



References on Neurodegenerative Studies Using ALZET® Osmotic Pumps

1. ALS

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

ALZET Comments: Poloxamer 188; CSF/CNS (lateral ventricle); Mice; 2006, 1004; 42 days; 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);

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

ALZET Comments: P110-TAT (47-57); SC; Mice; 28 day pump; 60 days; 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: (see pg. 14); .

Q5704: W. Wang, *et al.* Motor-Coordination and Cognitive Dysfunction Caused by Mutant TDP-43 Could Be Reversed by Inhibiting Its Mitochondrial Localization. *Mol Ther* 2017;25(1):127-139

ALZET Comments: Peptide, PM1; PBS; SC; Mice (transgenic); 2006; Controls received mp w/ control peptide; animal info (C57BL/6-Tg); neurodegenerative (amyotrophic lateral sclerosis); behavioral testing (Rotarod; grip strength; open field; y maze; t maze; object recognition, fear conditioning); Pumps primed in 37C PBS overnight; Dose (1.5 or 0.5 mg/kg/day);.

Q5884: U. N. Ramirez-Jarquín, *et al.* Chronic infusion of SOD1(G93A) astrocyte-secreted factors induces spinal motoneuron degeneration and neuromuscular dysfunction in healthy rats. *J Cell Physiol* 2017;232(10):2610-2615

ALZET Comments: ACM-hG93A; CSF/CNS (intrathecal); Rat; 2004; 16 days; animal info (male, Wistar, 270-300g, adult); neurodegenerative (amyotrophic lateral sclerosis); post op. care (IM penicillin); behavioral testing (rotarod test; paw grip endurance); Pumps primed in 37C saline for 28 hours; used wound clips;

Q5882: L. Pasetto, *et al.* Targeting Extracellular Cyclophilin A Reduces Neuroinflammation and Extends Survival in a Mouse Model of Amyotrophic Lateral Sclerosis. *J Neurosci* 2017;37(6):1413-1427

ALZET Comments: MM218 Inhibitor; PBS; CSF/CNS; Mice; 2004; 56 days; Controls received mp w/ vehicle; animal info (SOD1 mice; 98 days old); pumps replaced after 28 days; ALZET brain infusion kit 3 used; post op. care (0.15 mg/kg buprenorphine as analgesic immediately before and 12 h after the surgery); behavioral testing (Rotarod test); “MM218 does not pass the blood–brain barrier (BBB), so the drug was administered intracerebroventricularly by continuous infusion using minipumps” p. 1421; MM218 is a specific inhibitor of extracellular PPIA ; Therapeutic indication (Amyotrophic Lateral Sclerosis); Dose (1 or 10 uM);.

Q5966: P. Weydt. Mechanisms and Modifiers of Energy Metabolism in ALS and Huntington Disease. Open Access Repositorium der Universität Ulm 2016;

ALZET Comments: Cannabinol; PEG 400; SC; Mice; 2004; 4 weeks; animal info (SOD 1 transgenic); pumps replaced every 28 days; Therapeutic indication (amyotrophic lateral sclerosis); Dose (5 mg/kg);.

Q6500: J. D. Talbot, *et al.* Preservation of neuromuscular function in symptomatic SOD1-G93A mice by peripheral infusion of methylene blue. *Exp Neurol* 2016;285(Pt A):96-107

ALZET Comments: Methylene blue; Saline; Intramuscular (hind limb); Mice (transgenic); 1004; 4 weeks; Dose (0, 100, 200 or 400 µM); Controls received mp w/ vehicle; animal info (male SOD1-G93A); post op. care (2 injections of 0.05–0.1mg/kg buprenorphine); neurodegenerative (familial amyotrophic lateral sclerosis);.

Q5207: Y. Solomonov, *et al.* Reduction of cytosolic phospholipase A2alpha upregulation delays the onset of symptoms in SOD1G93A mouse model of amyotrophic lateral sclerosis. *J Neuroinflammation* 2016;13(1):134



ALZET Comments: Oligonucleotide, antisense anti-Cytosolic phospholipase A2 alpha; Saline; CSF/CNS; Mice (transgenic); 4 weeks; 6 weeks; Controls received mp w/ vehicle; animal info (male, B6.Cg-Tg(SOD1G93A)1Gur/J hemizygous transgenic, 10 weeks old, 25 g); ALZET brain infusion kit 3 used; antisense (oligonucleotide anti-Cytosolic phospholipase A2 alpha); neurodegenerative (amyotrophic lateral sclerosis); behavioral testing (rotarod test; ladder testing); pumps primed overnight in 37C saline; Dose (10 ug/day); Brain coordinates (right lateral cerebral ventricle (-1.0 mm mediolateral and -0.5 mm anteroposterior from Bregma));

Q5186: U. N. Ramirez-Jarquin, *et al.* Neuropathological characterization of spinal motor neuron degeneration processes induced by acute and chronic excitotoxic stimulus in vivo. *Neuroscience* 2016;331(78-90

ALZET Comments: AMPA; Phosphate buffer; CSF/CNS (intrathecal); Rat; 2004; 5 days; Controls received mp w/ vehicle; animal info (male, Wistar, 270-300g); neurodegenerative (amyotrophic lateral sclerosis); post op. care (IM penicillin); behavioral testing (rotarod, paw grip endurance; stride analysis); AMPA aka a-amino-3- hydroxy-5-methyl-4-isoxazoleacetic acid; pumps primed for 48 hours in 37C saline; used surgical clips;

Q4859: D. Matusica, *et al.* Inhibition of motor neuron death in vitro and in vivo by a p75 neurotrophin receptor intracellular domain fragment. *Journal of Cell Science* 2016;129(517-530

ALZET Comments: Peptide, c29; SC; Mice; 1004; Controls received mp w/ vehicle; animal info (SOD G93A, 9 weeks old); pumps replaced every month until death; neurodegenerative (amyotrophic lateral sclerosis); neurodegenerative (amyotrophic lateral sclerosis); long-term study; peptides; Dose (5 mg/kg/day);

Q4830: M. Gravel, *et al.* IL-10 Controls Early Microglial Phenotypes and Disease Onset in ALS Caused by Misfolded Superoxide Dismutase 1. *The Journal of Neuroscience* 2016;36(3):1031-1048

ALZET Comments: Antibody, Interleukin-10 receptor; CSF/CNS; Mice; 2006; 42 days; Controls received mp w/ saline; animal info (SOD1 G93A, 60 days old); neurodegenerative (amyotrophic lateral sclerosis); behavioral testing (hindlimb rellflex); pumps primed overnight in 37C saline; used dental cement; Dose (3.6 ug/day);

Q4951: F. G. Vieira, *et al.* Guanabenz Treatment Accelerates Disease in a Mutant SOD1 Mouse Model of ALS. *PLoS One* 2015;10(8):e0135570

ALZET Comments: Guanabenz acetate; Ethanol; water; propylene glycol; SC; Mice; 2004; Controls received mp w/ vehicle; animal info (SOD1-G93A); pumps replaced every 28 days; dose-response (pg 4); neurodegenerative (amyotrophic lateral sclerosis); post op. care (antibiotic ointment; buprenorphine 0.1 mg/kg); used lot#10284-12; Dose (0.45, 1.5, or 4.5 mg/kg/day);

Q4930: A. Ruban, *et al.* Combined Treatment of an Amyotrophic Lateral Sclerosis Rat Model with Recombinant GOT1 and Oxaloacetic Acid: A Novel Neuroprotective Treatment. *Neurodegener Dis* 2015;15(4):233-42

ALZET Comments: Kanic acid; cyclothiazide; CSF, artificial; CSF/CNS (intrathecal); Rat; 2001; 14 days; 36 days; animal info (male, Wistar, 8-9 weeks old, 240-250g); pumps replaced every week; neurodegenerative (ALS amyotrophic lateral sclerosis); behavioral testing (rotarod testing); pumps primed in 37C sterile saline overnight; catheter placement verified by visual examination;

Q5255: P. Rabinovich-Toidman, *et al.* Mutant SOD1 Increases APP Expression and Phosphorylation in Cellular and Animal Models of ALS. *PLoS One* 2015;10(11):e0143420

ALZET Comments: Antibody, monoclonal, BBS; CSF/CNS (right lateral ventricle); mice; 2006; 42 days; Controls received mp w/ isotype-matched non relevant MAb; animal info (male Hemizygous B6SJLTgN (SOD1G93A) 1 Gur mice); brain infusion cannula used; neurodegenerative (ALS); immunology; antibodies infused; MAb aka Monoclonal antibody; Ketamine and Xylazine anesthesia; Dose (1.5 mg/mL); Brain coordinates; l-2mm [Bregma] in the antero-posterior direction, 2.8mm in mediolateral direction and 3mm depth.

Q3981: Y. J. Liu, *et al.* Activation of AMP-activated protein kinase alpha1 mediates mislocalization of TDP-43 in amyotrophic lateral sclerosis. *Human Molecular Genetics* 2015;24(787-801



ALZET Comments: JMF1907; Saline; SC; Mice (transgenic); 18 weeks; Controls received mp w/ vehicle; animal info (B6SJL-Tg, 6 weeks old); pumps replaced every 4 weeks; neurodegenerative (Amyotrophic lateral sclerosis); no stress (see pg. 792); behavioral testing (rotarod, forelimb grip); long-term study;

Q4324: G. Battaglia, *et al.* Activation of mGlu3 metabotropic glutamate receptors enhances GDNF and GLT-1 formation in the spinal cord and rescues motor neurons in the SOD-1 mouse model of amyotrophic lateral sclerosis. *NEUROBIOLOGY OF DISEASE* 2015;74(126-136

ALZET Comments: LY379268; Saline; SC; Mice; 2004; 40 days; Controls received mp w/ vehicle; animal info (male, C57BL6J or SOD1G93A, 8 weeks old, 20-22g); pumps replaced every 28 days; neurodegenerative (amyotrophic lateral sclerosis); behavioral testing (rotarod testing); immunology;

2. Alzheimer's

Q6991: N. Yousefi, *et al.* Prestimulation of Microglia Through TLR4 Pathway Promotes Interferon Beta Expression in a Rat Model of Alzheimer's Disease. *J Mol Neurosci* 2019;

ALZET Comments: Amyloid beta oligomers; High-density lipoprotein, human; CSF/CNS (lateral ventricle); Rat; 1002; 14 days; Dose (25 µg- Aβ oligomer, 250 µg/ml human high-density lipoprotein); Controls received mp w/ vehicle; animal info (Male Wistar rats, 220–250 g); Brain coordinates (AP, – 0.96; L, ± 1.8; DV, – 3.4); neurodegenerative (Alzheimer's);

Q6992: R. A. Whittington, *et al.* Administration of the benzodiazepine midazolam increases tau phosphorylation in the mouse brain. *Neurobiol Aging* 2019;75(11-24

ALZET Comments: Midazolam; Saline; SC; Mice; 2001D; 1 week; Dose (10 mg/kg or 25 mg/kg); 0.9% Saline used; Controls received mp w/ vehicle; animal info (Male C57BL/6 mice, 8-10-week-old); post op. care (preemptive analgesia with carprofen 5 mg/kg s.c.); midazolam is a benzodiazepine; neurodegenerative (Alzheimers);

Q5552: T. Cassano, *et al.* Early intrathecal infusion of everolimus restores cognitive function and mood in a murine model of Alzheimer's disease. *Exp Neurol* 2019;311(88-105

ALZET Comments: Everolimus; DMSO; CSF, artificial; CSF/CNS (right lateral ventricle); Mice; 1002; 2 weeks; Dose (0.167 µg/µl/day); 10% DMSO used; Controls received mp w/ vehicle; animal info (6-month-old 3×Tg-AD male mice and their wild type male littermates (Non-Tg)); Brain coordinates (0.5mm anterior-posterior, 1.1mm medio-lateral, and 2.5mm dorso-ventral to the skull); neurodegenerative (Alzheimer's disease);

Q7262: N. Reichenbach, *et al.* P2Y1 receptor blockade normalizes network dysfunction and cognition in an Alzheimer's disease model. *J Exp Med* 2018;215(6):1649-1663

ALZET Comments: MRS 2179, BPTU; Saline, DMSO; CSF/CNS (lateral ventricle); Mice; 2006; 6 weeks; Dose (MRS2179 1mM, BPTU 10uM); Controls received mp w/ vehicle; animal info (KM67/671NL mice, 8–9 mo); post op. care (Buprenorphine s.c. was used as an analgesic.); behavioral testing (Barnes maze test); ALZET brain infusion kit 3 used; Brain coordinates (anteroposterior [AP] –0.2 mm, medial lateral [ML] +1 mm relative to bregma; dorsal ventral [DV] +2.5 mm from the brain surface); neurodegenerative (Alzheimer's);

Q7258: X. M. Qi, *et al.* Intraventricular infusion of clusterin ameliorated cognition and pathology in Tg6799 model of Alzheimer's disease. *BMC Neurosci* 2018;19(1):2

ALZET Comments: Apolipoprotein J; DMSO; CSF/CNS (Lateral ventricle); Mice; 2002; 2 weeks; Dose (20 µg/200 µl); Dose (20 µg/200 µl); animal info (8-month transgenic mouse model Tg6799); behavioral testing (water-maze testing); Apolipoprotein J aka Clusterin; ALZET brain infusion kit 3 used; neurodegenerative (Alzheimer's);

Q7055: H. G. Pourbadie, *et al.* Early minor stimulation of microglial TLR2 and TLR4 receptors attenuates Alzheimer's disease-related cognitive deficit in rats: behavioral, molecular, and electrophysiological evidence. *Neurobiol Aging* 2018;70(203-216

ALZET Comments: Amyloid protein, beta (1-42), High-density lipoprotein, human; PBS; CSF/CNS (left lateral ventricle); Rat; 1002; 2 weeks; Dose (25 ug oligomeric Amyloid beta 1-42 and 250 ug/ml human high-density lipoprotein); animal info (2.5



month old Adult male Wistar rats (220-250 g)); behavioral testing (Morris water maze); Brain coordinates (AP: -0.96, L: +/- 1.8, DV: -3.4.); neurodegenerative (Alzheimer's);.

R0365: L. Maletinska, *et al.* The impact of anorexigenic peptides in experimental models of Alzheimer's disease pathology. *J Endocrinol* 2018;

ALZET Comments: PrRP palmitoylated analogs, Leptin, Amylin, Cyclic AC253, Exendin 4; SC, CSF/CNS (lateral ventricle); Mice; 2 months; 28 days; 5 weeks, 5 months, 16 weeks; Dose: Palm11-PrRP (5 mg/kg/day), Leptin (2.4 nmol/day), Amylin (0.24 mg/kg/day), Exendin-4 (3.5 pmol/kg/min); animal info (7 month old THY-Tau22 mice; 5 month old APP/PS1 mice; 6 month old AMP8 mice); behavioral testing (Y-maze); neurodegenerative (Alzheimer's); This review summarizes current information on the potential neuroprotective properties of food intake-lowering (anorexigenic) peptides that have been tested in experimental models of AD-like pathology.

Q7177: A. Habib, *et al.* Human Umbilical Cord Blood Serum-derived alpha-Secretase: Functional Testing in Alzheimer's Disease Mouse Models. *Cell Transplant* 2018;27(3):438-455

ALZET Comments: Cord Blood Serum Fraction, Aged Blood Serum Fraction; IP; Mice; 2004; 6 weeks; Dose (1 mg/kg/day or 30 mg/mouse/day); animal info (5-month-old 5XFAD mice); CBS-specific fraction aka alphaCBSF, AgBS fraction aka AgBSF; neurodegenerative (Alzheimer's disease);.

Q7136: G. Fonar, *et al.* Intracerebroventricular Administration of L-arginine Improves Spatial Memory Acquisition in Triple Transgenic Mice Via Reduction of Oxidative Stress and Apoptosis. *Transl Neurosci* 2018;9(43-53

ALZET Comments: Arginine, L-; CSF, artificial; CSF/CNS (lateral ventricle); Mouse; 1004; 28 days; Dose (1.148 M, pH 7.3); Controls received mp w/ vehicle; animal info (6.5 months old, female); behavioral testing (Morris water maze test); Brain coordinates (-0.2 mm caudal, 0.9 mm lateral to bregma); Loctite 454 cyanoacrylate adhesive; neurodegenerative (Alzheimer's disease);.

Q5619: G. Fonar, *et al.* Intracerebroventricular Administration of L-arginine Improves Spatial Memory Acquisition in Triple Transgenic Mice Via Reduction of Oxidative Stress and Apoptosis. *Transl Neurosci* 2018;9(43-53

ALZET Comments: Arginine, L-; Saline; CSF/CNS (lateral ventricles); Mice; 1004; 1 month; Controls received mp w/ vehicle; animal info (3xTg-AD mice, 6.5-month-old female mice); behavioral testing (Morris water maze, Spontaneous alternation Y-Maze); Brain coordinates (-0.2 mm caudal, 0.9 mm lateral to bregma); cyanoacrylate adhesive; neurodegenerative (Alzheimer's);.

Q5587: Y. Fang, *et al.* The adhesion and migration of microglia to beta-amyloid (A β) is decreased with aging and inhibited by Nogo/NgR pathway. *J Neuroinflammation* 2018;15(1):210

ALZET Comments: NEP1-40; PBS, DMSO; CSF/CNS (lateral ventricle); Mice (transgenic); 2004; 2 months; Dose (500 μ M); Dose (500 μ M); 2.5% DMSO used; animal info (6 month old APP/PS1 transgenic mice); pumps replaced after 28 days; NEP1-40 is a competitive antagonist of Nogo/NgR pathway; ALZET brain infusion kit 2 used; neurodegenerative (Alzheimer's);.

Q6548: D. S. Yang, *et al.* Cyclodextrin has conflicting actions on autophagy flux in vivo in brains of normal and Alzheimer model mice. *Hum Mol Genet* 2017;26(5):843-859

ALZET Comments: Cyclodextrin, 2-hydroxypropyl-b-; CSF (artificial); CSF/CNS (right lateral ventricle); Mice; 2002; 14 days; Dose (40 mg/kg/day); Controls received mp w/ vehicle; animal info (TgCRND8 and wild type (WT) mice); ~6.5 hour half-life (p.12); 2-hydroxypropyl-b-cyclodextrin aka CYCLO; Brain coordinates (AP - 0.22mm to bregma, ML 1.0mm to bregma, and DV 2.5mm to cranium.); neurodegenerative (Alzheimer's Disease);.

Q5928: S. Yamashita, *et al.* Oral Administration of Ethanalamine Glycerophospholipid Containing a High Level of Plasmalogen Improves Memory Impairment in Amyloid beta-Infused Rats. *Lipids* 2017;52(7):575-585

ALZET Comments: Amyloid protein, beta (1-40); Aluminum trichloride; CSF/CNS; Rat; 2002; 2 weeks; animal info (male, Wistar, 12 weeks old); neurodegenerative (Alzheimers); behavioral testing (radial maze-learning ability); "Instead of A β 1-42 that is easy to aggregate in osmotic pump and line to cerebral ventricle, A β 1-40 and AIC3 were used and enabled to aggregate in cerebral ventricle." pg 3;.



Q6277: W. Xu, *et al.* The Efficacy and Pharmacological Mechanism of Zn7MT3 to Protect against Alzheimer's Disease. *Sci Rep* 2017;7(1):13763

ALZET Comments: Zn7MT3; PBS; CSF/CNS (lateral ventricle); Mice; 2006; 6 weeks; Dose (50 µg/day/mouse); Controls received mp w/ vehicle; animal info (APP^{swe}/PSEN1dE9 (APP/PS1) double transgenic mice, approx. 5 months old, on a C57BL/6 background); behavioral testing (Morris water maze test, step-down type passive avoidance test); ALZET brain infusion kit 3 used; Brain coordinates (lateral 1.0 mm, posterior 0.4 mm to bregma as the zero point); neurodegenerative (Alzheimer's disease);

Q5916: M. Wiesmann, *et al.* Angiotensin II, hypertension and angiotensin II receptor antagonism: Roles in the behavioural and brain pathology of a mouse model of Alzheimer's disease. *J Cereb Blood Flow Metab* 2017;37(7):2396-2413

ALZET Comments: Angiotensin II; SC; Mice; 1004; 2 months; Controls received mp w/ saline; animal info (male, WT or AbetaPP/PS1, 10 months old); neurodegenerative (Alzheimer's disease); post op. care (separately housed after implantation); behavioral testing (Morris Water maze); cardiovascular; peptides; BP measured using tail cuff; Dose (500 ng/kg/min);

Q6228: T. van Groen, *et al.* The Abeta oligomer eliminating D-enantiomeric peptide RD2 improves cognition without changing plaque pathology. *Sci Rep* 2017;7(1):16275

ALZET Comments: RD2, D-enantiomeric peptide; Saline; IP; Mice; 1004; 28 days; Dose (5.3 mg/kg/day); Controls received mp w/ vehicle; animal info (7 month old female APP/PS1 mice); post op. care (mice were housed individually after pump implantation); behavioral testing (open field test, zero maze, Morris water maze); neurodegenerative (Alzheimer's);

3. Ataxia

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

ALZET Comments: Isoproterenol, l-; SC; Mice; 7 days; 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

ALZET Comments: EUK-189; Mannitol; SC; Mice; 2004; 56, 84 days; Controls received mp w/ vehicle; long-term study; pumps replaced every 28 days; no stress (see pg.941); cancer (thymoma); EUK-189 is a synthetic catalytic antioxidant w/ both catalase & superoxide dismutase activities; neurodegenerative (ataxia telangiectasia).

4. Huntington's

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)

ALZET Comments: P110; SC; Mice; 8 weeks; 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);

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

ALZET Comments: Bumetanide; DMSO, ethanol, saline; CSF/CNS (lateral ventricle); Mice; 1002; 2 weeks; 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 Rep* 2018;23(4):1020-1033

ALZET Comments: Isoprenaline; PBS; SC; Mice; 14 days; Dose (30 mg/kg/day); animal info (Male, B6C3F1/J or C56B6/J); neurodegenerative (Huntington's disease);.

Q6196: L. Naia, *et al.* Comparative Mitochondrial-Based Protective Effects of Resveratrol and Nicotinamide in Huntington's Disease Models. *Mol Neurobiol* 2017;54(7):5385-5399

ALZET Comments: Resveratrol; Nicotinamide; Cyclodextrin, 2-hydroxypropyl- β ; Saline; SC; Mice; 28 days; Dose (resveratrol 1 mg/kg/day; nicotinamide 250 mg/kg/day); Controls received mp w/ vehicle; animal info (9-month-old YAC128 transgenic mice and age-matched WT controls); neurodegenerative (Huntington's Disease);.

Q6704: L. Naia, *et al.* Histone Deacetylase Inhibitors Protect Against Pyruvate Dehydrogenase Dysfunction in Huntington's Disease. *J Neurosci* 2017;37(10):2776-2794

ALZET Comments: Sodium butyrate; Saline; SC; Mice; 2004; 28 days; Dose (1 mg/kg/d); 0.9% saline used; Controls received mp w/ vehicle; post op. care (butorphanol (1:50; 2.5 ml/kg)); neurodegenerative (Huntington's Disease);.

Q6450: Y. H. Kao, *et al.* Targeting ENT1 and adenosine tone for the treatment of Huntington's disease. *Hum Mol Genet* 2017;26(3):467-478

ALZET Comments: JM1907; SC; Mice; 6 weeks; Dose ((0.11mg/kg/day); Controls received mp w/ vehicle; animal info (7 week old R6/2 mice); enzyme inhibitor (ENT1); neurodegenerative (Huntington's disease);.

Q4882: A. M. Schroeder, *et al.* Cardiac Dysfunction in the BACHD Mouse Model of Huntington's Disease. *PLoS One* 2016;11(1):1-25

ALZET Comments: Isoproterenol; Saline; SC; Mice; 2001; 3 months; Controls received mp w/ vehicle; animal info (BACHD or WT, 2-3 months old); neurodegenerative (Huntington's Disease); long-term study; cardiovascular; Dose (0.24, 0.48, 0.97 mg/day);.

Q5174: Y. Pan, *et al.* Inhibition of DNA Methyltransferases Blocks Mutant Huntingtin-Induced Neurotoxicity. *Sci Rep* 2016;6(31022)

ALZET Comments: Cytidine, fluorodeoxy-; Saline; CSF/CNS; Mice; 2001; 1 week; ALZET brain infusion kit 3 used; neurodegenerative (Huntington's disease); stability verified by ("...FdCYd fully maintained its neuroprotective activity after 45 days of pre-incubation" see supplement 2); "...decitabine and FdCyd, are known to be degraded rapidly by cytidine deaminase in the liver (in vivo half life of decitabine <20 min)⁶², indicating that systemic administration may not be an effective strategy for drug delivery to the brain. We therefore chose intracerebroventricular (icv) administration using an Alzet osmotic pump, which provides continuous infusion of drug at a consistent rate from a subcutaneous pump" pg 8; FdCyd aka Cytidine, fluorodeoxy-; decitabine and FdCyd are similar in structure.

Q6590: Y. Mao, *et al.* Targeting TEAD/YAP-transcription-dependent necrosis, TRIAD, ameliorates Huntington's disease pathology. *Hum Mol Genet* 2016;25(21):4749-4770

ALZET Comments: Lysophosphatidic acid; Sphingosine-1-phosphate; PBS; CSF/CNS (subarachnoid); Mice; 3 days; Controls received mp w/ vehicle; animal info (9 week old R6/2 mice); Brain coordinates (lateral 0.6mm; -2.0mm from Bregma);.

Q4907: Jun Wu, *et al.* Enhanced Store-Operated Calcium Entry Leads to Striatal Synaptic Loss in a Huntington's Disease Mouse Model. *The Journal of Neuroscience* 2016;36(1):125-141

ALZET Comments: EVP4593; DMSO; PEG 300; CSF/CNS; Mice (transgenic); 2006; 6 weeks; Controls received mp w/ vehicle; animal info (YAC128 or WT, 10.5 months old); 10% DMSO and 90% PEG used; neurodegenerative (Huntington's disease);.



Q4804: Ilaria Ceccarelli, *et al.* Recombinant Adeno Associated Viral (AAV) vector type 9 delivery of Ex1-Q138-mutant huntingtin in the rat striatum as a short-time model for in vivo studies in drug discovery. *NEUROBIOLOGY OF DISEASE* 2016;86):41-51

ALZET Comments: Cystamine dihydrochloride; Dulbecco's PBS; SC; Rat; 2ML4; 21 days; Controls received mp w/ vehicle; animal info (female, Wistar, 175-200g); neurodegenerative (Huntington's disease); Dose (100 mg/Kg/day);.

Q5858: X. Guo, *et al.* VCP recruitment to mitochondria causes mitophagy impairment and neurodegeneration in models of Huntington's disease. *Nat Commun* 2016;7(12646

ALZET Comments: TAT peptide; HV-3 peptide; SC; Mice; 8 weeks, 9 months; Controls received mp w/ control peptide; animal info (5 weeks old, 3 months old); pumps replaced every 4 weeks in 5 week old mice, replaced every month x 9 months; long-term study; peptides; Therapeutic indication (Huntington's Disease); Dose (3 mg/kg/day);.

Q6163: M. H. Disatnik, *et al.* Potential biomarkers to follow the progression and treatment response of Huntington's disease. *J Exp Med* 2016;213(12):2655-2669

ALZET Comments: P110-TAT (47-57); SC; Mice; 1 week, 8 weeks; Dose (3 mg/Kg/d); Controls received mp w/ vehicle; animal info (5 week old Hemizygous R6/2 HD mice); pumps replaced every 4 weeks; neurodegenerative (Huntington's);.

Q5604: M. Anglada-Huguet, *et al.* Prostaglandin E2 EP2 activation reduces memory decline in R6/1 mouse model of Huntington's disease by the induction of BDNF-dependent synaptic plasticity. *Neurobiol Dis* 2016;95(22-34

ALZET Comments: Misoprostol; PBS; IP; Mice; 1004; 4 weeks; Controls received mp w/ vehicle; animal info (14-18 weeks) ; neurodegenerative (Huntington's disease); behavioral testing (T-maze test, novel object recognition test); Therapeutic indication (Huntington's disease); Dose (50 µg/kg/day);.

5. Neimann

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(319-326

ALZET Comments: MARCKS peptide; Saline, sterile; CSF/CNS; Mice; 1004; 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); MARCKS is a protein required for PI(4,5)P2 membrane clustering and hydrolysis.

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(933-945

ALZET Comments: Cyclodextrin, 2-hydroxypropyl-B-; CSF/CNS; Mice; 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

ALZET Comments: Nerve growth factor; CSF, artificial; CSF/CNS; Mice; 1002; 7 days; 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

ALZET Comments: PD-98059; DMSO; saline; dye, Evan's blue; CSF/CNS; Mice; 1002; 2 weeks; 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



ALZET Comments: Roscovitine; olomoucine; iso-olomoucine; DMSO; CSF/CNS; Mice; 1002; 2, 4 weeks; 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 to accommodate 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

ALZET Comments: Cyclodextrin, 2-hydroxypropyl- β -; Saline, sterile; CSF/CNS; Mice (knockout); 2004; 28 days; 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- β -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).

6. Parkinson

Q5620: L. Chen, *et al.* PPAR δ agonist alleviates NLRP3 inflammasome-mediated neuroinflammation in the MPTP mouse model of Parkinson's disease. *Behav Brain Res* 2019;356(483-489)

ALZET Comments: GW501516; DMSO; PBS; CSF/CNS (left lateral ventricle); Mice; 1007D; 7 days; Dose (60, 120, 240 μ 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 β/δ (PPAR β/δ) 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);.

R0377: X. S. Zeng, *et al.* Neurotoxin-Induced Animal Models of Parkinson Disease: Pathogenic Mechanism and Assessment. *ASN Neuro* 2018;10(1759091418777438)

ALZET Comments: Rotenone, MPTP; IV, IP; Rat; 14 days, 33 days; Dose (Rotenone (3 mg/kg/day); MPTP (46 mg/kg/day)); neurodegenerative (Parkinson's);.

Q7160: Y. W. Yu, *et al.* Glucose-Dependent Insulinotropic Polypeptide Mitigates 6-OHDA-Induced Behavioral Impairments in Parkinsonian Rats. *Int J Mol Sci* 2018;19(4):

ALZET Comments: Glucose-dependent insulinotropic polypeptide; Saline; SC; Rat; 2002; 2 weeks; Dose (7.8 or 15 nmol/kg/day); Controls received mp w/ vehicle; behavioral testing (Open field test); functionality of mp verified by plasma levels; Resultant plasma level (GIP administration at 15 nmol/kg/day resulted in total GIP plasma levels of 203.9 pmol/L); neurodegenerative (Parkinson's);.

Q6114: M. Bourque, *et al.* The plasmalogen precursor analog PPI-1011 reduces the development of L-DOPA-induced dyskinesias in de novo MPTP monkeys. *Behav Brain Res* 2018;337(183-185)

ALZET Comments: MPTP; SC; Monkey (Macaca fascicularis); 4.5 months; Dose (0.5 mg/day); MPTP is 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine; neurodegenerative (Parkinson's);.

Q5677: S. Stayte, *et al.* Activin A Inhibits MPTP and LPS-Induced Increases in Inflammatory Cell Populations and Loss of Dopamine Neurons in the Mouse Midbrain In Vivo. *PLoS One* 2017;12(1):e0167211

ALZET Comments: Active A, recombinant; PBS; CSF/CNS; Mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info (male, C57BL6, 11 weeks old); neurodegenerative (Parkinson's disease); Pump removed after 1 week and cannula tubing sealed with heat; Dose (295 ng/day);.

Q6772: S. Seiler, *et al.* Antagonization of the Nogo-Receptor 1 Enhances Dopaminergic Fiber Outgrowth of Transplants in a Rat Model of Parkinson's Disease. *Front Cell Neurosci* 2017;11(151)

ALZET Comments: NEP1-40; Saline; CSF/CNS (right lateral ventricle); Rat; 2ML2; 2 weeks; Dose (75 mg/kg/day); Controls received mp w/ vehicle; animal info (Adult female hemi-parkinsonian Wistar rats); ALZET brain infusion kit 2 used; Brain coordinates (posterior 0.8 mm, lateral 1.6 mm and 3.5 mm ventral to the dura, the incisor bar was set at 0.0 mm.); neurodegenerative (Parkinson's disease);.



Q6188: N. J. Ortner, *et al.* Lower Affinity of Isradipine for L-Type Ca(2+) Channels during Substantia Nigra Dopamine Neuron-Like Activity: Implications for Neuroprotection in Parkinson's Disease. *J Neurosci* 2017;37(28):6761-6777

ALZET Comments: Isradipine; DMSO; PEG 300; SC; Mice; 2004; Dose (3 mg/kg/day); animal info (Male C57BL/6, 12–15 weeks of age, wild-type or age-matched Cav1.3 knock-out mice); Resultant plasma level (3 ng/mL); neurodegenerative (Parkinson's disease);.

Q6343: M. Oki, *et al.* Zonisamide ameliorates levodopa-induced dyskinesia and reduces expression of striatal genes in Parkinson model rats. *Neurosci Res* 2017;122(45-50)

ALZET Comments: Levodopa; Benserazide; SC; Rat; 2ML4; 2 weeks; Dose (Levodopa: 24 mg/kg/day; Benserazide 6 mg/kg/day); animal info (220-250g female Sprague-Dawley rats); neurodegenerative (Parkinson's disease);.

Q6442: C. Laloux, *et al.* Continuous cerebroventricular administration of dopamine: A new treatment for severe dyskinesia in Parkinson's disease? *Neurobiol Dis* 2017;103(24-31)

ALZET Comments: Dopamine, anaerobia; Saline; CSF/CNS; Mice; 2001; 7 days; Controls received mp w/ vehicle; animal info (5 month old C57BL/6 J mice); neurodegenerative (Parkinson's disease);.

Q6473: Gravius A, *et al.* Further pharmacological characterization of eltoprazine: focus on its anxiolytic, anorexic, and adverse effect potential. *Acta Neurobiol Exp (Wars)* 2017;77(1):77-85

ALZET Comments: Eltoprazine; Water; SC; Rat; 2ML2; Dose (8 mg/kg/day); animal info (male Sprague Dawley rats weighing 180–200 g); behavioral testing (elevated plus testing); comparison of twice daily SC injections (1 mg/kg) vs mp; Eltoprazine aka 1 (2,3 dihydro 1,4 benzodioxin 8 yl)piperazine; neurodegenerative (Parkinson's disease);.

Q6371: Gao Q, *et al.* Azilsartan ameliorates apoptosis of dopaminergic neurons and rescues characteristic parkinsonian behaviors in a rat model of Parkinson's disease. *ONCOTARGET* 2017;8(15):24099-24109

ALZET Comments: Rotenone; CSF/CNS (right supranigral); Rat; 2ML4; 4 weeks; Dose (2.5 mg/kg/day); Controls received mp w/ vehicle; animal info (Male Lewis rats weighing 280-300 g); Brain coordinates (anteroposterior: 5.5 mm; mediolateral: 2.5 mm; dorsoventral: 7.0 mm, from bregma as a reference); neurodegenerative (Parkinson's disease);.

Q6267: P. Farzanehfar, *et al.* Can Valproic Acid Regulate Neurogenesis from Nestin+ Cells in the Adult Midbrain? *Neurochem Res* 2017;42(8):2127-2134

ALZET Comments: Valproic acid; Saline; CSF/CNS (left midbrain); Mice (transgenic); 1002; 2 weeks; 4 weeks; Dose (0.25 mg/μl); Controls received mp w/ vehicle; animal info (NestinCreERT2 C57BL/6 mice); ALZET brain infusion kit 1 used; Brain coordinates (3.0 mm posterior to Bregma, 1.5 mm lateral to the midline, and 4.0 mm below the surface of the brain); neurodegenerative (Parkinson's disease);.

Q5771: P. J. Cocker, *et al.* Chronic administration of the dopamine D2/3 agonist ropinirole invigorates performance of a rodent slot machine task, potentially indicative of less distractible or compulsive-like gambling behaviour.

Psychopharmacology (Berl) 2017;234(1):137-153

ALZET Comments: Ropinirole; Saline; SC; Rat; 28 days; Controls received mp w/ vehicle; animal info (275-300 g) ; post op. care (Buprenorphine, Anafen); behavioral testing (Rodent slot machine task); Ropinirole is a dopamine D2/3 agonist ; Therapeutic indication (Parkinson's disease, Compulsive behavior, Gambling); Dose (5 mg/kg/day);.