



**Recent References (2021-Present) on Extended Duration Studies
Using ALZET® Osmotic Pumps**

- Q11320:** M. Itoh, *et al.* Lysosomal cholesterol overload in macrophages promotes liver fibrosis in a mouse model of NASH. *J Exp Med* 2023;220(11):
Agents: Cyclodextrin-polyrotaxane, beta- **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Strain:** MC4R-KO (C57BL/6J background); **Pump:** 2002; **Duration:** 6 weeks;
ALZET Comments: Dose (30 mg/kg/d); controls received mp w/ vehicle; animal info (Male; 8 weeks old); pumps replaced every 2 weeks;
- Q11032:** Q. Yu, *et al.* Urotensin II Enhances Advanced Aortic Atherosclerosis Formation and Delays Plaque Regression in Hyperlipidemic Rabbits. *International Journal of Molecular Sciences* 2023;24(4):
Agents: Urotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Rabbit; **Strain:** Not Stated; **Pump:** 2006; **Duration:** 6; 12; 24 weeks;
ALZET Comments: Dose: 5.4 ug/kg/h; Controls received mp w/ vehicle; animal info: Male/female rabbits, six weeks old; pumps replaced every 6 weeks; Blood pressure/heart rate measured via medial auricular artery; cardiovascular; atherosclerosis
- Q11030:** D. Ye, *et al.* Antisense oligonucleotides targeting hepatic angiotensinogen reduce atherosclerosis and liver steatosis in hypercholesterolemic mice. *Global Translational Medicine* 2023;2(1):
Agents: Losartan **Vehicle:** Water; **Route:** SC; **Species:** Mice; **Strain:** LDL receptor -/-; **Pump:** 2006; **Duration:** 12 weeks;
ALZET Comments: Dose: Losartan 15 mg/kg/day; Controls received mp w/ vehicle; animal info: Male ~8 weeks old; pumps replaced after 6 weeks; Blood pressure measured via: Tail cuff; see pg. 3 fig. 1; cardiovascular (liver steatosis, atherosclerosis)
- Q10989:** A. Sakamoto, *et al.* CD163+ macrophages restrain vascular calcification, promoting the development of high-risk plaque. *JCI Insight* 2023;8(5):
Agents: IKK-NBD peptide, control; NBD peptide, NFκB inhibitor **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Strain:** ApoE-/-; **Pump:** 2006; **Duration:** 18 weeks;
ALZET Comments: Dose (both peptides 100 μg/kg/day); animal info: 8 weeks old; pumps replaced every 6 weeks, total of 3 surgeries per mouse were required; peptides; cardiovascular; vascular calcification (atherosclerotic coronary artery)
- Q10966:** K. Nagaoka, *et al.* Acetaminophen improves tardive akathisia induced by dopamine D(2) receptor antagonists. *Journal of Pharmacological Sciences* 2023;151(1):9-16
Agents: Haloperidol **Vehicle:** Cyclodextrin, hydroxypropyl-b; **Route:** Not Stated; **Species:** Rat; **Strain:** Wistar; **Pump:** 2ML4; **Duration:** 21 days;
ALZET Comments: Dose: (1 mg/kg/day); animal info (Male, 9 weeks old, 200-250 g); pumps replaced: removed on the 21st day and new pumps were implanted in the same manner; behavioral testing (open field test.); akathisia
- Q10964:** J. M. Motherwell, *et al.* Effects of Adjunct Antifibrotic Treatment within a Regenerative Rehabilitation Paradigm for Volumetric Muscle Loss. *International Molecular of Life Sciences* 2023;24(4):
Agents: Losartan potassium **Vehicle:** DMSO; saline; **Route:** SC; **Species:** Rat; **Strain:** Lewis; **Pump:** 2ML4; **Duration:** 56 days;
ALZET Comments: Dose (10 mg/kg/day); (1:1 solution of DMSO and 0.9% normal saline used; animal info: Adult male Lewis rats (343 +/- 25.1 g; behavioral testing (running wheel activity); pumps replaced after 28 days; fibrosis, volumetric muscle loss
- Q11059:** K. Momenzadeh, *et al.* Propylene glycol and Kolliphor as solvents for systemic delivery of cannabinoids via intraperitoneal and subcutaneous routes in preclinical studies: a comparative technical note. *Journal of Cannabis Research* 2023;5(1):24
Agents: Tetrahydrocannabinol; cannabinoids **Vehicle:** Propylene glycol; Kolliphor; ethanol; saline; **Route:** SC; **Species:** Rat; **Strain:** Sprague-Dawley; **Pump:** 2ML4; **Duration:** 8 weeks;
ALZET Comments: Dose (20 mg/kg); controls received mp w/ vehicle; animal info (13-week male (approximately 330 g.); post op. care (Enrofloxacin); pumps replaced after 4 weeks; comparison of injection vs mp; stress/adverse reaction: (see pg.3-5); used sterile technique and changed solvent; "We conclude that subcutaneous delivery utilizing osmotic pumps with Kolliphor as a solvent provides viable and consistent route of administration for long-term systemic cannabinoid delivery in the preclinical context."



Q11198: J. Kushioka, *et al.* Therapeutic effects of MSCs, genetically modified MSCs, and NFκB-inhibitor on chronic inflammatory osteolysis in aged mice. *Journal of Orthopaedic Research* 2023;41(5):1004-1013

Agents: Polyethylene particles, contaminated; lipopolysaccharides; oligodeoxynucleotides **Vehicle:** BSA; PBS; **Route:** Bone (femur); **Species:** Mice; **Strain:** BALB/c; **Pump:** Not Stated; **Duration:** 3 weeks;

ALZET Comments: Dose (3.1 x 10¹⁰ particles /ml); 10% BSA/PBS used; Controls received mp w/ vehicle; animal info: 15-17 month old female mice; post op. care (0.1mg/kg of buprenorphine); pumps replaced after 3 weeks; vinyl catheter used; aging; good methods (targeting femur)

Q11049: S. Kumar, *et al.* Neuroprotection of Retinal Ganglion Cells Suppresses Microglia Activation in a Mouse Model of Glaucoma. *ARVO Journals* 2023;64(7):24

Agents: Meclofenamic acid **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Strain:** C57BL/6; **Pump:** 2004; **Duration:** 4 w
ALZET Comments: Dose (20 mg/kg/d); animal info: adult, 3-4 months old, both sexes; pumps replaced after 4 weeks; (glaucoma)

Q11125: D. Knez, *et al.* 8-Hydroxyquinolylnitrones as multifunctional ligands for the therapy of neurodegenerative diseases. *Acta Pharmaceutica Sinica B* 2023;13(5):2152-2175

Agents: Quinoline **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Strain:** C57BL/6Jcl; **Pump:** 2004; **Duration:** 2; 4 months;
ALZET Comments: Dose (0.62 mg/kg/day); Controls received mp w/ vehicle; animal info (Female; 5 and 10 months old); pumps replaced every 28 days; neurodegenerative; "The osmotic mini-pumps are widely used for continuous drug administration in the study of neurodegenerative diseases." p. 21

Q11124: H. Kishimoto, *et al.* Indoxyl sulfate induces left ventricular hypertrophy via the AhR-FGF23-FGFR4 signaling pathway. *Frontiers in Cardiovascular Medicine* 2023;10(990422)

Agents: H3B-6527 **Vehicle:** Saline; **Route:** IP; **Species:** Mice; **Strain:** C57BL/6J; **Pump:** 2002; 1004; **Duration:** 4 weeks;
ALZET Comments: Dose (7.5 mg/kg); Controls received mp w/ vehicle; animal info (Male; 8 weeks old; Fed high phosphorous diet); H3B is an FGFR4 inhibitor; 2002 pumps replaced biweekly

Q11044: B. A. Karamian, *et al.* Varenicline mitigates the increased risk of pseudarthrosis associated with nicotine. *The Spine Journal* 2023;23(8):1212-1222

Agents: Nicotine; varenicline **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Rat; **Strain:** Sprague-Dawley; **Pump:** 2ML4; **Duration:** 8 weeks;

ALZET Comments: Dose: Nicotine 15mg/kg/day, 22.5mg/kg/day, 30mg/kg/day; Varenicline 1mg/kg/day, 2mg/kg/day; animal info: eight-week-old male Sprague-Dawley rats ~300 grams; post op. care: skin closed with running sub-cuticular 4-0 Vicrylsuture, incision was dressed with triple antibiotic ointment; pumps replaced after 4 weeks; functionality of mp verified by serum levels; good methods (pump replacement) p. 2-3; therapeutic indication: (Pseudarthrosis, spinal fusion)

Q11079: A. Huang, *et al.* Modulation of foraging-like behaviors by cholesterol-FGF19 axis. *Cell & Bioscience* 2023;13(1):20

Agents: Fibroblast growth factor 19 **Vehicle:** CSF, artificial; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 2006; **Duration:** 2 weeks;

ALZET Comments: Dose: FGF19 (15 ng/0.5 ul/h); Controls received mp w/ vehicle; animal info (Male; 5 months old); peptides; pumps replaced twice; functionality of mp verified by measuring residual volume; Brain coordinates: (Anteroposterior -0.3 mm to bregma, lateral 1 mm to bregma, -2.5 mm below skull); vinyl tubing used; behavioral testing (Open field);

Q11276: O. Gremy, *et al.* Chelation therapy with 3,4,3-Li(1,2-HOPO) after pulmonary exposure to plutonium in rats. *Chemico-Biological Interactions* 2023;378(110488)

Agents: 3,4,3-Li(1,2-HOPO); Diethylenetriamine pentaacetic acid **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Strain:** Sprague Dawley; **Pump:** 2004; **Duration:** 8 weeks;

ALZET Comments: Dose (LiHOPO 30 umol/kg; DTPA 300 umol/g); Controls received mp w/ vehicle; animal info (Male; Weighed about 250 g); pumps replaced after 4 weeks; comparison of mp vs IV injection, oral gavage



Q11107: U. K. Goand, *et al.* Immuno-metabolic effect of pancreastatin inhibitor PSTi8 in diet induced obese mice: In vitro and in vivo findings. *Life Sciences* 2023;316(121415)

Agents: PSTi8 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Strain:** C57BL/6; **Pump:** 2004; **Duration:** 8 weeks;

ALZET Comments: Dose: (2 mg/kg/day); animal info (Male; 8-10 weeks old; Weighed on average 22-25 g); pumps replaced after 4 weeks; comparison of oral gavage vs mp; peptides;

Q11273: Y. Fu, *et al.* Effects of Leptin and Body Weight on Inflammation and Knee Osteoarthritis Phenotypes in Female Rats. *JBMR Plus* 2023;7(7):e10754

Agents: Leptin, recombinant **Vehicle:** Tris hydrochloride; **Route:** SC; **Species:** Rat; **Strain:** Zucker (F344 BN F1); **Pump:** 2006; **Duration:** 23 weeks;

ALZET Comments: Dose (3.6 ug/day); Controls received mp w/ vehicle; animal info (Female; Obese; 12 months old, hybrid); pumps replaced every 5 weeks; long-term study; functionality of mp verified by plasma levels p. 7

Q11249: C. Brat, *et al.* Endogenous anti-tumorigenic nitro-fatty acids inhibit the ubiquitin-proteasome system by directly targeting the 26S proteasome. *Cell Chemical Biology* 2023;30(10):1277-1294 e12

Agents: 9-Nitro-oleic acid **Vehicle:** DMSO; **Route:** SC; **Species:** Mice; **Strain:** SCID; **Pump:** 2001; **Duration:** 7; 8 ;15 days;

ALZET Comments: controls received mp w/ vehicle; animal info: 5–6 week-old; pumps replaced after 8 days;

Q11233: T. Ali, *et al.* Peptide aptamer targeting Abeta-PrP-Fyn axis reduces Alzheimer's disease pathologies in 5XFAD transgenic mouse model. *Cellular and Molecular Life Sciences* 2023;80(6):139

Agents: PA8; Thioredoxin A **Vehicle:** Not Stated; **Route:** CSF (intraventricular); **Species:** Mice; **Strain:** 5XFAD transgenic; **Pump:** 2006; **Duration:** 12 weeks;

ALZET Comments: Dose (14.4 µg/day); animal info (Female; 6 weeks old); pumps replaced every 6 weeks; behavioral testing (Open field test; Contextual fear conditioning test); neurodegenerative (Alzheimer's Disease); stress: "Three animals of the PA8 treatment group had to be euthanized due to complications following the second surgery and before the experimental end point and behavioral experiments. Issues included difficult wound healing and displacement of the osmotic pump tubing." p. 3

Q10896: Y. Zheng, *et al.* Beta-Hydroxybutyrate Inhibits Ferroptosis-Mediated Pancreatic Damage in Acute Liver Failure Through the Increase of H3K9bbh. *Cell Reports* 2022;41(12):111847

Agents: Hydroxybutyrate, beta- **Vehicle:** PBS; **Route:** IP; **Species:** Mice; **Strain:** C57BL/6J; **Pump:** 2001D; **Duration:** 48 hours;

ALZET Comments: Dose (1 g/mL); Controls received mp w/ vehicle; animal info (Male mice; 8 weeks old; Hepatectomy used to remove over 70% of their livers); post op. care (Carprofen); pumps replaced after liver resection;

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; **Strain:** 5XFAD; **Pump:** 2004; **Duration:** 8.5 months;

ALZET Comments: Dose (1 mg/kg/day); Animal info: (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);

Q11036: C. A. Wood, *et al.* Activity disruption causes degeneration of entorhinal neurons in a mouse model of Alzheimer's circuit dysfunction. *eLife* 2022;11(**Agents:** Tetrodotoxin **Vehicle:** Saline; trypan blue; **Route:** CSF/CNS (right dorsal);

Species: Mice; **Strain:** Nop-GlyCl; TeTX; **Pump:** 1003D; **Duration:** 3 days; 9 days;

ALZET Comments: Dose: 23 ul/day; 0.9% saline containing 0.04% Trypan blue used; Controls received mp w/ vehicle; pumps primed overnight; animal info: 3 to 6 months old; pumps replaced 4 and 7 days later to continue TTX administration; ALZET brain infusion kit 3 used; Brain coordinates (AP -4.5, ML +3.0, and DV -2.5 mm that targeted immediately above the right EC or at AP -3.1, ML +3.0, and DV -2.65 to target the dorsal DG); neurodegenerative (Alzheimer's); "



Q10725: J. A. Whitson, *et al.* Age-Related Disruption of the Proteome and Acetylome in Mouse Hearts is Associated With Loss of Function and Attenuated by Elamipretide (SS-31) and Nicotinamide Mononucleotide (NMN) Treatment. *Geroscience* 2022;44(3):1621-1639

Agents: Elamipretide **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Strain:** C57BL/6; **Pump:** Not Stated; **Duration:** 4 weeks; **ALZET Comments:** Dose: (3 mg/kg body weight/day); animal info: , Male mice aged to 5–6 and 24 months; pumps replaced every 4 weeks; Elamipretide aka (SS-31); peptides; aging

Q10774: R. M. Wang, *et al.* Myocardial Matrix Hydrogel Acts as a Reactive Oxygen Species Scavenger and Supports a Proliferative Microenvironment for Cardiomyocytes. *Acta Biomaterialia* 2022;152(47-59)

Agents: Uridine, 5-Ethynyl-2'deoxy-; Uridine, Bromodeoxy- **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Strain:** Sprague Dawley; **Pump:** Not Stated; **Duration:** 3 weeks; **ALZET Comments:** Dose: (20 mg/kg/day); Controls received mp w/ vehicle; animal info: Female; pumps replaced after 1.5 weeks; 5-Ethynyl-2 deoxyuridine aka (EdU); Bromodeoxy, uridine aka (BrdU); cardiovascular;

Q10672: J. Santiago-Moreno, *et al.* Expression of Aquaglyceroporins in Spermatozoa from Wild Ruminants Is Influenced by Photoperiod and Thyroxine Concentrations. *International Journal of Molecular Sciences* 2022;23(6):

Agents: Thyroxine **Vehicle:** Saline; **Route:** SC (lateral shoulder); **Species:** Ibex (Iberian); **Strain:** Not Stated; **Pump:** 2ML2; **Duration:** 56 days; **ALZET Comments:** Dose (164 µg/day); 0.9% normal saline used; T4 aka thyroxine; pumps replaced after 14 days; functionality of mp verified by plasma concentrations

Q10663: D. Rohde, *et al.* Bone Marrow Endothelial Dysfunction Promotes Myeloid Cell Expansion in Cardiovascular Disease. *Nature Cardiovascular Research* 2022;1(1):28-44

Agents: Ang II **Vehicle:** Saline; **Route:** SC; IP; **Species:** Mice; **Strain:** Wild-type; **Pump:** 1004; 2006; 1003D; **Duration:** 8 weeks; **ALZET Comments:** Dose (490 ng min/kg); Controls received mp w/ vehicle; animal info (; Western-type diet); pumps replaced after 3 weeks; 90 mmHg - 140 mmHg; peptides; cardiovascular;

Q10658: C. F. Reese, *et al.* Multiple Subregions Within the Caveolin-1 Scaffolding Domain Inhibit Fibrosis, Microvascular Leakage, and Monocyte Migration. *PLoS One* 2022;17(2):e0264413

Agents: Bleomycin; Angiotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Strain:** Wild-type, C57BL/6; **Pump:** 1007D; 1002; **Duration:** 7 days; **ALZET Comments:** Dose (Bleomycin 100 U/kg; Ang II 2.1 mg/kg/day); Controls received mp w/ vehicle; animal info (10 weeks old;); pumps replaced after 8 days; peptides; cardiovascular;

Q10651: T. Prasse, *et al.* Bisphenol A-Related Effects on Bone Morphology and Biomechanical Properties in an Animal Model. *Toxics* 2022;10(2):

Agents: Bisphenol A **Vehicle:** DMSO; **Route:** SC; **Species:** Rat; **Strain:** Wistar; **Pump:** 2ML4; **Duration:** 12 weeks; **ALZET Comments:** Controls received mp w/ vehicle; animal info (rats total; 10 weeks old); post op. care (Metamizole); pumps replaced every 4 weeks; long-term study; toxicology;

Q10635: A. C. M. Omoto, *et al.* Central Nervous System Actions of Leptin Improve Cardiac Function After Ischemia-Reperfusion: Roles of Sympathetic Innervation and Sex Differences. *Journal of American Heart Association* 2022;11(21):e027081

Agents: Leptin **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Strain:** Wistar; **Pump:** 2002; **Duration:** 28 days; **ALZET Comments:** Dose Leptin (0.62 µg/h); Controls received mp w/ vehicle; animal info (rats (12-to 14-weeks old)pumps replaced on day 14; catheter; See (p.3-4)ischemia (ischemia/reperfusion injury.);



Q11190: C. Liu, *et al.* Mitochondrial HSF1 triggers mitochondrial dysfunction and neurodegeneration in Huntington's disease. *EMBO Molecular Medicine* 2022;14(7):e15851

Agents: DH1 peptide; TAT peptide, control **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Strain:** YAC128 (transgenic); **Pump:** 2006; **Duration:** 3 months;

ALZET Comments: Dose (3 mg/kg/day); Controls received mp w/ vehicle; animal info: Male; Wild-type; 6 months old; behavioral testing (Open-field test; Rotarod test); pumps replaced every 6 weeks; long-term study; peptides; neurodegenerative (Huntington's Disease); "Of note, continuous treatment of DH1 improved motor deficits, as tested by open-field test." p. 10

Q10819: J. Kwon, *et al.* Continuous Administration of Mirabegron Has Advantages in Inhibition of Central Sensitization Compared with Short-Term Treatment Cessation in a Mouse Model of Overactive Bladder. *Neurourology and Urodynamics* 2022;41(6):1355-1363

Agents: Mirabegron **Vehicle:** DMSO; Saline; **Route:** SC; **Species:** Mice; **Strain:** C57BL/6; **Pump:** 2002; 2004; **Duration:** 20 days;

ALZET Comments: Dose: 2mg/kg; Controls received mp w/ vehicle; animal info: Eight-week-old female mice; pumps replaced after 10 days; Overactive bladder (Mirabegron)

Q10562: T. J. Jurrissen, *et al.* Role of Adropin in Arterial Stiffening Associated with Obesity and Type 2 Diabetes. *American Journal of Physiology* 2022;323(5):H879-H891

Agents: Adropin **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Strain:** Db/db; **Pump:** 2001; **Duration:** 4 weeks;

ALZET Comments: Dose: (63 mg/kg/h) Controls received mp w/ vehicle; animal info: mice (9 wk old); resultant plasma levels (see fig. 4); Adropin is a peptide hormone expressed in liver; pumps replaced after 2 weeks; peptides; cardiovascular;

Q10943: J. Hu, *et al.* Alteration in Rab11-mediated endocytic trafficking of LDL receptor contributes to angiotensin II-induced cholesterol accumulation and injury in podocytes. *Cell Proliferation* 2022;55(6):e13229

Agents: Angiotensin II **Vehicle:** Saline; **Route:** Not Stated; **Species:** Mice; **Strain:** C57BL6; **Pump:** 2004; **Duration:** 8 weeks;

ALZET Comments: Dose (700 ng/kg/min); 0.9% saline used; Controls received mp w/ vehicle; animal info (male, 8 weeks old); pumps replaced after 4 weeks; peptides; nephrology (chronic kidney disease)

Q10942: Y. C. Hsieh, *et al.* (Pro)renin receptor inhibition attenuated liver steatosis, inflammation, and fibrosis in mice with steatohepatitis. *FASEB Journal* 2022;36(10):e22526

Agents: Peptide, handle region **Vehicle:** Water, distilled **Route:** SC **Species:** Mice **Strain:** C57BL/6 **Pump:** 1004; **Duration:** 12 w

ALZET Comments: Dose: 0.1 mg/kg/day; Controls received mp w/ vehicle; animal info (8–10 weeks,; pumps replaced every 4 weeks; HRP is a prorenin receptor blocker; nonalcoholic steatohepatitis

Q10385: Y. Hasuike, *et al.* CAG repeat-binding small molecule improves motor coordination impairment in a mouse model of Dentatorubral-pallidoluysian atrophy. *Neurobiology of Disease* 2022;163(105604

Agents: Naphthyridine-azaquinolone **Vehicle:** PBS; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** Not Stated; **Pump:** 2004; **Duration:** 16 weeks;

ALZET Comments: Dose (2 mM); Controls received mp w/ vehicle; animal info (6 weeks old); behavioral testing (Tested motor function with rotarod device; Beam-walking test); pumps replaced every 4 weeks; long-term study; ALZET brain infusion kit used; Brain coordinates (0.4 mm posterior; 1.0 mm right lateral; 2.5 mm ventral); neurodegenerative (Dentatorubral-pallidoluysian atrophy); Therapeutic indication (DRPLA);

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; **Strain:** Wild-type; TDP-43; **Pump:** 2004; **Duration:** 60 d

ALZET Comments: Dose (10 mg/ml); 50% DMSO used; Controls received mp w/ vehicle; animal info (Female; ; Ovariectomy); wound clips used; pumps replaced every 4 weeks; replacement therapy (Estrogen); neurodegenerative (ALS)



Q10609: C. M. Francisco, *et al.* Resveratrol Reverses Male Reproductive Damage in Rats Exposed to Nicotine During The Intrauterine Phase and Breastfeeding. *Andrology* 2022;10(5):951-972

Agents: Nicotine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Strain:** Wistar; **Pump:** 2ML4; **Duration:** 50 days;

ALZET Comments: Dose: Nicotine (2 mg/kg/day); Controls received mp w/ vehicle; animal info: rats pregnant female; cyanoacrylate glue used; pumps replaced after 28 days; dependence

Q10745: T. S. Eteläinen, *et al.* Removal of Proteinase K Resistant α 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; **Strain:** C57BL/6; **Pump:** 1002; **Duration:** 2 weeks; 4 weeks;

ALZET Comments: Dose: (10 mg/kg/day.); Controls received mp w/ vehicle; animal info: Male 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)

Q10271: N. Daneshgar, *et al.* Elamipretide treatment during pregnancy ameliorates the progression of polycystic kidney disease in maternal and neonatal mice with PKD1 mutations. *Kidney International* 2022;101(5):906-911

Agents: Elamipretide **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Strain:** PKD1RC/null; PKD1 β ; **Pump:** 1004; **Duration:** 10 w

ALZET Comments: Dose (3 mg/kg/d); animal info (mice were generated by crossing mice PKD1RC/RC with PKD1 β / mice. The PKD1 / were generated by PKD1flox/flox breeding mice, JAX, with germline Sox2-Cre transgenic mice); pumps replaced after 5 weeks; peptides; teratology; Therapeutic indication (ADPKD);

Q10428: C. H. Cho, *et al.* Role of the JAK/STAT pathway in a streptozotocin-induced diabetic retinopathy mouse model. *Graefes Archive Clinical and Experimental Ophthalmology* 2022;260(11):3553-3563

Agents: CP-690550; Pyridone 6; WP1066 **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Strain:** C57BL/6; **Pump:** Not Stated; **Duration:** 8 weeks;

ALZET Comments: Dose: (Pyridone 6: 45 mg/kg, CP-690550: 15 mg/kg, WP1066: 40 mg/kg); Controls received mp w/ vehicle; animal info: healthy male mice (18–22 g; 6 weeks old); pumps replaced after 4 weeks; CP-690550 aka tofacitinib citrate, Pyridone 6 is a JAK inhibitor, WP1066 is a STAT3 inhibitor; diabetes; Diabetic retinopathy

Q10425: X. Chen, *et al.* Klotho-derived peptide 6 ameliorates diabetic kidney disease by targeting Wnt/beta-catenin signaling. *Kidney International* 2022;102(3):506-520

Agents: KP6 **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Mice; **Strain:** CD-1; SAU; **Pump:** Not Stated; **Duration:** 8 weeks;

ALZET Comments: Dose: KP6 (1 mg/kg per day); Controls received mp w/ vehicle; animal info: Male mice; mice; Male db/db and db/m mice; pump replaced after 4 weeks Klothoderived peptide 6 aka (KP6); peptides; diabetes;

Q10420: S. Canovas Nunes, *et al.* Validation of a small molecule inhibitor of PDE6D-RAS interaction with favorable anti-leukemic effects. *Blood Cancer Journal* 2022;12(4):64

Agents: DW0254 **Vehicle:** DMSO; Ethanol; **Route:** SC; **Species:** Mice; **Strain:** NBSGW; DW0254; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Dose: (500 mg/ml); 50% DMSO and 15% Ethanol vehicle used; Controls received mp w/ vehicle; animal info: mice; is a small molecule RAC inhibitor; pumps replaced after one week; cancer (lymphoblastic leukemia)

Q10503: M. D. Campbell, *et al.* Elamipretide effects on the skeletal muscle phosphoproteome in aged female mice. *Geroscience* 2022;44(6):2913-2924

Agents: Elamipretide **Vehicle:** Saline, sterile, isotonic; **Route:** SC; **Species:** Mice; **Strain:** C57BL/6; **Pump:** 1004; **Duration:** 8 w

ALZET Comments: Dose (3 mg/kg/day); animal info (Female; Mice; 6-7 and 28-29 months old); post op. care: IP injection of meloxicam; pumps replaced every 4 weeks; peptides; wound clips used; aging; good methods (see page 2)

Q10742: Y. Zuchowski, *et al.* Cardiometabolic Consequences of Maternal Hyperandrogenemia in Male Offspring. *Physiological Reports* 2021;9(14):e14941

Agents: Angiotensin II **Vehicle:** Saline; **Route:** Not Stated; **Species:** Rat; **Strain:** Sprague–Dawley; **Pump:** 1002; **Duration:** 27 d

ALZET Comments: Dose: Ang II (50 ng/kg/min); (200 ng/kg/min); Controls received mp w/ vehicle; animal info: Female (SD) rats were obtained at 3 weeks of age; pumps replaced to deliver higher dose of Ang II; cardiovascular; polycystic ovary syndrome



Q10878: J. Zhang, *et al.* ADORA(1)-Driven Brain-Sympathetic Neuro-Adipose Connections Control Body Weight and Adipose Lipid Metabolism. *Molecular Psychiatry* 2021;26(7):2805-2819

Agents: Adenosine; N-cyclopentyl- **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Strain:** wild-type C57/BL6J; **Pump:** 2ML4; **Duration:** 8 weeks;

ALZET Comments: Dose: (7.5µg/h); Controls received mp w/ vehicle; animal info: Male, female, 6–8 weeks of age; behavioral testing: open field test; pumps replaced once in middle of experiments; obesity

Q10859: C. M. Yuede, *et al.* Pimavanserin, a 5HT(2A) Receptor Inverse Agonist, Rapidly Suppresses Abeta Production and Related Pathology in a Mouse Model of Alzheimer's Disease. *Journal of Neurochemistry* 2021;156(5):658-673

Agents: Pimavanserin **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Strain:** APP/PS1; **Pump:** 2006; **Duration:** Not Stated;

ALZET Comments: Dose: (3 mg/kg/day); Controls received mp w/ vehicle; animal info: 6 months of age, hemizygous male and female mice; pumps replaced every 2.5–5 weeks, alternating location on either side of back; half-life (p.660); Pimavanserin is a 5HT2A receptor inverse agonist; neurodegenerative (Alzheimer's disease);

Q10286: E. A. L. Wozniak, *et al.* Cholecystokinin 1 receptor activation restores normal mTORC1 signaling and is protective to Purkinje cells of SCA mice. *Cell Reports* 2021;37(2):109831

Agents: A71623 **Vehicle:** PBS; **Route:** IP; **Species:** Mice; **Strain:** ATXN1[30Q]D776;Cck-/-; **Pump:** 1004; **Duration:** 30 weeks;

ALZET Comments: Dose (0.02mg/kg/day); animal info (6 weeks old, ~20g or larger); behavioral testing (tested on a rotarod apparatus, beam walk); pumps replaced every 7 weeks; Cck1 receptor agonist aka A71623; neurodegenerative (Spinocerebellar ataxia);

Q9957: T. Wakamatsu, *et al.* Type I Angiotensin II Receptor Blockade Reduces Uremia-Induced Deterioration of Bone Material Properties. *Journal of Bone & Mineral Research* 2021;36(1):67-79

Agents: Olmesartan, Hydralazine Hydrochloride **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Strain:** Not Stated; **Pump:** 2ML2; **Duration:** 6 weeks;

ALZET Comments: Dose (Olmesartan- 3 mg/kg/day or Hydralazine Hydrochloride- 10 mg/kg/day); Controls received mp w/ vehicle; animal info (); pumps replaced every 2 weeks; long-term study; Blood pressure measured via Tail Cuff Method ;dependence;

Q9517: P. S. van Nieuwenhuijzen, *et al.* Targeting GABAC Receptors Improves Post-Stroke Motor Recovery. *Brain Sciences* 2021;11(3):

Agents: L655,708; (R)-4-ACPBPA; (S)-4-ACPBPA **Vehicle:** DMSO; Saline; **Route:** Not Stated; **Species:** Mice; **Strain:** C57BL/6J; **Pump:** 1002; **Duration:** 4 weeks;

ALZET Comments: Dose (200 ug/kg/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (male mice, 2-3 months old, 27-30 g); behavioral testing (Grid-Walking test; Cylinder task); pumps replaced every 2 weeks; ischemia

Q10712: T. Utsunomiya, *et al.* Different Effects of Intramedullary Injection of Mesenchymal Stem Cells During the Acute vs. Chronic Inflammatory Phase on Bone Healing in the Murine Continuous Polyethylene Particle Infusion Model. *Frontiers in Cell and Developmental Biology* 2021;9(631063

Agents: Polyethylene particles, contaminated **Vehicle:** BSA; PBS; **Route:** SC; **Species:** Mice; **Strain:** BALB/c; **Pump:** 2006; **Duration:** 6 weeks;

ALZET Comments: Dose: 3.1×10^{10} particles/ml; 10% BSA/PBS vehicle used; Controls received mp w/ vehicle; animal info: 11–12-week-old male mice; post op. care: (0.1 mg/kg of buprenorphine); Contaminated polyethylene particles aka (cPE)d; vinyl catheter used; pumps replaced every 3 weeks; immunology (chronic inflammation, bone healing)

Q9505: T. Troiano, *et al.* Inhibition of NOX1 mitigates blood pressure increases in elastin insufficiency. *American Physiological Society* 2021;

Agents: Apocynin **Vehicle:** DMSO; **Route:** SC; **Species:** Mice; **Strain:** Eln+/+; Eln+/-; **Pump:** 1004; **Duration:** 56 days;

ALZET Comments: Dose (3 mg/kg/day); 50% DMSO used; Controls received mp w/ vehicle; animal info Male (4–6 wk of age, mice); functionality of mp verified by volume of solution; pumps replaced every 28 days; Blood pressure measured via angiocatheter; cardiovascular;



- Q10053:** J. Pajarinen, *et al.* Interleukin-4 repairs wear particle induced osteolysis by modulating macrophage polarization and bone turnover. *Journal of Biomedical Material Research Part A* 2021;109(8):1512-1520
Agents: Polyethylene, ultra high molecular mass weight; Interleukin-4, mouse recombinant **Vehicle:** BSA; PBS; **Route:** SC;
Species: Mice; **Strain:** BALB/cByJ; **Pump:** 2006; **Duration:** 8 weeks;
ALZET Comments: Dose (15 mg/ml ultra high molecular mass weight polyethylene; 10 ug/ml Interleukin-4); 1% BSA-PBS used; Controls received mp w/ vehicle; animal info (male 10-12 weeks); post op. care (buprenorphine); functionality of mp verified by residual volume; pumps replaced every 4 weeks; ultra high molecular mass weight polyethylene aka UHMWPE; mouse recombinant interleukin-4 aka IL-4; dependence;
- Q10620:** A. Nakano, *et al.* Intrathecal Infusion of Diosgenin during the Chronic Phase of Spinal Cord Injury Ameliorates Motor Function and Axonal Density. *Neurochemical Journal* 2021;15(4):454-461
Agents: Diosgenin **Vehicle:** CSF, artificial; **Route:** CSF/CNS (intrathecal); **Species:** Mice **Strain:** ddY **Pump:** 1004 **Duration:** 56 d
ALZET Comments: Dose: (0.1 µM); 0.1% ethanol vehicle used; Controls received mp w/ vehicle; animal info: Eight-week-old female; post op. care: During and after surgery, the mice were placed on a heating pad to maintain their body temperature; behavioral testing: Climbing performance; spinal cord injury; mouse intrathecal catheter used; pumps replaced after 28 days
- Q10254:** T. Masaki, *et al.* GIP_HUMAN[22-51] is a new proatherogenic peptide identified by native plasma peptidomics. *Scientific Reports* 2021;11(1):14470
Agents: Glucose-dependent insulinotropic polypeptide; Glucose-dependent insulinotropic polypeptide neutralising antibody
Vehicle: Saline; **Route:** SC; **Species:** Mice; **Strain:** ApoE; **Pump:** 1002; **Duration:** 4 weeks;
ALZET Comments: Dose: (0.6 nmol/kg/h) or (1.4 µg/kg/h); Controls received mp w/ vehicle; animal info: , 17 weeks of age, pumps replaced after 2 weeks; Glucose-dependent insulinotropic polypeptide aka (GIP)
- Q9358:** S. Maeda, *et al.* Notch signaling-modified mesenchymal stem cells improve tissue perfusion by induction of arteriogenesis in a rat hindlimb ischemia model. *Scientific Reports* 2021;11(1):2543
Agents: Cyclosporin **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Strain:** Sprague–Dawley; **Pump:** Not Stated; **Duration:** 28 d
ALZET Comments: Dose (10 mg/kg/day); animal info (Female rats, 10 weeks old); pumps replaced every 2 weeks; ischemia (rat hindlimb ischemia model);
- Q10222:** S. Kumar, *et al.* Neuroprotection of the Inner Retina Also Prevents Secondary Outer Retinal Pathology in a Mouse Model of Glaucoma. *Investigative Ophthalmology & Visual Science*, 2021;62(9):35
Agents: Meclofenamic Acid **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Strain:** C57BL/6; WT; **Pump:** 2004;
Duration: Not Stated;
ALZET Comments: Dose: (20 mg/kg/day); Controls received mp w/ no vehicle; animal info: mice and on connexin 36 knock-out mice; pumps replaced at 4 weeks; Meclofenamic acid aka (MFA); neurodegenerative (Glaucoma);
- Q10386:** L. Huang, *et al.* YK-4-279 Attenuates Progression of Pre-Existing Pigmented Lesions to Nodular Melanoma in a Mouse Model. *Cancers (Basel)* 2021;14(1):
Agents: YK-4-279 **Vehicle:** DMSO; **Route:** IP; **Species:** Mice; **Strain:** Not Stated; **Pump:** 1004; **Duration:** Not Stated;
ALZET Comments: Dose (1.6 mg/kg; 8 mg/kg); dose-response (see p. 3); Controls received mp w/ vehicle; half-life (p.3); pumps replaced after 28/29 days; cancer (Melanoma); Therapeutic indication (Melanoma);
- Q9228:** N. D. Fried, *et al.* Angiotensin II type 1 receptor mediates pulmonary hypertension and right ventricular remodeling induced by inhaled nicotine. *American Journal of Physiology Heart Circulatory Physiology* 2021;320(4):H1526-H1534
Agents: Losartan **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Strain:** C57BL6/J; **Pump:** 1004; **Duration:** 8 weeks;
ALZET Comments: Dose (6.5, 5.0 mg/kg/day); Controls received mp w/ vehicle; animal info (Adult, male mice, 8 to 12 weeks old, 23 to 30 g); post op. care (buprenorphine); pumps replaced every 4 weeks; cardiovascular;



Q10143: K. E. Chen, *et al.* Prolactin enhances T regulatory cell promotion of breast cancer through the long form prolactin receptor. *Translational Oncology* 2021;14(11):101195

Agents: SMO; LFPRLR SMO, mice; LFPRLR SMO, human **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Mice;

Strain: Foxp3+EGFP Balb/c or NOD-SCID; **Pump:** 2004; **Duration:** 28 days;

ALZET Comments: Dose: (100 pmoles/h); Controls received mp w/ vehicle; animal info:8-week old mice; pumps replaced (as needed); SMO aka splice modulating oligomer; LFPRLR aka long form prolactin receptor; cancer (Breast cancer);

Q9169: S. L. Burke, *et al.* Role of Mineralocorticoid and Angiotensin Type 1 Receptors in the Paraventricular Nucleus in Angiotensin-Induced Hypertension. *Frontiers in Physiology* 2021;12(640373)

Agents: Angiotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Rabbit; **Strain:** Not Stated; **Pump:** 2ML4; **Duration:** 12 weeks;

ALZET Comments: Dose (24 ng/kg/min); 0.9% NaCl used; Controls received mp w/ vehicle; animal info (male New Zealand White rabbits, 2.3-3.1 kg); pumps replaced every 4 weeks; cardiovascular;

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; **Strain:** Not Stated; **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);

Q10355: H. Arnould, *et al.* Loss of prion protein control of glucose metabolism promotes neurodegeneration in model of prion diseases. *PLoS Pathogens* 2021;17(10):e1009991

Agents: DCA **Vehicle:** DMEM; PIPES; HEPES; **Route:** IP; **Species:** Mice; **Strain:** Not Stated; **Pump:** Not Stated;

Duration: Not Stated;

ALZET Comments: Dose (100 mg/kg/day); animal info (8 weeks old; Male; Inoculated intracerebrally with 20 ul of sample containing cell extracts); pumps replaced every 3 weeks; neurodegenerative (Prion diseases); Therapeutic indication (Prion diseases);