

Authors	Study	Year	Findings in SN	Strain	Mouse Source
McCormack et al. <i>PQ Dose Regimen: 1, 5, or 10 mg/kg, once/wk, 3 doses.</i>	Environmental risk factors and Parkinson's disease: selective degeneration of nigral dopaminergic neurons caused by the herbicide paraquat.	2002	PQ caused a dose-dependent loss of TH-immunoreactive neurons in the SNpc of 10, 18, and 28% after 3 once weekly injections at 1, 5, and 10 mg/kg respectively.	C57BL/6	Not stated
Manning-Bog et al. <i>PQ Dose Regimen: 10 mg/kg, once/wk, 3 doses.</i>	The herbicide paraquat causes up-regulation and aggregation of alpha-synuclein in mice.	2002	In mice exposed to PQ, brain levels of alpha-synuclein were significantly increased.	C57BL/6	Simonsen Laboratories, CA.
Goers et al. <i>PQ Dose Regimen: 10 mg/kg, once/wk, 3 doses.</i>	Nuclear localization of alpha-synuclein and its interaction with histones.	2003	PQ mice exhibited an increase in synuclein immune-reactivity that stained both the cytosol & nuclei of nigral cells.	Mouse strain not specified	Simonsen Laboratories, CA.
Manning-Bog et al. <i>PQ Dose Regimen: 10 mg/kg, once/wk, 3 doses.</i>	Alpha-synuclein over expression protects against paraquat-induced neurodegeneration.	2003	The number of TH-positive cells was significantly reduced by 25–35% in the SNpc of PQ-treated mice.	C57BL/6	Not stated
McCormack et al. <i>PQ Dose Regimen: 10 mg/kg, once/wk, 3 doses.</i>	Effects of L-dopa and other amino acids against paraquat-induced nigrostriatal degeneration.	2003	Injections of 10 mg/kg PQ once a week for 3 weeks caused a 25% reduction in the number of TH-immunoreactive cells in the SNpc.	C57BL/6	Not stated
McCormack et al. <i>PQ Dose Regimen: 10 mg/kg, once/wk, 3 doses.</i>	Role of oxidative stress in PQ-induced dopaminergic cell degeneration.	2005	Single PQ exposure did not cause dopaminergic cell death. Two PQ injections resulted in a significant decrease of TH-positive neurons. A third PQ injection had no additional effect on the number of nigral dopaminergic neurons.	C57BL/6	Charles River, Hollister, CA.

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McCormack et al. <i>PQ Dose Regimen:</i> 10 mg/kg, once/wk, 2 or 3 doses.	Decreased susceptibility to oxidative stress underlies the resistance of specific dopaminergic cell populations to paraquat-induced degeneration.	2006	PQ produced a significant loss of dopaminergic neurons in SNpc. In contrast, tyrosine hydroxylase-positive cells in SNvt were spared from PQ-induced degeneration.	C57BL/6	Not stated
Purisai et al. <i>PQ Dose Regimen:</i> 10 mg/kg, once/wk, 1 or 2 doses.	Microglial activation as a priming event leading to PQ-induced dopaminergic cell degeneration.	2007	Single PQ exposure was followed by an increase in the number of cells with immune-histochemical, morphological and biochemical characteristics of activated microglia.	C57BL/6	Charles River, Hollister CA & Jackson Labs, Bar Harbor, ME.
Khwaja et al. <i>PQ Dose Regimen:</i> 10 mg/kg, once/wk, 3 doses.	Nicotine partially protects against paraquat-induced nigrostriatal damage in mice; link to alpha6 beta2 nAChRs.	2007	Paraquat treatment decreased (25%) nigral dopaminergic neurons.	C57BL/6	Charles River Laboratories, Gilroy, CA.
Fei et al. <i>PQ Dose Regimen:</i> 10 mg/kg, once/wk, 3 doses.	Paraquat neurotoxicity is mediated by a Bak-dependent mechanism.	2008	Number of TH-immunopositive neurons in the SNpc of PQ-treated mice was reduced by 26%.	C57BL/6J	Jackson Labs, Bar Harbor, ME.
Brooks et al. <i>PQ Dose Regimen:</i> 5 or 10 mg/kg, once/wk, 3 doses.	Paraquat elicited neuro-behavioral syndrome caused by dopaminergic neuron loss.	1999	PQ produces a decrease in substantia nigra dopaminergic neurons assessed by a Fluoro-gold pre-labeling method.	C57BL/6J	Not stated
Thiruchelvam et al. <i>PQ Dose Regimen:</i> 10 mg/kg, twice/wk, 12 doses. Also combination with MB 30 mg/kg.	The nigrostriatal dopaminergic system as a potential target of repeated exposures to combined paraquat & maneb: implications for Parkinson's disease.	2000a	PQ + MB reduced locomotor activity, striatal dopamine and TH+ counts in the SNpc but not the VTA. Little effect of PQ alone. Not full stereology.	C57BL/6	Taconic, Germantown, NY.

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Thiruchelvam et al. <i>PQ Dose Regimen:</i> 5 or 10 mg/kg, once/wk, 4 doses. Also combination with MB 15-30 mg/kg.	Potentiated and preferential effects of combined paraquat effects & maneb on nigrostriatal dopamine systems.	2000b	PQ + MB reduced locomotor activity, increased striatal dopamine and dopamine turnover. TH staining density in the striatum reduced in combined exposures only. No stereology in the SNpc.	C57BL/6	Taconic, Germantown, NY.
Thiruchelvam et al. <i>PQ Dose Regimen:</i> 0.3 mg/kg PND5-19; as adults: 10 mg/kg, twice/wk, 6 doses	Developmental exposure to the pesticides paraquat and maneb and the Parkinson's.	2002	PQ & MB, alone or combined, resulted in a loss of TH-positive neurons in the SNpc.	C57BL/6	Not stated
Thiruchelvam et al. <i>PQ Dose Regimen:</i> 10 mg/kg, twice/wk, 6 doses	Age-related irreversible progressive nigrostriatal dopaminergic neurotoxicity.	2003	Both PQ alone and PQ + MB were associated with an age-dependent decrease in the number of TH-positive neurons in the SNpc.	C57BL/6	Nat. Inst. Aging Rodent Colony, Harlan Sprague Dawley Inc.
Thiruchelvam et al. <i>PQ Dose Regimen:</i> 5 mg/kg, twice/wk, 14 doses in combination with MB 15 mg/kg	Risk factors for dopaminergic neuron loss in human alpha- synuclein transgenic mice.	2004	PQ + MB induced reductions (20%) in TH+ counts in the SNpc. No effects on locomotor activity or striatal dopamine.	C57BL/6 Wild Type	Jackson Labs, Bar Harbor, ME.
Barlow et. al. <i>PQ Dose Regimen:</i> Prenatal: 0.3 mg/kg Gest Days 10-17, Postnatal: 5 mg/kg, daily, PND 48-55	A fetal risk factor for Parkinson's disease.	2004	Pre & postnatal PQ resulted in selective dopaminergic-neuron loss in SNpc (stereology).	C57BL/6J	Jackson Labs, Bar Harbor, ME.

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Peng et al. <i>PQ Dose Regimen: 7 mg/kg at 2-day intervals, 10 doses</i>	The herbicide paraquat induces dopaminergic nigral apoptosis through sustained activation of the JNK pathway.	2004	TH immunohistochemistry revealed a significant depletion of TH-positive neurons in the SNpc.	C57BL/6	Jackson Labs, Bar Harbor, ME.
Peng et al. <i>PQ Dose Regimen: 7 mg/kg at 2-day intervals, 10 doses</i>	Superoxide dismutase / catalase mimetics are neuroprotective against selective PQ-mediated dopaminergic neuron death in the substantia nigra: implications for PD.	2005	Systemic administration of superoxide dismutase / catalase mimetic, EUK-189, decreases PQ-mediated SNpc dopaminergic neuronal cell death.	C57BL/6	Jackson Labs, Bar Harbor, ME.
Peng et al. <i>PQ Dose Regimen: 10 mg/kg, twice/wk, 6 doses</i>	Iron and paraquat as synergistic environmental risk factors in sporadic Parkinson's disease accelerate age-related neurodegeneration.	2007	PQ exposure reduced dopaminergic neurons in all four age groups to the same extent, suggesting that PQ toxicity is age independent.	C57BL/6	Jackson Labs, Bar Harbor, ME.
Peng et al. <i>PQ Dose Regimen: 10 mg/kg, twice/wk, 6 doses</i>	Iro-enhanced paraquat-mediated dopaminergic cell death due to increased oxidative stress as a consequence of microglial activation.	2009	PQ administration resulted increases in gp91phox – a biomarker for NADPH oxidase and indicative of microglial activation.	C57BL/6	Jackson Labs, Bar Harbor, ME.
Mangano & Hayley <i>PQ Dose Regimen: 10 mg/kg, three times per week, 9 doses</i>	Inflammatory priming of the substantia nigra influences the impact of later paraquat exposure: Neuro-immune sensitization of neurodegeneration.	2008	Exposure to paraquat caused a 30% reduction in the number of TH+ cells across levels of the SNC.	C57BL/6	Charles River Laboratories, Laprairie, Quebec, Canada.

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Littlejohn et al. <i>PQ Dose Regimen: 10 mg/kg, three times per week, 9 doses</i>	Interferon gamma deficiency modifies the motor and co-morbid behavioral pathology and neurochemical changes provoked by the pesticide paraquat.	2009	PQ induced reductions in locomotor activity and striatal dopamine in WT mice.	C57BL/6J	Jackson Labs, Bar Harbor, ME.
Mangano et al. <i>PQ Dose Regimen: 10 mg/kg, three times per week, 9 doses</i>	Interferon gamma deficiency modifies the motor and co-morbid behavioral pathology and neurochemical changes provoked by the pesticide paraquat. Abstract / Poster Society for Neuroscience 2009	2009	PQ induced reductions in locomotor activity and striatal dopamine in WT mice. WT mice had a 30% reduction	C57BL/6J	Jackson Labs, Bar Harbor, ME.
Prasad et al. <i>PQ Dose Regimen: 10 mg/kg i.p. single dose or 10-50 mg/kg orally single dose</i>	Prolonged toxicokinetics and toxicodynamics of paraquat in mouse brain.	2007	PQ kinetic study with PQ brain levels linked to elevated lipid peroxidation in different brain regions.	C57BL/6J	Bred in house at UMDNJ.
Prasad et al. <i>PQ Dose Regimen: 10 mg/kg i.p multiple doses 2 or 3 times/wk for up to 36 doses. Oral administration in drinking water 0.03 - 0.05 mg/ml for 8 or 12 wks.</i>	Toxicokinetics and toxicodynamics of paraquat accumulation in mouse brain.	2009	PQ kinetic study following repeated doses of PQ. PQ decreased striatal dopamine levels after the 18 th to 36 th i.p. dose and reduced the striatal level of TH.	C57BL/6J	Jackson Labs, Bar Harbor, ME.

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Fernagut et al. <i>PQ Dose Regimen:</i> 10 mg/kg, once/wk, 3 doses.	Behavioral and histo-pathological consequences of paraquat intoxication in mice: effects of alpha-synuclein over expression	2007	Paraquat induced a significant decrease of the total number of TH-IR neurons in the SNc in both Thy1-aSYN and WT mice.	C57BL/6-DBA/2 background Not pure C57Bl/6	Generated in house.
Cristovao et al. <i>PQ Dose Regimen:</i> 10 mg/kg once every 3 days, 3 doses.	The role of NADPH oxidase 1-derived reactive oxygen species in PQ-mediated dopaminergic cell death.	2009	Dosing of PQ resulted in a 35% reduction of TH-positive neurons in SNpc.	C57BL/6	Charles River Wilmington, MA.
Kang et al. <i>PQ Dose Regimen:</i> 10 mg/kg, twice/wk, 6 doses.	PQ induces alternation of the dopamine catabolic pathways & glutathione levels in the substantia nigra of mice.	2009	PQ reduced the number of TH-positive neurons in SNpc, by approximately 40%	C57BL/6	Japan SLC, Inc., Shizuoka, Japan.
Li et al. <i>PQ Dose Regimen:</i> 5 or 10 mg/kg at 2-day intervals, 10 doses.	Paraquat induces selective dopaminergic nigrostriatal degeneration in aging C57BL/6 mice.	2005	TH-positive neuron cell counts were reduced in the SN of PQ-treated mice.	C57BL/6	Animal Center of Chinese Medical University, Shenyang, China.
Ren et al. <i>PQ Dose Regimen:</i> Oral dosing of 10 mg/kg daily for four months.	Toxic influence of chronic oral administration of paraquat on nigrostriatal dopaminergic neurons in C57BL6 mice.	2009	PQ induced reductions in locomotor activity, striatal dopamine and TH staining in the SNpc by 49%. Not stereology though.	C57BL/6	Not stated
Choi et al. <i>PQ Dose Regimen:</i> 10 mg/kg, once/wk, 1 or 3 doses.	PEP-1-SOD fusion protein efficiently protects against PQ-induced dopaminergic neuron damage in a PD mouse model.	2006	In the paraquat treated mice, the number of TH-positive cells in the substantia nigra was reduced by 60%.	C57BL/6J	Not stated

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Yin et al. <i>PQ Dose Regimen: 1 or 5 mg/kg, once/wk, 3 doses.</i>	Genetic analysis of paraquat sensitivity in mice: a model to study the genetics of sporadic Parkinson's disease? Abstract / Poster Society for Neuroscience 2009	2009	1 mg/kg PQ did not produce a statistically significant loss of TH+ neurones. % mg/kg PW produced a 39% loss of TH+ neurones in the SNpc.	C57BL/6J	Jackson Labs, Bar Harbor, ME.
Song et al. <i>PQ Dose Regimen: 20 mg/kg, once/wk, 3 doses.</i>	The effects of paraquat and alpha-synuclein transgenic expression on reproducing features of Parkinson's disease in mice. Abstract / Poster Society for Neuroscience 2009	2009	No effect of 3 x 20 mg/kg PQ on rota rod motor performance, striatal dopamine or TH+ counts in the SNpc. Control TH+ cell counts were 12,000 – 14,000.	C57BL/6J	Source requested from authors.
Li et al. (Exponent Study) <i>PQ Dose Regimen: Postnatal: 0.3 mg/kg PND 5-19, Adult: 10 mg/kg twice/wk, 7 doses</i>	Relating pre-weaning / adult model of Parkinson's disease to occupational exposures in the United Kingdom. Abstract / Poster SOT	2009 & 2010	No effect of PQ on motor activity or neuropathology. No effect on TH+ counts in the SNpc to date.	C57BL/6	Charles River, UK.
Syngenta CTL studies <i>PQ Dose Regimen: 10 mg/kg, once or twice/wk, 3 or 6 doses.</i>	CTL Report nos. XM7229, XM7258, XM7371 & XM7480.	2003 to 2005	PQ induced a 20 - 25% loss of TH+ neurones in the SNpc. No effect on striatal dopamine or locomotor activity.	C57BL/6J Crl	Charles River, Margate, Kent, UK.
Syngenta WIL studies		2008 to 2010		C57BL/6J	Jackson Labs, Bar Harbor, ME.

Research Group	Location	Sources of C57BL/6 mice	Most recent source of C57BL/6 mice
Dino Di Monte	PI, Sunnyvale, CA	Charles River, Hollister, CA Simonsen Labs, CA Jackson Labs, Bar Harbor, ME	Jackson Labs, Bar Harbor, ME
Deborah Cory-Slechta	Uni. Rochester, NY / Rutgers, NJ	Taconic Germantown, NY Harlan (Natl. Inst. Aging Res. Col.) Jackson Labs, Bar Harbor, ME	Jackson Labs, Bar Harbor, ME
Julie Andersen	Buck Inst. For Aging Research, Novato, CA	Jackson Labs, Bar Harbor, ME	Jackson Labs, Bar Harbor, ME
Hayley	Carleton Uni. Ottawa, Canada	Charles River, Laprairie, Quebec, Canada. Jackson Labs, Bar Harbor, ME	Jackson Labs, Bar Harbor, ME
Eric Richfield	Robert Wood Johnson Medical School, UMDNJ	<i>In house</i> at UMDNJ Jackson Labs, Bar Harbor, ME	Jackson Labs, Bar Harbor, ME
Chesselet	UCLA	<i>In house</i>	<i>In house</i>
Flint Beal	Cornell, NY	Charles River, Wilmington, MA	Charles River, Wilmington, MA
Kang	Seoul, S. Korea	Japan SLC, Inc., Shizuoka, Japan	Japan SLC, Inc., Shizuoka, Japan
Li / Ren / Sun	Shanghai, China	Animal Center of Chinese Medical University, Shenyang, China	Animal Center of Chinese Medical University, Shenyang, China
Choi	Hallym Uni. Chunchon, S. Korea	Not stated	Not stated
Yin	Penn State, PA	Jackson Labs, Bar Harbor, ME	Jackson Labs, Bar Harbor, ME
Song	UCSD, CA	Not stated	Not stated. Requested from authors.
Abby Li	Exponent	Charles River, UK	Charles River, UK
Syngenta CTL	CTL, UK	Charles River, Margate, Kent, UK	Charles River, Margate, Kent, UK
Syngenta 2008 onwards	USA	Jackson Labs, Bar Harbor, ME	Jackson Labs, Bar Harbor, ME