Dr. Robert Gallo

[**Music**]

Marianne O'Hare: Welcome to Conversations on Health Care with Mark Masselli and Margaret Flinter, a show where we speak to the top thought leaders in health innovation, health policy, care delivery, and the great minds who are shaping the healthcare of the future.

This week Mark and Margaret speak with Dr. Robert Gallo, co-discoverer of HIV, the virus that launched the AIDS pandemic. His groundbreaking research in that area led to the first test and ultimately treatments for HIV. He's also founder of the Institute for Human Virology at the University of Maryland School of Medicine, and the co-founder of the Global Virus Network, a consortium of research institutes around the world focused on emerging viruses. They're currently conducting global research on COVID-19.

Lori Robertson also checks in, the Managing Editor of FactCheck.org and looks at misstatements spoken about health policy in the public domain, separating the fake from the facts. We end with a bright idea that's improving health and well being in everyday lives.

If you have comments, please e-mail us at chcradio@chc1.com or find us on Facebook, Twitter, or wherever you listen to podcasts. Now stay tuned for our interview with Dr. Robert Gallo here on Conversations on Health Care.

[**Music**]

Mark Masselli: Dr. Robert Gallo is one of the world's preeminent virus hunters and his experience and perspective are needed more than ever as the world fights COVID and the Omicron variant. His accomplishment is his co-discoverer of HIV, as the cause of AIDS means he can provide us with important insight about Omicron. In fact, the South African scientists who detected Omicron variant says it probably incubated in a body of a person with an immune system affected by HIV or another immune compromising condition.

Margaret Flinter: Dr. Gallo was portrayed by Alan Alda in the movie, And the Band Played On. Today he's the co-founder and director of the Institute of Human Virology at the University of Maryland School of Medicine, as well as the co-founder and international scientific adviser to the Global Virus Network. And Dr. Gallo, we're so glad to have you with us today.

Dr. Robert Gallo: Thank you.

Mark Masselli: There was a lot made of connection between HIV patients in the South African and Omicron. And I'm wondering what your thoughts are on it that made headlines around the globe and what insight can you give us on the connection?

Dr. Robert Gallo: Well, the first thing he said and I try to use this phrase. And that's the three words I think we don't use enough. And that's, I don't know. What I'm telling you would be opinion and what they're telling you is obviously an interpretation. It's an opinion. Any RNA virus mutates a lot, all of them, whether it's HIV which is hard to transmit, because HIV has very few target cells. So you can't compare the two pandemics except for public health things. And for notions like let's not forget already people are forgetting HIV until this thing hit, not even listed in the great pandemics of the century when it's still ongoing to a certain extent. So any one of these viruses, that's an RNA virus, and particularly Coronavirus, have a chance to undergo great genetic change rapidly. So think of like a slot machine with the numbers coming out and you're waiting for your pattern to come, you know, stop this one works better, you know, they keep changing and keep changing.

So when you get infected by an RNA virus, the term quasi species has been used. When you get infected you get an amount of virus, not one particle. But within the RNA viruses, there is extreme variation. And once they infect the clock starts going and you're changing all the time. That's the nature of this beast. Now this one is exceptional. SARS Coronavirus 2 in itself is exceptional and in that we have a greater exception with this Omicron or whatever. So it's truly a major genetic change of the kind that usually would take really much longer if ever to reach this amount. So it does look, if you had to take a guess, that something is impacted this other than its usual terrific mutation rate.

South Africa was the home of the greatest epidemic of HIV on Earth. My friend there is truly in the thick of it. He's the leader. His name is Salim Abdool Karim. He heads their main institute, their science related to HIV and viruses. It's called CAPRISA. He's the one that's doing the talking. When he talks, listen. So if you're here, you want to hear what's going on in South Africa watch for his name. When you're learning something of what's going on there, its likely coming from him. So I can only speculate it is not unreasonable. There are many HIV infected people. Since President George W. Bush created the President's Emergency Program for AIDS Relief, most of them didn't have any therapy but certainly today with that program and other programs of helping Africa most people today get a crack at good therapy. Yet the number of HIV infected people is very high in South Africa. And so it is a rational thought that without a good immune system, this thing is going to be replicating more and more and have a chance to mutate more.

The other way of looking at is when you do have a good immune system is that this guy tends to evolve away and mutate elsewhere because of the immune pressure on. But we haven't seen to

document cases where someone who has virtually no immune system. If you're an untreated AIDS patient, you don't have much immunity. So I would love to see this be proven, can get to a patient right at the beginning. It would be fascinating to know that. It's a reasonable idea but certainly not a proven one.

Margaret Flinter: Well, Dr. Gallo, our colleague Dr. Marwan Haddad here at Community Health Center and the Weitzman Institute is now the Chair of the HIV Medicine Association and we've been engaged in the HIV epidemic and work for 30 years. We're hearing in our support groups and in the various circles that we have for our patients who live with the virus that this is this most recent news is really kind of the pushes to the edge in terms of worry and anxiety. What would your best advice be, should people living with HIV be engaging and even more social distancing and masking, anything advice that you would have for patients living with the virus right now?

Dr. Robert Gallo: Well, first of all, we yet don't know how serious this is. I mean, we're getting headlines everywhere because of its movement, right? Remember, we get infected with seasonal Corona viruses a lot. They cause virtually nothing. So we don't yet know how dangerous this is, in terms of what happens. We're about a week away from having certain answers. One is about the efficiency of the current vaccines. But the question is, is it better to be dominated by this one? We don't yet have enough disease stories yet. No one knows how, let's call it deadly this is or provoking serious illness. We don't know that yet. And we don't have the animal models ready yet. You know, I started this thing called the Global Virus Network in 2011 but it's not really running well. And we can go to the people right off the bat of who to call for what we need to know. And the best animal models are developed in the Catholic University of Leuven in Leuven Belgium. That tells us a lot because I mean, you know, they'll get sick if we get sick. And you know, we can follow things pretty well with small animal models. And we are going to find out how well they live with it. And we'll also have data in people that have been infected.

So far, we're not hearing a lot of deaths from it right? Before we're giving advice to people, we need to have a little more information. I would say if we want to make a marker around Christmas time, we should know. Let's say it's bad news, what would you advise those people? Of course, the person with HIV infection with a lower immune system, particularly if your treatment is not on top of things, this would possibly be catastrophic, right. So yeah, if I had HIV infection, I'd want to be a little extra cautious. I sure want to know who I was hanging around with. I might want to stimulate my innate immune system of interferon and natural killer cells nonspecific vaccines, I'll just say a word about it, measles, mumps, rubella, that are live can really stimulate the immune system, do no harm to you,

that might be helpful. But that's an old big scientific area that I'm exploring and pushing. And then you want to be with people who are vaccinated. You're not going to hibernate, but you better be careful in crowds indoors and yeah sure, you should wear a mask.

Mark Masselli: That's a great roadmap. And you know, I am going to pull the thread a little on, you said, you pulled together the Global Virus Network. We really need a global solution to these problems. And I'm wondering, in the early part of the virus in the 2020, was the Global Virus Network able to work together. Tell us a little more about how you kept this network together during those times.

Dr. Robert Gallo: The President of the Global Virus Network that we recruited Christian Bréchot used to be President of Pasteur Institute in Paris and President of Inserm, which is like their NIH that funds the various science and medicine for France. So GVN is pretty strong right now with corporate relationships and with 66 centers throughout the world of excellence in virology. We cover every single kind of virus that there's known to be able to cause human disease. So we have expertise in just about everything. And we can have that contact immediately. Before you had heard things we were talking to GVN people in China, as well as in Singapore experts, on the Coronaviruses. So we kind of knew what was coming. We knew ahead of time that they were going to publish the sequence of the entire genome, which they did on January 10th despite being criticized for being too slow. We had the sequence and could predict that the antibodies won't last that a vaccine cannot last more than five to seven months was our prediction back in January. But you know, you can't say too long because that'll even cause people to be more reluctant to do things they won't understand fully. So you don't say everything that you know but yes, I think if you said I want to listen to government, let's start by saying, well, which one?

The government's all different. Japan did nothing. Sweden said we should have herd immunity. I was shocked by that. Boris Johnson, Russia, President Trump, I mean, who do we listen to? And why should I be restricted in my knowledge base about what one or two government scientists want to say even if we're friends? I have access to the globe. So I think there has to be a bigger role for private organizations without any question. In some way linked with WHO and linked among themselves we need government for money for oversight, and really, for final decisions. But I don't need them for my sole source of scientific information, my God, mistakes scientifically were made but they not limited to government, but we need not to be limited by a few people. I mean, that's just ridiculous that I got to hear the news all the time, same people, same level of expertise, which gets highlighted is the super expertise, but it's not the reality. The reality is we need the best in each category virus all over the

world and communication, and not being told what they want. Maybe we should listen to Bol---what's his name---Bolsonaro in Brazil, Jesus, which President do you listen to, right? That's the point. Mexico, Brazil, America, Sweden, Japan, England, they all went their separate ways. That's a real lesson in all of this, to me, in all the pandemics.

Margaret Flinter: Well, Dr. Gallo, I think you've made great points. I guess the question we have is, it might have been better on this round if the NGOs had had played a greater role, what is that group of organizations that can speak, you know, with the science and some authority about the direction we should take as a global society, not just individual nations?

Dr. Robert Gallo: Well, I don't want to say the Global Virus Network alone, far from it. But obviously, that's a good beginning. It has 66 centers of excellence in virology all over the world in every single continent except Antarctica but everywhere else. I didn't want to make it related to government, because we wanted China and Japan to be involved too and they are involved. We just accepted two major centers from Russia only last week so you know, we have some from Brazil, we have several in South America, you know, many in the United States, Europe, and Africa, you know, really high qualified and they're getting more qualified by the minute. In Africa, you'd be really surprised how good they're becoming. But also, we have those centers that are not called centers of excellence, but we try to make them on the way toward. We have some in India, we have some in Africa, we have some in South America, we have some in Southeast Asia.

So I feel the advantage to us is we learn early of what's cooking on the ground. You know, that's important. And the second advantage is, if we had the money, you know, it had to have a room with a big wall with lights on it. We're in the world of where we have a center. And then we have like, if you press the second light what that center does and its expertise. You get to know in time and you know, when you knew people anyway in advance or you wouldn't call that center if you knew they had somebody well known who was an expert. We started with some flu people. We have the best flu guys that you can imagine. So I think we could press that button and have access to. A new disease comes it's gastrointestinal. It's coming out of Egypt. We're sending soldiers there to help Egypt with something. What are they going to do when they face there, you know, press a button gastrointestinal viruses. Who do we have on Earth that's the most expert and then we try to get funding to help and see what we could do.

So the GVN does advocacy. It does training for young virologist. How do you know that how do you go into virology? You go into it by chance you hear a lecture, that's what. You know, I went in because I

played tennis with a Chinese guy who was a very good virologist, and convinced me if I was interested in leukemia and cancer that the certain kinds of viruses known as retroviruses, which HIV is an example, are often involved in leukemia. He got me going in that direction. I never had formal training in virology. But I started paying attention. Then I started going to lectures and then I started working on it little by little. I got more and more into virology. This is chance. We shouldn't do it by chance only. The primary purpose is training new young virologist, advocacy, and education would be the first one.

Mark Masselli: That must have been the most consequential tennis match in history. So glad it happened. And, you know, I noted in The Baltimore Sun interview you gave in April, a real spot on prediction of where we'd be now and you'd mentioned variants and boosters at that time. And we've heard from Dr. Scott Gottlieb, who said the pandemic could be over in the United States by January, but others say Omicron will dominate and overwhelm the world in 2022. I'm wondering what your thoughts are right now as you sort of look out on the horizon.

Dr. Robert Gallo: Clearly that's happening so it's not exactly a prophet to say that that's going to overwhelm, it's happening right now. But will it be true in a year from now, I haven’t the foggiest notion. Will there be another variant? Will this guy burn out into some extent? It's hard to predict. And I don't think we should predict when we don't know. You could predict it right now it is going to be overwhelming for a lot of nations. That's true. But again, we don't know how serious this disease is causing. Maybe that's not such a bad, bad thing. Maybe it'll induce a good immune response and maybe it won't kill. Do we know this is killing people yet? I don't think so. Yeah, I mean, you kind of hold on a little bit. It’s a little premature to predict. It's not like when we saw the genome published by the Chinese the genetic sequence and looked at the spike sequence we could make an irrational prediction.

We know the spike protein is going to have a lot of sugar on it. And from our previous experience with HIV, flu, and other things, when that happens, the cells that make antibodies are B cells called B lymphocytes. Those cells select the target to make antibodies to such a thing. We know we don't know exactly why and we're studying it they don't live long. They don't mature to proper what we call plasma cells that are the most mature cells that make antibodies that last very long time, like your lifetime, like with Papillomavirus vaccines, or measles, mumps, rubella, polio, smallpox, they last your lifetime. So we said that back in January, this won't last more than six months, we'll need boosting and boosting. We're going to---so you can make predictions. It's too early to predict what's going to happen in a year from now. We don't know enough about this fellow yet, other than it replicates [inaudible 00:16:41] and has an amazing amount of genetic modification in it compared to the others.

Margaret Flinter: You know, Dr. Gallo, I was stunned by how quickly we had the vaccine for COVID. We gave our first vaccines here in our organization the last week in December, just a year ago, and that was nine months after here we are 30 years of responding to the HIV epidemic, and we still don't have that vaccine. What are your thoughts on whether we're going to have a vaccine for HIV?

Dr. Robert Gallo: I gave a lecture on World AIDS Day, December 1, at the Gladstone Institute at the University of California, San Francisco. Viruses are not the same and of all things for an RNA virus HIV is super unique. Why? With an RNA virus respiratory like Corona viruses, like flu, it's not a discovery to find the virus. It's dripping out of your nose and your mouth. It's obvious it's causing the disease, it's highly infectious. HIV is very poorly infectious, takes body fluid. And by the time you get the disease it's 10 years after you're infected. There was no way to recognize. And by the time you get the disease, you have hardly any T cells in your blood where we were looking for virus. So it's very hard to find.

With the respiratory virus like SARS Coronavirus 2, one day, you know, you just take the swab off the nose and you can see it under the electron microscope or do a test for foreign RNA, and you'll see a viral sequence come out in one day or two days, certainly in a week, you'll know the cause. We have a lot of vaccines against these kinds of viruses. It's not a big problem. But sure this was rapid. That's because of the messenger RNA technology. But everybody knew we'd have a vaccine for this, that it wouldn't be problematic. No question it would respond to antibodies. This is far from the case with HIV.

When HIV infects less than 24 hours later, its genes are in you and me and anybody who is a target, in our chromosomes, in our DNA forever. So right off the bat, there's no time for an immune recall. You get infected, you're going to get---it takes what a few weeks to make antibodies. And if you've already been vaccinated, it'll still take a few days. By that time this virus is integrating and making variants already and harming your immune system at the same time. You know the virus exists in this latent state but there's no virus to be seen. It's in the genes of you, and it pops up periodically when it feels like so it's a completely different story.

Moreover, no one has been able to raise the antibodies to the right level. You can't get the breadth to cover all the variants of the virus when they vary. It's not like just minor changes that occur with SARS Coronavirus 2, but you're changing some things that make it no longer recognizable to the envelope protein outside, it escapes right away. So it has really tricky ways of avoiding the immune system. It's one of the viruses that the antibodies don't last similar to SARS Coronavirus 2 similar to the COVID. They will last about five months, six months. In

primate studies, when we even when we get an effect, it doesn't last very long.

In top of that, you always want to get your cells and you'd like your T cells to respond also, not just antibodies. In fact, without T cells helping to make the antibodies they're called T helper cells. You don't get antibodies. But when you make a T cell do that, it has to be what we call activated. It's in a different metabolic state. But where does HIV go? It goes into exactly those cells. So while you're doing that, you're shooting yourself in the foot. You're making more houses for HIV, in which case, you might have a vaccine that went through the first phase of solving the problems but you'd never know it because your CD4 T-cells are getting infected more, not less, because you made more houses for the virus. So there are a number of hurdles.

In fact, I've changed as I said in my talk, and said this publicly before, I think I had been wrong and the field is wrong and the field is hyper funding only major consortiums that are looking for creative new young scientists. Two big consortia all doing the same thing that are getting funded from those groups that are funded by NIH. So what do they concentrate on just as if it was, if it was the same as the COVID-19 virus that is neutralizing antibodies. We don't reach the titer that's needed. We don't reach the breadth that's needed. This is 35 years going down knocking, give me 40 years, right so there's been going it's 37 years. And the first paper on neutralizing antibodies was my colleague, Marjorie Guroff and myself in nature. And the field focuses only on that.

I said at Gladstone UCSF that I think this pathway is wrong. The mass funding in one direction is wrong. I think we need a lot more creative thought on this, a lot more individual investigator initiated grants, and I think I was personally wrong. You have to emphasize that because when you're critical that I emphasize too much antibodies in the early I think it's going to be by cellular immunology, if we ever get an answer. And I think it's possible that we will. But by that time, I'll probably somewhere between Pluto and Mercury, I don't know.

Mark Masselli: Well, I want to switch over that one vaccines to the mRNA platform which has been successful in terms of the Pfizer and Moderna effort. What's your thought on---?

Dr. Robert Gallo: Successful for whom? For you and me?

Mark Masselli: Well, I mean, it seems to have better efficacy than perhaps some of the others.

Dr. Robert Gallo: Yes, for us but we don't get it out to people yet.

Mark Masselli: What are you seeing out in terms of other research that's going on now, on autoimmune diseases and other cancer that's happening with

the mRNA? Are you following that at all or anything you want to share with people, your hope for--?

Dr. Robert Gallo: Yes, I follow it, but I'm not the best person in our country to make the best interpretation of that. Yeah, I think there are reasonable things in cancer. I don't expect home runs from it. My former postdoc who's a senior scientist now at NIH has been well funded to do it for HIV. I hope I'm wrong, I don't think it will mean a hill of beans for HIV because it's not the method. It's what's in the package. And I don't think using just the envelope protein it's not, what we call the spike protein, the same function. I don't think just producing it by messenger RNA is going to make things seriously better. I just don't see it yet. But for some things, yeah, it's going to make a difference. But it might, if I were running a company my first thought wouldn't be HIV I'll tell you that.

Margaret Flinter: We've been speaking today with Dr. Robert Gallo. He's the co-founder and director of the Institute of Human Virology at the University of Maryland School of medicine. He's also the co-founder and international scientific adviser to the Global Virus Network. Follow him on Twitter @DrRobertCGallo. Dr. Gallo, I want to thank you for your brilliant work and your straight talk and for joining us today on Conversations on Health Care.

Dr. Robert Gallo: Thank you.

[**Music**]

Mark Masselli: At Conversations on Health Care we want our audience to be truly in the know when it comes to the facts about healthcare reform and policy. Lori Robertson is an award winning journalist and Managing Editor of FactCheck.org, a nonpartisan, nonprofit consumer advocate for voters that aim to reduce the level of deception in U.S. Politics. Lori, what have you got for us this week?

Lori Robertson: On November 24th, South Africa told the World Health Organization that amid a recent increase in COVID-19 cases, it had identified a new variant, later named Omicron, with a high number of mutations, raising concerns that it could spread more easily than other variants of the Coronavirus. On November 26th the WHO labeled it a variant of concern, meaning it could be associated with an increase in transmissibility or virulence. Researchers are still assessing that. The same day the United States and other countries announced travel restrictions on visitors from South Africa and nearby African countries. What impact might those travel restrictions have? Studies on international travel restrictions have shown they can slow the spread of diseases if they're strict enough, but such restrictions don't contain diseases.

The U.S. travel restrictions went into effect on November 29th, barring most non-citizens who had been in Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa and Zimbabwe in the 14 prior days from entering the U.S. However, the travel suspension doesn't apply to U.S. citizens or lawful permanent residents and nationals or lawful permanent residents. President Joe Biden said the point of the travel limitation is to give the U.S. time to have people get vaccinated or get booster doses of the COVID-19 vaccines. He said in remarks on November 29th that the U.S. needed that time before the Omicron variant was "going to move around the world".

But the variant had already started to move around the world, with cases detected in several European countries as well as Israel, Canada, Australia and Hong Kong before the U.S. travel restrictions were implemented. In a November 27th interview with NBC News, Dr. Anthony Fauci said he wouldn't be surprised if the variant had already arrived to the U.S. And indeed it had. The CDC confirmed the first known case in the US on December 1st. One study on travel restrictions and other emergency measures put in place early in the Coronavirus pandemic in China estimated that shutting down Wuhan, China slowed the viruses spread to other cities in the country by 2.91 days. Similarly, other studies have found modest effects.

This time, the U.S. has another tool to limit the spread of the virus, testing. The U.S. requires anyone including U.S. citizens, age two and older flying into the country to get a viral test with a negative result within one day of their flight to the United States. Testing can help limit the spread but it's still possible for someone to test negative early in the course of an infection before the amount of virus is sufficient to be detected.

And that's my fact check for this week. I'm Lori Robertson, Managing Editor of FactCheck.org.

[**Music**]

Margaret Flinter: FactCheck.org is committed to factual accuracy from the country's major political players and is a project of the Annenberg Public Policy Center at the University of Pennsylvania. If you have a fact that you'd like checked, e-mail us at www.chcradio.com , we'll have FactCheck.org's Lori Robertson check it out for you here on Conversations on Health Care.

[**Music**]

Margaret Flinter: Each week Conversations highlights a bright idea about how to make wellness a part of our communities and everyday lives. Stanford based bio engineer Manu Prakash has a simple goal. He wants to create a portable medical lab small enough to fit in a backpack and

he's already developed a tool that fits the bill. While sitting under a tree in Uganda, he noticed that the local medical clinics door was propped open by an expensive centrifuge machine, one that was reliant on electricity now broken and no longer in use. And he wondered how could he create a portable centrifuge that would be inexpensive to make, easy to operate and easy to replace. His inspiration came from a simple childhood toy, the whirligig, a toy that functions by pulling two ends of a string threaded through a round object like a button.

Manu Prakash: So we spent a significant portion of this time truly understanding the mathematical face-space for how you can convert linear motion into rotational motion. There's some beautiful mathematics hidden inside this object.

Margaret Flinter: So he took this simple toy idea to another level creating a human powered centrifuge made from simple components, paper, twine and plastic. All together each Paperfuge, as he calls it, can be constructed in under two minutes and costs only 20 cents. And yet remarkably, it works extremely efficiently.

Manu Prakash: With this set of principles, we're able to essentially make a centrifuge that spins all the way to 120,000 rpm. In the lab, we can separate and pull out malaria parasites from blood, separate blood plasma.

Margaret Flinter: It's currently being tested for malaria diagnoses, but it's being readied for far more complex diagnostic challenges.

Manu Prakash: This is a tool that requires no electricity, no infrastructure, and you can carry them around in your pockets for a price point of 20 cents.

Margaret Flinter: The Paperfuge, a cheap but highly effective field tool for clinicians providing a portable solution to diagnostic challenges creating a quicker pathway to diagnosis and treatment. Now that's a bright idea.

[**Music**]

Mark Masselli: You've been listening to Conversations on Health Care. I'm Mark Masselli.

Margaret Flinter: And I'm Margaret Flinter.

Mark Masselli: Peace and Health

[Music]

Marianne O'Hare: Conversations on Health Care is recorded at WESU at Wesleyan University, streaming live at www.chcradio.com, iTunes, or wherever you listen to podcasts. If you have comments, please e-mail us at www.chcradio@chc1.com or find us on Facebook or Twitter. We love hearing from you. This show is brought to you by the Community

Dr. Robert Gallo

Health Center.

[**Music**]