[MUSIC PLAYING]

KRISTIN STANFORD: We're really interested in looking at the effects of paternal exercise and the effects that that could have on offspring metabolic health. We took mice, and we saw that when they were exercised three weeks prior to conception, their offspring had an improved metabolic health when the offspring were adults at 52 weeks old. So they had improved glucose metabolism, and they had a lower body weight and decreased fat mass.

What we did is we took the sperm from the sires, and we saw that there were really dramatic changes in their small RNA profiles. So this includes microRNAs, tRFs, these small RNA fragments. And we saw that they were all really dramatically changed with exercise. And more importantly, a high fat diet, even a mild high fat diet, In this case it was only three weeks, changed the profile. But exercise kind of restore it back to normal.

What this is implicating is that if we have this even a brief exercise exposure, we're causing these epigenetic changes, which can then be transferred to the offspring and can really have these striking effects, and basically, change how the genes behave and have an overall effect on metabolism. So from a basic science perspective, we're going to try and look and see which smaller RNAs are really responsible for these effects and attempt to directly figure out how they're affecting the specific tissues in the offspring. So we can see if it's improving metabolic health in the liver or in the skeletal muscle, and why it's improving health in the offspring.

From a translational perspective, we're really interested to see if you could essentially tell someone, who wants to have a child, that they could exercise even for a moderate length of time. Again, in a mouse model this was just three weeks of exercise. We saw pretty dramatic changes in their sperm, which had a very strong impact on their offspring. So what this could mean in humans is that if we take someone who is getting ready to have a child and tell them to exercise for even a month prior to conception, that could have a really strong effect on metabolism in their children.

[MUSIC PLAYING]