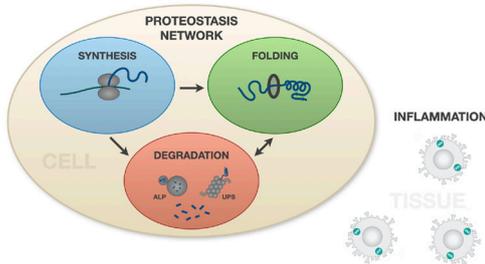


# HERANTIS PHARMA

## PIPELINE PROGRAMME SUMMARY: CDNF (CEREBRAL DOPAMINE NEUROTROPHIC FACTOR)



### PROTEOSTASIS:

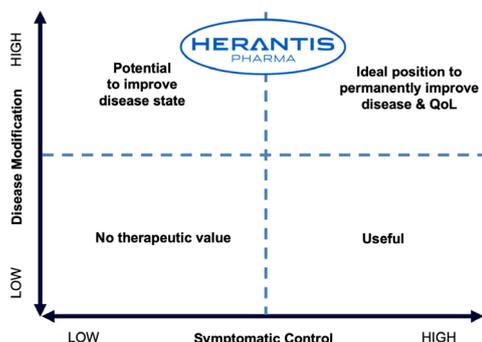
Interactive, highly regulated mechanisms that are critical to cell health

### Neurodegenerative Diseases Global Market Size



### RAPIDLY GROWING MARKET:

Aging population is driving incidence of neurodegenerative diseases



### COMPETITIVE NICHE

Opportunity to launch the first truly disease-modifying therapeutic for PD

Herantis is pioneering the use of human CDNF for treatment of Parkinson's Disease (PD) and other neurodegenerative diseases.

CDNF exerts protective and stimulatory effects in the brain through its effects on a cellular mechanism called proteostasis, which maintains the normal synthesis and folding of proteins, and labels "bad" proteins for degradation by the proteasome. If proteostasis is disrupted, due to cellular stress, specifically endoplasmic reticulum (ER) stress, proteins can become misfolded and dysfunctional, causing accumulation in the cell and leading to cell dysfunction and death.

PD is the second most common form of neurodegeneration, affecting 7 to 10 million people worldwide. Yet PD is poorly served, with few durable therapies, none of which can stop or slow disease progression. Herantis is seeking to transform PD treatment with the first truly disease-modifying therapeutic that is suitable for treating the disease in its early stages, where an appreciable population of dopaminergic neurons still remains and the neuroprotective and regenerative effects of CDNF can be maximised.

CDNF showed encouraging results in reversing motor and non-motor symptoms in animal models. Herantis recently reported 6 & 12 month readouts from a PhI/II clinical safety study in PD patients and subsequent extension study. As a first-in-human study, the primary endpoints were safety and tolerability. The study showed excellent tolerability for CDNF, with no dose-limiting toxicities.

Herantis is developing CDNF as a standalone therapeutic for restoring proteostasis, that can be administered via one of two minimally invasive routes.

i) **via Nose-to-Brain** (intranasal) delivery of CDNF has previously been shown to be a viable route of administration and Herantis is developing an optimised intranasal preparation of CDNF for Parkinsons Disease and other neurodegenerative conditions.

ii) **via Skin injections** (subcutaneous) of CDNF; in acute neurodegenerative conditions (such as stroke), the BBB may be compromised, and Herantis is investigating CDNF treatment with simple subcutaneous injections.

Comprehensively, the total available market for neurodegenerative diseases was estimated to be worth €29.2Bn in 2018 and is projected to reach €54Bn by 2026 (CAGR = 7.2%). Parkinson's disease alone represents a serviceable market of €3.8Bn, growing to €5.0Bn by 2024. Based on the market share of incumbent therapeutics for PD (e.g. Levodopa & Deep Brain Stimulation), we project the serviceable obtainable market opportunity for CDNF to be >€2.5Bn