



**Recent References (2017-2019) on the Intracerebroventricular Administration of Agents
Using ALZET® Osmotic Pumps**

Q6949: T. Zera, *et al.* Microglia and brain angiotensin type 1 receptors are involved in desensitising baroreflex by intracerebroventricular hypertonic saline in male Sprague-Dawley rats. *Autonomic Neuroscience: Basic and Clinical* 2019;217(49-57

Agents: Minocycline, Losartan **Vehicle:** Saline, iso-osmotic, Saline, hyperosmotic; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2ML2; **Duration:** 2 weeks;

ALZET Comments: Dose (Minocycline-5 µg/h; Losartan- 12.5 µg/h); 0.9% isosmotic saline with minocycline, 5% Hyperosmotic saline with Losartan used; animal info (Normotensive adult male Sprague-Dawley rats); enzyme inhibitor (microglia); ALZET brain infusion kit 2 used; Brain coordinates (1.2mm posterior to bregma, -1.8mm laterolateral from sagittal suture, diameter 0.5 mm) bilateral cannula used; cyanoacrylate adhesive; cardiovascular;

Q7039: X. Yu, *et al.* Synergistic antitumor effects of 9.2.27-PE38KDEL and ABT-737 in primary and metastatic brain tumors. *PLoS One* 2019;14(1):e0210608

Agents: 9.2.27-PE38KDEL immunotoxin, ABT-737 **Vehicle:** PBS, captisol, mouse serum albumin; **Route:** CSF/CNS; **Species:** Mice (nude); **Pump:** 1007D; **Duration:** 3 days;

ALZET Comments: 5% Captisol and 2% mouse serum albumin used; animal info (Nude mice (22–30 g, 6–8 weeks); ALZET brain infusion kit 3 used; cancer (glioblastoma); “Convection-enhanced delivery (CED), utilizing osmotic pumps, has been successfully used to bypass the blood-brain barrier and to deliver ITs directly into brain tumors” pg.12 ;

Q7632: C. Tang, *et al.* Neural Stem Cells Behave as a Functional Niche for the Maturation of Newborn Neurons through the Secretion of PTN. *Neuron* 2019;101(1):32-44 e6

Agents: Pleiotrophin **Vehicle:** PBS, Dulbecco's; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

ALZET Comments: Dose (1ug/100ul); Controls received mp w/ vehicle; animal info (8-12 week old male and female mice); Pleiotrophin (PTN) aka NSC-secreted factor; Brain coordinates (2.0 mm posterior to bregma, 1.7 mm lateral to the midline, and 2.0 mm below dura.); neurogenerative (neuron maturation);

Q7669: I. C. Stancu, *et al.* Aggregated Tau activates NLRP3-ASC inflammasome exacerbating exogenously seeded and non-exogenously seeded Tau pathology in vivo. *Acta Neuropathologica* 2019;137(4):599-617

Agents: MCC950 **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2006; **Duration:** 6 weeks;

ALZET Comments: Dose (0.15 ul/h); Controls received mp w/ vehicle; enzyme inhibitor (inflammasome inhibitor); ALZET brain infusion kit 3 used; Brain coordinates (A/P, - 0.5; L, - 1.1; relative to bregma); bilateral cannula used; cyanoacrylate adhesive; neurodegenerative (Alzheimer's Disease);

Q7420: A. M. Schiller, *et al.* Increased Brain-Derived Neurotrophic Factor in Lumbar Dorsal Root Ganglia Contributes to the Enhanced Exercise Pressor Reflex in Heart Failure. *Int J Mol Sci* 2019;20(6):

Agents: Brain-derived neurotrophic factor, Anti- **Vehicle:** Vehicle not stated; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1007D; **Duration:** 1 Week;

ALZET Comments: Dose (10 µg/mL); Controls received mp w/ vehicle; animal info (male Sprague-Dawley rats weighing 420 to 510 g); post op. care (Betadine, buprenorphine); cardiovascular;

R0384: A. A. Pieper, *et al.* Benefits of Enhancing Nicotinamide Adenine Dinucleotide Levels in Damaged or Diseased Nerve Cells. *Cold Spring Harbor Symposia on Quantitative Biology* 2019;

Agents: Uridine, bromodeoxy-; aminopropylcarbazole **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not stated; **Duration:** 1 week;

ALZET Comments: neurodegenerative (missing NPAS3 impaired hippocampal neurogenesis); Therapeutic indication (Missing NPAS1 enhanced hippocampal neurogenesis);

Q6955: A. Ortiz-Matamoros, *et al.* Differential Changes in the Number and Morphology of the New Neurons after Chronic Infusion of Wnt7a, Wnt5a, and Dkk-1 in the Adult Hippocampus In Vivo. *Anat Rec (Hoboken)* 2019;

Agents: Wnt7a, Wnt5a, Dkk-1 **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2004; **Duration:** 11 days;



ALZET Comments: Dose (0.25 μ L/hr); animal info (Male Wistar rats; 250–300 g, 3-months-old); Wnt7a and Wnt5a are Wnt agonists, and Dkk-1 is a Wnt antagonist; Brain coordinates (AP –3.6, L –3.1, and V + 2.0,); bilateral cannula used (3.5 mm long bilateral cannula made with silicate capillaries); neurodegenerative ();

Q7606: T. Okamoto, *et al.* Microbiome potentiates endurance exercise through intestinal acetate production. American Journal of Physiology Endocrinology and Metabolism 2019;316(5):E956-E966

Agents: Acetate; Butyrate **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Dose (1 μ L/h); Controls received mp w/ vehicle; animal info (Male, 10 week old, C57BL/6J); dependence;

Q7607: M. Okada, *et al.* Effects of acute and sub-chronic administrations of guanfacine on catecholaminergic transmissions in the orbitofrontal cortex. Neuropharmacology 2019;156(Agents: Guanfacine **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (0.12 mg/kg/day); animal info (Male, Sprague Dawley, 7 weeks old); neurodegenerative (ADHD);

Q7610: T. Odaira, *et al.* Mechanisms underpinning AMP-activated protein kinase-related effects on behavior and hippocampal neurogenesis in an animal model of depression. Neuropharmacology 2019;150(121-133

Agents: Peptide, zeta-inhibitor **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: Dose (5 μ g/12 μ L/day); animal info (6- weeks old, 26-28 g); behavioral testing (Forced Swim Test, Tail-Suspension Test); ZIP aka zeta-inhibitory peptide; enzyme inhibitor (zeta-inhibitor); ALZET brain infusion kit 3 used; Brain coordinates (1.00 L, 0.22 P, 3.00 to bregma); bilateral cannula used; cyanoacrylate adhesive; dependence;

Q8275: A. K. Mahato, *et al.* 2019;

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

ALZET Comments: Dose (BT13- 3-6 μ g/day, GDNF-3 μ g/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);

Q8260: Y. T. Liu, *et al.* Effects of porcine brain hydrolysate on impairment of cognitive learning ability in amyloid beta(1-40)-infused rats. Anim Sci J 2019;90(2):271-279

Agents: Amyloid B (1-40) **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2004; **Duration:** 4 weeks;

ALZET Comments: Dose (10, 50, or 100 mg/kg/day); Controls received mp w/ vehicle; animal info (Male, Wistar, 8 weeks old, 200-300g); behavioral testing (Morris Water Maze Test, Spatial Memory Test, Working Memory Test); Alpha B (1-40) aka AB; peptides; ALZET brain infusion kit 3 used; Brain coordinates (relative to bregma; 0.8 mm posterior, 1.4 mm lateral); dental cement used; neurodegenerative (Alzheimer's Disease);

Q8264: P. Liu, *et al.* Protein kinase C is involved in the neuroprotective effect of berberine against intrastriatal injection of quinolinic acid-induced biochemical alteration in mice. J Cell Mol Med 2019;23(9):6343-6354

Agents: Pan-PKC inhibitor **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

ALZET Comments: "Dose (0.11 μ L/hr); animal info (Male, 2 months old, 22-25 g, KM); Pan-PKC inhibitor aka Go6983; enzyme inhibitor (PKC inhibitor); ALZET brain infusion kit 2 used; Brain coordinates (0.5 mm posterior to bregma, 3 mm below the surface of the cranium); neurodegenerative (Motor and cognitive deficit); "

Q8252: O. Leiter, *et al.* Exercise-Induced Activated Platelets Increase Adult Hippocampal Precursor Proliferation and Promote Neuronal Differentiation. Stem Cell Reports 2019;12(4):667-679

Agents: Platelet factor 4 **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (100 ng/mL); 0.9% Saline used; Controls received mp w/ vehicle; animal info (8 weeks old, C57BL/6JRj, Female); Platelet factor 4 aka PF4; Brain coordinates (relative to bregma: anterior-posterior -1.3 mm; mediallateral +1.0 mm; ventral-dorsal -2.2 mm); bilateral cannula used; neurodegenerative (Adult neurogenesis);



Q8251: M. L. Lehmann, *et al.* The Behavioral Sequelae of Social Defeat Require Microglia and Are Driven by Oxidative Stress in Mice. *J Neurosci* 2019;39(28):5594-5605

Agents: N-acetyl-L-cysteine **Vehicle:** Artificial Cerebrospinal Fluid; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Dose (0.5 ul/hr); Controls received mp w/ vehicle; animal info (8-10 weeks old, Male, C57BL/6N, Cx2cr1 wt/gfp); N-acetyl-L-cysteine aka NAC; ALZET brain infusion kit 3 used; Brain coordinates (0.1 mm caudal to bregma, 1.0 mm lateral to the midline, and 2.4 mm below the skull); bilateral cannula used; cyanoacrylate adhesive; neurodegenerative (Chronic Social Defeat);

Q8244: J. H. Lee, *et al.* Transgenic expression of a ratiometric autophagy probe specifically in neurons enables the interrogation of brain autophagy in vivo. *Autophagy* 2019;15(3):543-557

Agents: Chloroquine, Pan-MTOR inhibitor-21 mg/ml, or leupeptin **Vehicle:** Dimethyl sulfoxide; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1007D; **Duration:** 5 days (Pan-MTOR inhibitor) or 7 days (leupeptin);

ALZET Comments: Dose (Chloroquine-5 mg/kg/day, Pan-MTOR inhibitor-50 mg/kg/day, or leupeptin-4 mg/kg/day); 4% DMSO used; animal info (TRGL6, 4 months old); Pan-MTOR inhibitor aka AZD8055, leupeptin aka cysteine protease inhibitor; enzyme inhibitor (Cysteine protease inhibitor); Brain coordinates (lateral ventricle: AP – 0.3mm to bregma, ML 1.0mm to bregma, and DV 2.5 mm to cranium); neurodegenerative (Autophagy-Lysosome Pathway);

Q8240: T. A. Lanz, *et al.* Postmortem transcriptional profiling reveals widespread increase in inflammation in schizophrenia: a comparison of prefrontal cortex, striatum, and hippocampus among matched tetrads of controls with subjects diagnosed with schizophrenia, bipolar or major depressive disorder. *Transl Psychiatry* 2019;9(1):151

Agents: Haloperidol or Risperidone **Vehicle:** Acetic Acid; **Route:** CSF/CNS; **Species:** Rat; **Pump:** Not stated; **Duration:** 21 days;

ALZET Comments: Dose (haloperidol-0.25 mg/kg/day or risperidone-5 mg/kg/day); 1% Acetic Acid used; Controls received mp w/ vehicle; animal info (2 months old, Sprague Dawley, Male); neurodegenerative (Psychiatric Disorder);

Q8239: D. Lana, *et al.* Microglial distribution, branching, and clearance activity in aged rat hippocampus are affected by astrocyte meshwork integrity: evidence of a novel cell-cell interglial interaction. *FASEB J* 2019;33(3):4007-4020

Agents: Lipopolysaccharide **Vehicle:** Artificial Cerebrospinal Fluid; **Route:** CSF/CNS; **Species:** Rat; **Pump:** Not stated; **Duration:** 4 weeks;

ALZET Comments: "Dose (1.6 ug/mL); Controls received mp w/ vehicle; animal info (Male, Wistar, 3-22 week sold); Lipopolysaccharide aka LPS; Brain coordinates (on midline: 22.5 mm posterior to the lambda, 7 mm ventral to the dura); bilateral cannula used; neurodegenerative (Microglia Dysregulation); "

Q8233: Y. V. Kucheryavykh, *et al.* Targeted Delivery of Nanoparticulate Cytochrome C into Glioma Cells Through the Proton-Coupled Folate Transporter. *Biomolecules* 2019;9(4):

Agents: Folic acid-conjugated cytochrome c-containing nanoparticles **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2004; **Duration:** 14 days;

ALZET Comments: Dose (100 mg/mL); Controls received mp w/ vehicle; animal info (C57BL/6, 12-16 weeks old); Folic acid-conjugated cytochrome c-containing nanoparticles aka FA-CytC NPs; ALZET brain infusion kit 3 used; Brain coordinates (2 mm lateral, 1 mm caudal and 3 mm ventral a small burr hole); cancer (Glioma);

Q8226: M. Kongstorp, *et al.* High Accumulation of Methadone Compared with Buprenorphine in Fetal Rat Brain after Maternal Exposure. *J Pharmacol Exp Ther* 2019;371(1):130-137

Agents: Methadone or Buprenorphine **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2ML4; **Duration:** 28 days;

ALZET Comments: Dose (Buprenorphine- 1 mg/kg/day or); Controls received mp w/ vehicle; animal info (Female); post op. care (Metacam); dependence;

Q8041: P. Hundehage, *et al.* The next-generation sphingosine-1 receptor modulator BAF312 (siponimod) improves cortical network functionality in focal autoimmune encephalomyelitis. *Neural Regen Res* 2019;14(11):1950-1960

Agents: Sphingosine-1 receptor modulator **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not stated; **Duration:** Not stated;



ALZET Comments: Dose (0.3 or 1 ug/day); Controls received mp w/ vehicle; Sphingosine-1 receptor modulator aka BAF312 ; neurodegenerative (Multiple Sclerosis);

Q7530: R. J. Henry, *et al.* Inhibition of miR-155 Limits Neuroinflammation and Improves Functional Recovery After Experimental Traumatic Brain Injury in Mice. *Neurotherapeutics* 2019;16(1):216-230

Agents: miR-155 antagomir **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004D; **Duration:** 7 days;

ALZET Comments: Dose (0.5 nmol/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (C57Bl/6J, Male, 10-12 weeks old); behavioral testing (Motor function test); miR-155 antagomir aka micro-RNA hairpin inhibitor ; enzyme inhibitor (miR-155 hairpin inhibitor); ALZET brain infusion kit 3 used; neurodegenerative ();

Q7524: R. B. S. Harris. Low-dose infusions of leptin into the nucleus of the solitary tract increase sensitivity to third ventricle leptin. *American Journal of Physiology Endocrinology and Metabolism* 2019;316(5):E719-E728

Agents: Leptin **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1004; **Duration:** 14 days;

ALZET Comments: Dose (5, 10 ng/day); 0.9% saline used; animal info (Male, Sprague-Dawley, 275-300 g); bilateral cannula used; dependence;

Q5927: E. C. Gunther, *et al.* Rescue of Transgenic Alzheimer's Pathophysiology by Polymeric Cellular Prion Protein Antagonists. *Cell Reports* 2019;26(1):145-158 e8

Agents: Ceftazidime **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Mice (transgenic); **Pump:** 1004; **Duration:** 4 weeks;

ALZET Comments: Dose (100 mg/kg); Controls received mp w/ vehicle; animal info (aged APP/PS1 mice, 12-14 months of age); behavioral testing (Morris water maze); Ceftazidime aka Fortaz; ALZET brain infusion kit 2 used;

Q8006: M. J. Gerald, *et al.* Continuous infusion of an agonist of the tumor necrosis factor receptor 2 in the spinal cord improves recovery after traumatic contusive injury. *CNS Neurosci Ther* 2019;25(8):884-893

Agents: EHD2-sc-mTNFR2 **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004, 1002, 1003D; **Duration:** 28 days, 14 days, or 3 days;

ALZET Comments: Dose (10 mg/ml- 28 days, 4.4 mg/ml-14 days, 1.1 mg/ml-3 days); animal info (Adult, Female, C57Bl/6, 3 months old); post op. care (buprenorphine); Agonistic specific for TNFR2 aka EHD2-sc-mTNFR2 ; ALZET brain infusion kit 3 used; bilateral cannula used; spinal cord injury;

R0381: L. R. Galieva, *et al.* Therapeutic Potential of Extracellular Vesicles for the Treatment of Nerve Disorders. *Front Neurosci* 2019;13(163)

Agents: Extracellular vesicles, primary neuron culture-derived- **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

ALZET Comments: Dose (2mg total protein of EVs/ml); neurodegenerative (Alzheimer's);

Q8001: E. Gabande-Rodriguez, *et al.* Lipid-induced lysosomal damage after demyelination corrupts microglia protective function in lysosomal storage disorders. *EMBO J* 2019;38(2):

Agents: Ca074Me **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** 1 month;

ALZET Comments: Dose (1 mg/ml); 0.9% Saline used; Controls received mp w/ vehicle; animal info (ASMko, 2 months old); behavioral testing (Rotarod Test); CathB inhibitor aka Ca074Me; enzyme inhibitor (Cath B inhibitor); ALZET brain infusion kit 3 used; Brain coordinates (AP, -0.5 mm; ML, 1 mm; and DV, -2.2 mm); dependence;

Q7638: J. Enriquez Perez, *et al.* The effect of locally delivered cisplatin is dependent on an intact immune function in an experimental glioma model. *Sci Rep* 2019;9(1):5632

Agents: Cisplatin **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1003D; **Duration:** 3 days;

ALZET Comments: Dose (1080, 120, or 12 ug/kg/day); 0.9% Saline used; animal info (C57BL/6, NSG, 8-10 weeks old, 18-21 weeks old); ALZET brain infusion kit 3 used; cyanoacrylate adhesive; cancer (Glioma);

Q8022: L. M. Cher, *et al.* Biomarkers and smart intracranial devices for the diagnosis, treatment, and monitoring of high-grade gliomas: a review of the literature and future prospects. *Neuro-Oncology Advances* 2019;1(1):

Agents: Bortezomib **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Not stated; **Pump:** Not stated; **Duration:** Not stated;



ALZET Comments: Dose (200 ul); cancer (Glioblastoma);

Q6981: H. Chao, *et al.* Cardioplin-dependent mitophagy guides outcome after traumatic brain injury. *J Neurosci* 2019;
Agents: RNA, small interfering (cardiolipin synthase); RNA, small interfering (Phospholipid scramblase-3) **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1003D; **Duration:** 72 hours;

ALZET Comments: Dose (30 nmol); animal info (17-day-old male Sprague-Dawley rats); Brain coordinates (-0.8 mm posterior to bregma, -1.5 mm lateral to midline, and -4.6 mm ventral to the skull surface); Traumatic brain injury;

Q7737: J. A. Sandgren, *et al.* Angiotensin AT1A receptors expressed in vasopressin-producing cells of the supraoptic nucleus contribute to osmotic control of vasopressin. *American Journal of Physiology Regulatory, Integrative, and Comparable Physiology* 2018;314(6):R770-R780

Agents: Angiotensin II **Vehicle:** CSF, artificial; **Route:** CSF/CNS(lateral ventricle); **Species:** Mice; **Pump:** 1004; **Duration:** 2 weeks;

ALZET Comments: "Dose (5 or 50 ng/h); animal info (adult mice of both sexes ranging in age from 8 to 20 wk,); behavioral testing (blood pressure measured via tail-cuff); ALZET brain infusion kit 3 used; Brain coordinates (1.0 mm lateral, 0.3 mm anterior-posterior, and 2.3 mm dorsal-ventral relative to the bregma); "

Q7264: C. Rivat, *et al.* Inhibition of neuronal FLT3 receptor tyrosine kinase alleviates peripheral neuropathic pain in mice. *Nat Commun* 2018;9(1):1042

Agents: RNA, small interfering (Flt3, scrambled) **Vehicle:** Not Stated; **Route:** CSF/CNS(Intrathecal); **Species:** Mice; **Pump:** 1002; **Duration:** 6 days;

ALZET Comments: Dose (12.53 ng/ml); animal info (C57BL/6 naive mice, Flt3KO mice 25–30 g.); behavioral testing (reflexive tail flick); spinal cord injury; stress/adverse reaction: (see pg. 10);

Q7263: L. Riemann, *et al.* Transplantation of Neural Precursor Cells Attenuates Chronic Immune Environment in Cervical Spinal Cord Injury. *Front Neurol* 2018;9(428)

Agents: Platelet-Derived Growth Factor, Epidermal Growth Factor, Basic Fibroblast Growth Factor **Vehicle:** Platelet-Derived Growth Factor, Epidermal Growth Factor, Basic Fibroblast Growth Factor; **Route:** CSF/CNS(Intrathecal); **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (PDGF-AA, 1 µg/100 µL; EGF, 3 µg/100 µL; bFGF, 3 µg/100mL;); 0.1% rat serum albumin used; animal info (female Wistar rats 250 g); post op. care (moxifloxacin, buprenorphine); spinal cord injury;

Q7227: M. McMillin, *et al.* FXR-Mediated Cortical Cholesterol Accumulation Contributes to the Pathogenesis of Type A Hepatic Encephalopathy. *CMGH* 2018;6(1):47-63

Agents: Farnesoid X receptor morpholino, FXR mismatch, Cyclodextrin 2-hydroxypropyl-beta **Vehicle:** Endo-Porter solution; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: Dose (2-HbC, 6 mg/kg/day; FXR morpholino 1mg/kg; FXR mismatch 1 mg/kg); animal info (C57Bl/6 mice 25–30 g); ALZET brain infusion kit used; Brain coordinates (anteroposterior -0.34, mediolateral -1.0, and dorsoventricular -2.0);

Q8096: W. Liu, *et al.* Oxidative stress-elicited YY1 potentiates antioxidative response via enhancement of NRF2-driven transcriptional activity: A potential neuronal defensive mechanism against ischemia/reperfusion cerebral injury. *Biomed Pharmacother* 2018;108(698-706)

Agents: YY1-siRNA **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not stated; **Duration:** 4 days;

ALZET Comments: animal info (Male, C57B/6, 25-35 g); Brain coordinates (mediolateral=1.0 mm, anteroposterior=0.2 mm; dorsoventral=3.1 mm); ischemia (Cerebral);

Q8094: C. B. Liu, *et al.* Lycopene mitigates beta-amyloid induced inflammatory response and inhibits NF-kappaB signaling at the choroid plexus in early stages of Alzheimer's disease rats. *J Nutr Biochem* 2018;53(66-71)

Agents: Amyloid, beta 1-42 **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not stated; **Duration:** 21 days;



ALZET Comments: Controls received mp w/ vehicle; animal info (Male, Wistar, 250-300 g); Brain coordinates (anteroposterior 1.2 mm from Bregma, mediolateral 2.0 mm, dorsoventral 4.0 mm); cyanoacrylate adhesive; neurodegenerative (Alzheimer's Disease);

Q8087: H. Lin, *et al.* Extracellular Lactate Dehydrogenase A Release From Damaged Neurons Drives Central Nervous System Angiogenesis. *EBioMedicine* 2018;27(71-85

Agents: CD31 antibody, LHDA **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1007D; **Duration:** 1 week;

ALZET Comments: Dose (0, 10, 100 ug/kg/day-LHDA,); Controls received mp w/ vehicle; animal info (C57BL/6J); Brain coordinates (0.2 mm posterior, 2.5 mm left, and 3 mm depth from the skull surface); bilateral cannula used; cyanoacrylate adhesive; neurodegenerative (Angiogenesis);

Q7081: S. A. Jannetti, *et al.* PARP-1-Targeted Radiotherapy in Mouse Models of Glioblastoma. *J Nucl Med* 2018;59(8):1225-1233

Agents: 131I-poly(ADP-ribose) polymerase inhibitor (131I-PARPi), radio-isotope (131I) **Vehicle:** PEG 300, saline, 131I tracer; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1003D; **Duration:** 5 days;

ALZET Comments: 30% PEG-300 used; animal info (6 to 8-week-old female athymic nude CrTac:NCr-Fo mice); 131I-PARPi is an 131I-labeled poly(ADP-ribose) polymerase 1 enzyme inhibitor; ALZET brain infusion kit 3 used; Brain coordinates (2 mm lateral and 1 mm anterior to the bregma); cancer (glioblastoma);

Q7886: X. Du, *et al.* Regeneration of Cochlear Hair Cells and Hearing Recovery through Hes1 Modulation with siRNA Nanoparticles in Adult Guinea Pigs. *Mol Ther* 2018;26(5):1313-1326

Agents: siHes1, scRNA NPs **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Guinea Pig; **Pump:** 2001; **Duration:** 1 day;

ALZET Comments: Dose (1 uL/hr); animal info (200-250 g, Female); siHes1 aka Hes1 siRNA; bilateral cannula used; cyanoacrylate adhesive; dependence;

Q5585: J. Y. Choi, *et al.* K284-6111 prevents the amyloid beta-induced neuroinflammation and impairment of recognition memory through inhibition of NF-kappaB-mediated CHI3L1 expression. *J Neuroinflammation* 2018;15(1):224

Agents: Amyloid protein, beta (1-42) **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

ALZET Comments: Dose (300 pmol); animal info (8-10-week-old male imprinting control region (ICR) mice); behavioral testing (Morris water maze, probe, and passive avoidance tests); ALZET brain infusion kit 1 used; Brain coordinates (- 1.0 mm anterior/posterior, + 0.5 mm medial/lateral, and - 2.5 mm dorsal/ventral);

Q7089: F. X. Blaudin de The, *et al.* Engrailed homeoprotein blocks degeneration in adult dopaminergic neurons through LINE-1 repression. *EMBO J* 2018;37(15):

Agents: Colominic acid, RNA, small interfering (anti-Orf2p), cell-permeable peptide Penetratin-coupled siRNA **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1003D; **Duration:** 3 days;

ALZET Comments: 0.9% sodium chloride used; Dose (1.5 ug/ul- colomic acid, 5 uM- En 1/2); Controls received mp w/ vehicle; animal info (male, En1-het mice,); Brain coordinates (-3.8 mm dorso/ventral); neurodegenerative (dopaminergic neurons);

Q7172: P. Assis-Nascimento, *et al.* EphB3 signaling induces cortical endothelial cell death and disrupts the blood-brain barrier after traumatic brain injury. *Cell Death & Disease* 2018;9(1):7

Agents: EphrinB3, recomb. **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2001D; **Duration:** 24 hours;

ALZET Comments: Dose (80 ug/kg/day); post op. care (Buprenorphine (0.1 mg/kg) and saline administered post-surgery); Locite 454 cyanoacrylate adhesive; Therapeutic indication (Traumatic brain injury);

Q5932: T. Yang, *et al.* 4,4'-Diisothiocyanatostilbene-2,2'-disulfonic acid attenuates spontaneous recurrent seizures and vasogenic edema following lithium-pilocarpine induced status epilepticus. *Neurosci Lett* 2017;653(51-57

Agents: DIDS **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1007D; **Duration:** 1 week;

ALZET Comments: Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 250-300g); ALZET brain infusion kit used; DIDS aka 4,4' - diisothiocyanatostilbene-2,2' -disulfonic acid; Therapeutic indication (epilepsy); Dose (0.6 ug/day);



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

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

ALZET Comments: 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;

Q6531: C. Wang, *et al.* IL-17 induced NOTCH1 activation in oligodendrocyte progenitor cells enhances proliferation and inflammatory gene expression. *Nat Commun* 2017;8(15508)

Agents: Interleukin 17 receptor A **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Mice (knockout); **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: Controls received mp w/ decoy peptide; animal info (8-12 week old female B6.129X1-Notch1tm2Rko/GridJ, Jag1tm2Grid/J and B6.Cg-Tg BAKik/J mice); Interleukin 17 receptor A aka IL-17RA; peptides; Brain coordinates (1mm lateral, 0.3mm posterior and 2mm deep to the bregma); Therapeutic indication (multiple sclerosis);

Q5900: T. Tsuji, *et al.* Vasopressin casts light on the suprachiasmatic nucleus. *J Physiol* 2017;595(11):3497-3514

Agents: Antagonist, vasopressin V1A receptor **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2001; **Duration:** 3 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (Sprague Dawley, 250-350g); ALZET brain infusion kit 2 used; Dose (416 ng/hr);

Q5692: H. Z. Toklu, *et al.* Intracerebroventricular tempol administration in older rats reduces oxidative stress in the hypothalamus but does not change STAT3 signalling or SIRT1/AMPK pathway. *Applied Microbiology and Biotechnology* 2017;42(1):59-67

Agents: Tempol **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Rat; **Pump:** Not Stated; **Duration:** 3 weeks;

ALZET Comments: Controls received mp w/ vehicle; animal info (male, Fischer 344 x Brown Norway, 3 months or 23 months old); functionality of mp verified by ; Vehicle pumps replaced after one week; Dose (300 ug/h);

Q5691: K. W. Tian, *et al.* Role of C16, angiopoietin-1 and regeneration gene protein 2 in attenuating inflammation in an experimental rat model of autoimmune encephalomyelitis. *J Anat* 2017;230(1):30-46

Agents: Reg-2 **Vehicle:** Saline; PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (male, Lewis, adult, 250-300g); ALZET brain infusion kit used; post op. care (rats placed in temperature and humidity controlled chambers overnight for recovery; Penicillin IM 2500IU); immunology; immunology; Pumps primed overnight in room temperature saline;

Q5892: J. Tang, *et al.* A selective CB2R agonist (JWH133) restores neuronal circuit after Germinal Matrix Hemorrhage in the preterm via CX3CR1(+) microglia. *Neuropharmacology* 2017;119(157-169)

Agents: shRNA, NM_133534.1; antibody, CX3CR1 **Vehicle:** NaCl; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1003D; **Duration:** 3 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (male, Sprague Dawley, P7); ALZET brain infusion kit 3 used; ALZET brain infusion kit 3 used; Brain coordinates;

Q5956: J. Tam, *et al.* Peripheral cannabinoid-1 receptor blockade restores hypothalamic leptin signaling. *Mol Metab* 2017;6(10):1113-1125

Agents: Leptin; SHU-9119 **Vehicle:** PBS; **Route:** SC; CSF/CNS; **Species:** Mice; **Pump:** 2004; **Duration:** 12 weeks, 7 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (leptin-deficient ob/ob mice); long-term study; pumps replaced every 28 days; SHU-9119 is a MC4R antagonist; Leptin dissolved in PBS and delivered SC for 12 weeks; SHU-9119 dissolved in saline and delivered ICV for 7 days; Pumps model incorrectly listed as Model 2001D. It should be Model 2004 based on description.



- Q6498:** T. Y. Tai, *et al.* Antiepileptic action of c-Jun N-terminal kinase (JNK) inhibition in an animal model of temporal lobe epilepsy. *Neuroscience* 2017;349(35-47)
Agents: SB203580; SP600125; Lamotrigine isethionate **Vehicle:** Saline; DMSO; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2ML2; 2ML4; **Duration:** Not Stated;
ALZET Comments: Lamotrigine isethionate Dose (20 mg/kg/d); 1% DMSO used; animal info (6 week-old male Sprague Dawley); “Also, i.c.v. delivery of drugs via osmotic pump achieves steady-state drug levels without diurnal variation; avoids issues with drug blood-brain barrier permeability; avoids the animal stress that would occur with repeated drug injection or gavage; and minimizes drug amounts used.” pg. 4
- 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
Agents: Active A, recombinant **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;
ALZET Comments: 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);
- Q5974:** H. Shimaoka, *et al.* A cytokine signal inhibitor for rheumatoid arthritis enhances cancer metastasis via depletion of NK cells in an experimental lung metastasis mouse model of colon cancer. *Oncol Lett* 2017;14(3):3019-3027
Agents: Tofacitinib **Vehicle:** PEG 300; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2002; **Duration:** 6 days;
ALZET Comments: animal info (Wild-type CD1) ; Controls received mp w/vehicle; dose (15 mg/kg/day); cancer; enzyme inhibitor (JAK3)
- Q5950:** C. Quarta, *et al.* Molecular Integration of Incretin and Glucocorticoid Action Reverses Immunometabolic Dysfunction and Obesity. *Cell Metabolism* 2017;26(4):620-632 e6
Agents: Glucagon-like peptide-1, Dexamethasone **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;
ALZET Comments: Controls received mp w/ vehicle; Dose (GLP-1: 0.1 mg/24h; Dexa: 0.0219mg/ml); animal info (20 week-old male C57bl6j); post op. care (meloxicam for post-surgical pain (3 mg/kg); ALZET brain infusion kit 3 used; Brain coordinates (anteroposterior: 0.5 mm from bregma, lateral: +/-1;2 mm to bregma and dorsoventral: 2.1 mm below skull); Therapeutic indication (obesity);
- Q6340:** M. Piazza, *et al.* Simulating vasogenic brain edema using chronic VEGF infusion. *J Neurosurg* 2017;127(4):905-916
Agents: Vascular endothelial growth factor **Vehicle:** PBS; Rat serum albumin; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2001; 1007D; **Duration:** Not Stated;
ALZET Comments: Dose (2, 10, and 20 ng/hr); 0.1% rat serum albumin used; Controls received mp w/ vehicle; animal info (275-350g Male Fischer-344 rats); Brain coordinates (2.5 mm to the right of and 1 mm anterior to bregma); cyanoacrylate adhesive;
- Q5877:** D. E. Peragine, *et al.* RFamide-related peptide-3 (RFRP-3) suppresses sexual maturation in a eusocial mammal. *Proc Natl Acad Sci U S A* 2017;114(5):1207-1212
Agents: RFamide-related peptide-3 **Vehicle:** saline; **Route:** CSF/CNS; **Species:** Rat (naked mole); **Pump:** 2004; **Duration:** 4 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (13–65 mo of age; 34–58 g); ALZET brain infusion kit 3 used;
- 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
Agents: MM218 Inhibitor **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2004; **Duration:** 56 days;
ALZET Comments: 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);



Q6712: B. M. Park, *et al.* Fermented garlic extract ameliorates monocrotaline-induced pulmonary hypertension in rats. *Journal of Functional Foods* 2017;30(247-253)

Agents: Oxadiazolo quinoxalin-1-one, 1H-[1,2,4], [4,3-a] **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002;

Duration: 21 days;

ALZET Comments: Dose (2 mg/kg/day); animal info (Eight-week-old male Sprague-Dawley); 1H-[1,2,4] oxadiazolo [4,3,- a] quinoxalin-1-one aka ODQ; Brain coordinates (lateral, -3.3 mm from the bregma; posterior, 2.0 mm from the midline; ventral, -2.5 mm from dura); bilateral cannula used; cardiovascular;

Q6033: R. L. O'Hare Doig, *et al.* Specific ion channels contribute to key elements of pathology during secondary degeneration following neurotrauma. *BMC Neuroscience* 2017;18(1):62

Agents: Oxidized ATP **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 4 weeks;

ALZET Comments: Controls received mp w/ vehicle; animal info (160-200g); oxATP is a P2X7 receptor inhibitor. Therapeutic indication (Neurotrauma); Dose (1 mM);

Q6355: N. Mittal, *et al.* Beta-arrestin 1 regulation of reward-motivated behaviors and glutamatergic function. *PLoS One* 2017;12(10):e0185796

Agents: Ifenprodil tartrate **Vehicle:** Tartaric acid; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

ALZET Comments: Dose (18ng/h); 0.1% tartaric acid used; animal info (two to three months old, male and female mice from heterozygous matings); Brain coordinates (A/P: +1.1mm, M/L: +/-0.05mm, D/V:

4.5mm); bilateral cannula used; cyanoacrylate adhesive;

Q6604: D. Z. Milikovsky, *et al.* Electrocorticographic Dynamics as a Novel Biomarker in Five Models of Epileptogenesis. *J Neurosci* 2017;37(17):4450-4461

Agents: Transforming growth factor- β 1; SJN2511; Interleukin-6; Bovine serum albumin **Vehicle:** CSF; artificial; dextran;

Route: CSF/CNS; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

ALZET Comments: Dose (0.4mM BSA, 100 ng/ml (TGF)- β 1, 300 μ M SJN2511); Controls received mp w/ vehicle; animal info (2- to 3-month-old FVB/N and C57BL/6 mice); SJN2511 is a selective blocker of the TGF-B type I receptor/ALK5; Brain coordinates (0.5 mm posterior, 1 mm lateral to bregma);

Q6477: Y. F. Liang, *et al.* Hydrogen sulfide in paraventricular nucleus attenuates blood pressure by regulating oxidative stress and inflammatory cytokines in high salt-induced hypertension. *Toxicol Lett* 2017;270(62-71

Agents: GYY4137, hydroxylamine hydrochloride **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2006;

Duration: 6 weeks;

ALZET Comments: Controls received mp w/ vehicle; animal info (male Dahl rats,); post op. care (buprenorphine);

hydroxylamine hydrochloride aka HA; Brain coordinates (1.8 mm posterior to the bregma, 0.4 mm lateral to the central line, and 7.9 mm ventral to the zero level); bilateral cannula used; Cannula placement verified via histological confirmation;

Q6438: A. H. Leko, *et al.* Insulin-like growth factor I and its binding protein-3 are regulators of lactation and maternal responsiveness. *Sci Rep* 2017;7(1):3396

Agents: NBI-31772; Insulin-like growth factor I **Vehicle:** CSF, artificial; DMSO; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002;

Duration: 14 days;

ALZET Comments: Dose (48 μ g IGF-I/day; 19,92 μ g NBI-31772/day); 1% DMSO used; Controls received mp w/ vehicle; animal info (85 female Wistar rats weighing 250–300 g); post op. care (Tardomyocel® comp. III antibiotics (0.1 ml/kg body weight) was given s.c. to the animals for 5 days); enzyme inhibitor (brain IGFBP-3); ALZET brain infusion kit 2 used; Brain coordinates (antero-posterior, -0.5; lateral, 1.4; ventral, 3.6 mm);

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

Agents: Dopamine, anaerobia **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (5 month old C57Bl/6 J mice); neurodegenerative (Parkinson's disease);



Q6082: N. Kourdougli, *et al.* Depolarizing gamma-aminobutyric acid contributes to glutamatergic network rewiring in epilepsy. *Annals of Neurology* 2017;81(2):251-265

Agents: Bumetanide; Antibody, anti-pan-neurotrophin receptor p75 **Vehicle:** Ethanol; PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 3 days;

ALZET Comments: Dose (bumetanide: 86ng/24 hours, p75NTR antibody: 6.67 ug/mL); 0.3% of ethanol in 1M PBS; Controls received mp w/ vehicle or rabbit IgG; animal info (adult male Wistar rats); post op. care (0.03 mg/kg buprenorphine administered SC); ALZET brain infusion kit used; Brain coordinates (anterior/posterior, -3.8; lateral/medial, +2.5; dorsal/ventral,+3.0);

Q5674: J. Y. Kim, *et al.* PDI regulates seizure activity via NMDA receptor redox in rats. *Sci Rep* 2017;7(42491

Agents: RNA, small interfering (PDI; DTNB); bacracin; Immunoglobulin, anti-PDI; tunicamycin ; **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days, 14 days;

ALZET Comments: Controls received mp w/ vehicle or control siRNA or control IgG; animal info (male, Sprague Dawley, 7 weeks old); pumps replaced every week; ALZET brain infusion kit 1 used; behavioral testing (behavioral seizure severity); Brain coordinates;

Q6448: I. Kazanis, *et al.* Subependymal Zone-Derived Oligodendroblasts Respond to Focal Demyelination but Fail to Generate Myelin in Young and Aged Mice. *Stem Cell Reports* 2017;8(3):685-700

Agents: Arabinofuranoside, cytosine b-D- **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1007D; **Duration:** 4 days;

ALZET Comments: Controls received mp w/ vehicle; ALZET brain infusion kit 2 used; Brain coordinates (1mm lateral to bregma);

Q5049: G. Karpel-Massler, *et al.* Induction of synthetic lethality in IDH1-mutated gliomas through inhibition of Bcl-xL. *Nat Commun* 2017;8(1):1067

Agents: hydroxyglutarate, 2-R-2- **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

ALZET Comments: Dose (10mM); functionality of mp verified by adding 1% Gadolinium to the pumps and performing MRIs after removal;

Q6462: J. B. Henningsen, *et al.* Roles of RFRP-3 in the Daily and Seasonal Regulation of Reproductive Activity in Female Syrian Hamsters. *Endocrinology* 2017;158(3):652-663

Agents: RFRP-3, Syrian hamster **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Hamster; **Pump:** 2006; **Duration:** 5.5 weeks;

ALZET Comments: Dose (12 ug/d); Controls received mp w/ vehicle; animal info (Adult sexually mature female Syrian hamsters); ALZET brain infusion kit 1 used; replacement therapy (ovariectomy);

Q6141: S. He, *et al.* Sequential EMT-MET induces neuronal conversion through Sox2. *Cell Discovery* 2017;3(17017

Agents: 5C medium; IFB medium **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (Six- to eight-week-old CD-1 (ICR) male mice); ALZET brain infusion kit 2 used; Brain coordinates (2.1 mm posterior to the bregma, lateral 1.2 and 3.2 mm to the skull);

Q5854: H. L. Gao, *et al.* PVN Blockade of p44/42 MAPK Pathway Attenuates Salt-induced Hypertension through Modulating Neurotransmitters and Attenuating Oxidative Stress. *Sci Rep* 2017;7(43038

Agents: PD-98059 **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2006; **Duration:** 6 weeks;

ALZET Comments: Controls received mp w/ vehicle; animal info (8 weeks old) ; Controls received mp w/ vehicle; animal info (8 weeks old) ; Therapeutic indication (Oral drug delivery, Pharmacokinetics); Dose (.025 ug/hr);

Q5327: G. Futamura, *et al.* Evaluation of a novel sodium borocaptate-containing unnatural amino acid as a boron delivery agent for neutron capture therapy of the F98 rat glioma. *Radiat Oncol* 2017;12(1):26

Agents: Boron-10 containing sodium borocaptate, ACBC-BSH (Boron-10 derivative) **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2001D; **Duration:** 24 hours;



ALZET Comments: ALZET brain infusion kit used; comparison of IV injections vs mp; cancer (F98 glioma); brain tissue distribution; “we succeeded in achieving a high accumulation of boron in the tumors of rats in which ACBC-BSH was administered by CED, compared with ACBC-BSH administered intravenously” pg. 9 ; ACBC-BSH is a boron-10 containing sodium borocaptate derivative, 1-amino-3-fluorocyclobutane-1-carboxylic acid; Dose (1.2 mg/kg);

Q5811: L. Feng, *et al.* EphA4 may contribute to microvessel remodeling in the hippocampal CA1 and CA3 areas in a mouse model of temporal lobe epilepsy. *Mol Med Rep* 2017;15(1):37-46

Agents: unclustered ephrin A5 Fc, clustered (C) ephrin A5 Fc, antibody, IgG **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1007D; **Duration:** Not Stated;

ALZET Comments: Controls received mp w/ vehicle; animal info (C57BL/6, 5-6 weeks old) ALZET brain infusion kit 3 used; no stress “All mice survived, and no apparent behavioral discomfort was observed.” (see pg. 41); Therapeutic indication (angiogenesis, Temporal lobe epilepsy); Dose (50 ug/mL);

Q6385: X. Du, *et al.* Local GABAergic signaling within sensory ganglia controls peripheral nociceptive transmission. *J Clin Invest* 2017;127(5):1741-1756

Agents: GABA; muscimol; NO711 **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (adult male Sprague-Dawley rats weighing 180–200 g); NO711 is a GAT1 inhibitor; ALZET brain infusion kit 2 used;

Q6386: Dorfman MD, *et al.* Deletion of Protein Kinase C I in POMC Neurons Predisposes to Diet-Induced Obesity. *Diabetes* 2017;66(4):920-934

Agents: Leptin **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Rat; Mice; **Pump:** Not Stated; **Duration:** 14 days;

ALZET Comments: animal info (male Wistar rats; Eight-week-old male and female POMC-IKO and WT mice); Brain coordinates (0.8 mm posterior to bregma; 1.5 mm lateral to the sagittal suture, and 3.6 mm below the skull surface); diabetes;

Q5785: S. devos. Tau reduction prevents neuronal loss and reverses pathological tau deposition and seeding in mice with tauopathy. *Science Translational Medicine* 2017;9(374):

Agents: Oligonucleotide, antisense (Tau-specific) **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not Stated; **Duration:** 28 days, 4 weeks;

ALZET Comments: Controls received mp w/ scrambled ASO, or vehicle; animal info (PS19 mice); antisense (Tau-specific ASO-12); neurodegenerative (Alzheimer’s disease); Therapeutic indication (Alzheimer’s disease, tauopathy); Dose (30 ug/day);

Q6016: J. Clasadonte, *et al.* Connexin 43-Mediated Astroglial Metabolic Networks Contribute to the Regulation of the Sleep-Wake Cycle. *Neuron* 2017;95(6):1365-1380 e5

Agents: L-lactate, Sodium **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks;

ALZET Comments: Controls received mp w/ vehicle; animal info (8 weeks old); bilateral cannula; Therapeutic indication (Sleep); Dose (5 mM);

Q6395: K. E. Clafin, *et al.* Angiotensin AT1A receptors on leptin receptor-expressing cells control resting metabolism. *J Clin Invest* 2017;127(4):1414-1424

Agents: CSF, artificial **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** Not Stated;

ALZET Comments: animal info (C57BL/6J mice); ALZET brain infusion kit 3 used; Brain coordinates (1.1 mm lateral, 0.5 mm caudal to bregma, and 3.0 mm ventral);

Q6321: S. C. Chen, *et al.* Administration of sonic hedgehog protein induces angiogenesis and has therapeutic effects after stroke in rats. *Neuroscience* 2017;352(285-295

Agents: Sonic hedgehog protein, Cyclopamine, antibody, anti-VEGF **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;



ALZET Comments: Dose (1 mg/mL Shh, 20 µM Shh plus Cyc, 25 µg/ml Shh plus VEGF antibody); animal info (Male Sprague–Dawley rats); Cyclopamine is a sonic hedgehog protein inhibitor; Brain coordinates (bregma -0.8 mm anteroposterior, ±1.5 mm mediolateral, and -4.5 mm dorsoventral);

Q6402: K. Chen, *et al.* Sequential therapy of anti-Nogo-A antibody treatment and treadmill training leads to cumulative improvements after spinal cord injury in rats. *Experimental Neurology* 2017;292(135-144

Agents: Immunoglobulin G1, anti-Nogo-A antibody 11C7; Immunoglobulin G1, anti-cyclosporin A **Vehicle:** Not Stated;

Route: CSF/CNS; **Species:** Rat; **Pump:** 2ML2; **Duration:** 2 weeks;

ALZET Comments: animal info (female Sprague–Dawley rats weighing 200–250 g); Therapeutic indication (spinal cord injury);

Q6009: B. Changyaleket, *et al.* Heparanase promotes neuroinflammatory response during subarachnoid hemorrhage in rats. *J Neuroinflammation* 2017;14(1):137

Agents: OGT2115 **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 1003D; **Duration:** 48 hours;

ALZET Comments: Controls received mp w/ vehicle; animal info (250–300g); enzyme inhibitor (heparanase inhibitor); Dose (0.4 µM);

Q5941: A. Cebrian-Silla, *et al.* Unique Organization of the Nuclear Envelope in the Post-natal Quiescent Neural Stem Cells. *Stem Cell Reports* 2017;9(1):203–216

Agents: Ara-C **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not Stated; **Duration:** 6 days;

ALZET Comments: animal info (Wild-type CD1 mice); Ara-C is an antimetabolic agent a.k.a. cytosine-b-D-arabino-furanoside;

Q5761: S. Capsoni, *et al.* The chemokine CXCL12 mediates the anti-amyloidogenic action of painless human nerve growth factor. *Brain* 2017;140(1):201–217

Agents: Nerve growth actor, human painless **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Mice (transgenic); **Pump:** Not Stated; **Duration:** 28 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (wt and transgenic 5xFAD); neurodegenerative (Alzheimer’s disease); behavioral testing (Y-maze test); Therapeutic indication (Alzheimer’s disease); Dose (.54 µg/kg);

Q6409: S. M. Brooker, *et al.* Hippocampal bone morphogenetic protein signaling mediates behavioral effects of antidepressant treatment. *Mol Psychiatry* 2017;22(6):910–919

Agents: BMP4; Noggin **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not Stated; **Duration:** 15 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (Eight to ten week old C57Bl/6 male and female mice);

Q5968: B. K. Becker, *et al.* Central TrkB blockade attenuates ICV angiotensin II-hypertension and sympathetic nerve activity in male Sprague–Dawley rats. *Autonomic Neuroscience: Basic and Clinical* 2017;205(77–86

Agents: Angiotensin II **Vehicle:** CSF, artificial; DMSO; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 11 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (350–400g); 50% DMSO, 50% aCSF used Therapeutic indication (Hypertension);

Q6423: K. Azim, *et al.* Pharmacogenomic identification of small molecules for lineage specific manipulation of subventricular zone germinal activity. *PLoS Biol* 2017;15(3):e2000698

Agents: CHIR99021; AR-A014418 **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Not Stated; **Pump:** 1003D; **Duration:** 3 days;

ALZET Comments: Controls received mp w/ vehicle; CHIR99021 and AR-A014418 are GSK3B inhibitors; ALZET brain infusion kit 3 used; Brain coordinates (Bregma –0.5 mm; lateral 1 mm, depth: 2.5 mm);

Q5730: B. Albright, *et al.* Progressive neuronal activation accompanies epileptogenesis caused by hippocampal glutamine synthetase inhibition. *Experimental Neurology* 2017;288(122–133

Agents: Methionine sulfoximine **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2004; **Duration:** 28 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (200–250 g) ; MSO: methionine sulfoximine ; enzyme inhibitor (methionine sulfoximine); Therapeutic indication (Temporal lobe epilepsy); Dose (2.5 mg/mL);



Q5869: D. A. Adekunbi, *et al.* Role of amygdala kisspeptin in pubertal timing in female rats. PLoS One 2017;12(8):e0183596
Agents: Peptide 234 **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 14 days, 2 weeks;
ALZET Comments: animal info (21 and 100 day old rats); Peptide 234 is a kisspeptin receptor antagonist ; Bilateral cannulae used; Correct cannula placement in the MePD was confirmed by microscopic inspection of 30 μ m brain sections;
Therapeutic indication (Obesity);
Dose (2 nmol in 6 μ l/d); Brain coordinates; 2.5 mm posterior to bregma (AP), 3.2 mm lateral (ML), and 7.8 mm below the surface of the dura (DV)