FOOD AND DRUG ADMINISTRATION (FDA)
Center for Biologics Evaluation and Research (CBER)
157th Vaccines and Related Biological Products Advisory Committee (VRBPAC) Meeting

OPEN SESSION - TOPIC I

FDA White Oak Campus
Great Room
Silver Spring, MD 20903

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This transcript appears as received from the commercial transcribing service after inclusion of minor corrections to typographical and factual errors recommended by the DFO.

ATTENDEES

Hana El Sahly, M.D.	Baylor College of Medicine
Hayley Gans, M.D.	Stanford University Medical Center
Holly Janes, Ph.D.	Fred Hutchinson Cancer Research Center
H. Cody Meissner, M.D.	Tufts University School of Medicine
Michael Kurilla, M.D., Ph.D.	National Institutes of Health
Sheldon Toubman, J.D.	New Haven Legal Assistance Association
Melinda Wharton, M.D, M.P.H.	Centers for Disease Control and Prevention
Tammy Beckham, D.V.M., Ph.D.	Department of Health and Human Services
Paul Spearman, M.D.	University of Cincinnati School of Medicine
Geeta K. Swamy, M.D.	Duke University
Steven A. Pergam, M.D., M.P.H., FIDSA	Seattle Cancer Care Alliance
Lisa L. Bollinger, M.D., FAAP	GRAAS, Research and Development Amgen
Carolyn Wilson, Ph.D.	Food and Drug Administration
Jerry P. Weir, Ph.D.	Food and Drug Administration
Marion Gruber, Ph.D.	Food and Drug Administration
Konstantin Chumakov, Ph.D.	Food and Drug Administration
Marian Major, Ph.D.	Food and Drug Administration
Serina A. Hunter-Thomas, M.S.A., R.N.	Food and Drug Administration
Prabhakara Atreya, Ph.D.	Food and Drug Administration
Monique Hill, M.H.A.	Food and Drug Administration

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CALL TO ORDER/INTRODUCTIONS

MS. HUNTER-THOMAS: Okay. Good morning everyone. I think we're going to go ahead and get started. Hana? Dr. El Sahly?

DR. EL SAHLY: Yes, I'm with you. Good morning.

MS. HUNTER-THOMAS: Great. Good morning. We'll go ahead and get -- yeah. So you could go ahead, Dr. El Sahly.

DR. EL SAHLY: Good morning, everyone. Welcome to the FDA Center for Biologics Evaluation and Research 157th Meeting of the Vaccines and Related Biological Products Advisory Committee. I want to welcome the members, participants, the public, and the audience for joining us today via the webcast.

Next up, I'm going to invite the members to introduce themselves this morning.

MS. HUNTER-THOMAS: Would you like me to do the round table, Dr. El Sahly?

DR. EL SAHLY: Yes, please.

MS. HUNTER-THOMAS: Okay. Let's start with Dr. Gans. Dr. Gans? Hello?

DR. EL SAHLY: Dr. Hayley Gans? Maybe you are on mute.

MS. HUNTER-THOMAS: Dr. Holly Janes?

DR. JANES: Good morning. This is Holly Janes. I'm a biostatistician, a faculty member of the Fred Hutchinson Cancer Research Center. I do work on vaccine evaluation, mostly in HIV and a few other pathogens including malaria and flu. Thank you.

MS. HUNTER-THOMAS: Thank you. Dr. Michael Kurilla? Dr. Kurilla?

DR. KURILLA: Hi. Mike Kurilla here. I'm the director of the Division of Clinical Innovation at the National Center for Advancing Translational Sciences at NIH, formerly with the National Institute of Allergy and Infectious Diseases working in biodefense, including vaccine development. I'm a pathologist by training.

MS. HUNTER-THOMAS: Thank you. Dr. Cody Meissner?

DR. MEISSNER: Good morning. I am a professor of pediatrics at Tufts School of Medicine in Boston. I concentrate in pediatric infectious diseases with a particular interest in immunization. I appreciate the opportunity to participate this morning.

MS. HUNTER-THOMAS: Thank you. Dr. Paul Spearman?

DR. SPEARMAN: Good morning. This is Paul Spearman. I'm a pediatric ID specialist and director of Infectious Diseases at Cincinnati Children's Hospital. I work on HIV biology and also on vaccine clinical trials. Thank you.

MS. HUNTER-THOMAS: Thank you. Dr. Geeta Swamy? Dr. Swamy? Mr. Sheldon Toubman?

MR. TOUBMAN: Good morning. This is Sheldon Toubman. I'm an attorney with New Haven Legal Assistance Association in New Haven, Connecticut. I mostly work on behalf of Medicaid clients; and I am the consumer representative for today.

MS. HUNTER-THOMAS: Thank you, Mr. Toubman. Dr. Melinda Wharton?

DR. WHARTON: Good morning. I'm an adult infectious disease specialist and I'm director of the Immunization Services Division at the Centers for Disease Control and Prevention.

MS. HUNTER-THOMAS: Thank you. Dr. Tammy Beckham?

DR. BECKHAM: Hi. I'm Tammy Beckham. I'm Director of the Office of Infectious Disease and HIV/AIDS Policy and Deputy Assistant Secretary for Vaccines and Infectious Diseases.

MS. HUNTER-THOMAS: Thank you. Dr. Steven Pergam? Dr. Pergam? Circling back to Dr. Hayley Gans. Dr. Geeta Swamy? Dr. Lisa Bollinger?

DR. SWAMY: Hi, this is Geeta. Sorry. I could hear you, but you couldn't hear me. So, I just called in by phone. I'm here.

MS. HUNTER-THOMAS: Okay. Thank you, Geeta. If you could provide your affiliation.

DR. SWAMY: Yes, sorry. This is Geeta Swamy. I'm an OB-GYN faculty member at Duke University and my research is primarily focused in vaccine work and

maternal immunization.

MS. HUNTER-THOMAS: Thank you. Dr. Wentworth, are you on the line? Circling back to Dr. Hayley Gans one more time. And Dr. Steven Pergam. Okay. So, we will check in with --

DR. GANS: This is Hayley Gans. Can you hear me?

MS. HUNTER-THOMAS: Yes, hi. Good morning.

DR. GANS: Oh, hi. Sorry. I didn't know how to unmute myself.

MS. HUNTER-THOMAS: Okay. Can you provide your affiliation?

DR. GANS: Sure. This is Hayley Gans. I'm a pediatric infectious disease physician at Stanford University, and I work on immunologic responses to viral vaccines.

MS. HUNTER-THOMAS: Thank you. And Steven Pergam? Checking in one more time. We'll check in later. Dr. Wentworth will be joining us shortly. He's from CDC. He's our speaker for today. Checking in again with Dr. Bollinger. Okay, we'll move forward

with the FDA representation that's in the room.

DR. GRUBER: Good morning. This is Marion Gruber. I'm the director of the Office of Vaccines Research and Review at CBER FDA.

DR. WEIR: And I'm Jerry Weir. I'm the director of the Division of Viral Products in the Office of Vaccines.

DR. CHUMAKOV: I'm Konstantin Chumakov. I'm an associate director for research at the Office of Vaccines.

DR. WILSON: Carolyn Wilson, associate director for research, Center for Biologics.

MS. HUNTER-THOMAS: Okay. Hana, that was the introductions. I'll check in with the other members that didn't respond later, if you want to proceed.

DR. EL SAHLY: Of course. Thank you all for being here this morning. My name is Hana El Sahly. I'm also adult infectious diseases from Baylor College of Medicine. My work centers mostly on clinical vaccine development research.

Next on the agenda, Ms. Serina Hunter-Thomas

will read the housekeeping items and Conflict of Interest statement.

ADMIN ANNOUNCEMENTS, COI STATEMENT

MS. HUNTER-THOMAS: Thank you, Dr. El Sahly. Good morning everyone. My name is Captain Serina Hunter-Thomas and it is my pleasure to serve as a Designated Federal Officer for the 157th VRBPAC Meeting today. The Committee Management Specialist for this meeting is Ms. Monique Hill. The Committee Management Officer for this meeting is Ms. Casey Stewart. And also, our division director is here, Dr. Prabhakara Atreya.

On behalf of the FDA, the Center for Biologics Evaluation and Research, and VRBPAC, we would like to welcome everyone to this meeting. Today's meeting has two topics. Topic one is partially closed and topic two is open in its entirety. Both meeting topics were described in the Federal Register Notice that was published on August 27th, 2019.

The transcriptionist for the meeting today is Ms. Devin Shiple. I would like to remind everyone to please check your pagers and cell phones and make sure that they are either turned off or in silent mode. When making your comment, please first state your name and speak up so that your comments are accurately recorded for transcription.

Please also keep in mind that the committee members are joining us remotely, and we would like everyone to be heard for the benefit of the FDA staff here in the room, members of the public, and those listening via webcast. I will now proceed to reading the Conflict of Interest statement for topic one.

The Food and Drug Administration is convening today, October 9, 2019, for the 157th Meeting of the Vaccines and Related Biological Products Advisory Committee under the authority of the Federal Advisory Committee Act of 1972.

Dr. Hana El Sahly is serving as the Chair of the meeting for both topic one and topic two. The meeting today will have two Conflict of Interest

disclosure statements read prior to each topic session that will occur during the meeting today.

In the morning for topic one, in the open session, the committee will hear overview presentations on the Laboratory of Hepatitis Viruses and the Laboratory of Vector-Borne Viral Diseases, Division of Viral Products, Office of Vaccines Research and Review.

For agency guidance, this session is determined to be a non-particular matter which would have no impact on outside financial interests. Hence, no effected firms were identified, and members were not screened for this topic. In the latter part of the afternoon, the meeting will be closed to permit discussions where disclosure would constitute a clearly unwarranted invasion of personal privacy.

Dr. Lisa Bollinger is currently serving as the acting industry representative to this committee. Dr. Bollinger is employed by Amgen. Industry representatives act on behalf of all related industry and bring general industry perspective to the committee. Industry representatives are not appointed

as Special Government Employees and serve as non-voting members of the committee. Hence, industry representatives are not screened and do not participate in the closed sessions, and do not have voting privileges.

Mr. Sheldon Toubman is serving as the consumer representative for this committee. Consumer representatives are appointed Special Government Employees and are screened and cleared prior to their participation in the meeting. They are voting members of the committee and, hence, do have voting privileges and they do participate in the closed sessions if they are held.

Dr. David Wentworth is employed by the Centers for Disease Control and Prevention and serves as Chief of the Virology Surveillance and Diagnosis Branch in the Division of Influenza. He is an internationally known expert in influenza virus epidemiology, world-wide influenza disease burden, and influenza virus vaccines. Dr. Wentworth is a regular government employee and serves as the speaker for this meeting

under topic two. He is also serving as a temporary non-voting member for topic two. He is not authorized to attend the topic one session.

This Conflict of Interest statement will be available for public viewing at the registration table. This concludes my reading of the Conflict of Interest statement for the public record. At this time, I would like to hand the meeting back over to Dr. El Sahly. Thank you.

DR. EL SAHLY: Thank you, Serina. Our first speaker this morning is Dr. Carolyn Wilson who is the Associate Director for Research at CBER FDA. Dr. Wilson?

OVERVIEW OF RESEARCH/SITE VISIT PROCESS, CBER

DR. WILSON: Hi, good morning. Thank you, and hopefully everybody can hear me all right. I'm going to provide a brief overview about the Center for Biologics and a little bit about how our research programs are managed so that you have a context for how

the site visits fits into our overall research management strategy.

So, for those of you who have been on VRBPAC, obviously you're aware of the far right three green topics: vaccines, live biotherapeutic products, and allergenic products. But to just orient you more broadly, CBER regulates a variety of complex products including blood and blood components, various derivatives, certain devices, cell and gene therapies to certain human tissues, and xenotransplantation products.

Because of the diversity and complexity of the products we regulate, combined with the fact that most of our products aren't amenable to terminal sterilization and it's challenging to identify sometimes how best to characterize these products and ensure -- there's some background noise.

MS. HUNTER-THOMAS: Sorry. Go ahead, Dr. Wilson. If everyone can -- in the Adobe Connect environment -- please mute your microphone. Thank you.

DR. WILSON: Okay. So, anyway, this is the

reason why we feel it's very important to have an active and robust research program. The combination of science and regulation allows us to advance product development. This is a graphic I've been using for a number of years, so for those of you who've heard my talk before, bear with me. But if you haven't, hopefully this will help you understand the role of our research program and supporting our regulatory mission.

So, the idea is that everything derives from a public health problem that drives the development of a novel product. However, those novel products oftentimes pose a challenge in a regulatory context. Sometimes we don't have enough information about how they act to inform development of a potency assay. Reference materials may need to be developed. Or just basic understanding of how you even characterize these products is not well understood.

That's where regulatory science or a combination of discovery science and direct application and development of new tools can help to provide better scientific information, methods and approaches that can

help us to provide better regulatory policy to our sponsors, help inform our decision making in a science-based manner, and by that, we then hopefully get improved data to inform our benefit risk decisions.

It doesn't stop there. With a licensed product, which we hope is safe and effective, with post market surveillance, we need to continue to remain vigilant to collect information about safety and efficacy as it goes out into the marketplace.

Our center has four broad research goals that advance the scientific basis for regulation of biologics, human tissues and blood. By developing and evaluating technology reagents and standards to inform chemistry manufacturing and controls. Developing and assessing nonclinical models and methods predictive of clinical performance with respect to toxicity and effectiveness, improving clinical evaluation pre and post-licensure through a variety of different methodologies and preparing for future regulatory and public health challenges.

We feel further that the benefits of the

research program -- because our researchers are what we call researcher reviewers, which means that our research scientists not only are involved in overseeing and running their own research program, they also have all the same regulatory responsibilities of full-time reviewers, meaning they are reviewing regulatory submissions, they may go out on inspections. They inform and participate in policy development, presentations to advisory committees like today as well as other public workshops.

This, because of their active engagement and their scientific community combined with their understanding of what's coming in the doors, they can see firsthand both in a responsive way to what are the challenges in our regulatory submissions. But also in a proactive way to prepare for future innovative products and the public health challenges those may present.

So, by having this relevant expertise, we hope that it's applied in a way that develops tools and data that are timely. And because we publish our work, it's

different than what a sponsor may do for a specific product. We do work that hopefully is more cross-cutting across a whole product class, publish it, and make it available to all stakeholders.

We also feel that it's an important element to recruit and maintain highly trained scientists with necessary expertise to review our regulatory submissions. So, we have a wide array of scientific expertise. I've grouped a bunch here under applied technologies in things like application of NMR and mass spectrometry to get high-resolution structural information about the products we regulate. Obviously, we do a lot of flow cytometry, some micro-ray, high-throughput sequencing, or NGS, and related bioinformatics and IT to support those efforts.

As you can imagine, we obviously have to be very deep in areas of microbiology, immunology, biochemistry, molecular biology, cell and developmental biology; and we also are expanding our expertise into new areas like tissue engineering and microphysiologic systems. Epidemiology, biostatistics are mainstays, of

course. And then bioinformatics is an area where we are continuing to grow, and we see this as a needed area for the future.

We have a number of core facilities in our White Oak Lab Facility that help support the research program. We have core facilities in flow cytometry, kind of focal in electron microscopy, variety of biotechnology, traditional biotechnology including next-gen sequencing, and then the bioinformatic support for that. We have a state-of-the-art vivarium to support our research program with advanced imaging capabilities such as MRI, digital x-ray, and other tools as well as ABSL-2 and 3, and procedure rooms and a transgenic derivation facility.

Recently, we have expanded what we used to call a PI Peer Mentoring Group into what's called a PI Networking and Information Group. This has been a really useful forum for our PIs to come and exchange information about how to manage a variety of different responsibilities. It's open to all PIs and we always make sure that at least one or more senior PIs have

volunteered to be there each month to help facilitate the discussion.

We obviously can't do everything we do covering the waterfront of the products we regulate by ourselves; so we do a variety of external collaborations across the nation, across the globe, and a variety of different sectors. So that we obviously try to leverage external capabilities to the extent possible.

So, now, just to dive in, in the last few minutes, into the research management processes. We have a Regulatory Science Council which is a governance body that develops research goals and objectives. It provides a research evaluation framework and criteria to measure scientific and regulatory impact. And it performs portfolio review of the research program as well as horizon scanning.

We evaluate the research program through two broad ways. One is through management and one is through peer review. So, what does that mean? This is a little bit of a busy slide, but I'll walk you through

it.

The management review is really thought of as three different types. One is, every year. Each project is reviewed by line supervisors from the lab chief on up to the office director.

Once every four years, there's a programmatic review of the office, which is presented to the Regulatory Science Council. And the focus of that is to identify programs and projects that are supporting the regulatory mission and the research goals, as well as identify potential gaps, duplications, or things that may be slightly out of scope and need to be reprogrammed.

And then, finally, once every four years, we do a center-wide horizon scanning to help us to be proactive and inform strategic planning.

Our peer review process also happens to run into three buckets. Every year, we do an internal peer review of projects that is looking at any new projects that are proposed and one-fourth of the entire portfolio.

The second bucket, which is why we're here today, is an external review which we call site visits. And those are looking at PI programs and the various projects under that program.

The report that you'll be talking about in closed session then becomes part of a larger package that goes to the committee for promotion and evaluation of researcher reviewers, and that looks at the individual PI's program, not just their research accomplishments and the quality of the work that their doing, but also the regulatory work that they're doing.

So, to do a little bit deeper dive on the peer review piece. Again, the internal projects are every four years and new projects, and that's by other FDA scientists. Site visit is external and every four years using subject matter experts of relevance to the program. And the CPERR does individual PI review for GS-14 and 15 promotions or salary adjustments in the case of service fellows.

Actually, that's a mistake. They shouldn't be saying one office per year there. Sorry, that's a

mistake. But that's an internal peer review by CBER scientists.

Okay. Finally, the evaluation framework, we've identified metrics in four major buckets. First, to make sure that the work we're doing is relevant to our mission, aligning with goals and objectives; providing us our scientific and review capability base that it's being disseminated to the scientific community and other stakeholders through presentations and publications. That there's uptake of that information by the scientific community and regulated stakeholders. And that it's contributing to our regulatory practice.

So, the site visit is held for all researcher reviewers who are in the Service Fellowship Program as well as permanent staff. The top row, which we call senior staff fellows and visiting scientists if they're in the Service Fellowship Program versus Principal Investigators if they're permanent. These are our independent scientists that run their own research program and are provided their own resources to oversee

that program.

In the bottom row, the staff fellow/visiting associate in the Service Fellowship or the staff scientist and its permanent staff are support scientists working under the direction of a principal investigator. In all cases, we ask them to go through a site visit to make sure that the research is on target, of high scientific quality, productivity and supporting our mission.

The report that you'll be talking about in closed session is generated from that site visit. And you have three opportunities, three potential outcomes from your discussion today. You can accept the report as written, you can amend the report, or you can reject the report and send it back to the site visit team.

Once it's approved, then the final report is really an important document used in a variety of ways. As I mentioned, it goes into part of the larger package for the CPERR review. The PIs take all of the recommendations very seriously to improve their research program. And management obviously takes your

recommendations into account in terms of resource allocation decisions.

I want to just finish by thanking all of you today as well as the members of the site visit team. And to just mention that it was chaired by Dr. El Sahly and Dr. Offit, and to put in a plug for other AC members. We have site visits periodically. We're always looking to recruit AC members to chair and co-chair these reviews. And we're really grateful for the work that you do, because it does truly make sure that our research is fulfilling our regulatory mission. So, I'll stop there and answer any questions. Okay, thank you.

DR. EL SAHLY: Thank you, Dr. Wilson. I would like to introduce now Dr. Jerry Weir, who is the Director of the Division of Viral Products, Office of Vaccine Research and Review. Dr. Jerry Weir?

OVERVIEW OF DVP, OVERVIEW OF LHV, & OVERVIEW OF LVVD

DR. WEIR: Oh, thank you. Good morning. The

Lab Chief of the Laboratory of Hepatitis Viruses, Marian Major, is out of town this week. So, I'm going to give a combined overview of the laboratories that were reviewed, the Division of Viral Products, as well as a couple of slides about the Office of Vaccines Research and Review. So, this is one big overview, but it'll be relatively brief.

Starting at the top, the Office of Vaccines Research and Review, Marion Gruber is the Director and Phillip Krause is the Deputy Director. There are three divisions within the office. Two of them, the Division of Viral Products and the Division of Bacterial, Parasitic and Allergenic Products are product divisions that have research components.

If you go to the next slide which states the regulatory mission and portfolio of the Office of Vaccines; our mission is to protect and enhance public health by assuring the availability of safe and effective vaccines, allergenic extracts, and other related products. Of course, we regulate vaccines as well as allergenic products and some diagnostic tests.

But we also have in our portfolio a live biotherapeutic products and phage therapy as examples of other things we regulate.

If you go to the next slide, it lists some of the regulatory challenges we face. We have an emphasis on safety. As you can imagine, vaccines are products for mass use, often universal. The recipients are healthy individuals most of the time, often children. We also have, in many cases, a short regulatory cycle.

One obvious example is seasonal influenza vaccines, which we'll talk about a little later today. But also our response to emerging pathogens is often very serious time constraints to our review cycles. Examples from recent years -- Ebola, Zika, Pandemic vaccines. Also, a lot of our products are fairly old. Vaccines have been around for a long time, but at the same time, we have challenges with new innovative technologies being utilized from proved products. And research plays a critical role in the regulation of vaccines.

The next slide states our research goals.

They're fairly simple. Our major goals are safety, efficacy, and availability. This sort of drives all of the research that is done in the Office of Vaccines. In safety, to enhance the safety of vaccines in related products through the development of models, methods, and reagents needed for the manufacture and evaluation of these products.

Efficacy, the goal of the research is to improve effectiveness of vaccines and related products; once again, through the development of models, methods, and reagents needed to measure and predict the effectiveness. But also, we have a goal of increasing the availability of the products that we regulate.

Now I'm going to switch to the Division of Viral Products. Here, I'm the director and I have a deputy, Robin Levis. There are seven laboratories ranged roughly, but not perfectly, around the product lines that we regulate. The subject of the site visit that is today's discussion concerns the Laboratory of Hepatitis Viruses. Marian Major is the Chief of that laboratory. And also, the Laboratory of Vector-Borne

Viral Diseases, and Marian Major is the Acting Chief of that laboratory.

The next slide simply states our mission and functions. It's fairly simple. We regulate viral vaccines and related biological products ensuring their safety and efficacy for human use, but also we try to facilitate the development, evaluation and the licensure of new viral vaccines that positively impact the public health.

We have quite a few responsibilities shown on the next slide. The staff is involved in investigation on new drug and biologics license application review and other premarketing activities. The staff is involved in BLA supplement review, lot release review, other postmarking activities. The staff participates in manufacture inspections, both pre and post-licensure. We have an extensive role in consultation with other public health agencies -- for example, the World Health Agency. And last but not least, we conduct research related to the development, manufacturing, evaluation, and testing of viral

vaccines.

The next slide describes the role of research in our division. The research in all of our laboratory activities is designed to compliment the regulatory mission. It's designed to address issues related to regulated viral vaccines as well as to anticipate and address issues related to the development and evaluation of new viral vaccine products. Sometimes these are very general issues applicable to many products or product classes. For example, cell substrate issues. Sometimes they're very specific to product issues that are being addressed, such as establishing correlates of protection necessary for efficacy evaluation.

The next slide simply gives a quick snapshot of -- actually, the next two slides -- the staff and the budget overview. Our recently concluded fiscal year of 2019, the division had about 75 full-time equivalents. These are government employees. And the research program is complimented and supported by approximately 40 contractors. Many but not all are

part of our ORISE program. This includes quite a few postdoctoral fellows as well as post-bac students.

In the last year that just finished, the division budget had a basic operating budget of about 4 and a half million dollars. We had targeted FDA support of another 3 and a half million dollars, and external DVP support from outside grants and contracts of over 2 million dollars. This amount of money supports all of our research operations. It doesn't cover salaries. That's separate. And just for reference, this was actually very ample to support all of our research needs.

The next slide shows a breakdown of the FTEs by laboratories. I didn't mention this earlier, but all laboratories are not the same size. There's a different number of principal investigators in them. You see the Hepatitis Viruses has 5 FTEs and Vector-Borne Viral Diseases has 3.

The next few slides, I'm switching to the laboratories with the subject of the site visit. As I said, there's the Laboratory of Hepatitis Viruses.

Marian Major is the chief of that laboratory. She is one of the two PIs. Gabriel Parra is the other PI of this laboratory. The Laboratory of Vector-Borne Viral Diseases, Tony Wang is the PI in this laboratory.

The next slide breaks this down a little further into the different units in the laboratories. In the Laboratory of Hepatitis Viruses, as I said, Marian Major is a PI of this group. She has a couple of FTEs and three contract fellows. Gabriel Parra is the second PI in this laboratory in the unit of gastroenteritis viruses. He has one FTE and a couple of contract fellows. Gabriel is a relatively new PI in this laboratory. He came in May of 2016.

In the Laboratory of Vector-Borne Viral Diseases, just for reference -- this is probably in our site visit report -- this laboratory was headed by Lew Markoff for many years. He was the PI and Lab Chief, and he retired in December 2017. And now, Marian Major is the Acting Chief of this laboratory. But Tony Wang, who was recruited as a PI in August of 2018, is a PI in this laboratory. He has a couple of FTEs as well as

contract fellows to support his research program.

The next slide lists the regulatory responsibilities of the two laboratories in question being reviewed. This is by the pathogens that they review. So, it's listed as primary pathogens for the Laboratory of Hepatitis Viruses which, of course, their responsibilities include hepatitis viruses, hepatitis A, B, C, and E, both prophylactic and therapeutic vaccines. They also have a responsibility for rotavirus and norovirus vaccine products.

The Laboratory of Vector-Borne Viral Diseases has quite a large portfolio. It includes Japanese encephalitis virus, yellow fever, dengue, Zika, West Nile, chikungunya, and several of the E. coli and encephalitis viruses. Both of these laboratories also have responsibility for regulating challenge viruses that are being used in clinical studies. These include noroviruses as well as dengue viruses.

The last two slides, I think, is simply sort of a quick summary of ways in which the Laboratory of Hepatitis Viruses and the Laboratory of Vector-Borne

Viral Diseases support the FDA public health mission. This is just sort of a quick summary. The laboratory's research provides the expertise for review and guidance to industry on all aspects of vaccine development and manufacturing. Examples of this include release tests for vaccines under development, assays to evaluate clinical responses to vaccines. The research also is designed to evaluate the utility of novel scientific technologies relative to vaccines. A short list of these include RNA vaccines, large scale genomics, novel virus cell culture systems and methods to assess subpopulation live attenuated viral vaccines.

Carrying this further on the next slide, the research is designed to create new approaches to induce protective immunity and modify antigen presentation. Examples are epitope presentation of hepatitis C, chimeric virus-like particles for noroviruses, and attenuated viruses for dengue.

The research program also develops and assess animal models for preclinical evaluation of vaccines for safety and efficacy. These are animal models to

support licensure as well as animal models to assess neurovirulence of viruses -- for example, Zika.

Last in this list is the research is designed to improve the clinical evaluation of pre and post-licensure through use of analytical and modeling approaches. Examples include the in-silico modeling of hepatitis C transmission, a choice of appropriate challenge viruses for norovirus studies, and assess seeing the cross-reactivity of flavivirus responses, zengue (phonetic) and dengue for examples.

I'll close by thanking everyone for the Site Visit Committee as well as the Advisory Committee. These program reviews, as Carolyn Wilson pointed out, are very important to us and helpful to us to assess the progress on projects pursued in the last four to five years as well as there is a component of individual review. A different staff are up for consideration of promotion, and of course we appreciate any input on the evaluation of future directions. Thank you.

DR. EL SAHLY: Thank you, Dr. Weir. Any

questions for Dr. Weir from the attendees on the on the webcast? Okay. I hear none.

DR. JANES: Good morning. Hana, this is Holly. I had a question for Dr. Weir. And this is just emanating from a desire to better understand the division and how research contributes to the division, and how it interfaces with the regulatory responsibilities.

I was just wondering if you could comment on how you manage the potential conflicts of interest of the PIs in relation to how their research may -- given that their research, in some instances I would assume, is relatively closely aligned with the classes of products that they're regulating.

So, could you just comment and elaborate a little bit on that just for our understanding? Again, I don't have any particular concerns about any particular individuals or the division as a whole, just to further my understanding. Thank you.

DR. WEIR: Sure, sure. I can give you sort of a general answer. Most of the research that we do, of

course, approaches general subjects and there's not really a conflict of interest. On the other hand, the staff do sometimes have grants and contracts and collaborations with outside entities, and all of those are heavily scrutinized. We have a process that, if you need to know more, Carolyn Wilson can describe it.

But all of these things are reviewed and signed off and, if necessary, staff is recused from reviewing anything that poses either a conflict or even a potential perceived conflict of interest. So, we do look at this at all times to make sure that we take that into account.

DR. EL SAHLY: Great. Thank you. Any other questions? Okay. The next item on the agenda now is a 10-minute break. It's 9:11 eastern time, so should we reconvene at 9:21?

MS. HUNTER-THOMAS: Yes. That sounds good, Dr. El Sahly. Thank you.

DR. EL SAHLY: All right. Thank you all.

[BREAK]

OPEN PUBLIC HEARING

DR. EL SAHLY: On the agenda now, is the open public hearing. So do we not have an open public hearing request?

CPT. HUNTER-THOMAS: That's correct. There are no OPH speakers for this portion of the meeting.

DR. EL SAHLY: Okay. Thank you. So then next on the agenda is the closed session?

[END OF OPEN SESSION]