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Researchers ID cluster of genes in blood that predict Parkinson's

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Because there is currently no laboratory test that can diagnose Parkinson's disease, it is practically impossible to detect those individuals who are in the earliest stages of the disease. As a result, Parkinson's disease can only be diagnosed by a clinical neurological examination based on findings suggestive of the disease.

But researchers from the Technion-Israel Institute of Technology Faculty of Medicine have now identified a biomarker comprised of five genes shown to predict Parkinson's disease with high accuracy. The findings appear in a research article published last week by the scientific journal *Molecular* Neurodegeneration.

“A predictive biomarker for Parkinson's disease could also help to identify high-risk individuals before symptoms develop — a stage where prevention treatment efforts might be expected to have their greatest impact to slow disease progression,” says lead researcher Dr. Silvia Mandel. “It could allow diagnosis of carriers of the genetic risk factors, or those who may exhibit pre-symptomatic stages of the disease [depression, sleep disturbances or hyposmia (reduced ability to smell)] and are good candidates for neuroprotective treatment.”

All five genes that comprise the biomarker play a role in the ubiquitin-proteasome system of protein degradation, whose involvement in the pathology of Parkinson's disease has previously been demonstrated.

The study was conducted on blood samples from 62 early stage

Parkinson's disease patients and 64 healthy age-matched control subjects. The selection of the genes and determination of their expression in the blood was based on previous research conducted by Dr. Mandel and Prof. Moussa Youdim on the brains of deceased Parkinson's disease patients.

More strikingly, in 30 patients at advanced stages of Parkinson's disease, the model was 100 percent accurate. It was also able to fully discriminate between Parkinson's disease and Alzheimer's disease.

The researchers believe the blood test could one day be combined with brain imaging and/or biomarkers in the spinal fluid or other peripheral tissues, as a gold standard not only for early diagnosis, but also for the differential diagnosis of Parkinson's disease and motor disorders that often mimick the disease symptoms.

Dr. Mandel, who is Vice Director of the Eve Topf Center of Excellence for Neurodegenerative Diseases Research and Teaching at the Technion, conducted the research together with her PhD student Leonid Molochnikov, Professor Youdim; Prof. Judith Aharon of Rambam Medical Center; and Prof. Martin Rabey of Assaf HaRofeh Medical Center. Scientists from the Universities of Würzburg and Pisa also contributed to the research.

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