Max-Planck-Institut für molekulare Biomedizin

New Ways in Search of Fighting Parkinson's

The Michael J. Fox Foundation funds search for novel active agents to fight Parkinson's disease in a cooperation of the Max Planck Institute for Molecular Biomedicine with the Lead Discovery Center GmbH Dortmund

In Parkinson's disease, neurons in a certain region in the brain - the substantia nigra of the midbrain - die off in large numbers. The result: The transmitter dopamine is no longer produced in sufficient amounts, which leads to neurodegenerative symptoms like amyostasia, muscular rigidity or akinesia. The causes for Parkinson's disease are multifarious. In some cases the familial Parkinson's diseases are triggered by mutations in the so-called LRRK2 gene. Two functions of the protein encoded by the LRRK2 gene are particularly interesting: a so-called kinase and a GTPase activity, both of which have been given particular attention in studying the cause of PD.

A team of researchers led by Hans Schöler at the Max Planck Institute for Molecular Biomedicine (MPI) in Münster, in cooperation with the Lead Discovery Center GmbH (LDC) in Dortmund, will specifically search for substances that can reduce the negative effects of mutations of the LRRK2 gene. What's special here is that while most approaches in the search for such active agents focus on kinase activity, the researchers at Max Planck will investigate GTPase.

The reasons behind this are explained by project manager Dr. Jared Sterneckert: "GTPase in the LRRK2 protein, that has been altered through mutations in the LRRK2 gene, has proven to be poisonous for neurons." At the same time, it causes a longer activation of the mutated gene - with serious harmful consequences for the nervous tissue. "Identifying substances that inhibit the activation of GTPase will provide the first step in bringing better treatments to patients", says Sterneckert. And another reason, according to Sterneckert, speaks for a therapeutical influence of GTPase: "The mutated GTPase also stimulates the activation of harmful kinases, for which active agents are being searched already. If we manage to find therapeutics against GTPase activation, we may simultaneously limit kinase activity."

For the studies that have now been started, the cooperation with the active agent research organization LDC is of great importance. "We will systematically check our substance libraries for active agents that specifically hinder the activation of the GTPase", Chief Executive Officer Dr. Bert Klebl explains. This cooperation obviously increases chances of a successful outcome in the search of new active agents, Schöler and Sterneckert are sure: "In a next step, we will be able to test such molecules on cell cultures and later design therapeutics from there," says Sterneckert.

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Background Information:

About MPI

The Max Planck Institute for Molecular Biomedicine investigates the formation of cells, tissues and organs. Scientists make use of molecular-biological and cell-biological methods in a bid to discover how cells exchange information, which molecules control their behaviour and what faults in the dialogue between cells cause diseases to develop. The work of the Institute is dedicated to three closely intertwined areas. One field in which the Institute is active is stem cell research. Scientists study how stem cells can be generated and how they might be used to treat diseases. Another research area is that of inflammation processes, where one of the objectives is to fully understand the effects of blood poisoning. The third field of research is blood vessel growth, with the aim of identifying new targets for the development of therapies: blood vessels play an important role in many illnesses.

About LDC

The Lead Discovery Center GmbH (LDC) was founded by Max Planck Innovation and the Max Planck Society, to better make use of the potential of excellent basic research. The aim is to professionally transfer promising research projects into the design of new medication.

With a team of experienced scientists, drug developers and project managers, the LDC offers all the services in the field of Drug Discovery - from Target (biological target structure) to Lead (chemical lead structure) - according to the highest industry standards. Being an independent, commercially oriented company, LDC works on the interface of research and application. Focus lies on finding new active agents, especially so-called low molecular chemical substances. To this end, the LDC works closely together with research institutes, universities and the industry: It takes on promising research projects in early stages of development and, together with its partners, further develops them to get pharmaceutical active agents that already reach a “Proof-of-Concept” in animal studies and therefore meet a great demand in the industry.

About The Michael J. Fox Foundation for Parkinson’s Research

As the world’s largest private funder of Parkinson’s research, The Michael J. Fox Foundation is dedicated to accelerating a cure for Parkinson’s disease and improved therapies for those living with the condition today. The Foundation pursues its goals through an aggressively funded, highly targeted research program coupled with active global engagement of scientists, Parkinson’s patients, business leaders, clinical trial participants, donors and volunteers. In addition to funding over $238 million in research to date, the Foundation has fundamentally altered the trajectory of progress toward a cure. Operating at the hub of worldwide Parkinson’s research, the Foundation forges groundbreaking collaborations with industry leaders, academic scientists and government research funders; increases Parkinson’s awareness through high-profile advocacy, events and outreach; and coordinates the grassroots involvement of thousands of Team Fox members around the world.