

# Gene therapy for reduction and reversal of symptoms of aging and age-related disorders

University of Chile has generated an AAV-based gene therapy which overexpress XBP1 transcription factor in the brain for its use in reversing age-associated cognitive and motor dysfunction

## THE CHALLENGE

Brain aging is the most relevant risk factor for the appearance of dementia and neurodegenerative diseases such as Parkinson's and Alzheimer's diseases, frontotemporal dementia and amyotrophic lateral sclerosis, representing a major public health issue worldwide. A common feature in these age-related disorders is the accumulation of abnormal protein aggregates, suggesting cellular mechanisms controlling proteostasis may underlie the etiology of these diseases and drive age-associated cognitive dysfunction. Based on that hypothesis, the technology introduced here provides a mechanism to prevent and reduce symptoms of aging and age-related disorders.

## THE TECHNOLOGY

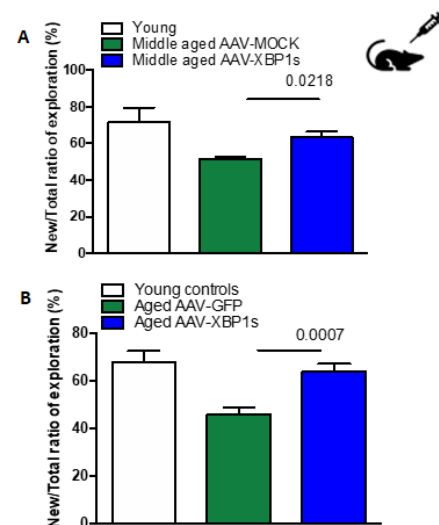
Unique AAV-based gene therapy that fully reverts age-associated dysfunction of the brain at behavioral, morphological and functional levels, based on the overexpression of the transcription factor XBP1s in the brain. Our *in vivo* results demonstrated that delivery of AAV-XBP1s in hippocampus of both middle-aged and aged mice **fully reverts cognitive decline to levels comparable to young mice**. Additionally, treated aged mice showed an increased number of dendritic spikes/rea and increased LTP in post-synaptic terminals. Furthermore, data in transgenic mice overexpressing XBP1s in the brain suggests that **this therapy would also revert motor disability associated with aging**.

## STAGE OF DEVELOPMENT

- *In vivo* studies in transgenic mice
- Therapy validated *in vivo* – Functional, behavioral and functional testing

## COMPETITIVE ADVANTAGES

- **Unprecedented therapy** to reduce and revert cognitive and motor age-associated symptoms



*Figure 1. Novel Object Location (A) and Recognition (B) tests indicates that aged mice injected in the hippocampus with AAV-XBP1s (n=15) present normal cognition compared to aged control animals (n=14).*

## APPLICATIONS

- Prevention or reduction of age-associated cognitive decline and motor disabilities
- Prevention or reduction of risk of neurodegenerative diseases

## OPPORTUNITY

University of Chile is searching for industry partners for **out-licensing** this technology.

## INTELLECTUAL PROPERTY/REFERENCES

- US provisional patent application 62/800,229