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Intro: You're listening to audio from one of our Ask The PhD videos. In this series, scientists at The Michael J. Fox Foundation discuss the latest Parkinson's research projects and their potential impact. Learn more about the Ask The PhD series at [michaeljfox.org](http://michaeljfox.org). Thanks for listening.

Maggie Kuhl: I'm Maggie Kuhl on the communications team at The Michael J. Fox Foundation. We fund research to better define, measure and treat Parkinson's. And today we're discussing how the immune system may play a role in this disease. Here with me are two of our staff scientists, Doctors Kuldip Dave and Andrew Koemeter-Cox. Thank you both for joining me.

Kuldip Dave: Thank you, Maggie.

Andrew Koemeter-Cox: Thank you.

Maggie: Kuldip, we usually think of the immune system as a good thing. How could it be involved in Parkinson's disease?

Kuldip: So the immune system is our body's response to something bad we are exposed to. Bacteria, viruses, and there's this concept of good and bad inflammation. So you know when you get a cut or you get a burn and you get redness and swelling, that's good inflammation. We want that to happen. But when that persists over a long period of time, when that starts to affect our normal function, our cells, our tissues, at that point it becomes bad for our body and that's what we call bad inflammation. If we can understand that interplay between good and bad inflammation in Parkinson's disease, we can then leverage the immune system to make better drugs for PD.

Maggie: Kind of what's the tipping point and what are the drivers?

Andrew: So that's one of the main pillars of our strategy is understanding how the immune system works and how inflammation works in patients with Parkinson's. For example, we know that inflammation occurs both after head injury and from pesticide exposure. So we want to know is this inflammation the link to these risk factors for Parkinson's disease?

Maggie: Measurement is another pillar of our research strategy. Could the immune system be used to find a diagnostic tool?

Andrew: For sure. The immune system could definitely be used to both diagnose the disease and actually measure how therapies are working for Parkinson's disease. We have a number of exciting projects and one of them is a brain scan

that hopefully will be able to measure inflammation in the living brain of Parkinson's patients.

Kuldip: And adding to what Andrew was just mentioning, a brain scan is one way of a biomarker to study inflammation. Another way would be to look at our blood. This is the one system in our body that's directly associated with the immune system. This is where all the immune cells, immune markers are released, and they kind of travel up and down your body. If we are then able to measure some of these immune markers and see if there are differences between Parkinson's and people without Parkinson's, we may be getting closer to that biomarker that we want to.

Maggie: And that could help us test therapies, as you said, Andrew. So Kuldip, what are we doing in the treatment realm?

Kuldip: For example, there's a study out there that says if you use an anti-inflammatory drug, you lower your risk of getting Parkinson's disease. We would like to understand that connection better. We could also leverage the immune system for our benefit. For example, our immune system makes antibodies every day against bacteria, viruses, things that we're exposed to in the environment. If we can channel those antibodies against things that are bad in Parkinson's, that would work out in our benefit.

Maggie: Okay. So immune system could be both friend and foe.

Kuldip: Right.

Maggie: Andrew, why so much potential in this area?

Andrew: Inflammation and chronic inflammation is kind of a shared feature across a large number of patients. So the hope is with these biomarkers and therapies for inflammation that they would be able to be applied to a large number of Parkinson's patients.

Kuldip: We don't fully appreciate and understand where and when it happens. Does it happen before Parkinson's disease sets in, or does it happen after Parkinson's disease sets in and kind of helps the progression of the disease, or maybe a little of both? If we can understand that better, we would have a better sense of using immune system to have better therapeutics for Parkinson's.

Maggie: So some questions but sounds like the Foundation has a robust strategy to go after the answers. Thank you both and thank you for supporting Parkinson's research. Visit [michaeljfox.org](http://michaeljfox.org) for more on this work and more on how you can play a role in speeding a cure for Parkinson's disease.

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