

'I'm Optimistic That Coronavirus Will Soon Be Behind Us,' Says Top Israeli Medical Expert

'The world's best brains have come together to beat this thing': Interview with Prof. Dina Ben-Yehuda, head of the hematology department at Hadassah Medical Center

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As Israel stampedes for normalcy, with schools stutteringly opening, shops and salons working overtime and restaurants and bars slated to reopen next week, talking with Prof. Dina Ben-Yehuda is heartening.

"I'm optimistic that this will soon be behind us," says Ben-Yehuda, head of the hematology department at the Hadassah Medical Center and dean of the Hebrew University medical school. "I see how the best brains around the world have come together to study this disease. None of the researchers at the Faculty of Medicine at the Hebrew University had previously studied the coronavirus [which had been unknown to science until late last year], and some never even worked with viruses at all. But they know how to do research, that's what they do, and they're now diverting their knowhow to the coronavirus."

In what way?

"Every one of these researchers is in constant touch with numerous other researchers in Israel and overseas, so many studies currently underway in our faculty are done as collaborative projects. This enhances research like a wildfire catching on. Everything goes quicker."

It sounds idyllic, but realistically isn't there competition between researchers in different faculties and institutions, with a lot of ego involved?

"People realize sick people are involved, and when you hear on the news that the elderly are dying in assisted-care facilities, or that a woman gives birth to a baby and they're sick, I'd like to believe that ego doesn't play a major role and that people come together, understanding that we're at war. I don't know how long this will continue, but there's a willingness to collaborate."

The public senses that the first wave is almost over. How much of this collaboration will remain the day after?

“It’s very important that these studies not end when everything settles down. If people had been wiser during the SARS outbreak, allowing the academic world to continue its research, we’d be in a different situation today.”

Why?

“Because then it would have been easier to develop a vaccine and test for levels of antibodies. The problem is that all the relevant studies around the world ceased when SARS disappeared. Our great hope is that when this war ends, when they start slashing budgets, they don’t stop our funding. It’s not just about biological research but about other areas too, such as public health and the economy, which have to be better understood. I have a dream in which virologists around the world unite and try to understand and predict what the next COVID-19 will be, not allowing a thing like that to dominate the world so dramatically.”

Will researchers evince the same zeal if the disease stops making headlines?

“It all depends on the support and budgets they receive. These studies are very costly and right now there is much willingness to support them. I don’t think all researchers around the world have to abandon their research and study only this virus, but it’s important that there is a group of researchers in every university continue to do so. When we get donations, we always think about the day after, so that the taps don’t close all at once.”

What kind of studies are underway at your institution?

“Regarding diagnosis, other methods are being looked at, some in collaboration with the Israel Institute for Biological Research and some with Rafael Advanced Defense Systems.”

What about research into a coronavirus vaccine?

“We have studies into various parts of the immune system that are involved in this disease. The immune system is complex: some parts are good for humans while others exacerbate what happens in the body. The research has to address both of these aspects. We have people in the Molecular Biology and Genetics Department who are trying to create viral proteins that the body’s immune system can detect and attack. These proteins are produced inside bacteria or in cells that are engineered for mass production. We now have something that is like a virus but without its genetic material, depriving it of the ability to multiply while activating our anti-viral defense mechanisms.”

Will this enable the development of a vaccine?

“This allows drugs to be tested and the examination of which antibodies can prevent the virus from entering cells... particularly in the lungs. One issue that’s become very relevant is the development of what is called passive immunity: creating antibodies that fight the virus, such as with the plasma of people who’ve recovered from the disease. We are developing a method of testing for antibodies in the plasma that neutralize the virus, giving these antibodies to seriously ill patients.”

When will there be more progress in this research?

“As soon as we have the proteins that stimulate the immune system and can produce these proteins in large quantities, they can be injected into sheep and horses at our veterinary institute. That’s a method of inducing passive immunity that will slow and prevent deterioration in people with COVID-19 or in people known to have been exposed to the disease. Another topic we’re investing a lot of effort into is to create a mouse model in which all these treatments can be tested. It’s a complicated story.”

Create a mouse?

“Yes, because the most-used model in science today is the mouse, but the problem is that mice aren’t infected by coronavirus. We’re now developing mice that can be infected by the virus.”

Engineering mice that can be infected with corona? It sounds unbelievable.

“Yes, we have a few groups engineering mice that can be infected by the coronavirus, and we’ll test vaccines and drugs on these. We may be among the first in the world to test the virus itself on mouse models. Prof. Yinon Ben-Neriah is leading a group of researchers establishing a national center in which researchers can work under maximal protection. There is also an immunology institute at the Shanghai Jiao Tong University where they’ve produced mice that can be infected, and they’re willing to give them to us.”

Testing an experimental vaccine: safety study clinical trial of a potential vaccine for COVID-19 created by Massachusetts-based Moderna Inc. Credit: Ted S. Warren, AP

What research are you planning or already doing using humans?

“There are patient studies, trying to understand why one patient has an mild, asymptomatic presentation and can remain at home while another needs ventilation.”

What are some hypotheses?

“Some of the explanations relate to age and background diseases. Now there is talk of different blood types.”

There are healthy young people who get seriously ill.

“Yes, and it’s also true that some older people develop only mild symptoms and can remain at home. The severity of the disease has a wide range at all ages. The important question is whether there are genetic parameters that impact the course of the disease.”

And what’s the answer?

“We have an important research group here, composed of computational biologists, geneticists, epidemiologists, and they’ll try to answer that. We’re already collecting samples from sick and recovered patients for this group. We don’t have an answer yet, but it seems that people with a normal immune system acquire something that shakes it up.”

Is it the coronavirus?

“Yes, and if we figure out how, we may be able to pinpoint susceptible and resistant populations. These may be epigenetic features (changes which are not in the DNA sequence itself) that are responsible. These are directions we’re looking at.”

What about research related to testing?

“Since Hadassah Medical Center is tightly linked to the Medical School, we’ve greatly upgraded our diagnostics. We now work by pooling tests from up to eight people. A negative result means they’re all free of the virus. If it’s positive, all eight have to be re-tested. This saves time and material, allowing wide-ranging testing.”

You’re aware of the big argument over wide-scale testing of healthy people? The Ministry of Health isn’t in favor.

“I hope they use pooled testing extensively. This is a war that requires intelligence to be gathered. If I knew, for example, how many people were infected in hotspots in Jerusalem, I could predict how many ventilators we’d be using. Decision makers need the best information they can get.”

How did this change the teaching of medicine?

“It changed very quickly, by shifting to Zoom. In any case I was trying to move away from only frontal lectures. But remote learning can’t work for all subjects, obviously. Some balance needs to be found.”

How do you see the next year or two? How will this impact the world?

“I’m worried that a blame game will erupt. I’m concerned that conclusions will be reached too quickly regarding economic and medical issues, and that people will return to normal too soon.”

What are some good things?

“A pattern has been established, with mutual aid and volunteering, with rare connections between people. I think this will continue, because people realized how good this was. People will realize that decisions must be made by experienced and knowledgeable people, and that decisions should not be made out of political considerations.”