



**Recent References on Neurodegenerative Studies  
Using ALZET® Osmotic Pumps**

**ALS (2018-Present)**

**Q10538:** E. E. Handley, *et al.* Estrogen Enhances Dendrite Spine Function and Recovers Deficits in Neuroplasticity in the prpTDP-43(A315T) Mouse Model of Amyotrophic Lateral Sclerosis. *Molecular Neurobiology* 2022;59(5):2962-2976

**Agents:** Estradiol **Vehicle:** Saline; DMSO; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 60 days;

**ALZET Comments:** Dose (10 mg/ml); 50% DMSO used; Controls received mp w/ vehicle; animal info (Female; Wild-type and TDP-43; Ovariectomy); wound clips used; pumps replaced every 4 weeks; replacement therapy (Estrogen);

**Q10284:** H. Tran, *et al.* Suppression of mutant C9orf72 expression by a potent mixed backbone antisense oligonucleotide. *Nature Medicine* 2022;28(1):117-124

**Agents:** Oligonucleotide, antisense **Vehicle:** PBS; **Route:** CNS/CSF (ICV); **Species:** Mice; **Pump:** 1007D; **Duration:** 21 days;

**ALZET Comments:** Dose (2.5-20 nmol/day); dose-response (dose-dependent reduction in V1 and V3 repeat-containing transcripts in both the cortex and spinal cord regions after being treated with ASO3 and ASO5); animal info (C9BAC transgenic mice); antisense oligonucleotides aka ASO; antisense (oligonucleotide); ALZET brain infusion kit 3 used; bilateral cannula used; 2.5-20 nmol/day of each ASO were continuously infused over 10 d into the right lateral ventricle of age-matched heterozygous C9BAC mice through a cannula using an implanted Alzet osmotic pump/tissue perfusion (brain); neurodegenerative (ALS);(FTD) Therapeutic indication (ALS, FTD);

**Q10066:** R. A. Smith, *et al.* Development of a molecular therapy for the SOD1 familial variant of ALS. *Neurotherapeutics in the Era of Translational Medicine* 2021;1-18

**Agents:** Oligonucleotides; Methylene blue **Route:** CSF/CNS (right lateral ventricle); **Species:** Rat; **Duration:** 14 days;

**ALZET Comments:** Animal info (G93A SOD1 transgenic rats, 2-3 months of age); functionality of mp verified by pump weight; neurodegenerative (ALS);

**Q9420:** J. Post, *et al.* A Novel Anti-Inflammatory d-Peptide Inhibits Disease Phenotype Progression in an ALS Mouse Model. *Molecules* 2021;26(6):

**Agents:** All-D-peptide RD2 **Vehicle:** Saline; **Route:** IP; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Dose (19 mg/kg/d); Controls received mp w/ vehicle; animal info (Twelve weeks old female SOD1\*G93A mice); all-D-peptide RD2 aka RD2RD2; neurodegenerative (Amyotrophic lateral sclerosis);

**Q10356:** A. Arnoux, *et al.* Evaluation of a 5-HT2B receptor agonist in a murine model of amyotrophic lateral sclerosis. *Scientific Reports* 2021;11(1):23582

**Agents:** BW723C86 **Vehicle:** DMSO; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** Not Stated;

**ALZET Comments:** Dose (1 mg/kg/d; 3 mg/kg/d); 20% DMSO used; animal info (Female; Male; 75 days old); pumps replaced every month; neurodegenerative (Amyotrophic lateral sclerosis); Therapeutic indication (Amyotrophic lateral sclerosis);

**Q10705:** M. C. Trolese, *et al.* CXCL13/CXCR5 Signaling is Pivotal to Preserve Motor Neurons in Amyotrophic Lateral Sclerosis. *EBioMedicine* 2020;62(103097

**Agents:** MAb 5261; Immunoglobulin G **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004;

**ALZET Comments:** "Dose: (7.2 mg/ml CSCL13 antibody); animal info: Female transgenic SOD1G93A mice on C57BL/6 J or 129SvHsd genetic background, hereafter indicated as C57-mSOD1 and 129Sv-mSOD1; Immunoglobulin G aka (IgG); MAb 5261 (anti-CSCL13 antibody; neurodegenerative; (amyotrophic lateral sclerosis); "

**Q8668:** P. S. Mishra, *et al.* Transmission of ALS pathogenesis by the cerebrospinal fluid. *Acta Neuropathologica Communications* 2020;8(1):65

**Agents:** CSF, amyotrophic lateral sclerosis **Vehicle:** CSF, artificial; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (mice (mean age 230.41 ± 37.7 days)); behavioral testing (open-field test); amyotrophic lateral sclerosis CSF aka ALS-CSF; Brain coordinates (1.50 mm lateral, – 1.00 mm antero-posterior and – 2.00 dorsoventral from Bregma); neurodegenerative (Amyotrophic Lateral Sclerosis);



**Q7006:** R. Malik, *et al.* The molecular tweezer CLR01 inhibits aberrant superoxide dismutase 1 (SOD1) self-assembly in vitro and in the G93A-SOD1 mouse model of ALS. *J Biol Chem* 2019;294(10):3501-3513

**Agents:** CLR01 **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 6 weeks;

**ALZET Comments:** Dose (0, 0.5, or 5.0 mg/kg); 0.9% saline used; Controls received mp w/ vehicle; animal info (Transgenic B6SJL-Tg mice); behavioral testing (grip-strength test, rotarod test); half-life: 1-2 hours (p.5); CLR01 is a broad-spectrum inhibitor of the self-assembly and toxicity of amyloid proteins; enzyme inhibitor (superoxide dismutase 1 (SOD1); neurodegenerative (amyotrophic lateral sclerosis);

**Q9161:** E. Blacher, *et al.* Potential roles of gut microbiome and metabolites in modulating ALS in mice. *Nature* 2019;572(7770):474-480

**Agents:** Nicotinamide; Phenol Sulfate **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 months;

**ALZET Comments:** Dose (NAM- 30.8 mg/kg/week or 49.28 mg/kg/week); Controls received mp w/ vehicle; animal info (40-180 days old); pumps replaced every 4 weeks; Nicotinamide aka NAM; neurodegenerative (Amyotrophic Lateral Sclerosis);

**Q7540:** S. Watanabe, *et al.* Intracerebroventricular administration of Cystatin C ameliorates disease in SOD1-linked amyotrophic lateral sclerosis mice. *J Neurochem* 2018;145(1):80-89

**Agents:** Cystatin C, Recombinant human **Vehicle:** PBS; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (66 ng/day); Controls received mp w/ vehicle; animal info (100-day-old, transgenic SOD1G93A, male $\geq$ 30g and female $\geq$ 20g); stability verified by (influenza hemagglutinin (HA)-tagged CysC administration for 1 week); CysC is an endogenous protease inhibitor; enzyme inhibitor (cathepsin); ALZET brain infusion kit used; neurodegenerative (ALS); "After 1 week of continuous HA-tagged CysC administration using an osmotic pump, the CysC was successfully delivered to the lumbar spinal cord and was predominantly distributed in the ventral horn neurons (Fig. 1b and c), whereas CysC was rarely found in neurons of the dorsal horn. These data indicate that intracerebroventricular administration was sufficient to deliver CysC to lower motor neurons in the lumbar spinal cord." pg.82; implanted pump remained on the back of mice until end-stage; "the disease end-stage was determined as the time when animals in a lateral position were unable to right themselves within 20s" p.81; Therapeutic indication (Bunina body formation and regulation of AMPK/PGC-1 $\alpha$  pathway);

**Q7312:** N. Tsuburaya, *et al.* A small-molecule inhibitor of SOD1-Derlin-1 interaction ameliorates pathology in an ALS mouse model. *Nat Commun* 2018;9(1):2668

**Agents:** SOD1-Derlin-1 inhibitor #56-40, SOD1-Derlin-1 inhibitor #56-59 **Vehicle:** DMSO; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** 2006; **Duration:** 36 weeks;

**ALZET Comments:** Dose (1 mM #56-40 or 3 mM #56-59); Controls received mp w/ vehicle; animal info (22 weeks, male, C57BL/6); behavioral testing (rotarod performance); behavioral testing (rotarod performance); pumps replaced every 6 weeks until mouse showed paralysis onset; long-term study; stability verified by (in-vitro immunoprecipitation assay); 3-Amino-N-(4-pyridyl)-6-(3-pyridyl)thieno[2,3-b]pyridine-2-carboxamide aka #56-40; N-Allyl-3-amino-N-phenyl-6-(pyridin-3-yl)thieno[2,3-b]pyridine-2-carboxamide aka #56-59; enzyme inhibitor (SOD1-Derlin-1 interaction); ALZET brain infusion kit 3 used; neurodegenerative (Amyotrophic lateral sclerosis);

**Q7208:** J. J. Riehm, *et al.* Poloxamer 188 decreases membrane toxicity of mutant SOD1 and ameliorates pathology observed in SOD1 mouse model for ALS. *Neurobiol Dis* 2018;115(115-126

**Agents:** Poloxamer 188; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** 2006, 1004; **Duration:** 42 days;

**ALZET Comments:** Dose (1.5 pM/h); Controls received mp w/ vehicle; animal info (40-55 day old male B6SJL-Tg(SOD1\*G93A)1Gur/J mice); neurodegenerative (amyotrophic lateral sclerosis);

**Q7210:** M. Maier, *et al.* A human-derived antibody targets misfolded SOD1 and ameliorates motor symptoms in mouse models of amyotrophic lateral sclerosis. *Sci Transl Med* 2018;10(470):

**Agents:** miSOD1, alpha- **Vehicle:** PBS; **Route:** CSF/CNS (left ventricle); **Species:** Mice; **Pump:** 1004; **Duration:** 20, 30, 40, 55, 70, 80 days;

**ALZET Comments:** Dose (0.1 mg/kg/day); Controls received mp w/ vehicle; animal info (Mice, 60 days of age); pumps replaced every 28 days; ALZET brain infusion kit used; neurodegenerative (amyotrophic lateral sclerosis); Therapeutic indication (amyotrophic lateral sclerosis);



**Q7189:** A. U. Joshi, *et al.* Inhibition of Drp1/Fis1 interaction slows progression of amyotrophic lateral sclerosis. *EMBO Molecular Medicine* 2018;10(3):

**Agents:** P110-TAT (47-57) **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 28 day pump; **Duration:** 60 days;  
**ALZET Comments:** Dose (3 mg/kg/day); animal info (4–6 weeks old AdultB6SJL Tg (SOD1G93A) 1 Gur/J male mice); behavioral testing (Activity chamber); pumps replaced after 30 days; long-term study; P110 is a selective peptide inhibitor of Drp1/Fis1; neurodegenerative (amyotrophic lateral sclerosis); neurodegenerative (amyotrophic lateral sclerosis); stress/adverse reaction:

**Q7904:** U. Gomez-Pinedo, *et al.* Histological changes in the rat brain and spinal cord following prolonged intracerebroventricular infusion of cerebrospinal fluid from amyotrophic lateral sclerosis patients are similar to those caused by the disease. *Neurologia* 2018;33(4):211-223

**Agents:** Cerebrospinal fluid, cytotoxic ALS **Vehicle:** Saline, physiological; **Route:** CSF/CNS (lateral ventricle); **Species:** Rat; **Pump:** 2006; **Duration:** 20, 43 days;

**ALZET Comments:** Dose (0.15 l/h); Controls received sham surgery w/ inert tube; animal info (1-5 months, male, Wistar); behavioral testing (inclined plane test); Cytotoxic CSF obtained from ALS patients; ALZET brain infusion kit used; Brain coordinates (–0.5 mm anteroposterior, –1.4 mm lateral and –3.3 mm dorsoventral); neurodegenerative (amyotrophic lateral sclerosis); no stress ("none of them showed signs of infection (abscess, edema or discharge in the implant)" see pg.215 );

### Alzheimer's (2020-Present)

**Q10887:** Y. Zhao, *et al.* ATAD3A Oligomerization Promotes Neuropathology and Cognitive Deficits in Alzheimer's Disease Models. *Nature Communications* 2022;13(1):1121

**Agents:** TAT control peptide; DA1 peptide **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Mice; **Pump:** 2004; **Duration:** 8.5 months;

**ALZET Comments:** Dose (1 mg/kg/day); Animal info: (5XFAD mice); behavioral testing: (Y-maze test; Barnes maze test; Nest building performance test; Open field test); pumps replaced every 4 weeks; peptides; neurodegenerative (Alzheimer's Disease);

**Q10715:** C. Vandendriessche, *et al.* Biomarker and Therapeutic Potential of Peripheral Extracellular Vesicles in Alzheimer's Disease. *Advanced Drug Delivery Reviews* 2022;190(114486

**Agents:** Vesicle; extracellular **Vehicle:** Not Stated; **Route:** CSF/CNS (hippocampus); **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Dose (2 mg/ml); animal info (APPswe, PS1dE9 mice); neurodegenerative (Alzheimer's disease);

**R0398:** M. Klonarakis, *et al.* The Three Sisters of Fate: Genetics, Pathophysiology and Outcomes of Animal Models of Neurodegenerative Diseases. *Neuroscience and Biobehavioral Reviews* 2022;135(104541

**Agents:** Sodium azide **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 4 weeks;

**ALZET Comments:** animal info (Male Sprague-Dawley); neurodegenerative (Alzheimer's; Parkinson's; Huntington's disease);

**Q10537:** J. O. Hendrickx, *et al.* Short-Term Pharmacological Induction of Arterial Stiffness and Hypertension with Angiotensin II Does Not Affect Learning and Memory and Cerebral Amyloid Load in Two Murine Models of Alzheimer's Disease. *International Journal of Molecular Sciences* 2022;23(5):

**Agents:** Angiotensin II **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Dose (1 µg/kg/min); Controls received mp w/ vehicle; animal info (5 months old hAPP23+/-, APPswe/PSEN1dE9 C57BL6 mice); wound clips used; behavioral testing (Morris water maze); Blood pressure measured via non-invasive CODA tail-cuff blood pressure system; peptides; neurodegenerative (Alzheimer's disease); cardiovascular (hypertension)

**Q10445:** G. E. Barbone, *et al.* X-ray multiscale 3D neuroimaging to quantify cellular aging and neurodegeneration postmortem in a model of Alzheimer's disease. *European Journal of Nuclear Medicine and Molecular Imaging* 2022;49(13):4338-4357

**Agents:** LY37926 **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 28 days;

**ALZET Comments:** Dose: (1 mg/kg/day). Controls received mp w/ vehicle; animal info: 11-month-old male B6/129 wild-type (WT) mice' 3xTgAD mutant mice (B6;129-Tg); LY379268 is selective agonist of group II metabotropic glutamate receptors; neurodegenerative (Alzheimer's disease);



**Q10489:** B. Anand, *et al.* Significance of native PLGA nanoparticles in the treatment of Alzheimer's disease pathology. *Bioactive Materials* 2022;17(506-525

**Agents:** PLGA **Vehicle:** CSF; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;  
**ALZET Comments:** Dose: (25 µM)); animal info: Three-month old 5xFAD mice along with age-matched wild-type (WT) control mice; behavioral testing: Novel-object recognition test; PLGA aka Acidic poly(D,L-lactide-co-glycolide) nanoparticles; ALZET Brain Infusion Kit used; Brain coordinates (right ventricle (-0.8 mm mid/lateral, -0.1 mm antero/posterior and -3.0 mm dorso/ventral from Bregma); neurodegenerative (Alzheimer's);

**Q9557:** Y. Z. Wu, *et al.* Cordyceps cicadae NTTU 868 Mycelium with The Addition of Bioavailable Forms of Magnesium from Deep Ocean Water Prevents the Aβ40 and Streptozotocin-Induced Memory Deficit via Suppressing Alzheimer's Disease Risk Factors and Increasing Magnesium Uptake of Brain. *Fermentation* 2021;7(1):

**Agents:** Amyloid protein, beta (40); Streptozotocin **Vehicle:** Acetonitrile; Trifluoroacetic acid; **Route:** CSF/CNS (left ventricle); **Species:** Rat; **Pump:** 2004; **Duration:** 28 days;  
**ALZET Comments:** Dose (24,299 µg); 35% Acetonitrile, 0.1% Trifluoroacetic Acid used; Controls received mp w/ vehicle; animal info (Male Sprague Dawley rats, 6-8 weeks old); behavioral testing (Morris Water Maze); Amyloid protein, beta (40) aka AB40; Brain coordinates (relative to the bregma; 0.8 mm posterior, 1.4 mm latera); dental cement used; neurodegenerative (Alzheimer's);

**Q10321:** S. Schemmert, *et al.* In Vitro and In Vivo Efficacies of the Linear and the Cyclic Version of an All-d-Enantiomeric Peptide Developed for the Treatment of Alzheimer's Disease. *International Journal of Molecular Sciences* 2021;22(12):

**Agents:** RD2D3; cRD2D3 **Vehicle:** PBS; **Route:** IP; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;  
**ALZET Comments:** Dose: (8 mg/kg/d); Controls received mp w/ vehicle; animal info: Eleven months old Tg-SwDI mice, post op. care: Medetomidine; Ketamine; behavioral testing: nesting behavior, marble burying, open field test and MWM; peptides; neurodegenerative (Alzheimer's Disease)

**Q9406:** S. Park, *et al.* Intermittent fasting with a high-protein diet mitigated osteoarthritis symptoms by increasing lean body mass and reducing inflammation in osteoarthritic rats with Alzheimer's disease-like dementia. *British Journal of Nutrition* 2021;1-13

**Agents:** Amyloid protein, beta (25-35) **Vehicle:** Saline, sterile; **Route:** CSF/CNS (hippocampus); **Species:** Rat; **Pump:** Not Stated; **Duration:** 14 days;  
**ALZET Comments:** Dose (3 to 6 nmol/d); animal info (Sprague-Dawley female rats, 10 weeks, 235 g); Brain coordinates (lateral, -3.3 mm from the bregma; posterior, 2.0 mm from the midline; ventral, -2.5 mm from the dura); neurodegenerative (Alzheimer's disease);

**Q10619:** T. Nagase, *et al.* Skeletal Muscle Atrophy-Induced Hemopexin Accelerates Onset of Cognitive Impairment in Alzheimer's Disease. *Journal of Cachexia, Sarcopenia and Muscle* 2021;12(6):2199-2210

**Agents:** Hemopexin, recombinant **Vehicle:** CSF, artificial; **Route:** CSF/CNS (intracerebroventricular); **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info: Wildtype and 5XFAD mice (6-7 weeks old, male and female behavioral testing: Object location test Brain coordinates (A/P: 0.2 mm, M/L: +1.0 mm, depth: 3.0 mm.); neurodegenerative (Alzheimer's disease);

**Q10577:** C. Kondak, *et al.* Hydromethylthionine Enhancement of Central Cholinergic Signaling is Blocked by Rivastigmine and Memantine. *Journal of Neurochemistry* 2021;160(2):172-184

**Agents:** Rivastigmine; Memantine **Vehicle:** Aqua ad injectabilia; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;  
**ALZET Comments:** Dose (Rivastigmine 0.5 mg/kg/d; Memantine 1 mg/kg/d); dose-response (see p. 174); animal info (60 of each species so 120 mice total; Female; 6-8 months old; NMRI); enzyme inhibitor (Rivastigmine); wound clips used; neurodegenerative (Alzheimer's Disease);

**Q9297:** Q. Jin, *et al.* Extracellular Vesicles: Novel Roles in Neurological Disorders. *Stem Cells International* 2021;2021(6640836

**Agents:** HSP70; HSP90 **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days;  
**ALZET Comments:** Dose (12 µg/day); neurodegenerative (Alzheimer's Disease);



**Q8510:** M. Gonzalez-Prieto, *et al.* Microglial CX3CR1 production increases in Alzheimer's disease and is regulated by noradrenaline. *Glia* 2021;69(1):73-90

**Agents:** Reboxetine **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Dose (10 mg/kg/day); Controls received mp w/ vehicle; animal info (7 month old male WT and heterozygous 5xFAD mice); half-life (p. 2; 12.5 hr); neurodegenerative (Alzheimer's);

**Q10152:** J. Di, *et al.* The molecular tweezer CLR01 improves behavioral deficits and reduces tau pathology in P301S-tau transgenic mice. *Alzheimer's Research & Therapy* 2021;13(1):6

**Agents:** CLR01 **Vehicle:** Saline, sterile; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Dose: (0.3 or 1.0 mg/kg per day); 0.9% sterile saline vehicle used; Controls received mp w/ vehicle; animal info: P301S-tau transgenic mice; Homozygous P301S-tau and wild-type littermates; behavioral testing: Open field test; Grip-strength test; CLR01, is a broad-spectrum inhibitor of amyloid proteins' toxicity; neurodegenerative (Alzheimer's disease); CLR01 is a promising drug candidate for the prevention and possibly treatment of (AD) and other tauopathies. CLR01 reduces early behavioral deficits in the P301S-tau model, suggesting that similar therapeutic effects could be translated to human therapy. (see pg. 17)

**Q10148:** K. Cho, *et al.* Selective striatal cell loss is ameliorated by regulated autophagy of the cortex. *Life Sciences* 2021;282(119822

**Agents:** 3-nitropropionic Acid; NQDI-1 **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Dose: 3-NP (0.5 µl/h); NQDI-1 (2.5 mg/kg/day); 3-nitropropionic acid aka (3-NP); NQDI-1 aka ASK1 inhibitor; "Neurodegenerative (Alzheimer's disease; Parkinson's disease (PD); Huntington's disease (HD)"

**Q9893:** I. J. Yeo, *et al.* Antifungal drug miconazole ameliorated memory deficits in a mouse model of LPS-induced memory loss through targeting iNOS. *Cell Death & Disease* 2020;11(8):623

**Agents:** AB 1-42 **Vehicle:** Saline; **Route:** CNS/CSF; **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** Dose (300 pmol); 0.9% Saline used; Controls received mp w/ vehicle; animal info (8-10 weeks old, C57BL/N); ALZET brain infusion kit 1 used; Brain coordinates (–1.0 mm anterior/posterior, +0.5 mm medial/lateral, and –2.5 mm dorsal/ventral); neurodegenerative (Alzheimer's Disease);

**Q9897:** L. Yang, *et al.* The Regulatory Functionality of Exosomes Derived from hUMSCs in 3D Culture for Alzheimer's Disease Therapy. *Small* 2020;16(3):e1906273

**Agents:** Exosome, 3D-cultured; Exosome, 2D-cultured; **Vehicle:** Saline; **Route:** CSF/CNS (right hippocampus); **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

**ALZET Comments:** Dose (2 mg protein per mL); Controls received mp w/ vehicle; animal info (nine-month-old male APP/PS1 mice); behavioral testing (Morris water maze); 3D-cultured Exosome aka 3D-Exo, 2D-cultured Exosome aka 2D-Exo; ALZET brain infusion kit 3 used; Brain coordinates (anteroposterior, –2.0 mm; mediolateral, –1.0 mm; dorsoventral, –2.0 mm); neurodegenerative (Alzheimer's Disease);

**Q9910:** T. Yan, *et al.* FAM222A encodes a protein which accumulates in plaques in Alzheimer's disease. *Nature Communications* 2020;11(1):411

**Agents:** Amyloid protein, beta **Vehicle:** CSF, Artificial; **Route:** CSF/CNS (intracerebral); IV; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Animal info (5xFAD transgenic mice); behavioral testing (Barnes maze test; Y maze test); Amyloid protein, beta aka AB; ALZET brain infusion kit 3 used; Brain coordinates (relative to bregma: anteroposterior –0.5 mm, medial lateral 0.75 mm); cyanoacrylate adhesive; neurodegenerative (Alzheimer's disease);

**Q9772:** N. J. D. Wright. A Novel Preclinical Rat Model of Alzheimer's Disease. *Neuromethods* 2020;

**Agents:** Amyloid-Beta 1-42 Peptides **Vehicle:** Not Stated; **Route:** CSF/CSN; **Species:** Rat; **Duration:** 14 days;

**ALZET Comments:** Dose (160 pmol/day); animal info (Male, Wistar, ); behavioral testing (Water Maze Test); peptides; Brain coordinates (AP: –0.3, L: 1.2, V: 4.5); bilateral cannula used; dental cement used; neurodegenerative (Alzheimer's Disease);





**Q9506:** S. T. Tsai, *et al.* Rostral intralaminar thalamic deep brain stimulation ameliorates memory deficits and dendritic regression in beta-amyloid-infused rats. *Brain Structure and Function* 2020;225(2):751-761

**Agents:** Amyloid protein, beta (1-40); Amyloid protein, beta (1-42) **Vehicle:** Saline, Isotonic; **Route:** CSF/CNS (intracerebral); **Species:** Rat; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** Dose (300 pmol/day); animal info (Male Wistar rats (250–350 g body weight)); behavioral testing (Morris water maze test); Amyloid protein, beta (1-40) aka A $\beta$ 1–40; Amyloid protein, beta (1-42) aka A $\beta$ 1–42; Brain coordinates (AP: – 0.3 mm; ML 2.5 mm; DV: – 4.0 mm); dental cement used; neurodegenerative (Alzheimer's disease);

**Q9494:** H. Tanaka, *et al.* YAP-dependent necrosis occurs in early stages of Alzheimer's disease and regulates mouse model pathology. *Nature Communications* 2020;11(1):507

**Agents:** Sphingosine-1-phosphate **Vehicle:** CSF, artificial; **Route:** CSF/CNS (subarachnoid space); **Species:** Mice; **Pump:** 2006; **Duration:** 28 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (4 week old mice); behavioral testing (Y-shape maze test); Sphingosine-1-phosphate aka S1P; neurodegenerative (Alzheimer's disease);

**Q9983:** Y. Sun, *et al.* Modulation of the Astrocyte-Neuron Lactate Shuttle System contributes to Neuroprotective action of Fibroblast Growth Factor 21. *Theranostics* 2020;10(18):8430-8445

**Agents:** Fibroblast Growth Factor 21 **Vehicle:** Not Stated; **Route:** CNS/CSF; **Species:** Mice; **Pump:** **Duration:** 14 days;

**ALZET Comments:** Dose (0.4 ug/day); Controls received mp w/ vehicle; animal info (6 month old); Fibroblast Growth Factor 21 aka FGF21 ; Brain coordinates (0.1 mm anteroposterior to bregma; 0.9 mm lateral from midline; 2.5 mm below the dura); bilateral cannula used; neurodegenerative (Alzheimer's Disease);

**Q9486:** D. Spieler, *et al.* Donepezil, a cholinesterase inhibitor used in Alzheimer's disease therapy, is actively exported out of the brain by abcb1ab p-glycoproteins in mice. *Journal of Psychiatric Research* 2020;124(29-33

**Agents:** Donepezil HCl **Vehicle:** Saline; **Route:** Not Stated; **Species:** Mice; **Pump:** Not Stated; **Duration:** 11 days;

**ALZET Comments:** Dose (0.2 mg donepezil hydrochloride/kg bodyweight/day); 0.9% NaCl used; animal info (Male abcb1ab(–/–) mice and FVB/N wildtype mice); Resultant plasma level (0.47 ng/ml donepezil); neurodegenerative (Alzheimer's disease);

**Q8840:** G. A. Rodriguez, *et al.* Chemogenetic attenuation of neuronal activity in the entorhinal cortex reduces Abeta and tau pathology in the hippocampus. *PLOS Biology* 2020;18(8):e3000851

**Agents:** Clozapine-N-Oxide **Vehicle:** DMSO; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2006; **Duration:** 6 weeks;

**ALZET Comments:** Dose (1 mg/kg/day); 0.05% DMSO used;

**Q8813:** Y. Qin, *et al.* Estradiol Replacement at the Critical Period Protects Hippocampal Neural Stem Cells to Improve Cognition in APP/PS1 Mice. *Frontiers in Aging Neuroscience* 2020;12(240

**Agents:** p75 NTR metalloprotease inhibitor **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Duration:** 7 days;

**ALZET Comments:** Dose (0.25 ul/hr); Controls received mp w/ vehicle; animal info (APP/PS1, 4-10 months old); p75 NTR metalloprotease inhibitor aka TAPI-2 ; enzyme inhibitor (p75 NTR metalloprotease inhibitor); Brain coordinates (0.3 mm posterior, 1.0 mm lateral, and 2.3 mm ventral to Bregma); bilateral cannula used; neurodegenerative (Alzheimer's Disease);

**Q8361:** E. E. Parks, *et al.* Interleukin 6 reduces allopregnanolone synthesis in the brain and contributes to age-related cognitive decline in mice. *J Lipid Res* 2020;61(10):1308-1319

**Agents:** Interleukin-6 **Vehicle:** Saline; **Route:** CNS/CSF; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

**ALZET Comments:** Dose (100 ng/day); Controls received mp w/ vehicle; animal info (Male, C57BL/6N); neurodegenerative

**Q8494:** L. Park, *et al.* tPA Deficiency Underlies Neurovascular Coupling Dysfunction by Amyloid-beta. *Journal of Neuroscience* 2020;40(42):8160-8173

**Agents:** PAI-039 **Vehicle:** Not stated; **Route:** CNS/CSF; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (42 ng/kg/min); Controls received mp w/ vehicle; animal info (10-11 months old); behavioral testing (Maze Test, Novel Object Recognition Test); enzyme inhibitor (PAI-1 inhibitor); Brain coordinates (–0.22 mm lateral, 0.8 mm, dorsal 2 mm); neurodegenerative (Alzheimer's Disease);



**Q8927:** J. C. Palmer, *et al.* Zibotentan, an Endothelin A Receptor Antagonist, Prevents Amyloid-beta-Induced Hypertension and Maintains Cerebral Perfusion. *Journal of Alzheimer's Disease* 2020;73(3):1185-1199

**Agents:** Amyloid protein, beta (1-40) **Vehicle:** Saline; **Route:** CSF/CNS (parenchyma); **Species:** Rat; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Dose 6 ug/d; Controls received mp w/ vehicle; animal info (Male Wistar rats, aged 12–14 weeks, mean initial weight of 343 g); Blood pressure measured via telemetry system; 102 mmHg - 105 mmHg; Amyloid protein, beta (1-40) aka AB1-40; ALZET brain infusion kit 1 used; Brain coordinates (AP –1.0 mm, L –3.0 mm, D 5.0 mm); dental cement used; neurodegenerative (Alzheimer's disease);

**Q8923:** T. C. Ooi, *et al.* Neuroprotection of Tropical Fruit Juice Mixture via the Reduction of iNOS Expression and CRH Level in beta-Amyloid-Induced Rats Model of Alzheimer's Disease. *Evidence-Based Complementary and Alternative Medicine* 2020;2020(5126457)

**Agents:** Amyloid beta 1-42 **Vehicle:** PBS; **Route:** CSF/CNS (left lateral ventricle); **Species:** Rat; **Pump:** Not Stated; **Duration:** 2 weeks;

**ALZET Comments:** Dose (0.5µl/hour); Controls received mp w/ vehicle; animal info (Wistar male rats weighing 200 to 250 g); behavioral testing (Open Field Test); Amyloid beta 1-42 aka AB1-42; Brain coordinates (anteroposterior +1.2 mm from Bregma, mediolateral +2.0 mm, dorsoventral +4.0 mm); cyanoacrylate adhesive; neurodegenerative (Alzheimer's Disease);

**Q8915:** A. Nyul-Toth, *et al.* Increases in hypertension-induced cerebral microhemorrhages exacerbate gait dysfunction in a mouse model of Alzheimer's disease. *Geroscience* 2020;42(6):1685-1698

**Agents:** Angiotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2006; **Duration:** 10 days;

**ALZET Comments:** Dose (1 ug/min/kg); Controls received mp w/ vehicle; animal info (12-month-old male TG2576 mice); Blood pressure measured via tail-cuff method; 155 mmHg - 170 mmHg; Angiotensin II aka Ang II; neurodegenerative (Alzheimer's disease);

**Q10048:** M. A. Nunes, *et al.* Kinin B2 Receptor Activation Prevents the Evolution of Alzheimer's Disease Pathological Characteristics in a Transgenic Mouse Model. *Pharmaceuticals (Basel)* 2020;13(10):

**Agents:** Amyloid Beta 1-42 **Vehicle:** CSF, Artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** 8 weeks;

**ALZET Comments:** Dose (10 nmol/kg/h); Controls received mp w/ vehicle; animal info (Twelve-month-old transgenic mice); pumps replaced every 4 weeks; Amyloid Beta 1-42 aka AB peptide; peptides; neurodegenerative (Alzheimer's Disease);

**Q10244:** X. Lu, *et al.* Hypertension accelerates cerebral tissue PO2 disruption in Alzheimer's disease. *Neuroscience Letters* 2020;715(134626)

**Agents:** Angiotensin II **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2006; **Duration:** 3 months;

**ALZET Comments:** Dose: (1000 ng/kg/min); animal info: hypertensive mice, 3 months old; post op. care: To alleviate pain, buprenorphine (at

0.1 mg/kg) was administered subcutaneously 30 min before the surgery; Angiotensin II aka (Ang II); neurodegenerative (Alzheimer disease); cardiovascular; Hypertension"

**Q8624:** N. Lax, *et al.* Systemic microbial TLR2 agonists induce neurodegeneration in Alzheimer's disease mice. *Journal of Neuroinflammation* 2020;17(1):55

**Agents:** Zymosan; CU-CPT22 **Vehicle:** Not Stated; **Route:** CSF/CNS (intracerebral); IV; **Species:** Mice; **Pump:** 1007D; 1004; 1002; **Duration:** 28 days; 1 week; 2 weeks;

**ALZET Comments:** Dose (25 ug zymosan; 10 ug/day CU-CPT22); animal info (male and female 5xFAD mice); CU-CPT22 aka Toll-like receptor 2 antagonist; Brain coordinates (A = 0, L = 1, H = 2.5); neurodegenerative (Alzheimer's disease);

**Q10319:** M. Krishnan, *et al.* beta-hydroxybutyrate Impedes the Progression of Alzheimer's Disease and Atherosclerosis in ApoE-Deficient Mice. *Nutrients* 2020;12(2):

**Agents:** PBS; Beta-hydroxybutyrate **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 8 weeks;

**ALZET Comments:** Dose: (1.5 mmol/kg/day in PBS); Controls received mp w/ vehicle; animal info: Six-week-old male ApoE<sup>0/0</sup> (C57BL/6J background) and C57BL/6J mice; pumps replaced every 4 weeks; half-life (p.10);



### Ataxia

**Q10692:** S. Talele, *et al.* Central Nervous System Distribution of the Ataxia-Telangiectasia Mutated Kinase Inhibitor AZD1390: Implications for the Treatment of Brain Tumors. *Journal of Pharmacology and Experimental Therapeutics* 2022;383(1):91-102

**Agents:** AZD1390 **Vehicle:** DMSO; **Route:** IP; **Species:** Mice; **Pump:** 1003D; **Duration:** 24 hours;

**ALZET Comments:** Dose (10 mg/ml); Controls received mp w/ vehicle; animal info (Male; Female; 8-14 weeks old; Wild-type, TKO); enzyme inhibitor (AZD1390 is a ataxia telangiectasia mutant kinase inhibitor); cancer (Glioblastoma);

**Q1073:** C. R. Foster, *et al.* Ataxia telangiectasia mutated kinase plays a protective role in beta-adrenergic receptor-stimulated cardiac myocyte apoptosis and myocardial remodeling. *Molecular and Cellular Biochemistry* 2011;353(1-2):13-22

**Agents:** Isoproterenol, I- **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Animal info (4 mo old, male, female, wt, hKO)

**P6477:** S. E. Browne, *et al.* Treatment with a catalytic antioxidant corrects the neurobehavioral defect in ataxia-telangiectasia mice. *Free Radical Biology and Medicine* 2004;36(7):938-942

**Agents:** EUK-189 **Vehicle:** Mannitol; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 56, 84 days;

**ALZET Comments:** Controls received mp w/ vehicle; long-term study; pumps replaced every 28 days; no stress (see pg.941);

### Huntington's (2018-Present)

**R0398:** M. Klonarakis, *et al.* The Three Sisters of Fate: Genetics, Pathophysiology and Outcomes of Animal Models of Neurodegenerative Diseases. *Neuroscience and Biobehavioral Reviews* 2022;135(104541

**Agents:** Sodium azide **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 4 weeks;

**ALZET Comments:** animal info (Male Sprague-Dawley); neurodegenerative (Alzheimer's; Parkinson's; Huntington's disease);

**Q9411:** B. Martinez, *et al.* Altered microRNA expression in animal models of Huntington's disease and potential therapeutic strategies. *Neural Regeneration Research* 2021;16(11):2159-2169

**Agents:** 3-nitropropionic acid **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** Not Stated;

**ALZET Comments:** Animal info (male Lewis rats, 12 weeks old); 3-nitropropionic acid aka 3NP; neurodegenerative (

**Q10148:** K. Cho, *et al.* Selective striatal cell loss is ameliorated by regulated autophagy of the cortex. *Life Sciences* 2021;282(119822

**Agents:** 3-nitropropionic Acid; NQDI-1 **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Dose:3-NP (0.5 µl/h); NQDI-1 (2.5 mg/kg/day);

**Q8479:** J. Ganz, *et al.* A novel specific PERK activator reduces toxicity and extends survival in Huntington's disease models. *Scientific Reports* 2020;10(1):6875

**Agents:** MK-28 **Vehicle:** DMSO; PEG-400; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 2 weeks; 28 days;

**ALZET Comments:** Dose (6 mg/kg; 1 mg/kg); Controls received mp w/ vehicle; animal info (B6 wild type mice; four-week-old mice); behavioral testing (Rotarod test); MK-28 aka small molecule PERK activator; neurodegenerative (Huntington's disease);

**Q8389:** G. Birolini, *et al.* Striatal infusion of cholesterol promotes dose-dependent behavioral benefits and exerts disease-modifying effects in Huntington's disease mice. *EMBO Mol Med* 2020;12(10):e12519

**Agents:** cholesterol (cyclodextrin, methyl-b balanced) **Vehicle:** CSF, Artificial; **Route:** CSF/CNS (corpus striatum); **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (wild-type mice, 5 weeks old); behavioral testing (Rotarod, Activity Cage, Novel object recognition (NOR) test); ALZET brain infusion kit 3 used; Brain coordinates (stereotaxic coordinates 1.75 mm mediolateral, 0.5 mm anteroposterior, 3 mm dorsoventral);

**Q9841:** Y. Zhao, *et al.* ATAD3A oligomerization causes neurodegeneration by coupling mitochondrial fragmentation and bioenergetics defects. *Nature Communications* 2019;10(1):1371

**Agents:** TAT control peptide or DA1 peptide **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 6,8 weeks;

**ALZET Comments:** Dose (1 mg/kg/day); animal info (Male, YAC128, 3 month old); behavioral testing (Tail Suspension Test); pumps replaced every 4 weeks; peptides;





**Q8971:** Y. Zhao, *et al.* ATAD3A oligomerization causes neurodegeneration by coupling mitochondrial fragmentation and bioenergetics defects. *Nature Communications* 2019;10(1):1371

**Agents:** TAT control peptide; DA1 peptide **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 6, 8 weeks; **ALZET Comments:** Dose (1 mg/kg/day); animal info (Male, YAC128, 3 month old); behavioral testing (Tail Suspension Test); pumps replaced every 4 weeks; peptides; neurodegenerative (Huntington's Disease);

**Q7602:** E. Paldino, *et al.* Modulation of Phospho-CREB by Systemically Administered Recombinant BDNF in the Hippocampus of the R6/2 Mouse Model of Huntington's Disease. *Neurosci J* 2019;2019(8363274

**Agents:** neurotrophic factor, Recomb brain derived **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks; **ALZET Comments:** Dose (4 ug/d); Controls received mp w/ vehicle; animal info (4 week old, Male);

**Q6969:** A. U. Joshi, *et al.* Drp1/Fis1-mediated mitochondrial fragmentation leads to lysosomal dysfunction in cardiac models of Huntington's disease. *J Mol Cell Cardiol* 2019;127(125-133

**Agents:** P110 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 8 weeks; **ALZET Comments:** Dose ((3 mg/Kg/day); animal info (5-week old Hemizygous R6/2 HD mice); P110 is a Drp1/Fis1 interaction peptide inhibitor; neurodegenerative (Huntington's);

**Q7587:** Y. T. Hsu, *et al.* Enhanced Na(+) -K(+) -2Cl(-) cotransporter 1 underlies motor dysfunction in huntington's disease. *Mov Disord* 2019;34(6):845-857

**Agents:** XPro1595 **Vehicle:** Saline; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks; **ALZET Comments:** "Dose (0.08 mg/kg/day); Controls received mp w/ vehicle; animal info (6.5 weeks, Transgenic R6/2); XPro1595 is a dominant-negative inhibitor of soluble TNF-alpha; ALZET brain infusion kit 3 used; neurodegenerative (Huntington's); Therapeutic indication (disease progression in HD due to inflammation); "

**Q9006:** Y. Zhao, *et al.* Inhibition of Drp1 hyperactivation reduces neuropathology and behavioral deficits in zQ175 knock-in mouse model of Huntington's disease. *Biochemical and Biophysical Research Communications* 2018;507(1-4):319-323

**Agents:** Peptide, TAT; Peptide, P110 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 8 months; **ALZET Comments:** "Dose ((TAT 3 mg/kg/day), (P110 3 mg/kg/day)); Controls received mp w/ TAT control peptide; animal info (4 months, male, C57BL/6J and zQ175 knock-in); behavioral testing (open field test); pumps replaced once every month; long-term study; peptides; neurodegenerative (Huntington's); Therapeutic indication (Drp1 hyperactivation by P110 treatment has a neuroprotective effect in zQ175 KI HD mice by attenuating behavioral deficits, striatal neuronal loss and white matter disorganization and also reduces anxiety-like behavior); "

**Q8149:** K. Ouk, *et al.* Chronic paroxetine treatment prevents disruption of methamphetamine-sensitive circadian oscillator in a transgenic mouse model of Huntington's disease. *Neuropharmacology* 2018;131(337-350

**Agents:** Cocaine hydrochloride **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks; **ALZET Comments:** Dose (30 mg/kg/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (12 weeks old);

**Q7127:** Z. Dargaei, *et al.* Restoring GABAergic inhibition rescues memory deficits in a Huntington's disease mouse model. *Proc Natl Acad Sci U S A* 2018;115(7):E1618-E1626

**Agents:** Bumetanide **Vehicle:** DMSO, ethanol, saline; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** Dose (6 mg/mL); 50% DMSO and 15% ethanol used; Controls received mp w/ vehicle; animal info (Males, females, R6/2); behavioral testing (Novel object recognition test, Novel object location test ); functionality of mp verified by (incorrectly) weighing the pump; functionality of mp verified by (incorrectly) weighing the pump; Cannula placement and patency were confirmed by injection of luxol fast green dye followed by dissection of the brain while; neurodegenerative (Huntington's disease); Bumetanide was administered directly to the lateral ventricle since previous studies reported that brain penetration may not be optimal following systemic administration due to its pharmacokinetic properties;

**Q7116:** D. D. Child, *et al.* Cardiac mTORC1 Dysregulation Impacts Stress Adaptation and Survival in Huntington's Disease. *Cell Reports* 2018;23(4):1020-1033

**Agents:** Isoproterenol **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days; **ALZET Comments:** Dose (30 mg/kg/day); animal info (Male, B6C3F1/J or C56B6/J); neurodegenerative (Huntington's disease);



### Niemann-Pick's

**Q3736:** L. Trovo, *et al.* Improvement of biochemical and behavioral defects in the Niemann-Pick type A mouse by intraventricular infusion of MARCKS. *NEUROBIOLOGY OF DISEASE* 2015;73(3):319-326

**Agents:** MARCKS peptide **Vehicle:** Saline, sterile; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** Not Stated;

**ALZET Comments:** Control animals received mp w/ vehicle; animal info (ASMko, 4 mo old); peptides; ALZET brain infusion kit 3 used; cyanoacrylate used; behavioral testing (accelerating rotarod);

**Q3991:** N. Marschalek, *et al.* The natural history of cerebellar degeneration of Niemann-Pick C mice monitored in vitro. *Neuropathology and Applied Neurobiology* 2014;40(9):933-945

**Agents:** Cyclodextrin, 2-hydroxypropyl- $\beta$ - **Route:** CSF/CNS; **Species:** Mice;

**ALZET Comments:** Animal info (NPC); pumps mentioned in introduction

**Q1986:** C. Cabeza, *et al.* Cholinergic Abnormalities, Endosomal Alterations and Up-Regulation of Nerve Growth Factor Signaling in Niemann-Pick Type C Disease. *Molecular Neurodegeneration* 2012;7(1):U1-U18

**Agents:** Nerve growth factor **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (BALB/c, NPC/1 -/-); aCSF recipe; brain infusion kit used

**P9265:** M. Zhang, *et al.* Mitogen-activated protein kinase activity may not be necessary for the neuropathology of Niemann-Pick type C mice. *Journal of Neurochemistry* 2008;107(3):814-822

**Agents:** PD-98059 **Vehicle:** DMSO; Saline; dye, Evan's blue; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by dye infusion; dose-response (fig. 1); enzyme inhibitor (MAPK/ERK 1); brain tissue distribution; animal info (female, BALB/c, Nctr-Npc, 5 wks old); 50% DMSO used; behavioral testing (limb motor activity/coat hanger test)

**P6916:** M. Zhang, *et al.* Cyclin-dependent kinase inhibitors attenuate protein hyperphosphorylation, cytoskeletal lesion formation, and motor defects in Niemann-Pick type C mice. *American Journal of Pathology* 2004;165(3):843-853

**Agents:** Roscovitine; olomoucine; iso-olomoucine **Vehicle:** DMSO; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; **Duration:** 2, 4 weeks;

**ALZET Comments:** Pumps replaced every 2 weeks for 4 week infusions; enzyme inhibitor (CDK); neurodegenerative (Alzheimer's disease, Amyotrophic Lateral Sclerosis, Niemann-Pick Type C disease); lynch coil used for 75% DMSO

**P5859:** F. Camargo, *et al.* Cyclodextrins in the treatment of a mouse model of Niemann-Pick C disease. *Life Sci* 2001;70(2):131-142

**Agents:** Cyclodextrin, 2-hydroxypropyl- $\beta$ - **Vehicle:** Saline, sterile; **Route:** CSF/CNS; **Species:** Mice (KO); **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** stress/adverse reaction: (see pg.139) mice were active & broke the cemented cannulae away from the skull; ALZET brain infusion kit 2 used (per Dr. Erickson); 2-Hydroxypropyl- $\beta$ -cyclodextrin is (HPBCD); methylene blue dye infused (probably not by pump) after cyclodextrin infusion to confirm the intraventricular location; delivery route somewhat confusing - paper refers to the route alternately as intrathecal and intraventricular; neurodegenerative (Niemann-Pick Type C disease)

### Parkinson (2019-Present)

**Q10612:** M. Morissette, *et al.* Prevention of L-Dopa-Induced Dyskinesias by MPEP Blockade of Metabotropic Glutamate Receptor 5 Is Associated with Reduced Inflammation in the Brain of Parkinsonian Monkeys. *Cells* 2022;11(4):

**Agents:** MPTP **Vehicle:** Not Stated; **Route:** SC; **Species:** Monkey (cynomolgus); **Pump:** Not Stated; **Duration:** 24 hrs;

**ALZET Comments:** animal info (Drug-naïve; Ovariectomized; Female); behavioral testing (Motor Behavior Measures);

**Q10608:** E. Montalban, *et al.* Translational Profiling of Mouse Dopaminoceptive Neurons Reveals Region-Specific Gene Expression, Exon Usage, and Striatal Prostaglandin E2 Modulatory Effects. *Molecular Psychiatry* 2022;27(4):2068-2079

**Agents:** Misoprostol; Haloperidol **Vehicle:** PBS; Saline; **Route:** IP; CSF/CNS (intracerebral); **Species:** Mice; **Pump:** 1004; 2004; **Duration:** 1004; 2004;

**ALZET Comments:** animal info (D2-TRAP; C57BL/6 mice Wild-type Male; Female; Transgenic); behavioral testing (rotarod/food-cued Y maze); bilateral cannula used; Therapeutic indication (Neuromodulators);



**Q10588:** R. Landau, *et al.* The Rat Rotenone Model Reproduces the Abnormal Pattern of Central Catecholamine Metabolism Found in Parkinson's Disease. *Disease Models & Mechanisms* 2022;15(1):

**Agents:** Rotenone **Vehicle:** DMSO; PEG; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 10 days;

**ALZET Comments:** Dose (2 mg/kg/day); 1:1 DMSO:PEG used; animal info (Male Sprague Dawley; 10 weeks old; Acclimated for at least 3 days before mp implantation); enzyme inhibitor (Rotenone); neurodegenerative (Parkinson's disease);

**R0398:** M. Klonarakis, *et al.* The Three Sisters of Fate: Genetics, Pathophysiology and Outcomes of Animal Models of Neurodegenerative Diseases. *Neuroscience and Biobehavioral Reviews* 2022;135(104541

**Agents:** Sodium azide **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 4 weeks;

**ALZET Comments:** animal info (Male Sprague-Dawley); neurodegenerative (Alzheimer's; Parkinson's; Huntington's disease);

**Q10166:** Q. Gao, *et al.* Angiotensin-(1-7) reduces alpha-synuclein aggregation by enhancing autophagic activity in Parkinson's disease. *Neural Regeneration Research* 2022;17(5):1138-1145

**Agents:** Angiotensin (1-7) **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Dose: (1.1 nmol/0.25 uL/hr); Controls received mp w/ vehicle; animal info: male Sprague-Dawley (SD) rats, aged 7 weeks and weighing 250–280 g; behavioral testing: grid test and bar test; Blood pressure measured via Tail cuff; 1 mmHg = 0.133 kPa.; Brain coordinates ((anteroposterior, –5.2 mm; mediolateral, –2.1 mm; dorsoventral, –7.8 mm from bregma); "Our current study shows that the Ang-(1–7)/MasR axis reduces  $\alpha$ -syn pathology in a rotenone-induced cell model by reducing dysfunctional autophagic activity. More importantly, our results imply potential of Ang-(1–7) for (PD) therapy in vivo. These findings deepen our insight into the protective mechanisms of the Ang-(1–7)/MasR axis during (PD) progression and support the development of related therapeutic strategies for the treatment of (PD) and other  $\alpha$ -synucleinopathies."

**Q10745:** T. S. Eteläinen, *et al.* Removal of Proteinase K Resistant  $\alpha$ Syn Species Does Not Correlate With Cell Survival in a Virus Vector-Based Parkinson's Disease Mouse Model. *Neuropharmacology* 2022;218(Agents: KYP-2047 **Vehicle:** Not Stated; **Route:** IP; **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks; 4 weeks;

**ALZET Comments:** Dose: (10 mg/kg/day.); Controls received mp w/ vehicle; animal info: Male C57BL/6 10–11 weeks old post op. care: Topical lidocaine (10 mg/ml), s.c. buprenorphine (0.1 mg/kg) and s.c. carprofen (5 mg/kg); pumps replaced after 2 weeks; KYP-2047 is a enzyme inhibitor (PREP); neurodegenerative (Parkinson's disease); good methods (pg. 3)

**Q10552:** F. Imafuku, *et al.* Central and Enteric Neuroprotective Effects by Eucommia ulmoides Extracts on Neurodegeneration in Rotenone-induced Parkinsonian Mouse. *Acta Medica Okayama* 2022;

**Agents:** Rotenone **Vehicle:** DMSO; PEG; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Dose: (2.5 mg/kg/day) Controls received mp w/ vehicle; animal info: Eight-week-old C57BL/6J male mice, behavioral testing: open field test; neurodegenerative (Parkinson's disease);

**Q10502:** M. Bourque, *et al.* AV-101, a Pro-Drug Antagonist at the NMDA Receptor Glycine Site, Reduces L-Dopa Induced Dyskinesias in MPTP Monkeys. *Cells* 2022;11(22):

**Agents:** 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine **Vehicle:** Not Stated; **Route:** SC; **Species:** Monkey (cynomologus);

**Pump:** Not Stated; **Duration:** 24 hours;

**ALZET Comments:** Dose (0.5 mg/24 h); animal info (Female; Ovariectomized; Macaca fascicularis; 9.2–12.7 years old; Weighed 3.6–5.2 kg); behavioral testing (Motor responses);

**Q10310:** J. M. Renko, *et al.* Neuroprotective Potential of a Small Molecule RET Agonist in Cultured Dopamine Neurons and Hemiparkinsonian Rats. *Journal of Parkinson's Disease* 2021;11(3):1023-1046

**Agents:** BT44; glial line-derived neurotrophic factor **Vehicle:** PBS; propylene glycol; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** Dose: BT44 (1 ug/24 h); (0.3 ug/24 h); Controls received mp w/ vehicle; animal info: C57BL/6J, and BALB/c mice 6–8 week old female; post op. care: buprenorphine 0.05 mg/kg; Temgesic® 0.3 mg/ml; Carprofen 5 mg/kg. Additional doses of buprenorphine and carprofen were given 1 day after the surgeries; behavioral testing: Rotational assay; Cylinder test; BT44 is a RET agonist, GDNF aka glial line-derived neurotrophic factor; (Alzet Brain infusion kit no. 2, Durect, USA) used; Brain coordinates (bregma A/P + 0.2; L/M –3.0; D/V –5.0mm); dental cement used; polycarboxylate cement; neurodegenerative (Parkinson's disease); "



**Q10297:** Z. Ou, *et al.* NLRP3 Inflammasome Inhibition Prevents alpha-Synuclein Pathology by Relieving Autophagy Dysfunction in Chronic MPTP-Treated NLRP3 Knockout Mice. *Molecular Neurobiology* 2021;58(4):1303-1311

**Agents:** MPTP **Vehicle:** Saline; **Route:** IP; **Species:** Mice; **Pump:** 2002; **Duration:** 28 days;

**ALZET Comments:** Dose: (40 mg/kg/day); Controls received mp w/ vehicle; animal info: Male NLRP3 knockout mice (NLRP3<sup>-/-</sup>) and their wild-type counterparts (NLRP3<sup>+/+</sup>) (both 6–8 weeks old) in a C57BL/6; MPTP aka (1-methyl-4-phenyl-1,2,3,6-tetrahydropyridin); neurodegenerative (Parkinson's disease);

**Q10170:** S. M. Graves, *et al.* Mitochondrial oxidant stress mediates methamphetamine neurotoxicity in substantia nigra dopaminergic neurons. *Neurobiology of Disease* 2021;156(105409

**Agents:** Isradipine **Vehicle:** DMSO; PEG300; saline; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 28 days; 14 days;

**ALZET Comments:** Dose: Isradipine (3 mg/kg/day); 50% DMSO; 15% PEG300; 0.9% Saline vehicle used; Controls received mp w/ vehicle; animal info: Male wild-type mice (C57/Bl6); Brain coordinates (coordinates: AP: -3.05, ML: 1.20, and DV -4.30.); neurodegenerative (Parkinson's disease);

**R0403:** A. des Rieux. Stem Cells and Their Extracellular Vesicles as Natural and Bioinspired Carriers for the Treatment of Neurological Disorders. *Current Opinion in Colloid & Interface Science* 2021;54(**Agents:** Not Stated **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Rat; **Pump:** Not Stated; **Duration:** 2 weeks;

**ALZET Comments:** Different EV and cell administration routes to the nervous system (p.17) fig. 6; neurodegenerative (Parkinson's disease);

**Q10148:** K. Cho, *et al.* Selective striatal cell loss is ameliorated by regulated autophagy of the cortex. *Life Sciences* 2021;282(119822

**Agents:** 3-nitropropionic Acid; NQDI-1 **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Dose: 3-NP (0.5 µl/h); NQDI-1 (2.5 mg/kg/day); 3-nitropropionic acid aka (3-NP); NQDI-1 aka ASK1 inhibitor; "Neurodegenerative (Alzheimer's disease; Parkinson's disease (PD); Huntington's disease (HD))"

**Q10910:** J. Zhu, *et al.* Apelin-36 Mediates Neuroprotective Effects by Regulating Oxidative Stress, Autophagy and Apoptosis in MPTP-Induced Parkinson's Disease Model Mice. *Brain Research* 2020;1726(146493

**Agents:** Apelin-36 **Vehicle:** Saline; **Route:** CSF/CNS (left ventricle); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose response: (0.1, 0.3 and 0.5 µg/mice/day); Controls received mp w/ vehicle; animal info: Nine- to eleven-week old male C57BL/6 mice (weight 23–27 g); Apelin-36 is a neuroendocrine peptide in 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridin; peptides; ALZET brain infusion kit 2 used; Brain coordinates (stereotactic coordinates: AP: -3.1 mm; ML: 1.3 mm; DV: -4.25 mm); neurodegenerative (Parkinson's disease); "

**Q9040:** J. Zhu, *et al.* Apelin-36 mediates neuroprotective effects by regulating oxidative stress, autophagy and apoptosis in MPTP-induced Parkinson's disease model mice. *Brain Research* 2020;1726(146493

**Agents:** Apelin-36 **Vehicle:** Saline; **Route:** CSF/CNS (substantia nigra); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose (0.1, 0.3 and 0.5 µg/ mice/day); Controls received mp w/ vehicle; animal info (Nine- to eleven-week old male C57BL/6 mice, 23–27 g); peptides; ALZET brain infusion kit 2 used; Brain coordinates (AP: -3.1 mm; ML: 1.3 mm; DV: -4.25 mm); neurodegenerative (Parkinson's disease);

**Q9868:** W. Zhang, *et al.* Inhibition of NADPH oxidase within midbrain periaqueductal gray decreases pain sensitivity in Parkinson's disease via GABAergic signaling pathway. *Physiological Research* 2020;

**Agents:** 6-hydroxydopamine **Vehicle:** CSF, Artificial; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1003D; **Duration:** 3 days;

**ALZET Comments:** Dose (6 µl/min); Controls received mp w/ vehicle; animal info (Male, Sprague Dawley, 200-250 g); behavioral testing (Rotation Behavior Test); 6-hydroxydopamine aka 6-OHDA ; Brain coordinates (3.3 mm rostral to the interaural line, 1.4 mm left of the midline, and 6.5 and 6.8 mm ventral to the dural surface); neurodegenerative

**Q9525:** Q. Wang, *et al.* Locus coeruleus neurons are most sensitive to chronic neuroinflammation-induced neurodegeneration. *Brain, Behavior, and Immunity* 2020;87(359-368

**Agents:** Diphenyleneiodonium; LPS **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Sated; **Duration:** 2 weeks;

**ALZET Comments:** Dose (10 ng/kg/day); Controls received mp w/ vehicle; animal info (Eight-week-old male mice);



- Q9428:** M. J. Renko, *et al.* GDNF Receptor Agonist Alleviates Motor Imbalance in Unilateral 6Hydroxydopamine Model of Parkinson's Disease. *Frontiers in Neurology and Neuroscience Research* 2020;  
**Agents:** BT13; Glial cell line-derived neurotrophic factor **Vehicle:** Propylene Glycol; PBS; **Route:** CSF/CNS (dorsal striatum); **Species:** Rat; **Pump:** 2002; **Duration:** 7 days;  
**ALZET Comments:** Dose (0.25 ug/ul BT13; 0.25 ug/ul Glial cell line-derived neurotrophic factor); Controls received mp w/ vehicle; animal info (Adult male Wistar rats, 240-435 g); post op. care (buprenorphine); behavioral testing (rotational symmetry); Glial cell line-derived neurotrophic factor aka GDNF; Brain coordinates (AP=+1.0; ML=+2.7; DV=-4.0 mm);
- Q8931:** H. W. Park, *et al.* Intrastriatal administration of coenzyme Q10 enhances neuroprotection in a Parkinson's disease rat model. *Scientific Reports* 2020;10(1):9572  
**Agents:** Coenzyme Q10 **Vehicle:** PBS; Tween 80; **Route:** CSF/CNS (striatum); **Species:** Rat; **Pump:** 2ML4; **Duration:** 4 weeks;  
**ALZET Comments:** Dose (1.5 and 2.4 µg); 2% Tween 80 used; Controls received mp w/ vehicle; animal info (male Sprague Dawley rats weighing 280–350 g); behavioral testing (rotation tests); Resultant plasma level (); coenzyme Q10 aka CoQ10; neurodegenerative (parkinson's disease);
- Q8672:** I. Miyazaki, *et al.* Chronic Systemic Exposure to Low-Dose Rotenone Induced Central and Peripheral Neuropathology and Motor Deficits in Mice: Reproducible Animal Model of Parkinson's Disease. *International Journal of Molecular Sciences* 2020;21(9):  
**Agents:** Rotenone **Vehicle:** DMSO; PEG; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;  
**ALZET Comments:** Dose (2.5 mg/kg/day); Controls received mp w/ vehicle; animal info (Male C57BL/6J mice (8 weeks old; approximately 25 g)); behavioral testing (open field, rotarod and cylinder test); neurodegenerative (Parkinson's disease);
- Q8626:** C. Lecours, *et al.* Levodopa partially rescues microglial numerical, morphological, and phagolysosomal alterations in a monkey model of Parkinson's disease. *Brain, Behavior, and Immunity* 2020;90(81-96  
**Agents:** 1-Methyl-4-phenyl-1,2,3,6-tetrahydropyridine **Vehicle:** Saline; **Route:** SC; **Species:** Monkey; **Pump:** Not stated; **Duration:** 2 weeks;  
**ALZET Comments:** Dose (0.5 mg/day); animal info (adult female monkeys, 4 to 11 years old, 2.4 to 4.6 kg);
- Q9277:** A. K. E. Hornsby, *et al.* Unacylated-Ghrelin Impairs Hippocampal Neurogenesis and Memory in Mice and Is Altered in Parkinson's Dementia in Humans. *Cell Report Medicine* 2020;1(7):100120  
**Agents:** Ghrelin, unacylated **Vehicle:** Saline, sterile; **Route:** SC; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;  
**ALZET Comments:** Dose (48 ug/day); Controls received mp w/ vehicle; animal info (six-month old homozygous GOAT null)
- Q9255:** A. C. Guyot, *et al.* A Small Compound Targeting Prohibitin with Potential Interest for Cognitive Deficit Rescue in Aging mice and Tau Pathology Treatment. *Scientific Reports* 2020;10(1):1143  
**Agents:** PDD005 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;  
**ALZET Comments:** Dose (8 mg/kg/day); Controls received mp w/ vehicle; animal info (Male 2- to 3-month-old C57Bl/6 J and 12-month-old C57Bl/6 J mice); behavioral testing (Y-maze test); PDD005 aka purine derivative drug;
- Q9154:** N. Bengoa-Vergniory, *et al.* CLR01 protects dopaminergic neurons in vitro and in mouse models of Parkinson's disease. *Nature Communications* 2020;11(1):4885  
**Agents:** CLR01 **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;  
**ALZET Comments:** Dose (40 ug/kg/day); Controls received mp w/ vehicle; animal info (C57BL/6, 17 month old); CLR01 aka amyloid inhibitor; enzyme inhibitor (CLR01); neurodegenerative (Parkinson's Disease);
- Q8332:** D. Alarcon-Aris, *et al.* Anti-alpha-synuclein ASO delivered to monoamine neurons prevents alpha-synuclein accumulation in a Parkinson's disease-like mouse model and in monkeys. *EBioMedicine* 2020;59(102944  
**Agents:** Oligonucleotides, antisense **Vehicle:** CSF, artificial; **Route:** CNS/CSF (lateral ventricle); **Species:** Mice; Monkey (rhesus macaques); **Pump:** 1004; 2ML4; **Duration:** 28 days;  
**ALZET Comments:** Dose (30 ug/day; 100 ug/day; 1 mg/day); Controls received mp w/ vehicle; animal info (Eight-week-old wild-type male C57BL/6J mice; male and female rhesus macaques, 20 years or older); antisense oligonucleotides aka IND-ASO; ALZET brain infusion kit 3 used; Brain coordinates (antero-posterior -0.34, medial-lateral -1.0 and dorsal-ventral -2.2 in mm); neurodegenerative (Parkinson's disease);





**Q7684:** K. C. Wu, *et al.* Down-regulation of natural resistance-associated macrophage protein-1 (Nrap1) is associated with 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP)/1-methyl-4-phenylpyridinium (MPP(+)) -induced alpha-synuclein accumulation and neurotoxicity. *Neuropathology and Applied Neurobiology* 2019;45(2):157-173

**Agents:** Pyridine, 1-methyl-4-phenyl-1,2,3,6-tetrahydro **Vehicle:** Saline; **Route:** IP; **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** Dose (30 mg/kg/day); Controls received mp w/ vehicle; animal info (Male C57BL/6 mice 6-8 weeks old); MPTP aka 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine; neurodegenerative (Parkinson's);

**Q9077:** B. Stutz, *et al.* Dopamine neuronal protection in the mouse Substantia nigra by GHSR is independent of electric activity. *Molecular Metabolism* 2019;24(120-138

**Agents:** Clozapine-N-oxide; Salvinorin B **Vehicle:** DMSO; Saline; **Route:** SC; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose (CNO- 0.3 mg/kg or Salvinorin B- 5 mg/kg); Controls received mp w/ vehicle; animal info (); Clozapine-N-oxide aka CNO, excitatory DREADD agonist, Salvinorin B aka inhibitory DREADD agonist ; neurodegenerative (Parkinson's Disease);

**Q7668:** S. Song, *et al.* Loss of Brain Norepinephrine Elicits Neuroinflammation-Mediated Oxidative Injury and Selective Caudo-Rostral Neurodegeneration. *Mol Neurobiol* 2019;56(4):2653-2669

**Agents:** Diphenyleiiodonium **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 3 months;

**ALZET Comments:** Dose (10 ng/kg/day); Controls received mp w/ vehicle; animal info (C57/BL, 3 months old, Male); DPI aka Diphenyleiiodonium ; enzyme inhibitor (NOX2 inhibitor); neurodegenerative (Parkinson's Disease);

**Q9994:** R. Shaltiel-Karyo, *et al.* Subcutaneous Administration of Carbidopa Enhances Oral Levodopa Pharmacokinetics: A Series of Studies Conducted in Pigs, Mice, and Healthy Volunteers. *Clinical Neuropharmacology* 2019;42(4):111-116

**Agents:** Carbidopa **Vehicle:** Saline; **Route:** CNS/CSF; **Species:** Mice; **Pump:** 1003D; **Duration:** Not Stated;

**ALZET Comments:** Dose (2.5 mg/mL); Controls received mp w/ vehicle; animal info (Female, 31 g); Carbidopa aka CD ; neurodegenerative (Parkinson's Disease);

**Q8826:** P. Rentsch, *et al.* Time dependent degeneration of the nigrostriatal tract in mice with 6-OHDA lesioned medial forebrain bundle and the effect of activin A on L-Dopa induced dyskinesia. *BMC Neuroscience* 2019;20(1):5

**Agents:** Activin A **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; 1003D; **Duration:** Not Stated;

**ALZET Comments:** Dose (294 ng/d); Controls received mp w/ vehicle; animal info (Male, C57BL/6J, 11 weeks old); behavioral testing (Amphetamine Induced Rotation Test); Brain coordinates (AP + 0.5, ML – 2.2, DV – 3.5 relative to bregma); neurodegenerative (Parkinson's Disease);

**Q7376:** I. Miyazaki, *et al.* Effects of Enteric Environmental Modification by Coffee Components on Neurodegeneration in Rotenone-Treated Mice. *Cells* 2019;8(3):

**Agents:** Rotenone **Vehicle:** DMSO, PEG; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (2.5 mg/kg/day); 50 DMSO: 50 PEG used; Controls received mp w/ vehicle; animal info (male C57BL/6J mice nine weeks old; approximately 25 g); enzyme inhibitor (Rotenone is a mitochondrial complex I inhibitor); neurodegenerative (Parkinson's disease);

**Q8275:** A. K. Mahato, *et al.* GDNF receptor agonist supports dopamine neurons in vitro and protects their function in animal model of Parkinson's. *bioRxiv* 2019;

**Agents:** Glial cell line-derived neurotrophic factor or BT13 **Vehicle:** PEG; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2002; **Duration:** 7 days;

**ALZET Comments:** Dose (BT13- 3-6 ug/day, GDNF-3 ug/day); 100% Propylene Glycol used; Controls received mp w/ vehicle; animal info (Male, C57BL/6, 8-15 weeks old, 19-32 g); Glial cell line-derived neurotrophic factor aka GDNF, BT13 aka selective activator of GFL receptor-dependent signaling, or P; ALZET brain infusion kit XX used; Brain coordinates (AP = +1.0; ML = +2.7; DV = -4.0); bilateral cannula used; dental cement used; neurodegenerative (Parkinson's Disease);



**Q8270:** M. Luisetto\*, *et al.* Role of plants, environmental toxins and physical neurotoxicological factors in Amyotrophic lateral sclerosis, Alzheimer Disease and other Neurodegenerative Diseases. *Journal of Neuroscience and Neurological Disorders* 2019;3(1):001-086

**Agents:** Rotenone **Vehicle:** Not stated; **Route:** CNS/CSF; **Species:** Rat; **Pump:** Not stated; **Duration:** 6 days;

**ALZET Comments:** Dose (3 mg/kg/day); Controls received mp w/ vehicle; Rotenone aka Rot; neurodegenerative (Alzheimer's Disease, Parkinson's Disease, Lou Gehrig's Disease);

**Q7353:** K. Kuter, *et al.* Astrocyte support is important for the compensatory potential of the nigrostriatal system neurons during early neurodegeneration. *J Neurochem* 2019;148(1):63-79

**Agents:** Fluorocitrate **Vehicle:** Not Stated; **Route:** CSF/CNS (substantia nigra pars compacta); **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose (2 nmol/day); Controls received mp w/ sealed catheters; animal info (Three months old male Wistar HAN rats); post op. care (antibiotic 100 IL/100 g, Lincospectin); behavioral testing (locomotion); Brain coordinates (SN pars compacta (coordinates: AP: 4.9 mm, L: +/-1.8 mm, V: 8.3 mm from bregma); bilateral cannula used; neurodegenerative (Parkinson's);

**Q5620:** L. Chen, *et al.* PPAR $\delta$ /agonist alleviates NLRP3 inflammasome-mediated neuroinflammation in the MPTP mouse model of Parkinson's disease. *Behavioural Brain Research* 2019;356(483-489

**Agents:** GW501516 **Vehicle:** DMSO; PBS; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose (60, 120, 240  $\mu$ g/day); 30% DMSO used; animal info (Male C57/BL6 mice (10–12 weeks old, 22–24 g)); behavioral testing (open field and pole tests); GW501516 is a peroxisome proliferator-activated receptor  $\beta/\delta$  (PPAR $\beta/\delta$ ) agonists; ALZET brain infusion kit 2 used; Brain coordinates (0.0mm posterior to the bregma, 1.2mm lateral to the midsagittal suture, and 2.5mm ventral to the skull); neurodegenerative (Parkinson's disease);

**Q7953:** M. Carmo, *et al.* Enhanced ATP release and CD73-mediated adenosine formation sustain adenosine A2A receptor over-activation in a rat model of Parkinson's disease. *Br J Pharmacol* 2019;176(18):3666-3680

**Agents:** adenosine diphosphate, alpha-beta-methylene- **Vehicle:** saline; **Route:** CSF/CNS (lateral ventricle); **Species:** Rat; **Pump:** 1002; **Duration:** Not stated;

**ALZET Comments:** Dose (100  $\mu$ M at 0.25  $\mu$ l/hr); Controls received mp w/ vehicle; animal info (male, Wistar, 220–250g); behavioral testing (open field, object recognition, cylinder test); alpha-beta-methylene ADP is a CDP inhibitor; enzyme inhibitor (Ecto-5'-Nucleotidase); ALZET brain infusion kit 2 used; Brain coordinates (1.5 mm posterior, 1.0 mm lateral, and 3.7 mm below the horizontal plane of bregma); neurodegenerative (Parkinson's);