

Stockholm 2022-06-14

Neogap's patented method opens for new individualized treatment of MS



A recent study shows that a part of Neogap Therapeutics' patented method for developing individualized immunotherapy for cancer treatment can also be used to identify which immune cells are involved in autoimmune diseases. In the study, four new target molecules for MS have been discovered.

Multiple sclerosis, MS, is a chronic inflammatory disease of the central nervous system. The condition is driven by immune cells mistakenly attacking the tissue surrounding nerve cells in the brain and spinal cord, leading to severe neurological symptoms. Today, there is no cure for MS. The aim of the existing treatments is mainly to slow down the disease and relieve the symptoms.

In a recent study, Associate Professor Hans Grönlund, CSO and founder of Neogap, and other researchers at Karolinska Institutet have shown that part of the method behind Neogap's patented immunotherapy for cancer also works to identify immune cells involved in autoimmune diseases such as MS. The study was published in the scientific journal Science Advances.

Stockholm 2022-06-14

The study was led by Mattias Bronge, a PhD student in Hans Grönlund's research group at the Department of Clinical Neuroscience, Karolinska Institutet. Hans Grönlund and Mattias Bronge are inventors and Neogap holds the patent for the autoantigens featured in the study.

Neogap's EpiTCer® method is central

Existing treatments for MS destroy the immune system non-specifically, resulting in side effects and complications. Therefore, the researchers want to find new ways to direct therapies solely against the immune cells driving MS.

Associate Professor Hans Grönlund's research group has, in collaboration with Professor Tomas Olsson's research group at Karolinska Institutet, developed a method that enables the identification of the specific T cells that recognize and react against autoantigens in MS. These autoantigens are endogenous tissue constituents, i.e., the organism's own molecules to which the immune system reacts. This is called autoreactivity.

By using Neogap's patented EpiTCer® particles, the researchers could perform a large-scale screening of various proteins to find autoantigens. The proteins were linked to the EpiTCer® microparticles and presented to T cells in order to identify which antigens caused autoreactivity.

Four new autoantigens were discovered

The study examined 63 proteins in blood samples from MS patients and healthy control subjects. The tested proteins were selected in collaboration with Human Protein Atlas and Professor Torbjörn Gräslund, KTH.

The study proves that it is possible to identify which autoantigens each unique MS patient has and also resulted in the discovery of four new proteins showing MS autoimmune reactivity. Previously, only a few autoantigens were known, and detecting these four new ones may be important for diagnosis and treatment.

"By identifying a patient's personal autoantigen profile, treatment can be adapted for that particular individual. T cells drive most autoimmune diseases, and if we can find a way to silence them in a disease such as MS, it can pave the way for a more precise way to treat other autoimmune diseases as well," says Hans Grönlund.

The method will now be included in an upcoming clinical phase II study to turn off MS aggressive T cells. The study will be conducted within the framework of a collaboration between the research groups at Karolinska Institutet and Professor Roland Martin at the University of Zurich.

Read the full study here:

[Identification of four novel T cell autoantigens and personal autoreactive profiles in multiple sclerosis](#)

Mattias Bronge, Klara Asplund Högelin, Olivia G. Thomas, Sabrina Ruhrmann, Claudia Carvalho-Queiroz, Ola B. Nilsson, Andreas Kaiser, Manuel Zeitelhofer, Erik Holmgren, Mathias Linnerbauer, Milena Z. Adzemovic, Cecilia Hellström, Ivan Jelcic, Hao Liu, Peter Nilsson, Jan Hillert, Lou Brundin, Katharina Fink, Ingrid Kockum, Katarina Tengvall, Roland Martin, Hanna Tegel, Torbjörn

Stockholm 2022-06-14

Gräslund, Faiez Al Nimer, André Ortlieb Guerreiro-Cacais, Mohsen Khademi, Guro Gafvelin, Tomas Olsson och Hans Grönlund.

Science Advances, online 27 april 2022, DOI: 10.1126/sciadv.abn1823.

For more information, please contact:

Samuel Svensson, CEO

Tel: +46 733 54 21 94

Email: samuel.svensson@neogap.se

About NEOGAP Therapeutics

NEOGAP Therapeutics is a Swedish biotechnology company that develops individualized immunotherapy for cancer treatment with the help of the patient's cells. The therapy is based on the company's two technologies: PIOR[®], a software that uses DNA sequencing data from the patient's tumor, and machine learning to select tumor-specific mutations. EpiTCer[®] is then used to increase the T cells that recognize the selected tumor-specific target structures. NEOGAP is located at the Center for Molecular Medicine, Karolinska Institutet, in Stockholm. For more information, visit the company's website neogap.se.