Transgenic Mouse Model of Parkinson's Disease with Age-Dependent Hypokinetic Motor Deficits, Dopaminergic Neuron Loss, and Alpha Synuclein Accumulation

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SUMMARY

UCLA inventors have developed a novel mouse model of Parkinson's disease (PD) exhibiting late onset behavioral and neuropathological phenotypes. Unlike currently used methods, this transgenic mouse model exhibits age-dependent progression of the disease.

BACKGROUND

Existing genetic mouse models based on known Parkinson's disease mutations recapitulate aspects of dopaminergic (DA) neuron dysfunction without exhibiting progressive degeneration of DA cell bodies. Furthermore, other genetic models, based on genes not linked to familial PD, do exhibit a DA neuron degeneration phenotype. However, in most cases, the loss of DA neurons occurs early in development, and its direct relevance to PD remains hypothetical.

INNOVATION

UCLA scientists have developed a mouse model of Parkinson's disease with late onset behavioral and neuropathological phenotypes. This novel mammalian genetic model can be used to study the mechanisms underlying age-dependent and the slowly progressive form of DA neuron degeneration.

APPLICATIONS

- This mouse model can be use to perform in vivo preclinical testing of PD therapeutics

ADVANTAGES

- This model exhibits late-onset and progressive hypokinetic motor deficits
- Age-dependent DA neuron degeneration.
- Significant reduction of striatal dopamine level
- Age-dependent accumulation of proteinase K resistant alpha-synuclein in substantia nigra

STATE OF DEVELOPMENT

Transgenic mouse model characterization has been completed.

RELATED MATERIALS

- Lu XH, Fleming SM, Meurers B, Ackerson LC, Mortazavi F, Lo V, Hernandez D, Sulzer D, Jackson GR, Maidment NT, Chesselet MF, Yang XW. Bacterial artificial chromosome transgenic mice expressing a truncated mutant parkin exhibit age-dependent hypokinetic motor deficits, dopaminergic neuron degeneration, and accumulation of proteinase K-resistant alpha-synuclein. J Neurosci. 29(7):1962-76 (2009).

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Novel Mouse Model for Huntingtons Disease
- Rosa HD
- A Cell-Based Seeding Assay for Huntingtin Aggregation

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OTHER INFORMATION

CATEGORIZED AS

- **Medical**
  - Disease: Central Nervous System
- **Research Tools**
  - Animal Models

RELATED CASES

2009-718-0

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