The Michael J. Fox Foundation for Parkinson's Research has awarded two grants to Michigan State University College of Human Medicine neuroscientists Caryl E. Sortwell, Ph.D., Timothy Collier, Ph.D. and Katrinn Paumier, Ph.D., for two Parkinson's disease studies. (Submitted photo)

The Michael J. Fox Foundation awards grants for MSU Parkinson's research

Caryl Sortwell has a concise expression she often uses that speaks a volume about the College of Human Medicine’s research into neurological diseases: “together we are smarter.”

“I think it speaks to the fact that we have accumulated a group of people who work well together,” said Timothy Collier, Ph.D., Sortwell’s colleague and director of the college’s Morris K. Udall Center of Excellence for Parkinson’s disease research at MSU.

Due to part to the team’s depth of experience, The Michael J. Fox Foundation for Parkinson’s Research has awarded it a pair of grants to study two aspects of the disease.

Under one of those grants, Sortwell and Paumier are studying whether a common genetic variant shared by about one-third of Parkinson’s patients makes them less responsive to medications commonly used in treating the disease. That variation disrupts the release of a protein called brain-derived neurotrophic factor (BDNF), which helps brain neurons survive and promotes the growth of new ones.

“The thing about Parkinson’s is everybody’s disease follows a different course,” said Sortwell, Ph.D., associate chair of the college’s Department of Translational Science and Molecular Medicine. “There’s so much variability.”

Some of that variability may be due to the BDNF modification, she said. That genetic variant does not necessarily cause Parkinson’s, she said, but it might explain why the disease progresses more rapidly and is less responsive to medication for some patients.

The most common treatment is dopamine replacement therapy, since the brain’s natural production of that neurotransmitter declines in Parkinson’s patients. Screening for the BDNF variant could help physicians predict how fast Parkinson’s will progress in certain patients. It also could help them determine which patients could benefit by participating in alternative treatments, such as deep brain stimulation or clinical trials of other, new medications.

“It’s about giving the physician and the patient a chance to personalize their therapy,” Sortwell said. With the second grant, Paumier, Ph.D., assistant professor of Translational Science & Molecular Medicine, will work with Collier to study whether a common antidepressant can slow the progress of Parkinson’s disease. In particular, they will look at a protein called alpha-synuclein, which is present in healthy brains. In Parkinson’s patients, production of that protein appears to go awry, leading to protein clumps called Lewy bodies, which are a characteristic of the disease.

“We don’t know if it’s a cause or a consequence of the disease,” Paumier said.

She and her colleagues previously found that a particular class of antidepressants called tricyclics appears to delay the time for early Parkinson’s patients to begin dopamine therapy, suggesting these drugs may actually slow the course of progression. More recent work in their laboratory suggests tricyclic antidepressants may slow the disease by preventing the alpha-synuclein protein from developing into Lewy bodies.

Paumier and Collier hope to discover whether a tricyclic antidepressant called mirtazapine can slow the progression of Parkinson’s when given to patients in the later stages of the disease. They also will determine the proper long-term dosage of mirtazapine to minimize side effects.

In addition to slowing the progress of the disease, mirtazapine therapy has been found to more effectively treat the depression that is common in Parkinson’s patients, Paumier said.

The two grants from The Michael J. Fox Foundation will allow the researchers to test whether their theories are valid, opening the door for further study and eventual treatments, Paumier said.

Ultimately, “we hope we can slow the progression of Parkinson’s disease and maintain or improve the quality of life,” Collier said.