BrainTransporter technology could **strengthen treatment efficacy**

BioArctic's BrainTransporter technology has the potential to strengthen the efficacy of biological drugs against diseases in the brain by increasing the transport of antibodies across the blood-brain barrier while decreasing the side effects. In 2023, BioArctic's technology entered into the preclinical development phase.

The blood-brain barrier controls the passage of substances between the bloodstream and the brain. It protects the brain from harmful substances, but at the same time it can make the transport of drugs into the brain more difficult. This is why researchers around the world have been attempting for some time to find solutions for the controlled introduction of drugs into the brain.

BioArctic's BrainTransporter technology uses the transferrin receptor, a carrier protein in the blood-brain barrier that normally transports iron into the brain. By binding to an existing transport receptor, antibodies and other biological drugs can enter the brain more easily and the efficacy of the treatment is thus aplified. Distribution of a drug improves with a larger amount of antibodies passing through the barrier. This results in a lower dose of the active compound required, which could potentially lead to better efficacy and decreased side effects.

In preclinical models, the BrainTransporter technology has proven able to achieve improved uptake and distribution as well as a robust increase of antibodies in the brain. The use of the transferrin receptor for the transport of biological drugs into the brains of human subjects was recently validated in another study presented at the 2023 CTAD Alzheimer's congress. After significant advances in developing the technology it is now being combined with antibodies in all of BioArctic's fields of therapy that are under development, and over the long term it could also be out licensed in order to increase the potential for other drugs that target diseases in the brain.

BrainTransporter technology combined with antibodies

Alzheimer's disease
In addition to the development of lecanemab, BioArctic has continued its dedicated and focused efforts on developing new antibody treatments for Alzheimer's disease, and two of its research projects – BAN2802 and BAN2803 – are linked to its BrainTransporter technology. These projects are in a preclinical phase.

Parkinson's disease
The latest project in the Parkinson's portfolio, PD-BT2238, is a project that combines the BrainTransporter technology with a selective antibody that targets aggregates of alpha-synuclein. The aim is to increase the amount of antibodies that reach the brain, with the objective of increasing the efficacy of a potential treatment. The project is currently in the discovery stage.

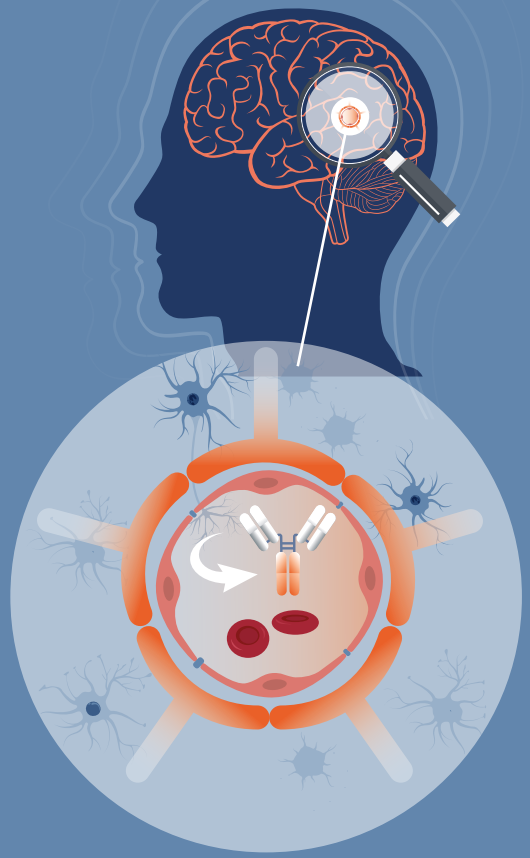
ALS
In ALS, BioArctic is pursuing two projects, one of which – ND-BT3814 – has been linked to the BrainTransporter technology. The aim is to develop an antibody drug against TDP-43, a protein that is believed to play a key role in the development of the rare neurodegenerative disease ALS. The project is in the research phase.

Gaucher disease
BioArctic has initiated a research project aimed at previously untreated CNS symptoms of Gaucher disease by further developing an enzyme replacement treatment. Gaucher disease is a rare genetic disease in which the impaired function of the enzyme glycosylceramidase leads to an accumulation of glycosylceramide in certain organs. Current treatments focus on enzyme replacement therapy, but the enzyme replacement must reach the brain in order to impact the harmful consequences of its absence in the CNS. By linking the enzyme replacement to BioArctic's BrainTransporter technology, BioArctic hopes to be able to develop a treatment that can alleviate both the CNS symptoms and the systematic manifestations of the disease.

Active transport into the brain

The challenge

The blood-brain barrier is a 600-kilometer long network that provides energy to and protects the brain. At the same time, the barrier makes the transport of drugs to the brain more difficult. Transporting antibody drugs is especially challenging due to its size and complexity.



BioArctic's solution

The antibody is modified so that it binds to the transferrin receptor, which normally transports iron across the blood-brain barrier.