing; and 3) to wear certain personal protective equipment (PPE). We assess that this policy will substantially reduce the risks associated with reopening our society and restoring our economy, thereby protecting our recovery.

Daily Certification of Symptoms

All employees and students must **certify (via smartphone app), before leaving home, that they are not experiencing enough of the following COVID-19 symptoms** to exceed a calculated risk, weighted by symptom frequency, of being infected with SARS-CoV-2 (incidence frequency and standard error are shown, with data sources):

a. Fever (0.64±0.030)[2–4]
b. Sinus pain (0.50±0.18)[4]
c. Cough (0.46±0.032) [2–4]
d. Reduced or altered sense of smell or taste (4/9)[4]
e. Expectoration (0.32±0.036)[3]
f. Stuffy nose (0.25±0.15)[4]
g. Chills (0.18±.044)[2]
h. Fatigue (0.18±0.025)[2,3]
i. Sore throat (0.13±0.039)[2]
j. Headache (0.13±0.037)[2,4]
k. Difficulty breathing (0.11±0.034)[2,4]
l. Joint or muscle pain(0.099±0.023)[3,4]
m. Diarrhea (0.056±0.015)[2–4]
n. Vomiting (0.026±0.018)[2]

This certification should detect the vast majority of symptomatic cases, including mildly symptomatic ones, among those who accurately respond. None of these individual symptoms are specific to COVID-19, but in aggregate they can be used to assess an individual's risk of being infected with SARS-CoV-2, and even if caused by other pathogens are a prudent basis for staying at home. The acceptable level of calculated risk may differ among occupations (for example, nursing home caregivers could be subject to a very low risk threshold). We note that symptomatic patients are thought to be contagious prior to feeling symptoms, and that a large fraction of infected persons may remain asymptomatic for the entire course of the infection.

Estimates of the continually asymptomatic fraction have been made from several closed-cohort studies. One study using data from Japanese citizens evacuated from Wuhan estimated the asymptomatic fraction at 31%

(95%CI 7.8%–54%).[5] Another study using data from the Diamond Princess cruise ship (which had an age distribution skewed older than the general population) estimated that 18% (95%CI: 16–20%) of infected persons remain asymptomatic, subject to assumptions about the incubation period.[6] In contrast, a third study of 4,950 close contacts found that only 6.2±2.2% of infected persons were fully asymptomatic throughout the course of the disease, but that an additional 38±5.4% showed only mild symptoms and may not have considered themselves to be infected.[3]

These data emphasize the importance of respondents giving accurate answers to survey questions and using centralized algorithms, rather than individual judgment, to make decisions about who can engage in work and school activities. A variety of strategies can be used to increase compliance, including assurances of pay while at home with symptoms. The calculated risk threshold can be set by governments and adapted to respond to real-time epidemiology.[7]

We also considered the use of fever screening devices that rapidly measure the temperatures of people at the entrances to schools and businesses. However, we are concerned that questions about the accuracy of this method, the availability and cost of fever screening devices at the scale needed, and the fact that fever screening assesses only one COVID-19 symptom may limit its practical usefulness in the current situation.

Whether fully asymptomatic COVID-19 cases pose an infection risk to others remain to be seen. We are only aware of one study that examined this question, but the statistical uncertainties were too large to make a useful deduction of the asymptomatic carrier risk.[3] However, because asymptomatic case fractions may be large, and because even symptomatic cases may be contagious prior to the onset of symptoms, frequent virus testing to detect viral presence is essential, in addition to a daily survey of symptoms.

Frequent Testing for Virus

Several methods, including PCR, can detect viral RNA in specimens collected from individuals. The sampling and analysis procedures for PCR tests, however, yield a significant false-negative rate, which means that relying on only a single PCR test for each individual may be insufficient. For example, in the case of tests performed on close-contact cohorts, throat-swab PCR was found to have a false-negative rate of 28.7% after one sample, reduced to 7.8% with a second sample at a later time. Another study found that China's national PCR test had a false-negative rate of 34%.[8] Note that the sensitivities of PCR tests for asymptomatic and pre-symptomatic cohorts have not been separately established. The steps described below, coupled with the certification of symptoms described above, will provide the data needed to establish these sensitivities.

Nasopharyngeal or throat-swab PCR sampling is too invasive and demanding for regular mass testing. **As an alternative, we propose frequent—ideally, daily—virus testing of all people returning to school or businesses from samples collecting by having people spit into barcoded tubes.** In one study of SARS-CoV-2 PCR tests, saliva collected from an individual's tongue was found to have 93.3±0.5% the sensitivity of samples taken from nasopharyngeal swabs.[9] Another study not specific to SARS-CoV-2, found that saliva was generally identical in sensitivity to nasopharyngeal swabs for most respiratory pathogens, but there was a high-rate of discordance between the two sampling locations (i.e., two-location sampling would substantially reduce false negatives but with a higher sample-collection burden).[10] These data suggest the probability of a single salivary PCR detecting a typical symptomatic person is about 67%. Collecting at least two specimens (which can be pooled) from an individual each day would greatly increase overall sensitivity. In addition, increasing the number of PCR cycles performed will also greatly increase the sensitivity of PCR testing, at the expense of a higher false positive rate.[8] However, "weak positives"—those with C_t values high enough that they would not have been detected with a standard PCR test thresholds—can be re-tested immediately the next day before work, requiring only a one-day quarantine (or less) while the follow-up test is processed. PCR primer sets that amplify endogenous human RNAs known to occur in saliva[10a] can be used as positive controls to authenticate sample collection and testing procedures.

From a practical perspective, samples for mass virus testing should ideally be collected at the end of the workday, processed overnight, and reported to individuals before they decide to come to work or school the next morning. Positive virus tests result in immediate quarantine, contact tracing, and quarantine of close contacts, ideally in coordination with state and local public health officials if governments succeed in establishing urgently needed contact tracing infrastructure. For the many employers and schools that will not be able to establish such a sample collection and testing capability, governments should facilitate the ability of drug stores and other local point-of-care facilities to perform standardized virus tests. We appreciate that this second component of our proposal is a major undertaking, but we anticipate that frequent testing of all people returning to work and school is critical to restarting our society and rescuing our economy while minimizing the chance of new outbreaks that force future shutdowns and cause additional loss of life.

Required Personal Protective Equipment (PPE)

We recommend that wearing PPE throughout the work or school day become a requirement. Multiple studies have shown that the single most effective piece of PPE is a face mask or respirator. **For the general public, we recommend surgical-style masks, with simple training on their use**. Surgical masks have been shown to be effective with an odds ratio of 0.32 (95%CI: 0.25–0.4), meaning that a person reduces their risk of contracting respiratory viruses to 32% of the normal risk by wearing a surgical mask.[11] N95 respirators can be even more effective, but are more difficult to acquire in mass quantities, and too burdensome to wear for prolonged periods to expect good compliance from most individuals. N95 respirators provide an odds ratio of 0.09 (0.03-0.30), with the high variance emphasizing the importance of leak-tight fit and proper use, which is difficult to maintain outside a trained user cohort.[11] Controlled comparisons of surgical masks and N95 respirators in real-world settings of occasional exposure have found them similarly effective in reducing respiratory infections.[12] Surgical masks therefore strike an optimal balance between availability and practical effectiveness for most people.

In contrast, cloth masks were reported to be 63% as effective as surgical masks in preventing any respiratory symptoms for the wearer, and only 8% as effective in preventing influenza-like illness.[13] As such, we recommend that **wearing surgical masks (or, for high-exposure settings, N95 respirators with appropriate training), rather than cloth masks, be required for entering schools and businesses**. We note that studies on the lifetime of coronaviruses on surfaces including paper[14a] suggest that if masks are in limited supply, reusing masks that have been stored away from human contact for 5-7 days may pose minimal additional risk.

Gloves can also lower infection risk, offering an odds ratio of 0.43 (95%CI: 0.29-0.65) in a hospital setting.[11] They could also be required, although proper use habits are needed for gloves to be effective. We anticipate that many people not accustomed to the uses of gloves for biomedical purposes will contaminate themselves, surfaces, or others through improper use.

Antibody (Serological) Testing

Antibody tests are an important tool in the fight against COVID-19. Unlike PCR tests, which detect the presence of the virus's RNA genome, and thus can approximate how many virus particles are present in a patient sample, antibody tests reveal the presence of antibodies that a person's immune system has produced as a consequence of being infected with SARS-CoV-2. It is possible—perhaps even likely—that protection from future SARS-CoV-2 reinfection by a person's own antibodies can be strong and can last >1 year. This expectation is based on one preliminary study[14] of SARS-CoV-2 in monkeys, and one long-term study[15] of humans infected with the virus that caused the original SARS epidemic. Importantly, however, this critical information is not yet known with actionable certainty.

Antibody tests provide important information for guiding public-health policy. They are the best tool currently available to understand the percentage of people within a community that have been previously infected with SARS-CoV-2. Antibody tests thus reveal the extent to which transmission countermeasures have been effective, how many people may need a COVID-19 drug or vaccine in the future, and how far away we are from "herd immunity." Antibody tests can also serve a surrogate measurement of a person's immunity to reinfection, with the important caveats presented below. Therefore, they can also be used to identify especially vulnerable or less-vulnerable sub-populations (see below).

Vaccines are widely seen as part of the COVID-19 endgame. The Milken Institute currently lists 79 vaccine development efforts underway. **Antibody testing is important for vaccine development** in two ways:

1) Antibody testing is needed to identify individuals who are eligible for testing any COVID-19 drug or preventative, including vaccine candidates. People with pre-existing SARS-CoV-2 antibodies cannot be used to test the effectiveness of such candidate drugs or vaccines, because the potential ability of those antibodies to neutralize the virus could obscure the effect of the drug or vaccine candidate in people who have not been previously exposed.

2) Antibody testing is needed to assess the ability of a vaccine candidate to do its job—to elicit antibodies in the subject.

These key benefits highlight the importance of continued development and deployment of antibody testing. However, **we do not anticipate that antibody tests will have a major impact on reopening workplaces or schools in the near future** for the following reasons:

1) It seems likely that only a low fraction of the population by the late spring of 2020 will have been infected with SARS-CoV-2. This assessment is based on the number of reported and projected deaths (not reported cases, which are highly dependent on testing coverage) and current estimates of the infection-fatality rate. Therefore, it is unlikely that people with SARS-CoV-2 antibodies will represent a significant fraction of our students or workforce in the coming months. An important exception to this point is noted below.

2) It is not yet known what level of antibody titers offer what probability of re-infection resistance, or for how long, as noted above. It is even more difficult to know how this assumed correlation will vary among individuals.

3) Based on recent reports, it takes ~2 weeks from first symptoms for the substantial majority (>90%) of infected people to form robust antibody titers, with possible dependence on the level of symptoms in the patient (there are conflicting reports on the latter point).[16,17]

4) Protecting our citizens from future infection is the most important requirement for a successful restoration of our society. Virus (PCR) tests inform infectivity much more than antibody tests—indeed, antibody tests do not explicitly assess infectivity at all.

One important exception to the lack of applicability of antibody tests to reopening schools and workplaces in the near future is that some local communities have experienced outbreaks with much greater than 10% exposure. For examples, in some towns, ships, nursing homes, detention centers, shipping warehouses, and health-care settings, exposure has far exceeded the modest average fraction of infected persons nationwide. In these special cases, serological testing can be an important surrogate for identifying who is still vulnerable, and who may be at lower risk to return to work.

Finally, we note the danger of strongly associating a positive antibody test with the right to return to school or to work. Plans to reopen our workplaces and schools must **avoid the moral hazard of creating a perverse incentive to purposefully increase one's risk of exposure** to the SARS-CoV-2 virus in order to increase the chance of being able to return to their studies or professional work.

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