

Research Profile:

Dr. Silke Appel-Cresswell
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Research Project: The fungal microbiome of the gut in Parkinson's

Project Grant: Funded by Parkinson Society British Columbia Pilot Project Grant of \$44,996 over one year through the Parkinson Canada Research Program



Project Description:

For researchers who study Parkinson's disease, a new frontier of investigation is emerging: the micro-organisms, including viruses, bacteria and fungi, that live in and on us.

At the University of British Columbia, Dr. Silke Appel-Cresswell, a neurologist and assistant professor, is concentrating on changes to the olfactory system and the gut that occur long before the tremor, stiffness and trouble walking that are the classic motor symptoms of Parkinson's.

Loss of the sense of smell, insomnia and constipation are all symptoms that people with Parkinson's may experience years or even decades before their movement difficulties emerge – but often, clinicians don't link the issues.

"If you look at the pathology, you can see pathological changes in the nervous system of the gut very early on," Appel-Cresswell says.

Appel-Cresswell and her colleagues know that the internal surface of the nose and the entire gut are heavily populated by microbes that co-exist there and serve as the interface between the environment and the human body.

"It turns out that the microbes outnumber the number of cells that are human by a factor of 100," she says. "We have more microbes in our system than human cells."

Appel-Cresswell now wonders if the fungi in the gut influence the development of Parkinson's disease. Using fecal and nasal samples from people who have Parkinson's and people who do not, she is assessing those samples to see if changes in the fungi could be related to Parkinson's and its symptoms ranging from tremor and rigidity to constipation, depression and impaired judgment and

reasoning.

If Appel-Cresswell can establish a relationship between fungi and the symptoms of Parkinson's disease, her work would open the door for follow-up studies to examine the mechanisms by which fungi might influence the development of Parkinson's disease. This line of research might eventually lead to treating the fungi with antifungal medications, for example, to see if eliminating the fungus or reducing the amount of it in the body also eliminates Parkinson's.

Alternatively, it might also be possible to boost other microbes in the body, such as with probiotics.

"The really exciting thing would be if in the future, we could look at people at high risk of Parkinson's and treat them early," she says. Identifying what role the human microbiome plays in disease is truly a new frontier for medicine, Appel-Cresswell says.

"It is something that is easily accessible and modifiable, so it holds promise for treatment."