

**Title** Cystamine and analogues for the treatment of Parkinson's disease

**Activity sector** Parkinson's disease therapeutics

**Inventor(s)** Francesca Cicchetti *et al.*, Axe Neurosciences, Centre de recherche du CHU de Québec-Université Laval



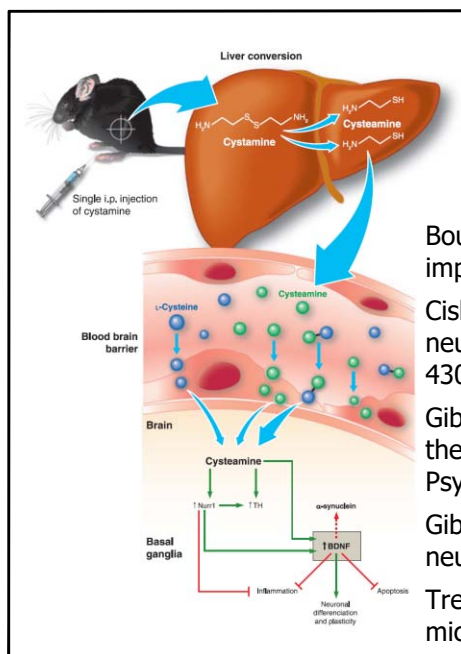
**Markets** Neurodegenerative disorders therapeutics

**Unmet need(s)** Disease-modifying drugs for halting and/or reversing neurodegenerative processes

**Solutions** Analogues of cystamine

**Description** Cystamine, a molecule with anti-inflammatory and anti-apoptotic properties, is a promising compound to halt or reverse the neurodegenerative processes endured by people suffering of Parkinson's disease. Cystamine has been reported to inhibit transglutaminase, an enzyme that contributes to the formation of insoluble protein aggregates observed in the brains of patients with Alzheimer's, Huntington's and Parkinson's disease.

Cystamine (and ultimately its metabolite cysteamine), a compound that can cross the blood-brain-barrier, 1° is neuroprotective in toxin-induced animal models of the disease, 2° can prevent cell death in part by increasing levels of brain derived neurotrophic factor (BDNF), and 3° has shown disease-modifying properties in relevant models of Parkinson's disease.



Bousquet M *et al.* (2010). Cystamine metabolism and brain transport properties: clinical implications for neurodegenerative diseases. *J Neurochem* **114**: 1651-1658.

Cisbani G *et al.* (2015). Cystamine/cysteamine rescue the dopaminergic system and show neurorestorative properties in animal models of Parkinson's disease. *Neurobiol Dis* **82**: 430-444.

Gibrat C *et al.* (2010). Cystamine prevents MPTP-induced toxicity in young adult mice via the activation of the brain-derived neurotrophic factor. *Prog Neuro-Psychopharmacol Biol Psychiatry* **34**: 193-203.

Gibrat C and F Cicchetti (2011). Potential of cystamine and cysteamine in the treatment of neurodegenerative diseases. *Prog Neuropsychopharmacol Biol Psychiatry* **35**: 380-389.

Tremblay ME *et al.* (2006). Neuroprotective effects of cystamine in aged parkinsonian mice. *Neurobiol Aging* **27**: 862-870.

**Strengths** Cystamine or more potent analogues could provide a breakthrough disease-modifying therapeutic option for Parkinson's disease

**Opportunity** SOVAR and Université Laval seek a partner for co-development or commercialization of this technology

**Intellectual property** Cicchetti F, C Rouillard, and F Calon (2017). Cystamine analogues for the treatment of Parkinson's disease. AU2012/220314B2; CA2732440C; EP2678009B1; JP6000985B2; MX350195B; RU2630583C2. Assignee: Université Laval.