By the time the symptoms of Parkinson’s disease appear, more than 70% of dopaminergic neurons have already been lost. Current therapies focus primarily on symptomatic control; while therapeutics or biomarkers targeting the earliest stages of the disease are nonexistent. Across age-associated neurodegenerative diseases, therapeutic development must focus on both the discovery of meaningful biomarkers of disease stage as well as compounds capable of slowing or halting the degenerative process.

Our preclinical work has identified a critical period when endogenous regeneration of neural stem cells rapidly declines. This is associated with decreased expression of Nrf2, a protein responsible for protecting neurons from oxidative damage and inflammation. We are working to develop Nrf2-based targets into compounds capable of restarting neural regeneration.

In parallel, we have developed a powerful new drug discovery platform using induced pluripotent stem cells (iPSCs) and fibroblasts from patients with neurodegenerative diseases.

Housing more than a hundred samples from individuals across the spectrum of age-associated neurodegenerative disorders—CIBS is leveraging this resource to develop and evaluate patient-specific therapeutics and biomarkers.