Central nervous system (CNS) disorders are a broad category of medical conditions (more than 600 human disorders) characterized by brain dysfunction limiting normal activities (Parkinson's Disease, Alzheimer's Disease, Multiple Sclerosis, Huntington Disease, and Others…).

**Neurodegenerative disease market – growth and trends**

**Geographic distributions:** North America, Europe, Asia-Pacific, Middle East and Africa, and South America.

The market was evaluated at approximately USD 40,000 million in 2021 and is expected to grow with a CAGR of 3.24% over the forecast period.

The market studied is moderately competitive. Some of the major market players are AbbVie Inc., Amneal Pharmaceuticals Inc., Boehringer Ingelheim International GmbH, F. Hoffmann-La Roche Ltd, Merck & Co. Inc., Pfizer Inc., Teva Pharmaceutical, Novartis AG, and UCB SA.

**Future: Microglia-targeting nanotherapeutics for neurodegenerative diseases**

**Future:** use of nano-enabled drug delivery systems for the treatment of neurodegenerative diseases (NDs)

To date there is no innovative nano-technological approach to contrast NDs

**Myelin Nano-Vesicles production and proprieties**

**Brain section**

**Myelin**

**Microfluidic**

**Size ~100nm**

**Myelin Nano-Vesicles (MyVes)**

**MyVes cross the BBB**

**MyVes deliver the drugs in microglia cells**

**MyVes commercial potentiality:** low production costs, industrial scale production, high economic impact on market.

**Applications:**

**Neurodegenerative diseases**

**Multiple Sclerosis treatment**

**Drug Types:** N-methyl-D-aspartate receptor antagonists, Cholinesterase inhibitors, Dopamine agonists, Immunomodulatory drugs….

**The QUESTIONS:** How reach the brain and specifically deliver the drug into the microglia cells?

**THE ANSWER:** Brain extraction of the myelin and bio-fabrication of Nano-vesicles to be injected into the body!

Several drug delivery systems are present in the pre-clinical phase, very few in the clinical trials, none used in current therapies. **Differences/advantages:** our system is made up of the same material (myelin) that microglia cells normally recognize and phagocyte, therefore it does not require specific directing agents. Furthermore, the MyVes are cyto-compatible and, being degradable they do not accumulate.

**MyVes anti-inflammatory drug loading**