PRESS RELEASE

New joint research project investigates neurodegenerative aspects of Alzheimer's disease

The interdisciplinary consortium HiPSTAR tries to decipher the molecular mechanisms leading to Morbus Alzheimer. In particular, pathological alterations at the blood-brain-barrier are in the focus of this applied research project. The long-term goal of this collaborative effort is the development of new drugs and therapies targeting this predominant form of dementia. The project is coordinated by the University of Würzburg (Medical Faculty, Department of Tissue Engineering and Regenerative Medicine, TERM), and the Fraunhofer Institute for Molecular Biology and Applied Ecology, ScreeningPort, is a partner in the consortium. The German Ministry for Education and Research (Bundesministerium für Bildung und Forschung, BMBF) funds this project with an overall budget of 1.7 million Euro.

In order to decipher the molecular mechanisms leading to Morbus Alzheimer and associated changes at the blood-brain-barrier the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt e. V., DLR) funds this interdisciplinary research project with an overall budget of 1.7 million Euro over a three year period. The acronym HiPSTAR is short for "Human iPS Cell-based Blood-Brain Barrier Technology in Alzheimer Research" and is coordinated by the Department of Tissue Engineering and Regenerative Medicine (TERM) of the University of Würzburg. The consortium consists of academic partners and small and medium sized enterprises (see below). HiPSTAR is part of the BMBF initiative "directive on the promotion of innovative stem cell technologies for individualised medicine".

Working hypothesis: Altered blood-brain-barrier is a prerequisite for the development of Alzheimer´s

"The development of new drugs requires more detailed research and understanding of the exact causes of neuronal degeneration in the brain", Dr. Marco Metzger explains. The coordinator of the HiPSTAR project at TERM continues: "In addition, we assume that an altered blood-brain-barrier plays an essential role in the development of Alzheimer's disease and also worsens the prognosis of the disease". The blood-brain-barrier is a protective barrier between the sensitive brain and the blood circulation.

Goal: Establishment of an in-vitro model of the blood-brain-barrier

The aim of the research project launched at the beginning of February this year is to develop a new in vitro model of the human blood-brain barrier specifically for Alzheimer's research. Dr. Metzger explains: "This model will serve as a research tool for the development of improved diagnostic methods, the identification of suitable target structures for treatment and the discovery of cellular mechanisms of the disease." The

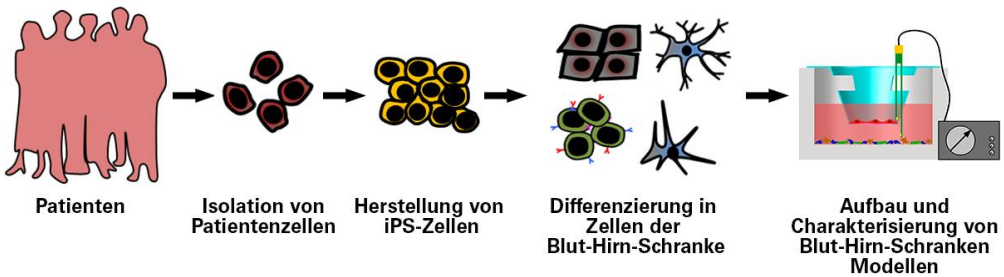
Contact
Dr. Ole Pless | Fraunhofer Institute for Molecular Biology and Applied Ecology IME, ScreeningPort |
Phone +49 40 303764-0 | Schnackenburgallee 114 | 22525 Hamburg, Germany | ole.pless@ime.fraunhofer.de | www.ime.fraunhofer.de

cells required for the model either originate directly from Alzheimer's disease patients or are artificially generated in the laboratory using molecular genetic methods, so that they carry the known mutations of Alzheimer's relevant genes. By applying microfluidics to mimic vesicular blood flow and disease-specific molecules the laboratory setting will be customized to the "real" situation within the patient´s brain. The newly established models will be validated with approved and marketed drugs and compared to conventional models currently applied in pharmaceutical drug development. In addition, the researchers are also developing a computer-based model to identify cellular target structures and predict the effects and transport properties of drugs at the blood-brain barrier.

The HiPSTAR consortium consists of:

- University Würzburg, Medical Faculty, Department of Tissue Engineering and Regenerative Medicine (TERM),
- Fraunhofer Institute for Molecular Biologie and Applied Ecology IME (ScreeningPort, Hamburg; www.ime.fraunhofer.de),
- University Halle, Medical Faculty, Department for Psychiatry, Psychotherapy and Psychosomatic Medicine (www.uk-halle.de),
- TissUse GmbH (Berlin, www.tissuse.com),
- Pharmacelsus GmbH (Saarbrücken, www.pharmacelsus.de),
- Insilico Biotechnology AG (Stuttgart, www.insilico-biotechnology.com),
- Austrian Institute of Technology (AIT) GmbH (Vienna/Austria; www.ait.ac.at).

Picture
For a print quality version of the picture please contact Dr. Ruth Hausmann:
ruth.hausmann@ime.fraunhofer.de



The principle of producing blood-brain-barrier models from Alzheimer's disease patients: In the first step, cells from tissue biopsies of Alzheimer's disease patients are isolated. In a second step, these cells can be used to produce pluripotent stem cells (iPS cells), which are differentiated in the laboratory into specialized cell types of the blood-brain barrier. The blood-brain-barrier models produced from these cells are used by scientists to investigate the mechanisms of Alzheimer's disease and to develop appropriate treatment strategies. (Source: TERM)

About the Fraunhofer Institute for Molecular Biology and Applied Ecology IME

The Fraunhofer IME conducts research in the field of applied life sciences from a molecular level to entire ecosystems, in the areas of pharmacy, medicine, chemistry, agriculture, as well as environmental and consumer protection. Our mission is the development and use of novel technologies for diagnosis and therapy of human and animal diseases as well as the protection of crop plants and food sources.
The IME's interdisciplinary organization features laboratories with state-of-the-art infrastructure, including GMP production facilities and complex facilities for environmental simulations, allowing a wide spectrum of research and development services in the divisions of Molecular Biology and Applied Ecology. We aim at taking innovative products closer towards the market, develop enabling technologies and provide scientific services to partners from academic institutions and industry.
Since 2014 the IME-ScreeningPort with its labs in Hamburg, Germany, is part of the institute. For more information, see
www.ime.fraunhofer.de/en/Research_Divisions/business_fields_TM/screeningport.html

Additional Contact
Dr. Ruth Hausmann | Fraunhofer Institute for Molecular Biology and Applied Ecology IME | Press & Public Relations |
Phone +49 241 6085-35029 | Forckenbeckstraße 6 | 52074 Aachen, Germany | ruth.hausmann@ime.fraunhofer.de | www.ime.fraunhofer.de