Neurodegeneration

Oxford BioSystems

Neurodegenerative diseases are a group of disorders that are characterised by the progressive loss of structure respective function of neurons, including their death.

The most well-known disorders include Alzheimer's Disease, Parkinson's disease, Multiple Sclerosis and Amyotrophic Lateral Sclerosis (ALS), but as research in this field increases, more diseases are shown to have similar cellular and sub-cellular pathogenic mechanisms.

Oxford Biosystems offers a range of products to detect and measure neurodegeneration biomarkers in both cerebrospinal fluid and blood samples.

IBL International GmbH, part of the Tecan Group, have wide range of products for research in the field of neurodegeneration:

- **Alzheimer's disease (AD),** a neurodegenerative disease leading to dementia, can be characterized by 3 hallmarks, which are formation of Amyloid-beta plaques, TAU fibrils and loss of neurons and synapses, leading to a significant brain volume reduction. The first 2 hallmarks lead to the fact that measuring these proteins in CSF is a valuable tool to support the research of Alzheimer's disease.
- **Neurofilaments** are the backbone of the neuronal cytoskeleton and are elevated in neurodegenerative disorders associated with the destruction of white matter (substantia alba), typically Parkinson's disease, Multiple sclerosis and ALS. The NF-Light ELISA kits are available for use with CSF and serum samples.
- **α-Synuclein** is a protein predominantly localized in the presynaptic terminals and is involved in vesicle fusion and neurotransmitter release. Tecan offers the hSYN ELISA, provided by Roboscreen, for the detection of total human α-Synuclein, and the α-Synuclein PATHO ELISA which utilizes the anti-human α-Synuclein 5G4 monoclonal antibody which strongly binds to the high molecular weight fraction of β-sheet rich oligomers, making it a promising tool in the research of Parkinson's disease.
- **TDP43** accumulated in the cytoplasm is characteristic of cytoplamsmic inclusions observed in ALS and in many cases of frontotemporal lobar degeneration (FTLD).

CSF samples have disadvantages and are not always available so it is useful to measure certain biomarkers in blood. The new T**ecan Neuro-IP** product portfolio, provided by Roboscreen, is a breakthrough in the pretreament of blood and CSF samples. The use of immunoprecipitation eliminates inhibiting matrix effects and enriches the target protein. Analysis of the sample is then possible using a variety of assay systems such as the Roche Elecsys®, the Mesoscale QuickPlex, Quanterix SIMOA®, Fujirebio Lumipulse®, and any type of ELISA.

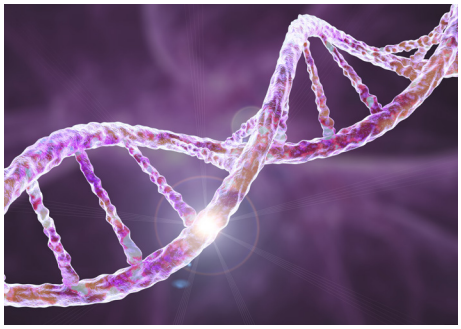
BioVendor R&D product range for neural tissue markers includes a variety of ELISA kits, antibodies and purified proteins for research in the field of neurodegenerative diseases.

Mediagnost's product portfolio includes the ELISA kit for the quantitative detection of Progranulin.
Progranulin has an application in the field of neurological research as an established marker for frontotemporal dementia (FTD). Decreased serum progranulin concentrations occur in approximately 5-10% of patients with FTD.

Apolipoprotein E in Neurodegenerative disease

Apolipoprotein E (ApoE) has key roles in the transport of cholesterol and other lipids within blood circulation and the central nervous system. ApoE is polymorphic exhibiting three different alleles, which differ by an alternating combination of two amino acids at position 112 and 158: E2 (C112_C158), E3 (C112_R158) and E4 (R112_R158).

Certain variants of Apolipoprotein E (ApoE) have been linked to specific health conditions: ApoE2 is associated with type III hyperlipoproteinemia, while ApoE4 is associated with cardiovascular disease and Alzheimer's disease.



The ViennaLab Apo E StripAssay® is an assay for the identification of apolipoprotein (apo) E isoforms E2, E3 and E4 based on polymerase chain reaction (PCR) and reverse-hybridization. The assay allows the discrimination between six possible heterozygous or homozygous apo E genotypes: E2/2, E2/3, E2/4, E3/3, E3/4, E4/4.

Kamiya Biomedical Company provides reagents for the quantitative determination of human Apolipoprotein E (Apo E) in serum and plasma by immunoturbidimetric assay. Protocols are available for use on a variety of different chemistry analysers.

Our products are manufactured by companies including:

IBL International GmbH, Germany, part of the Tecan Group
ViennaLab Diagnostics, Austria, part of the BioVendor Group
Kamiya Biomedical Company, USA
BioVendor R&D, Czech Republic, part of the BioVendor Group

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your specific assay requirements.