R3 - MS Podcast: Exposomics

00;00;05;06 - 00;00;17;22
Raja Flores
Hi. Welcome to the vitals here at Mount Sinai School of Medicine. Where we have a great show for you today. My name is Roger Flores. I am the host today, filling in for Leslie Schlichter.

00;00;17;25 - 00;00;28;13
Raja Flores
I happen to be the chairman of thoracic surgery here at Mount Sinai. And today we are welcoming, two experts in the field of exposome ICS.

00;00;28;29 - 00;00;35;14
Raja Flores
What is exposomics? Basically, it is a field that studies the effect of environment,

00;00;35;14 - 00;00;52;00
Raja Flores
different environmental factors that influence somebody's health. And we have two of the world experts here at Mount Sinai, doctor Rosalind Wright and Doctor Bob Wright. And they head the Institute for Exposome ICS.

00;00;52;00 - 00;00;53;08
Raja Flores
All right. So

00;00;53;12 - 00;01;00;02
Raja Flores
welcome, Bob and Roslyn. Right. To our show today. And can you.

00;01;00;02 - 00;01;05;20
Raja Flores
And just for full disclosure, I they're both married. Just so everybody know.

00;01;05;26 - 00;01;06;14
Robert O. Wright
To each other.

00;01;06;22 - 00;01;08;00
Raja Flores
And to each other,

00;01;08;17 - 00;01;16;18
Raja Flores
and, and so can you give us a brief introduction as to what is exposome mix?

00;01;16;20 - 00;01;42;14
Robert O. Wright
I think the simplest explanation or definition is it's the study of all the health relevant environmental exposures you experience across your lifespan. So it's meant to be a complement to the genome. So the genome is all your genomic risk factors for your health and exposome access all of the environmental risk factors for your health defined broadly. It's the social environment.

00;01;42;15 - 00;01;49;13
Robert O. Wright
It's the chemical environment, the physical and even the biological environment. Things like infections would also be part of your exposome and it's

00;01;49;22 - 00;01;54;22
Robert O. Wright
time varying. It starts, you know, when you're conceived and it goes on until the day you die.

00;01;55;10 - 00;02;01;01
Raja Flores
So I'm a thoracic surgeon and I operate in a lot of patients with lung cancer, mesothelioma.

00;02;01;05 - 00;02;11;03
Raja Flores
The cancer from his past is saying esophageal cancer. Can you give an example for the, audience as far as, let's say, lung cancer is concerned?

00;02;11;06 - 00;02;17;21
Raja Flores
And how would Exposome come to play as we're studying lung cancer?

00;02;17;24 - 00;02;51;01
Robert O. Wright
So everyone knows that smoking is a cause of lung cancer. Asbestos is also a cause of lung cancer. And there are genetic factors that make you have a higher risk for lung cancer. But what they're really doing is actually interacting with things that happen in your environment. So if you're exposed to air pollution and you have a genetic risk factor, it's the combination of the two that that may actually trigger, the onset of mutations and mutagenesis and that ultimately lead to lung cancer.

00;02;51;01 - 00;03;01;04
Robert O. Wright
So, Exposome is actually filling in a lot of the missingness of genomics. So we know that when people have a particular genetic variant,

00;03;01;04 - 00;03;01;13
Robert O. Wright
they're at

00;03;01;13 - 00;03;12;16
Robert O. Wright
high risk for having, say, lung cancer or any particular disease. But not everybody with that genetic variant gets the disease. And the difference is what you're exposed to. And when you're exposed to it.

00;03;12;18 - 00;03;16;23
Robert O. Wright
So it actually completes, you know, the Human Genome Project.

00;03;16;25 - 00;03;44;11
Raja Flores
I mean, I've always found that fascinating, where you can have two people, smoking the same amount, same cigaret brand one gets cancer and one doesn't. So I think that when you look at Exposome mix, that's, that's the missing piece. That's the piece we can influence because the genetics are there and it's how do we influence the exposures?

00;03;44;13 - 00;03;57;23
Raja Flores
With me. So Thelema the cancer from is this, how do you how would you study something like that? Because you have patients who are still being exposed and

00;03;57;23 - 00;04;00;16
Raja Flores
some will get cancer, some will not.

00;04;00;28 - 00;04;02;27
Raja Flores
How can you study that and

00;04;03;04 - 00;04;08;18
Raja Flores
affect things in a way that will help the majority of the population?

00;04;08;21 - 00;04;35;00
Rosalind J. Wright
Well, I think I'd like to say something about your your previous question too, but it relates to this is that it's not only, the, health relevant exposures over your life course that might interact with your genome to put you at higher risk if you are exposed to certain things in the environment smoking, chemicals, all the things that Bob was talking about, let's say now take the patient who has lung cancer and you have to treat that patient.

00;04;35;02 - 00;04;51;07
Rosalind J. Wright
The exposome is not only the external environment that you take into the body, but it's how your body, your biology, has been reprogramed because you have to adapt to that over time. This is the, context in which you live and your body

00;04;51;07 - 00;04;51;11
Rosalind J. Wright
is

00;04;51;11 - 00;05;00;24
Rosalind J. Wright
trying to balance the how do I how do I keep this person as optimally healthy as possible, given all these exposures that they have?

00;05;00;24 - 00;05;03;03
Rosalind J. Wright
So the physiology changes

00;05;03;07 - 00;05;03;17
Rosalind J. Wright
you have

00;05;03;17 - 00;05;03;20
Rosalind J. Wright
to

00;05;03;20 - 00;05;05;17
Rosalind J. Wright
treat them with chemotherapy.

00;05;05;20 - 00;05;10;09
Rosalind J. Wright
And some people respond and some people don't. So it's not only that

00;05;10;18 - 00;05;23;15
Rosalind J. Wright
there's differential risk because. But you mentioned once they both smoke but only one ends up with cancer. That part of that's genetic part of that's the environmental milieu from the outside

00;05;23;15 - 00;05;23;19
Rosalind J. Wright
that's

00;05;23;27 - 00;05;26;28
Rosalind J. Wright
in. And part of it is that reprograming that happens.

00;05;27;00 - 00;05;49;09
Rosalind J. Wright
And we as physicians need to get better to think about that, measuring those things to get a little closer to how do I best manage this person. We may not get down to the person, but we're going to get down to smaller and smaller risk groups that we understand something a little bit more about and better manage. And I think with mesothelioma,

00;05;49;14 - 00;05;51;09
Rosalind J. Wright
it's going to be a similar story.

00;05;51;09 - 00;06;13;15
Rosalind J. Wright
It's really we know that we're not exposed to one thing at a time. It's a mixture. And and the exciting thing about Exposome X is we now have the computational science available to us to really more comprehensively study those things. In the context of, delivering health care and making diagnoses and preventing,

00;06;14;00 - 00;06;17;18
Rosalind J. Wright
disease, which is the most exciting part to me.

00;06;17;20 - 00;06;49;03
Raja Flores
It's interesting you mentioned something that really resonated with me as a surgeon. So are we considered surgeons? Are we considered part of this? Exposome IC mixed because you have one surgeon that's going to treat a patient a certain way and another one. So it's a different treatment exposure where you have, you know, me or one of my partners operating on you, and you may have a different outcome depending on who's treating that particular patient.

00;06;49;06 - 00;06;54;09
Raja Flores
Is that included in the exposome make, capture data?

00;06;55;06 - 00;07;02;01
Robert O. Wright
In theory, it is. It would be difficult to tease out the individual

00;07;02;05 - 00;07;21;17
Robert O. Wright
set of, different surgeons. Patients have different degrees of severity. So that may play into that

as well. But yes, you're right, it is at some level part of the exposome and certainly procedures medications that people are on. Lots of things that you can get out of the electronic health

00;07;21;20 - 00;07;32;15
Robert O. Wright
are actually part of the exposome, in addition to things like water quality and air pollution and exposure to chemicals and the built environment and diet, all those things are part of Exposome.

00;07;32;18 - 00;07;47;03
Rosalind J. Wright
That's an interesting question, because we often think an epidemiologist is looking at, outcomes in in the health care setting. We think about case mix. So that's kind of what you're getting at is case mix is really you're at this institution or that institution,

00;07;47;03 - 00;07;47;09
Rosalind J. Wright
this

00;07;47;09 - 00;07;54;15
Rosalind J. Wright
this clinician is providing you a certain care approach at this clinician may choose another way to do that.

00;07;54;26 - 00;08;02;13
Rosalind J. Wright
It's that case mix and you can account for that. But you can imagine that we need bigger and bigger data

00;08;02;18 - 00;08;21;12
Rosalind J. Wright
to do that. And the more we have that. And that's why I was mentioning the computational tools and data science and artificial intelligence or augmented intelligence. We have to have the, the clinicians, right side by side with our data scientists helping to sort out and tease out what's important there.

00;08;21;15 - 00;08;29;08
Rosalind J. Wright
But, that's where we're moving. And that's very exciting, because that could get to the kind of question that you're you're asking.

00;08;29;10 - 00;08;55;28
Raja Flores
It's interesting because the computational analysis is we're getting better and better at that. We're better to record, absorb and translate that. What is it that you try to capture? So you're

looking at environmental stuff. How do you everybody want something quantifiable? To be able to explain something and to be able to change things, to improve health care.

00;08;56;00 - 00;09;00;16
Raja Flores
What are you capturing? What are you looking at?

00;09;00;18 - 00;09;22;28
Robert O. Wright
I think one of the biggest challenges is that we tend to approach science in a reductionist way. So if you think about how a randomized controlled trial works, you know, half a group gets a drug and the other half gets a placebo, and we're trying to see the effect, there'll be a difference in many cases if it, if a drug successful.

00;09;23;02 - 00;09;44;14
Robert O. Wright
But we don't know why some people who got the drug, you know, didn't have an effect. And that's sort of where Exposome x can come in. Genomics is thought of this way too. Maybe there's a reason genetically why some people get the drug don't have a good effect, and why some people who don't get the drug actually, there's a placebo effect to where people actually get healthy.

00;09;44;14 - 00;10;00;12
Robert O. Wright
Exposome X is trying to understand the context at the individual level, so that we understand that this person had a treatment failure because they were exposed to this, or this person, you know, was able to overcome, you know, the illness, which is a placebo effect.

00;10;00;18 - 00;10;09;29
Robert O. Wright
Even though, you know, they didn't get the drug. And Exposome actually gives us more information on the context of the individual, which actually is their diet.

00;10;10;01 - 00;10;14;07
Robert O. Wright
It's their environmental exposure. It's and it's even things that happened to them in childhood.

00;10;14;07 - 00;10;29;12
Raja Flores
can you give a simple scenario of how Exposome has changed management in a particular scenario that has improved care outcome in patients?

00;10;29;12 - 00;10;51;24
Robert O. Wright
air pollution apps and asthma might be a good, example. You know, there's, there's this new

ability because of cell phones, to understand at a personal level how much air pollution you're breathing. And so patients with asthma can actually gauge whether or not they should exercise outside or even go outside on a day that's really bad for air pollution.

00;10;51;24 - 00;11;04;21
Robert O. Wright
So there are ways that you can control your environment, which really didn't exist even ten years ago, like that. That information wasn't so readily available. So and that's, that's exposome like information. So that would be an example there.

00;11;04;23 - 00;11;28;09
Rosalind J. Wright
Aspen's a good paradigm for that. So I'm a pulmonologist so I take care of a lot of asthmatic but not but an adult pulmonologist. But I some of the research I do is really going way back, starting in utero and looking at factors collectively that program risk for asthma. And we've discovered a lot about what those health relevant environmental factors are.

00;11;28;11 - 00;11;43;18
Rosalind J. Wright
And it goes beyond things we thought it was allergens and tobacco smoke and those kinds of things. And that's where I started when I was doing my pulmonary fellowship. But I was only explaining like 15% of what was going on in that bothered me. Well, what are we missing? What are we missing?

00;11;43;18 - 00;12;04;24
Rosalind J. Wright
There was a study done in Baltimore where they had folks who had, 12 year olds that had asthma, very significant asthma. They were having multiple exacerbations even on best drug that we knew, should be, good for asthmatic. And they were having more hospitalizations, more air visits and greater morbidity.

00;12;04;27 - 00;12;32;27
Rosalind J. Wright
And they moved them. They gave them vouchers, moved them out of these, urban areas where there was, disinvestment, high pollution, lack of resources, not good access to healthy foods, these kinds of things. They moved them out before they did that. They measured in their homes the air pollution level, the dust. They characterized, their exposure to the allergens, tobacco smoked, all those things, as well as stress that they were experiencing.

00;12;32;29 - 00;12;57;22
Rosalind J. Wright
And then they a year later, they looked at outcomes and they measured those things when they moved as well. And they said, well, we did see a change in those for the better. All those environmental, out, external environmental factors. We saw improvement in the asthma. Well, what was mediating it. And it was really the psychological stressors, more so even than the, air

pollution, the tobacco smoke and the indoor allergens.

00;12;57;24 - 00;13;01;26
Rosalind J. Wright
But yet they're also interacting to be synergistically impact.

00;13;01;26 - 00;13;09;29
Rosalind J. Wright
So it's really, again, we start to think we have to really measure these things collectively and think about them as a big mixture of health.

00;13;09;29 - 00;13;34;14
Rosalind J. Wright
Rather, what are they then? The air pollution, ambient air pollution, outdoor air pollution from traffic, from industry, those kinds of things that's now been linked to not only onset of asthma, but exacerbation or worse, outcomes in asthma, on high pollution days. It's a diet that you eat. We know that nutrition, can actually mitigate the effects if we have diets that are high in certain things.

00;13;34;17 - 00;14;00;18
Rosalind J. Wright
And advantageous polyunsaturated fatty acids, antioxidants, higher intakes of those. Even if you live in an environment where you're exposed, to higher air pollution, etc., if you have a balanced, nutritious diet. And we knew what to optimize in that individual by taking an exposome like a scaling it up and taking a look at their, nutrition, that would be very helpful.

00;14;00;18 - 00;14;21;01
Rosalind J. Wright
So there's data to show that, even there was one study that came out where, pregnant women smoking, we know it has huge impact on lung growth. And these kids are going to have problems after they're born. They're going to have smaller lungs. They're going to be at greater risk for, chronic lung disease like asthma and others.

00;14;21;03 - 00;14;47;06
Rosalind J. Wright
And it's very difficult sometimes to convince people to stop smoking or get it's an it's an addiction. So even pregnant women, lots of folks can be motivated by I'm pregnant, I'm the baby. But some can't they they randomized mothers who are smoking during pregnancy to vitamin C, and they found that if they could give vitamin C an antioxidant in utero, they didn't see those lung impacts on the kids.

00;14;47;08 - 00;15;23;18
Rosalind J. Wright
So there are those kinds of studies. And one more I would mention recently, I was involved with is not only looking at the physical chemical exposures we've talked about, but the social

environment. So stress if you live in an environment with high levels of psychological stress, you know, unsafe environments, these kinds of things, you just as you breathe in tobacco smoke, it triggers changes in your physiology, the HPA axis, cortisol that you put out, the autonomic nervous system, those connect to the immune system.

00;15;23;25 - 00;15;28;26
Rosalind J. Wright
Asthma is an immune mediated disease. So there you go. You can make that direct connection.

00;15;28;26 - 00;15;35;28
Rosalind J. Wright
So people are starting to do that kind of work. We need to scale it up. That's, you know, that's starting so interesting.

00;15;36;03 - 00;16;01;11
Raja Flores
We think with cases like that, let's say homelessness, more stress, high cortisol levels, you know, decreased immune system, functioning. Do you draw blood in those patients to document the elevated cortisol? Do you just take prior studies that see, you know, this leads to higher cortisol levels and in turn or, or do you actually draw blood and check on that?

00;16;01;16 - 00;16;17;16
Rosalind J. Wright
We measure it, drawing blood. First of all, you put a needle in somebody's arm, their cortisol is going to go up. So it's not the best way to do it. But there are there are noninvasive ways you can do it. And, you know, cortisol is different over the course of a day. There's a diurnal rhythm to that.

00;16;17;16 - 00;16;37;16
Rosalind J. Wright
So there are lots of those. So we take saliva samples, repeated saliva samples from people. You can measure it in that. And there's some very interesting work that's come from here. You can you know, if you take hair just at the root and you, you start to go back, each centimeter represents a month and you can actually measure hormones in that.

00;16;37;16 - 00;16;55;06
Rosalind J. Wright
You can measure environmental exposures in that you can measure lots of different responses, physiologic response variables that can say some say you get somebody a delivery of a baby and they give you nine centimeters of hair. We can recreate the whole pregnancy from that hair sample.

00;16;55;06 - 00;16;56;10
Raja Flores
That is amazing.

00;16;56;10 - 00;17;15;14
Rosalind J. Wright
So those are the kinds of innovations that we need to really be taking advantage of for Exposome make something where you can measure multiple things, not only the exposures, but the biological responses that we think are operating underneath. So we have, insights into those as well at the same time.

00;17;15;16 - 00;17;34;09
Raja Flores
So it's interesting, let's say for a disease like me that the only one that you get from is Spence. This we see patients in the office where, they don't know if they were exposed. Right. And the scan doesn't show any evidence of this past this in the chest. And they think they may have been exposed, but you're not sure?

00;17;34;09 - 00;17;42;17
Raja Flores
Is there a way to check hair or something like that where you can see if they've been exposed to this in the past?

00;17;42;19 - 00;18;12;20
Robert O. Wright
Well, I don't know that there is a biomarker per se, but we know where it's pestis. Mines are. We know the occupations that tended to have higher levels of exposure, like Steve McQueen was exposed, I think, during the Navy, his stint in the Navy and the work he was doing there. And construction certainly gets out. So there are pieces of the puzzle that we can actually use to estimate the probability that you're exposed, like, where did you grow up?

00;18;12;27 - 00;18;34;25
Robert O. Wright
You know, we we as physicians, we never get a lifetime presidential history. Yet there's amazing information in where you used to live, you know, whether used to live in an urban area that might have been a food desert or you lived in a suburban area, or maybe you lived in Libby, Montana, when you were a child and you were probably breathing in some of the particles of asbestos.

00;18;34;27 - 00;18;55;11
Robert O. Wright
So there are ways to reconstruct that. And that's really part of what Exposome is, is actually trying to map your history and so we will get some biomarkers. You know, we we some of them might be in hair, might be in blood or might be in urine. And we can measure lots of chemicals as well as hormones and get a sense of, of what your body is doing today.

00;18;55;15 - 00;19;14;14
Robert O. Wright

But with maps, we can also go back in time and give you some information on what you may have been exposed to earlier in life. And I think that's the real power of Exposome X, and I think the growing interest in Exposome is really tied to the field of longevity, which has gotten a lot of press recently, but also health span.

00;19;14;14 - 00;19;38;29
Robert O. Wright
So not just how long you live, but how healthy you are during you when how healthy you are as you live. Exposome ties to that because if you're having information and there's something happening in your environment, it might be your diet, it might be chemical exposures, it might be air pollution, it might be a past history of asbestos exposure that may have triggered, you know, a tumor that somewhere in your body there's some signal there.

00;19;39;02 - 00;19;47;19
Robert O. Wright
And rather than just stop it saying, yes, there's inflammation in your body. Exposome X goes deeper and tries to figure out what the root causes.

00;19;47;22 - 00;20;13;13
Raja Flores
I think that's very relevant because many times when I have a patient who has a cancer, whether it's me with the Lima lung cancer esophageal cancer, they want to know if they were exposed to something in their home because they have other family members who have the same genetics, who are also exposed to that environmental insult that can trigger a cancer.

00;20;13;13 - 00;20;34;21
Raja Flores
So if we can use Exposome mix to figure out what was it that they were exposed to and where you can prevent cancer from happening in their family members. Because that's really the number one thing patients will ask me after I'm treating them. They worry about their family. What do I do with this?

00;20;34;21 - 00;20;40;12
Rosalind J. Wright
What? Right, right. That's a very good example of how it could be used. And a very important way.

00;20;40;12 - 00;21;03;11
Raja Flores
I think that is, pivotal for the patients that I see, you know, many of them are blue collar guys, insulators who are exposed at work. And it's interesting is over time, you found out that their spouses got cancer as well. And it's because they came home with this stuff on their clothes, and the spouse would clean it.

00;21;03;11 - 00;21;04;28

Raja Flores
And Nate developed the disease as.

00;21;04;28 - 00;21;27;10
Robert O. Wright
Well, right? Yeah. So one of the the values of exposome is we go beyond blood tests. We might actually if we wanted to do a full exposome analysis on, you know, we would go into your home and collect dust and then measure what's in the dust, because that's what you're breathing on a day to day basis. And, you know, think about how many hours you spend in your home, you know, breathing the air in your home.

00;21;27;10 - 00;21;47;20
Robert O. Wright
It adds up. Over the years. And so, you know, it's very important to have healthy air. It's very important to have healthy water or clean water. And so, you know, these are things that we can actually modify, but we have to measure that to know whether or not we need to modify them. And Exposome is giving patients agency so that they can see what's happening in their environment.

00;21;47;20 - 00;21;50;24
Robert O. Wright
And they have, you know, the will to change it if they so choose.

00;21;51;00 - 00;22;18;03
Rosalind J. Wright
Yeah. And, you know, with the there's going to be an explosion of wearable devices, because that's going to really, allow people to do that sort of monitoring where they are, where they live, where they work in schools, where kids spend a huge part of their day. That's going to be important data to have both for the clinician and, but they also the patient, because the patient can monitor that with these and.

00;22;18;03 - 00;22;18;22
Raja Flores
Modify.

00;22;18;22 - 00;22;41;00
Rosalind J. Wright
It. And you as the clinician can be guiding them. And well, here's what you would do in that situation. As well, we need to learn to work together with those types of devices. We need that kind of information more than the seeing the patient every six months or once a year or something like this, and trying to recreate it through a history, we can actually measure those, the effects.

00;22;41;07 - 00;23;02;17
Rosalind J. Wright

These things are not only the exposures, but the effects they're having on your body. We can monitor and your nutrition. You can monitor what you're taking in, understand why what how that affects you. That kind of thing. And then it's like tuning a radio, you know? But where do I locate this person? They have they're up on this, up on this, up on this.

00;23;02;17 - 00;23;22;19
Rosalind J. Wright
Well, let's talk about how you can minimize those exposures. That's always important. But in the meantime there are things we can do. We can fix your your nutrition a little bit in this way. How do we make that happen for you. Now some people don't have access to healthy foods. We have to take more of a public health lens there than just telling people advice.

00;23;22;19 - 00;23;24;29
Rosalind J. Wright
You go out and buy, you know, this or that.

00;23;25;06 - 00;23;48;13
Raja Flores
It's interesting before we get into nutrition, because that's probably one of the number one questions many patients ask what you know, if they have cancer or if they don't have cancer, what can they eat to avoid it? The home issue though, there's one question that I have. How about let's say, for example, a fireplace. Can you tell if you have an active fireplace in someone's home?

00;23;48;20 - 00;24;00;16
Raja Flores
Is there something coming out of that that can be an exposure that can trigger some kind of cancer, or something in an individual? Has that been looked at at all?

00;24;00;20 - 00;24;22;01
Robert O. Wright
I think smoke is a clearly a carcinogen. I think, you know, there there are air filtration devices with Hepa filters that you can use. Yeah. And you can make sure that you keep your, your chimney cleaned on a regular basis so it doesn't back up, which is also a safety issue. So there are things you can do.

00;24;22;03 - 00;24;43;01
Robert O. Wright
You don't necessarily have to stop using the fireplace, but if you want to understand your health and you want to promote your longevity and your health span, it would be wise to counsel patients to look into these things if they can afford it. You know, get your chimney cleaned, get you can get your air checked, and you can also get a filtration system.

00;24;43;06 - 00;25;06;01
Robert O. Wright

So those are things that are all possible, and they can have big effects because, you know, you can't stop breathing, you know. Yeah. We I think we underestimate how powerful clean air is until we start to think of how much air we breathe. Just on a day, you know, we take about 150,000 breaths a year. You know, multiply that by the number of years you're alive.

00;25;06;01 - 00;25;15;23
Robert O. Wright
So that just tells you how much air you're you're taking into your body and if it's polluted air, it that that effect is communicated accumulating over time.

00;25;15;29 - 00;25;36;24
Rosalind J. Wright
Yeah. And if that's in your home it affects things like sleep more short term things to sleep. The sleep quality is hugely important to almost any, health outcome that you want to look at. But even longevity, you're you have to have a good quality sleep. So it, it affects those things in the short term for cancer.

00;25;36;27 - 00;26;00;26
Rosalind J. Wright
Those are harder studies, right? Because there's such a late, long latency period of. So you really would need some measures of cumulative exposures over time. That's where some of the innovations that Bob was talking about, about mapping going back in time, that we can go back in time and recreate, similar to how we were talking about using hair to recreate a longer period of time.

00;26;00;26 - 00;26;11;16
Rosalind J. Wright
When you're looking at these different biologic, factors as well. We need to be creative and invest in doing more of that kind of thinking

00;26;11;16 - 00;26;12;09
Rosalind J. Wright
to be able to

00;26;12;09 - 00;26;12;15
Rosalind J. Wright
do

00;26;12;15 - 00;26;13;19
Rosalind J. Wright
that at the same time

00;26;13;26 - 00;26;14;29
Rosalind J. Wright
that we know going

00;26;15;03 - 00;26;16;06
Rosalind J. Wright
we really want to know

00;26;16;09 - 00;26;16;15
Rosalind J. Wright
these

00;26;17;17 - 00;26;17;25
Rosalind J. Wright
about

00;26;17;27 - 00;26;19;07
Rosalind J. Wright
people like you were talking

00;26;19;10 - 00;26;20;06
Rosalind J. Wright
earlier.

00;26;20;06 - 00;26;33;21
Rosalind J. Wright
We're better at what we put in the health record because we know those data can be very valuable, and we weren't doing that as thoughtfully, in the past, we could still do better, but we're doing we have made strides there.

00;26;33;26 - 00;26;36;21
Robert O. Wright
Yeah. I think it's physicians. We tend to think of doing

00;26;36;21 - 00;26;37;18
Robert O. Wright
blood tests,

00;26;37;18 - 00;26;53;05
Robert O. Wright
and that's what's valid. But there's a lot of information in, say, getting your house dust, getting, you know, the quality getting your air filtration system, getting a filter and measuring what's in the filter. There's a lot of information in maps, knowing where you grew up and what was in, you know, the areas where you grew up.

00;26;53;05 - 00;27;09;21
Robert O. Wright
You maybe you grew up next to a Superfund site and you never knew because you were a kid.

Yeah, but that that information is retrievable and maybe you were exposed to carcinogens because of that. You know, I was I was born in Okinawa and my father was stationed there. My mother's Okinawa, and I grew up across the street from Kadena Air Force Base.

00;27;09;21 - 00;27;32;14
Robert O. Wright
Kadena Air Force Base during the Vietnam War had a lot of Agent Orange contamination. So I may have been exposed to Agent Orange when I was a child, but that's information that I only learned because I decided to map my residential history and I looked into it more. So there's a lot of information on your potential health that actually won't necessarily come from a blood test.

00;27;32;16 - 00;28;02;24
Raja Flores
Yeah, it sounds like there's a wealth of information that you can find out about your past. I think, and what you've been exposed to and how that's going to affect your future. So starting now nutritionally, how do you figure out, especially nowadays, where there's ultra processed food, everything here is contaminated with this or that? How do you study food and how it affects whether or not you get cancer, your longevity, your quality of life?

00;28;02;24 - 00;28;06;06
Raja Flores
How do you how do you begin to study something like that?

00;28;06;08 - 00;28;34;27
Robert O. Wright
Well, we know obesity is a risk factor for cancers. So food that is obesity genic. So high carbohydrate diets regardless of whether they're contaminated with you know chemicals are from ultra processed foods. Just that diet alone is going to be pro carcinogenic because it's pro obesity genic. And so, you know, I would recommend a high protein low carbohydrate rate diet with as much green leafy vegetables as possible.

00;28;35;00 - 00;28;54;20
Robert O. Wright
That's hard to do. I think we have to factor in that. People that, you know, people have a hard time getting off of ultra processed foods. Part of it is the cost, but part of it is they are addictive. And so we have to understand that this is addict and addiction. I think GLP one drugs will really, really help people.

00;28;54;22 - 00;29;20;27
Robert O. Wright
I think most people don't want to be in a drug for the rest of their life, so I think they're useful for breaking the cycle. But at the same time, as clinicians, we have to give people the tools. So that they can learn how to eat healthy. And it doesn't necessarily have to be expensive. You know, I think it's a it's a bit of a cop out for the food industry to talk about how inexpensive their foods are when they're they're basically unhealthy foods.

00;29;21;05 - 00;29;38;19
Robert O. Wright
So we need to think about how we can provide healthy foods at a reasonable cost to people, but also give people the information about, you know, if you eat this product, you know, it's much healthier if you hit a high protein diet, low carbohydrate diet, you're probably going to eat or lose weight, or at least not gain weight.

00;29;38;22 - 00;29;41;10
Robert O. Wright
And that's going to be better for you in the long run.

00;29;41;12 - 00;30;09;08
Rosalind J. Wright
And how do you how do you study it? I mean, we have to measure it as comprehensively as we can. Nutrition. Behind beyond sort of these lumped these larger categories, right, processed foods, etc.. But that's where you get into the internal environment where you can actually do use omics platforms. And really on a scale of thousands, take a look at, those data using machine learning.

00;30;09;10 - 00;30;34;28
Rosalind J. Wright
AI, those kinds of tools to start to see, patterns that are predictive of certain disease outcomes. And we need to do more of that work that works going on. But we need to do even more of that work. And then in the individual right now, characterize that, make a change and then follow and see if you do see improvement in the in in those patterns and profiles.

00;30;35;13 - 00;30;41;15
Rosalind J. Wright
is going to be more than just a blood test. One biomarker really does need to be a more comprehensive.

00;30;42;22 - 00;30;56;12
Raja Flores
So what's your most useful tool. Is it the electronic medical record where you can extract all this information or what? What is your most valuable tool to plug something in and look at the omics?

00;30;56;14 - 00;31;15;20
Robert O. Wright
All right. I think it's all of the above. I think it's the electronic health record. I think it's the maps. I think it is. I think there is definitely a role for measuring your blood Exposome. So for measuring, you know, the chemicals in your blood, which will include things like hormones and nutrients and metabolites. So all those things come together.

00;31;15;22 - 00;31;35;27
Robert O. Wright
I don't think there is a game changing. One thing. It has to it has to be trying to bring these things together. And as I said, trying to figure out your past because you're not sick today unless you get unless you were hit by a car or you happen to catch an infection because of what happened to you today, you're sick because of things that happened to you in the past.

00;31;35;27 - 00;31;54;23
Robert O. Wright
So if we want to understand cancer, we have to be able to go back in time. And so a lot of our work is actually thinking about how can we go back in time and trying to think outside the box because, you know, physicians don't typically think about maps, but maps are they're very easy to understand because they're so visual and they go back in time.

00;31;54;25 - 00;32;22;26
Robert O. Wright
Yeah. Everybody's looked at a map from, you know, the, you know, the 1960s or 1950s when they were born in their neighborhood and seen how it's changed. You know, people use maps all the time and so, you know, maps are just intuitive, easy to understand. So if you grew up in Libby, Montana, and you could plot where your houses and you could plot where the mines are, and you could probably even get information on the wind direction or the average wind direction over time, you could actually estimate your exposure.

00;32;22;28 - 00;32;27;24
Raja Flores
So interesting. So just regular maps or. Oh yeah, a wealth of information.

00;32;27;24 - 00;33;11;17
Rosalind J. Wright
And dress, making sure that you can link that address, you know, not a zip code, where you live right down to what area that person's breathing and, and estimate those kinds of things. It's really what Bob's saying. It's it's making those multiple data streams interoperable and investing it like our health system has really done that in a big way, invested in high performance computing, linking genomics with the electronic health record, but also now we have to bring in the environmental pieces, these maps, but also the biomarkers that we're measuring as part of that, the exposures that we get from the wearable devices that we have, the response is that we're measuring in people

00;33;11;19 - 00;33;37;03
Rosalind J. Wright
out there living in the world through the wearable devices, etc. the all those data need to be interoperable and really streamed together. And that's the kind of, thing that they're building. Many health systems are trying I think we're way out ahead of that thinking and investment in that. And that's what's going to have to happen is really bring those things together using data, Medicare data.

00;33;37;06 - 00;34;01;08
Rosalind J. Wright
Right. Bill leveraging a lot of these existing administrative databases. That brings us interesting, data. You can link that then to air pollution exposures and or other exposures that you can create. You can model based on where someone lives. And you can actually start to really hone in on, you know, hotspots of why are so many people here getting mesothelioma.

00;34;01;11 - 00;34;07;11
Rosalind J. Wright
Yeah, you know, a little more had a past and really use those tools that.

00;34;07;11 - 00;34;31;11
Robert O. Wright
You know, there's a great quote from a science fiction writer, William Gibson. The future is already here. It's just not very evenly distributed. And what he means by that is all these tools exist. Yeah, but they're very siloed. And so with artificial intelligence and the computational infrastructure that we now have at Mount Sinai, we can start to bring it together and make it more evenly distributed so that we can start to use this information.

00;34;31;18 - 00;34;51;06
Robert O. Wright
The problem isn't the lack of information, it's how siloed it is. And so what we're trying to do with Exposome is bring all these different pieces together, including genomics. But we want the exposure biomarkers. We want them measures the biomarkers of inflammation. But we also want the maps. We want to know what your residential history was. Where did you grow up?

00;34;51;08 - 00;35;00;12
Robert O. Wright
You know, where were you at a particular given place in time, and what was happening at that place in time? And that information exists, so it just has to be brought together.

00;35;00;15 - 00;35;16;12
Raja Flores
Interesting. You know, you said something that made a lot of sense. If you're sick today, it's because of something that happened in the past that got you sick. So me eating Lucky Charms every day since I was ten years old, what am I going to have down the line?

00;35;16;12 - 00;35;19;18
Robert O. Wright
But you can't be looking at you. I don't think that happened.

00;35;19;21 - 00;35;32;20
Rosalind J. Wright
That doesn't mean you can't do something now. That's that is that, you know, you have to take

that life course perspective to really understand why you're where you are right now. But that doesn't mean you can't. There's not things we can do to to.

00;35;32;23 - 00;35;33;15
Robert O. Wright
It's never to.

00;35;33;18 - 00;35;41;22
Rosalind J. Wright
Put you back on a more optimal trajectory. You know? So it's not like it's all you can't you shouldn't throw up your hands and say, okay, well.

00;35;41;23 - 00;36;01;28
Robert O. Wright
Now the importance of of lifestyle, you can't underestimate it because you will, you know, even if you have mesothelioma, if you eat a healthy diet and and obviously you want to give up smoking if you're a smoker, but if you, if you if you have social connections, if you eat a healthy diet, if you avoid toxins, you will feel better.

00;36;02;00 - 00;36;07;00
Robert O. Wright
You know, it won't necessarily carry your disease, but it will probably increase your lifespan.

00;36;07;00 - 00;36;12;08
Rosalind J. Wright
Yeah, it might make you respond better to medications that we have that we.

00;36;12;08 - 00;36;13;18
Raja Flores
Oh, I believe that I've seen that.

00;36;13;21 - 00;36;15;03
Rosalind J. Wright
Absolutely. I have as well.

00;36;15;03 - 00;36;16;25
Raja Flores
Yeah. And exercise and.

00;36;16;25 - 00;36;21;29
Rosalind J. Wright
Exercise will do that as well. Yeah. There many lifestyle factors that you can.

00;36;21;29 - 00;36;42;27
Raja Flores

What is interesting to me is it you make it sound like the answer is out there and the data is out there. We just haven't been able to put everything together. It's like the puzzle is all over the place. We just got to put the pieces together. But half the fight is not knowing what exactly you're looking for.

00;36;42;27 - 00;37;03;24
Raja Flores
So how would you put together or improve what we're doing here? Because we're already ahead of the curve at Mount Sinai with your group. How do we make it better? How do we make it so that we can affect the health of more people? And how can our viewers participate in that so that they're part of the solution?

00;37;03;27 - 00;37;27;06
Robert O. Wright
Well, I think a lot of what Roz is doing with the Ctsa is to build maps. So we're we've hired health geographers. So these are data scientists that just make maps. And another beautiful thing about maps is you can map anything. You can map your genome. In fact, geneticists do this. That's how, you know, not 23 me, but the other company, Ancestry.com.

00;37;27;06 - 00;37;48;01
Robert O. Wright
That's how they make their living is telling you that we're geographically, you know, your ancestors came from. So everything can be mapped, so information can be mapped with you. All my cases can be mapped, like where people lived as a child who had mesothelioma. Today even that can be mapped. So you know, maps are sort of the great equalizer.

00;37;48;01 - 00;38;08;08
Robert O. Wright
You can put everything on a map. And I think that I really think that is the future of medicine is we're going to start looking at maps to understand what happened to people ten, 15, 20, 30 years ago to help us actually diagnose patients and possibly even help treat patients, because it might be information there that might actually lead us down a different pathway towards treatment.

00;38;09;03 - 00;38;34;21
Rosalind J. Wright
Yeah. That's an important piece of it. We, we don't know everything that we have to have. All the data that we need is not necessarily out there, but what we should understand is a lot of it is and we don't have to know everything to make huge strides forward. We know a lot about the health relevant drivers of of multiple chronic diseases that we, understand mental health as well.

00;38;34;21 - 00;39;00;16
Rosalind J. Wright
We talk a lot about physical health, but the same for the mental health outcomes. So but we need to build that infrastructure that allows those, all those data streams to come together so

that we can actually, have our data scientists help us think through how do we best analyze this data, to, find answers for different, you know, it's got to be disease agnostic.

00;39;00;16 - 00;39;24;29
Rosalind J. Wright
It would be useful to all, in the end. And at the same time, we need to invest in more wearable devices, developing those because we know we need that information. We know we need to have folks monitoring in the, you know, the ambulatory environment in which they live even more than we can do now. And those wearables are really going to help us, do that.

00;39;25;06 - 00;40;02;19
Rosalind J. Wright
And then you have the infrastructure there, and now you feed that data in and you start to, put that into your computational models. So we need to do both. We need we're we're already have an infrastructure that allows a lot of this data to be interoperable and used in that way. There are things we need to do better to bring in the geospatial, mapping, data that we can but, in the wearable devices and to, to sort of boil that down into an understandable parameter that clinicians can, utilize in the clinic as well.

00;40;02;19 - 00;40;04;21
Rosalind J. Wright
And, and advise patients,

00;40;04;23 - 00;40;13;07
Raja Flores
So a map, how do you construct a map and do you use ChatGPT for that? What how do you construct that?

00;40;13;12 - 00;40;16;21
Robert O. Wright
Do use AI, not specifically jet.

00;40;16;24 - 00;40;20;04
Raja Flores
Like what other AI?

00;40;20;06 - 00;40;27;26
Robert O. Wright
Well, first we have to get a data set. So the, the simplest, example would be air pollution.

00;40;27;26 - 00;40;32;18
Raja Flores
So and it's in an Excel sheet or what would, what would this data set?

00;40;32;21 - 00;40;38;12

Robert O. Wright
Well, I'm not the person making the map so it's but yeah huge amounts of data, billions of data points.

00;40;38;12 - 00;40;46;26
Rosalind J. Wright
It's like hourly measures of the air pollutants. But you're also looking at traffic patterns. You're also measuring whether and temperature.

00;40;46;28 - 00;40;48;12
Raja Flores
Is this government data.

00;40;48;12 - 00;40;49;12
Robert O. Wright
Yeah. It comes from some.

00;40;49;12 - 00;41;17;00
Rosalind J. Wright
Of it comes from NASA and the government. Yeah. The Environmental Protection Agency, the EPA has stationary monitors all over the country, more in some places than others that measure, certain pollutants that we know are health relevant. And those we, they take data from those. So they'll get that from the EPA. The modelers will and feed that into, the models that they're building as well.

00;41;17;00 - 00;41;29;22
Rosalind J. Wright
They look at land use regression. What's it being used for? Is there industry nearby, etc.. Other sort, an airport, other sources of pollution. That wildfire or the one that the B.

00;41;29;24 - 00;41;56;14
Robert O. Wright
Yeah, the the the simplest way it works is to think of it as, you know, they have the satellites up in the sky and they're measuring how much haziness there is between the satellite and the Earth. And then you have these monitors on the ground that EPA established, which have the actual truth. The measurement, because you don't know whether the haziness is a mile high, in which case you're not breathing it or it's right next to the ground, but the monitors tell you whether it's right next to the ground.

00;41;56;14 - 00;42;18;20
Robert O. Wright
So you calibrate the the haziness based on the monitor, and the monitors are spaced in a certain way and use AI to understand the gaps between the monitors. And you can use, as I said, point sources to also supplement that, because that's going to add to the haze. And you could also factor in wind and other variables and also cloudiness.

00;42;18;20 - 00;42;31;23
Robert O. Wright
Cloudiness makes it harder to see that haze obviously, but you can use AI to fill in the gaps of where the clouds are. And so our ability to make really accurate maps is actually much greater now because of AI.

00;42;31;26 - 00;42;36;16
Raja Flores
Yeah. Just like it knows how to anticipate a word there. It can anticipate a cloud.

00;42;36;20 - 00;42;39;10
Robert O. Wright
Exactly what and what the cloud is blocking. Yeah.

00;42;39;11 - 00;42;41;11
Raja Flores
That's right. Interesting.

00;42;41;11 - 00;43;00;11
Robert O. Wright
and we may have, other things other than air pollution and weather, you know, we also map, you know, businesses, so you can get into an administrative database and you can know whether or not this area is a food desert. You know, there's no supermarkets in this area. So, you know, we can we can understand what's called the built environment.

00;43;00;11 - 00;43;20;10
Robert O. Wright
We can understand whether there's parks in areas to walk in your neighborhood. So yeah, we can make what we call walkability scales, which tell us whether or not you live in an area that promotes exercise or tends to inhibit exercise. So there's all kinds of information that you can get from maps. And also you can see how that changes over time.

00;43;20;12 - 00;43;40;22
Robert O. Wright
So you know it also goes back in time. All of these maps. And again if if we have information at the individual level on inflammation and we know where somebody lives, we can actually map the inflammation. And we can see whether there's a spatial pattern to the inflammation. So maybe there's something going on geospatial in this one neighborhood.

00;43;40;22 - 00;43;57;29
Robert O. Wright
We don't know what it is yet, but we know there's something about this neighborhood that we should be looking into. And so that's another value of the map, is it can actually provide information that sort of sentinel, so that we can see that there's something going on here that

that actually should be looked into from a public health perspective.

00;43;58;01 - 00;44;27;09
Raja Flores
I think it's fascinating. And I think, you know, nowadays with all this big data around and different ways we evaluate it and who knows what else there's going to be in the future that can give you guys more tools to help human beings. I think it's it's amazing. It's kind of like detective work, you know, you're you're looking at something and you're trying to figure out a pattern and a puzzle, and solve the, solve the crime, right?

00;44;27;09 - 00;44;28;06
Robert O. Wright
Which is the disease.

00;44;28;06 - 00;44;29;12
Raja Flores
Yeah, yeah, yeah, exactly.

00;44;29;12 - 00;44;32;15
Rosalind J. Wright
Yeah, yeah. And apps actually,

00;44;32;15 - 00;44;55;02
Rosalind J. Wright
as we do it, as we start to show the power of that to improve health outcomes, to prevent disease, to improve, response to therapies, in certain patients, that's going to then show the value of it, the cost effectiveness of it, it's going to increase longevity. And there will be more investment in the tools like as you say.

00;44;55;02 - 00;45;03;03
Rosalind J. Wright
So it's a very exciting time. I think we're just at a point now where it's really going to take off because of those things. We've already shown benefit of it.

00;45;03;06 - 00;45;04;19
Robert O. Wright
But and people.

00;45;04;21 - 00;45;05;27
Rosalind J. Wright
It's going to be exponential.

00;45;05;29 - 00;45;27;15
Robert O. Wright
Yeah. I mean, people want to because they're interested in their health, the healthspan

movement and the longevity movement. They want the information that they can as, as we were saying, take agency on and decide for themselves what they're going to do about it. But they have to have information to do that. And, you know, and this is a technological age since the age of information.

00;45;27;15 - 00;45;34;06
Robert O. Wright
So people are demanding this. And I think there's going to be a lot of commercial aspects to exposome that come up in the next few years.

00;45;34;06 - 00;45;47;02
Raja Flores
Yeah. No, people are educating themselves with social media, the internet, they they're out there. They're looking at it when they come to see me. They have already done their homework. Do you have some examples of how,

00;45;47;02 - 00;46;02;29
Raja Flores
There has been intervention, in the public health sector that his improve things, plain examples that the audience would have heard of or understand.

00;46;03;01 - 00;46;08;10
Raja Flores
As far as making public health better based on this data?

00;46;08;12 - 00;46;31;22
Robert O. Wright
Well, the Clean Air Act, did have a major effect, you know, lowering the amount of air pollution, like when, when we were children before the Clean Air Act. You know, there was a lot more air pollution. Yeah, than that we faced when we were growing up and taking land out of gasoline, which happened in 1989, also reduced the lead levels.

00;46;31;25 - 00;46;53;20
Robert O. Wright
In the country of everybody, you know, the average blood level was greater than five micrograms per deciliter, which for for folks that don't understand, probably said in context, is less than one microgram per deciliter now because we took that out of gasoline. So those are both examples of how there were public health interventions that actually very likely improved the health of the population.

00;46;53;20 - 00;47;23;28
Robert O. Wright
Like one of my concerns is because our generation grew up in the era of leaded gasoline. We were all exposed to lead, which is a neurotoxin. And does that make us at higher risk for Alzheimer's disease? So we're not quite at that age yet, but it is something to think about

whether or not that childhood exposure that happened in the 1970s when we, you know, use of leaded gasoline was peaking actually May and when we were children may actually lead to Alzheimer's disease.

00;47;23;28 - 00;47;24;19
Raja Flores
I have thought.

00;47;24;19 - 00;47;25;20
Robert O. Wright
About two years later.

00;47;25;26 - 00;47;27;08
Raja Flores
I think that's a great question.

00;47;27;08 - 00;47;38;14
Robert O. Wright
And it's sort of like mesothelioma because there's a long line. Oh, yeah. Between the two. So it hasn't been noticed yet because we haven't reached the age where we're getting Alzheimer's disease yet. But in the next ten years we're going to reach that age.

00;47;38;19 - 00;47;43;21
Raja Flores
I forgot the next question I was going to ask. You see, it must be doing something.

00;47;44;14 - 00;48;12;25
Rosalind J. Wright
There's a, you know, there are other examples, to what Bob was talking about, of banning smoking in public restaurants, etc., second hand smoke, reducing secondhand smoke exposure. There's been a lot of data to show that that improves a number of health outcomes, whether it be respiratory or others. And then you think of natural experiments like, the Beijing Olympics when they stopped all, you know, one of the most highly polluted areas in the world.

00;48;12;28 - 00;48;38;06
Rosalind J. Wright
And when they they changed traffic patterns around the Olympic Village, etc. during that time, people took advantage of that. Scientists took advantage of that to measure the pollution pre and post and also go in and actually take samples from people and looking at their biological response, and showed clearly the benefits to the asthma system to reduce inflammation in the body and all those kinds of things.

00;48;38;06 - 00;48;42;29
Robert O. Wright
And their health records show that asthma admissions decreased during that time.

00;48;42;29 - 00;49;04;29
Raja Flores
Yeah. I mean, I got to tell you, I feel better after Bloomberg's stopped the smoking in public places stuff, you know, you'd go into a restaurant or a club or something and you'd inhale all this secondhand smoke when we were younger. And now you can actually breathe in there. One question that I had, trying to look at this in real time during Covid.

00;49;04;29 - 00;49;29;14
Raja Flores
Did you see anything from your area that you think helped or could have helped, with regards to as Covid was hitting, was there anything you would have done differently? Looking at people who were at more risk of death? What what is there anything that you have learned from the Covid experience?

00;49;29;16 - 00;49;36;10
Rosalind J. Wright
Well, I think, you know, the mapping, I it keeps coming up because mapping sort of communities that had higher risk.

00;49;36;10 - 00;49;38;10
Raja Flores
Public housing mapping.

00;49;38;12 - 00;50;14;17
Rosalind J. Wright
Right. And that's a lot of that was the environment. Yeah. The environmental factors that are affecting the things like the immune system and your ability to fight off, infections as they come along, was different. If you were living in an environment where you're exposed to lots of things that were sort of triggering and pushing that immune system in a certain direction, people who are, living in environments where there's more oxygen, oxidative stress induced by your environment, and that's tobacco smoke, that's a lot of the air pollution components that we think about.

00;50;14;19 - 00;50;39;25
Rosalind J. Wright
But psychological stress can do that too. So higher levels of stress, can certainly suppress your immune system and ability to fight off infections. And that's just as true of Covid as it is of any other. So understanding though. And again, this person comes to you now, they're intubated in your ICU with Covid. First of all, there was so much we didn't know about the disease.

00;50;39;27 - 00;51;05;05
Rosalind J. Wright
But you don't also know where this person has come from. Yeah. And to the point where, you know, having that information and taking that kind of history can be very helpful. And we need to

learn as clinicians. We need to learn to translate that to the clinical setting better so that we understand how much do we need to know what's enough so that we can make, different decisions?

00;51;05;05 - 00;51;06;21
Rosalind J. Wright
There?

00;51;06;24 - 00;51;35;12
Robert O. Wright
I think the number one public health issue in America today is obesity. And if we could make a dent in obesity, you know, first of all, it was a risk factor for higher morbidity and mortality during Covid. It's a risk factor for Alzheimer's disease, cardiovascular disease, cancer, you know, diabetes and all the complications of diabetes. I think I think if we could reduce obesity, we would actually save a lot of health care dollars.

00;51;35;12 - 00;51;58;22
Raja Flores
Well, I, I completely agree with that. I mean, I operate on esophageal cancer. And you think because you have esophageal cancer you can't get food down, so you'd be skinny? No, it's obese patients who get more reflux because they're obese. And then that reflux in the esophagus then predisposes you to getting cancer. So many of the patients I operate on with esophageal cancer are actually obese.

00;51;58;25 - 00;52;01;05
Raja Flores
So it's a little more intuitive.

00;52;01;08 - 00;52;22;04
Robert O. Wright
And we're all old enough to remember, you know, the 1970s. And there was obesity was uncommon back then. And, you know, our genes didn't change in the last 50 years. Our environment did. So whatever is causing this is environmental. And that's where we need to look. Because, you know, if we're going to make a dent in this, we really need exposome x.

00;52;22;04 - 00;52;58;20
Raja Flores
So resources for listeners. If a person has a concern about environmental exposure, how do you get information and access to care for children? We have an environmental pediatric team, parents requesting consultations through region two, pediatric environmental health specialty unit in new Jersey, New York. Telephone number is (866) 265-6201. Email p-h as you at m s s m.edu.

00;52;58;22 - 00;53;14;02
Raja Flores

And we have our website flashed on the screen as well. And how can listeners, whether you're scientists, students, health care workers or just concerned citizens, learn more, or advocate for this kind of research and protection?

00;53;14;02 - 00;53;23;29
Raja Flores
We have the, Mount Sinai Exposome x, link on our screen. Mount Sinai Exposome x.org.

00;53;24;01 - 00;53;47;10
Raja Flores
And, and if you're part of a community group or an organization, we'd love to connect with you. And, you can invite some of our research researchers to speak at your, at your community. You can email us at podcasts at Mount sinai.org. And, and I just want to thank both of you for coming today.

00;53;47;13 - 00;54;09;26
Raja Flores
I learned a wealth of information, and I think that, this is the future. You we have the data in front of us, and, you know, it's better to prevent disease than to cure disease that's already there. And this will help cure or prevent disease in many patients. So, Roz, Bob, thank you guys so much for coming.

00;54;09;26 - 00;54;11;01
Raja Flores
I appreciate it.

00;54;11;03 - 00;54;12;29
Rosalind J. Wright
Thank you. And well said.