

## DAVID ALTSHULER - "UNDERSTANDING COMMON DISEASE"



So we're living through a remarkable time, in which it's become possible to identify specific genes that affect a variety of human traits. This goes back 20 years or so when it became possible first to identify rare genes for diseases that affect a small number of people, but in those people the gene is the main cause and they're often devastating diseases. But the more common diseases like diabetes, cancer and heart attacks, have eluded discovery.

Now as we sit here in 2007, we're seeing quite a bit of progress, which is very exciting. So if you ask – "Where is it heading? – what we're actually learning is how the human body works and how the human species evolved, and in particular, how diseases occur. Why do people get diabetes and others not. Why do people have heart attacks and others not. How did our species get to be the way it is?

Will that affect you every day in life? Well, in rare cases it will. There will be some genetic tests that can be measured on a bit of blood or a cheek swab that'll predict something. But, you know what, that's not actually that different than how we are today. I'm a physician by training, and when you go to your doctor, they will actually measure your blood and tell you that you have a higher risk of heart disease, and you know how they'll do that? They'll measure something called cholesterol in your blood; it's magical. They stick a needle in your arm and they'll tell you that you have cholesterol that's higher than someone else, and you have a higher risk. We'll do that with genes as well. But it won't be a revolution in that way.

What'll be a revolution - to follow the cholesterol example - is when we can develop new interventions, new treatments, new behavioural changes – based on this knowledge – that prevent the disease. There was a long phase in medicine, where you could measure cholesterol, but you couldn't do anything about it. And you know what, people didn't care all that much. Because if you can measure something and not prevent it, how good is it? But when you get new treatment - as we now have with cholesterol-lowering, which came from the insight of forty years ago, that cholesterol caused heart attack - then that's exciting. Because you can get somebody to make an intervention that helps them.

So if you ask me what I'm most excited about - and I'm not sure it's five years away, but might be more like ten or fifteen - it's a new class of treatments, a new class of behavioural interventions that no one will even call genetic. It'll be based on: we know that's how diabetes works so we know how to fix it. Will that seed of knowledge have come from genetics? I believe it will. But will it actually look genetic when it comes to the clinic. I'm not sure it will. It'll just be someone who lives longer, a healthier life, because of something they did that they don't even know traced to genetics. To me, that would be the biggest success.