



### Recent References (2016-2019) 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. *Auton Neurosci* 2019;217(49-57)  
**ALZET Comments:** Minocycline, Losartan; Saline, iso-osmotic, Saline, hyperosmotic; CSF/CNS; Rat; 2ML2; 2 weeks; 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  
**ALZET Comments:** 9.2.27-PE38KDEL immunotoxin, ABT-737; PBS, captisol, mouse serum albumin; CSF/CNS; Mice (nude); 1007D; 3 days; 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 ;.
- 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;  
**ALZET Comments:** Wnt7a, Wnt5a, Dkk-1; PBS; CSF/CNS; Rat; 2004; 11 days; Dose (0.25 µL/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 ();.
- Q5927:** E. C. Gunther, *et al.* Rescue of Transgenic Alzheimer's Pathophysiology by Polymeric Cellular Prion Protein Antagonists. *Cell Rep* 2019;26(1):145-158 e8  
**ALZET Comments:** Ceftazidime; PBS; CSF/CNS; Mice (transgenic); 1004; 4 weeks; 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;.
- Q6981:** H. Chao, *et al.* Cardiolipin-dependent mitophagy guides outcome after traumatic brain injury. *J Neurosci* 2019;  
**ALZET Comments:** RNA, small interfering (cardiolipin synthase); RNA, small interfering (Phospholipid scramblase-3); CSF/CNS; Rat; 1003D; 72 hours; 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;.
- Q7264:** C. Rivat, *et al.* Inhibition of neuronal FLT3 receptor tyrosine kinase alleviates peripheral neuropathic pain in mice. *Nat Commun* 2018;9(1):1042  
**ALZET Comments:** RNA, small interfering (Flt3, scrambled); CSF/CNS(Intrathecal); Mice; 1002; 6 days; 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)  
**ALZET Comments:** Platelet-Derived Growth Factor, Epidermal Growth Factor, Basic Fibroblast Growth Factor; Platelet-Derived Growth Factor, Epidermal Growth Factor, Basic Fibroblast Growth Factor; CSF/CNS(Intrathecal); Rat; 1007D; 7 days; Dose (PDGF-AA, 1 µg/100 µL; EGF, 3 µg/100 µL; bFGF, 3 µg/100µL); 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. *Cell Mol Gastroenterol Hepatol* 2018;6(1):47-63



**ALZET Comments:** Farnesoid X receptor morpholino, FXR mismatch, Cyclodextrin 2-hydroxypropyl-beta; Endo-Porter solution; CSF/CNS; Mice; 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);.

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

**ALZET Comments:** 131I-poly(ADP-ribose) polymerase inhibitor (131I-PARPi), radio-isotope (131I); PEG-300, saline, 131I tracer; CSF/CNS; Mice; 1003D; 5 days; 30% PEG-300 used; animal info (6 to 8-week-old female athymic nude CrTac:NCr-Fo mice); 131I-PARPi is a 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);.

**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

**ALZET Comments:** Amyloid protein, beta (1-42); Saline; CSF/CNS; Mice; 1002; 14 days; 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):

**ALZET Comments:** Colominic acid, RNA, small interfering (anti-Orf2p), cell-permeable peptide Penetratin-coupled siRNA; Saline; CSF/CNS; Mice; 1003D; 3 days; 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 Dis* 2018;9(1):7

**ALZET Comments:** EphrinB3, recomb.; PBS; CSF/CNS; Mice; 2001D; 24 hours; Dose (80 µg/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)

**ALZET Comments:** DIDS; Saline; CSF/CNS; Rat; 1007D; 1 week; 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

**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 Aβ1–42 that is easy to aggregate in osmotic pump and line to cerebral ventricle, Aβ1–40 and AICl3 were used and enabled to aggregate in cerebral ventricle." pg 3;.

**Q5714:** W. Xu, *et al.* Myelin Basic Protein Regulates Primitive and Definitive Neural Stem Cell Proliferation from the Adult Spinal Cord. *Stem Cells* 2017;35(2):485-496

**ALZET Comments:** Ganciclovir; CSF/CNS; Mice; 1007D; 5 days; animal info (GFAP-TK); spinal cord injury;.

**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)



**ALZET Comments:** Interleukin 17 receptor A; CSF, artificial; CSF/CNS; Mice (knockout); 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

**ALZET Comments:** Antagonist, vasopressin V1A receptor; CSF, artificial; CSF/CNS; Rat; 2001; 3 days; 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. *Appl Physiol Nutr Metab* 2017;42(1):59-67

**ALZET Comments:** Tempol; CSF, artificial; CSF/CNS; Rat; 3 weeks; 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

**ALZET Comments:** Reg-2; Saline; PBS; CSF/CNS; Rat; 2002; 14 days; 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

**ALZET Comments:** shRNA, NM\_133534.1; antibody, CX3CR1; NaCl; CSF/CNS; Rat; 1003D; 3 days; 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

**ALZET Comments:** Leptin; SHU-9119; PBS; SC; CSF/CNS; Mice; 2004; 12 weeks, 7 days; 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

**ALZET Comments:** SB203580; SP600125; Lamotrigine isethionate; Saline; DMSO; CSF/CNS; Rat; 2ML2; 2ML4; 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

**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);.

**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



**ALZET Comments:** Tofacitinib; PEG 300; CSF/CNS; Mice; 2002; 6 days; animal info (Wild-type CD1) ; Controls received mp w/vehicle; dose (15 mg/kg/day); cancer; enzyme inhibitor (JAK3).

**Q5885:** R. L. Reeve, *et al.* Quiescent Oct4(+) Neural Stem Cells (NSCs) Repopulate Ablated Glial Fibrillary Acidic Protein(+) NSCs in the Adult Mouse Brain. *Stem Cells* 2017;35(9):2071-2082

**ALZET Comments:** Ara-C; ganciclovir; CSF/CNS; Mice; 1007D; 3 days; 7 days; 14 days; animal info (Oct4 CKO;tk);.

**Q5950:** C. Quarta, *et al.* Molecular Integration of Incretin and Glucocorticoid Action Reverses Immunometabolic Dysfunction and Obesity. *Cell Metab* 2017;26(4):620-632 e6

**ALZET Comments:** Glucagon-like peptide-1, Dexamethasone; Saline; CSF/CNS; Mice; 1002; 14 days; Controls received mp w/ vehicle; Dose (GLP-1: 0.1 mg/24h; Dexamethasone: 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

**ALZET Comments:** Vascular endothelial growth factor; PBS; Rat serum albumin; CSF/CNS; Rat; 2001; 1007D; 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

**ALZET Comments:** RFamide-related peptide-3; saline; CSF/CNS; Rat (naked mole); 2004; 4 weeks; 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

**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);.

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

**ALZET Comments:** Oxadiazolo quinoxalin-1-one, 1H-[1,2,4], [4,3-a]; Saline; CSF/CNS; Rat; 2002; 21 days; 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 ODO; 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 Neurosci* 2017;18(1):62

**ALZET Comments:** Oxidized ATP; PBS; CSF/CNS; Rat; 2002; 4 weeks; 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

**ALZET Comments:** Ifenprodil tartrate; Tartaric acid; CSF/CNS; Mice; 1002; 14 days; 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

**ALZET Comments:** Transforming growth factor- $\beta$ 1; SJN2511; Interleukin-6; Bovine serum albumin; CSF; artificial; dextran; CSF/CNS; Mice; 7 days; Dose (0.4mM BSA, 100 ng/ml (TGF)-  $\beta$ 1, 300 $\mu$ 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

**ALZET Comments:** GYY4137, hydroxylamine hydrochloride; CSF, artificial; CSF/CNS; Rat; 2006; 6 weeks; 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

**ALZET Comments:** NBI-31772; Insulin-like growth factor I; CSF, artificial; DMSO; CSF/CNS; Rat; 2002; 14 days; Dose (48  $\mu$ g IGF-I/day; 19,92  $\mu$ 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

**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);.

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

**ALZET Comments:** Bumetanide; Antibody, anti-pan-neurotrophin receptor p75; Ethanol; PBS; CSF/CNS; Rat; 2002; 3 days; Dose (bumetanide: 86ng/24 hours, p75NTR antibody: 6.67  $\mu$ g/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

**ALZET Comments:** RNA, small interfering (PDI; DTNB); bacitracin; Immunoglobulin, anti-PDI; tunicamycin ;; CSF/CNS; Rat; 1007D; 7 days, 14 days; 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

**ALZET Comments:** Arabinofuranoside, cytosine b-D-; Saline; CSF/CNS; Mice; 1007D; 4 days; 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

**ALZET Comments:** hydroxyglutarate, 2-R-2-; CSF/CNS; Mice; 7 days; 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

**ALZET Comments:** RFRP-3, Syrian hamster; CSF, artificial; CSF/CNS; Hamster; 2006; 5.5 weeks; 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 Discov* 2017;3(17017)

**ALZET Comments:** 5C medium; IFB medium; Saline; CSF/CNS; Mice; 2002; 14 days; 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)

**ALZET Comments:** PD-98059; CSF, artificial; CSF/CNS; Rat; 2006; 6 weeks; 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

**ALZET Comments:** Boron-10 containing sodium borocaptate, ACBC-BSH (Boron-10 derivative); CSF/CNS; Rat; 2001D; 24 hours; 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

**ALZET Comments:** unclustered ephrin A5 Fc, clustered (C) ephrin A5 Fc, antibody, IgG; CSF, artificial; CSF/CNS; Mice; 1007D; 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

**ALZET Comments:** GABA; muscimol; NO711; Saline; CSF/CNS; Rat; 2002; 14 days; 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

**ALZET Comments:** Leptin; PBS; CSF/CNS; Rat; Mice; 14 days; 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):

**ALZET Comments:** Oligonucleotide, antisense (Tau-specific); Saline; CSF/CNS; Mice; 28 days, 4 weeks; 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



**ALZET Comments:** L-lactate, Sodium; CSF, artificial; CSF/CNS; Mice; 1002; 2 weeks; Controls received mp w/ vehicle; animal info (8 weeks old); bilateral cannula; Therapeutic indication (Sleep); Dose (5 mM);.

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

**ALZET Comments:** CSF, artificial; CSF/CNS; Mice; 1004; 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)

**ALZET Comments:** Sonic hedgehog protein, Cyclopamine, antibody, anti-VEGF; PBS; CSF/CNS; Rat; 1007D; 7 days; 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. *Exp Neurol* 2017;292(135-144)

**ALZET Comments:** Immunoglobulin G1, anti-Nogo-A antibody 11C7; Immunoglobulin G1, anti-cyclosporin A; CSF/CNS; Rat; 2ML2; 2 weeks; 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

**ALZET Comments:** OGT2115; CSF, artificial; CSF/CNS; Rat; 1003D; 48 hours; 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

**ALZET Comments:** Ara-C; CSF/CNS; Mice; 6 days; animal info (Wild-type CD1 mice); Ara-C is an antimetabolic agent a.k.a. cytosine-b-D-arabinofuranoside;.

**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

**ALZET Comments:** Nerve growth factor, human painless; PBS; CSF/CNS; Mice (transgenic); 28 days; 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

**ALZET Comments:** BMP4; Noggin; CSF/CNS; Mice; 15 days; 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. *Auton Neurosci* 2017;205(77-86)

**ALZET Comments:** Angiotensin II; CSF, artificial; DMSO; CSF/CNS; Rat; 2002; 11 days; 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

**ALZET Comments:** CHIR99021; AR-A014418; CSF/CNS; 1003D; 3 days; 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. *Exp Neurol* 2017;288(122-133

**ALZET Comments:** Methionine sulfoximine; PBS; CSF/CNS; Rat; 2004; 28 days; 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

**ALZET Comments:** Peptide 234; CSF, artificial; CSF/CNS; Rat; 2002; 14 days, 2 weeks; 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 µm brain sections; Therapeutic indication (Obesity); Dose (2 nmol in 6 µl/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).

**Q5509:** N. Zhang, *et al.* MicroRNA-378 Alleviates Cerebral Ischemic Injury by Negatively Regulating Apoptosis Executioner Caspase-3. *Int J Mol Sci* 2016;17(9):

**ALZET Comments:** miR-378; CSF/CNS; Mice; 1003D; Controls received mp w/ vehicle; animal info (male, C57BL6J, 18-22g); ischemia (cerebral); pumps primed overnight at 37C; Brain coordinates ( Bregma: - 2.2 mm, dorsoventral: 3 mm, lateral: 1 mm);.

**Q5508:** F. Zhang, *et al.* In Vivo Targeted MR Imaging of Endogenous Neural Stem Cells in Ischemic Stroke. *Molecules* 2016;21(9):

**ALZET Comments:** Ara-C; CSF/CNS; mice; 1007D; 7 days; animal info (C57BL6J, 8-10 weeks old, 20-25g); ischemia (cerebral);.

**Q5502:** T. Yayeh, *et al.* Morphine dependence is attenuated by red ginseng extract and ginsenosides Rh2, Rg3, and compound K. *J Ginseng Res* 2016;40(4):445-452

**ALZET Comments:** Ginsenoside, Rg3; ginsenoside, Rh; compound K; morphine; Saline; CSF/CNS; Rat; 2ML1; 7 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 220-240g); behavioral testing (conditioned place preference; escaping behavior); dependence; cyanoacrylate wound closure; Dose (morphine 26nmol/10ul/hr, ginsenoside 10 ug/ul/h); Brain coordinates (L: 1.3 mm; AeP: e0.5 mm; and DeV: e4.3 mm);.

**Q4911:** J. Yang, *et al.* Inhibiting HIF-1alpha Decreases Expression of TNF-alpha and Caspase-3 in Specific Brain Regions Exposed Kainic Acid-Induced Status Epilepticus. *Cell Physiol Biochem* 2016;38(1):75-82

**ALZET Comments:** Estradiol, 2-methoxy; entanercept; CSF, artificial; CSF/CNS; Rat; 1003D; 3 days; Controls received mp w/ vehicle; animal info (male, Wistar, 200-250g); ALZET brain infusion kit used; Cannula placement verified via histologic analysis;.

**Q4913:** Y. Yamaguchi, *et al.* Real-Time Recording of Circadian Per1 and Per2 Expression in the Suprachiasmatic Nucleus of Freely Moving Rats. *J Biol Rhythms* 2016;31(1):108-11

**ALZET Comments:** Luciferin, D-; CSF, artificial; CSF/CNS; Rat; 2ML4; animal info (Per1-luc or Per2-luc); cyanoacrylate adhesive; Dose (measurement of real-time gene activity);.

**Q5102:** W. S. Xu, *et al.* Bumetanide promotes neural precursor cell regeneration and dendritic development in the hippocampal dentate gyrus in the chronic stage of cerebral ischemia. *Neural Regen Res* 2016;11(5):745-51

**ALZET Comments:** Bumetanide; Water, sterile; CSF/CNS; Rat; 2004; 21 days; animal info (male, Wistar, 200-250g); ischemia (cerebral); behavioral testing (Morris water maze); pumps primed overnight in 37C saline; used dental cement; Dose (200 ug/kg/day); Brain coordinates (anteroposterior -0.9, mediolateral +1.5);.

**Q5713:** H. Xu, *et al.* The Role of HMGB1 in Pial Arteriole Dilating Reactivity following Subarachnoid Hemorrhage in Rats. *J Vasc Res* 2016;53(5-6):349-357





**ALZET Comments:** HMGB1; Box A; OxPAPC; CSF, artificial; CSF/CNS; Rat; 1003D; 2 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 250-300g); Multiple pumps per animal (2); Bilateral infusion; Dose (HMGB1 120 ng/h; Box A 12-120 ng/hr; OxPAPC 20 ug/h);.

**Q5099:** J. Xing, *et al.* HIF-1alpha Activation Attenuates IL-6 and TNF-alpha Pathways in Hippocampus of Rats Following Transient Global Ischemia. *Cell Physiol Biochem* 2016;39(2):511-20

**ALZET Comments:** SC144; etanercept; CSF, artificial; CSF/CNS; Rat; 24 hours; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 200-300g); ALZET brain infusion kit used; ischemia (cerebral); used polycarbonate tubing; SC144 is a gp130 inhibitor; Brain coordinates (3.7 mm posterior to the bregma, 4.1 mm lateral to the midline, and 3.5 mm under the dura);.

**Q5711:** H. Xiao, *et al.* Effect of ephrin-B2 on the expressions of angiopoietin-1 and -2 after focal cerebral ischemia/reperfusion. *Neural Regen Res* 2016;11(11):1784-1789

**ALZET Comments:** Ephrin-B2-Fc, recombinant murine chimera; Saline; CSF/CNS; Rat; 1003D; 3 days; animal info (male, Sprague Dawley, 8-10 weeks old, ~280g); ischemia (cerebral); Brain coordinates;.

**Q4857:** M. Wen-Chung Liu, *et al.* Hyperbaric Oxygen Therapy Alleviates Carbon Monoxide Poisoning-Induced Delayed Memory Impairment by Preserving Brain-Derived Neurotrophic Factor-Dependent Hippocampal Neurogenesis. *Crit. Care Med* 2016;44(1):

**ALZET Comments:** TrkB-Fc, recombinant human; brain-derived neurotrophic factor; CSF, artificial; CSF/CNS; Rat; 1007D; 7 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, adult); animal info (male, Sprague Dawley, adult); behavioral testing (radial arm maze, memory talk); used dental cement; pumps primed in 37C saline prior to implantation; Dose (); brain coordinates;.

**Q5707:** S. G. Wei, *et al.* Endoplasmic reticulum stress increases brain MAPK signaling, inflammation and renin-angiotensin system activity and sympathetic nerve activity in heart failure. *Am J Physiol Heart Circ Physiol* 2016;311(4):H871-H880

**ALZET Comments:** Tauroursodeoxycholic acid; CSF, artificial; CSF/CNS; Rat; 2004; 4 weeks, 28 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, adult, 275-325g); cardiovascular; Used screws and dental orthodontic resin; Dose (10 ug/day); Brain coordinates;.

**Q5093:** H. Wei, *et al.* Inhibition of IL-6 trans-signaling in the brain increases sociability in the BTBR mouse model of autism. *Biochim Biophys Acta* 2016;1862(10):1918-25

**ALZET Comments:** Sgp130Fc; Saline; BSA; CSF/CNS; Mice; 2002; 14 days; animal info (BTBR); ALZET brain infusion kit 3 used; 0.1% BSA used; behavioral testing (sociability; self-grooming);.

**Q5705:** X. Wang, *et al.* Cerebral mTOR signal and pro-inflammatory cytokines in Alzheimer's disease rats. *Transl Neurosci* 2016;7(1):151-157

**ALZET Comments:** Rapamycin; amyloid protein, beta (1-42); CSF, artificial; CSF/CNS; Rat; 1002; 14 days; animal info (male, Sprague Dawley, 3-4 months old, 300-350g); Multiple pumps per animal (2); neurodegenerative (Alzheimer's); behavioral testing (Y-maze); immunology; Bilateral infusion; used jewelers' screw and dental zinc cement; Dose (10 mg/kg amyloid beta, rapamycin 500 ug/2 weeks); Brain coordinates;.

**Q5088:** L. Wang, *et al.* Increasing brain angiotensin converting enzyme 2 activity decreases anxiety-like behavior in male mice by activating central Mas receptors. *Neuropharmacology* 2016;105(114-23

**ALZET Comments:** Diminazene aceturate; A-779; Saline, normal; CSF/CNS; Mice; 1004; 1 week; Controls received mp w/ vehicle; animal info (male, C57BL6, 8-12 weeks old); ALZET brain infusion kit 3 used; behavioral testing (elevated plus maze); pumps primed in 37C saline 48 hours prior to implantation; diminazene aceturate aka DIZE; Dose (DIZE 11.1, 1.1 or 0.11 ug/hr; A-779 0.22 ug/h); Brain coordinates (anterior 0.2 mm, lateral (right) 1.0 mm, ventral 2.5 mm);.

**Q5082:** K. Uekawa, *et al.* Intracerebroventricular Infusion of Angiotensin-(1-7) Ameliorates Cognitive Impairment and Memory Dysfunction in a Mouse Model of Alzheimer's Disease. *J Alzheimers Dis* 2016;53(1):127-33



**ALZET Comments:** Angiotensin (1-7); A-779; CSF, artificial; CSF/CNS; Mice; 1004; 4 weeks; Controls received mp w/ vehicle; animal info (male, 5XFAD, 17 months old); ALZET brain infusion kit 3 used; neurodegenerative (Alzheimer's Disease); behavioral testing (Morris water maze); cardiovascular; peptides; used ALZET CSF formulation; Dose (Ang 1-7 500 ng/kg/h; A-779 5.0 ug/kg/h); Brain coordinates (relation to bregma 1.0mm lateral and 0.5 mm posterior);.

**Q5469:** E. Tuduri, *et al.* Acute stimulation of brain mu opioid receptors inhibits glucose-stimulated insulin secretion via sympathetic innervation. *Neuropharmacology* 2016;110(Pt A):322-32

**ALZET Comments:** DAMGO; Water, distilled; DMSO; saline; CSF/CNS; Mice; 5 Days; Controls received mp w/ vehicle; animal info (male, C57BL6J or alpha2A-KO, 8-10 weeks old); ALZET brain infusion kit 3 used; Dose (DAMGO 4.7 nmol/day); used 7 day pump;.

**Q5075:** Q. Tong, *et al.* PPARbeta/delta Agonist Provides Neuroprotection by Suppression of IRE1alpha-Caspase-12-Mediated Endoplasmic Reticulum Stress Pathway in the Rotenone Rat Model of Parkinson's Disease. *Mol Neurobiol* 2016;53(6):3822-31

**ALZET Comments:** GW501516; DMSO; saline; CSF/CNS; Rat; 2006; 6 weeks; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 200-220g); animal info (male, Sprague Dawley, 200-220g); 30% DMSO used; neurodegenerative (Parkinson's); behavioral testing (open field test; catalepsy test); "GW501516 does not readily cross the blood-brain barrier, so GW501516 or vehicle was administered intracerebroventricularly." pg 3823; pumps primed in 37C saline overnight; Brain coordinates (0.8 mm posterior to the bregma, 1.5 mm lateral to the midsagittal suture, and 4.0 mm ventral to the skull);.

**Q5687:** D. C. Tarlunganu, *et al.* Impaired Amino Acid Transport at the Blood Brain Barrier Is a Cause of Autism Spectrum Disorder. *Cell* 2016;167(6):1481-1494 e18

**ALZET Comments:** Isoleucine; leucine; Saline; CSF/CNS; Mice; 1007D; 2002; 20 days; pumps replaced after 1 week; ALZET brain infusion kit 3 used; behavioral testing (walking beam test, gait measurement, open field test); Pumps primed overnight in 37C saline; used topical tissue adhesive; Brain coordinates;.

**Q5681:** R. Svarcbahts, *et al.* Inhibition of Prolyl Oligopeptidase Restores Spontaneous Motor Behavior in the alpha-Synuclein Virus Vector-Based Parkinson's Disease Mouse Model by Decreasing alpha-Synuclein Oligomeric Species in Mouse Brain. *J Neurosci* 2016;36(49):12485-12497

**ALZET Comments:** KYP-2047; DMSO; PBS; CSF/CNS; Mice; 1002; 1004; 28 days; animal info (male, C57BL6J, 7-9 weeks old); 1002 pumps replaced every 2 weeks; ALZET brain infusion kit 3 used; 50% DMSO used; post op. care (buprenorphine); behavioral testing (cylinder test); Pumps primed in 37C saline overnight; Brain coordinates;.

**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));.

**Q4816:** Shu-Yan Dai, *et al.* Central Infusion of Angiotensin II Type 2 Receptor Agonist Compound 21 Attenuates DOCA/NaCl-Induced Hypertension in Female Rats. *Oxidative Medicine and Cellular Longevity* 2016;2016(**ALZET Comments:** Compound 21; CSF/CNS; Rat; 2004; 4 weeks; Controls received mp w/ vehicle; animal info (female, Wistar, 10-12 weeks, OVX); ALZET brain infusion kit used; cardiovascular; bp measured using radiotelemetry;.

**Q4903:** Y. Y. Shun-Guang Wei, Robert M. Weiss, Robert B. Felder. Inhibition of Brain Mitogen-Activated Protein Kinase Signaling Reduces Central Endoplasmic Reticulum Stress and Inflammation and Sympathetic Nerve Activity in Heart Failure Rats. *Hypertension* 2016;67(229-236



**ALZET Comments:** PD98059; SB203580; SP600125; CSF, artificial; DMSO; CSF/CNS; Rat; 2004; 4 weeks; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, adult, 275-325g); 5% DMSO used; cardiovascular;.

**Q5203:** M. Shigyo, *et al.* Extracellular vimentin is a novel axonal growth facilitator for functional recovery in spinal cord-injured mice. *Sci Rep* 2016;6(28293)

**ALZET Comments:** Vimentin, recombinant human; CSF, artificial; CSF/CNS; Mice; 1004; 21 days; Controls received mp w/ vehicle; animal info (female, ddY, 6-7 weeks old); ALZET brain infusion kit 3 used; spinal cord injury; behavioral testing (open field locomotion); cyanoacrylate adhesive; Therapeutic indication (spinal cord injury); Brain coordinates (bregma -0.22 mm, lateral to the left +1 mm and -2.5 mm depth);.

**Q5197:** K. M. Schoch, *et al.* Increased 4R-Tau Induces Pathological Changes in a Human-Tau Mouse Model. *Neuron* 2016;90(5):941-7

**ALZET Comments:** Oligonucleotides, antisense; CSF/CNS; Mice (transgenic); 28 days; Controls received mp w/ saline or scrambled ASO; animal info (hTau transgenic or tau N279k transgenic, 3-4 months old); antisense (3R to 4R MAPT splicing ASO; 4R to 3R MAPT splicing ASO); neurodegenerative (Alzheimer's disease); behavioral testing (nesting behavior); cyanoacrylate adhesive; pumps primed in 37C saline overnight; Industry authored (Ionis Pharmaceuticals); Dose (14 ug/day for 3R to 4R MAPT splicing ASO; 25 ug/day for 4R to 3R MAPT splicing ASO); Brain coordinates (-1.1mm M/L, -0.5mm A/P, -2.5mm D/V from bregma supplement pg 5);.

**Q5195:** P. J. Scarpace, *et al.* Rapamycin Normalizes Serum Leptin by Alleviating Obesity and Reducing Leptin Synthesis in Aged Rats. *J Gerontol A Biol Sci Med Sci* 2016;71(7):891-9

**ALZET Comments:** Rapamycin; DMSO; PEG 400; CSF/CNS; Rat; 28 days; Controls received mp w/ vehicle; animal info (male, F344 x Brown Norway, 24 months old); pumps replaced after 14 days; ALZET brain infusion kit used; 10% DMSO used; 90% PEG 400 used; post op. care (rats kept warm until recovered); used aCSF filled pump for 14 days, then replaced with rapamycin or vehicle for 28 day infusion; obesity; Dose (30 ug/day); Brain coordinates (1.3 mm posterior to bregma, 1.9 mm lateral to the midsagittal suture and to a depth of 3.5mm);.

**Q4880:** E. H. Sanchez-Mendoza, *et al.* Implantation of Miniosmotic Pumps and Delivery of Tract Tracers to Study Brain Reorganization in Pathophysiological Conditions. *Journal of Visualized Experiments* 2016;107(1-9)

**ALZET Comments:** Erythropoietin, recombinant human; CSF/CNS; Mice; 30 days; Controls received mp w/ vehicle; animal info (C57BL6); good methods (Jove Video; picture of pump and implantation pg. 4); ischemia (cerebral); post op. care (Carprofen 4 mg/kg); behavioral testing (rotarod test; hand grip strength); cyanoacrylate adhesive; "In this work we have shown the method of implantation of minipumps with a cannula connected to the skull in order to deliver the plasticity promoting protein rhEpo directly into the ventricle, thus circumventing the BBB." pg 8; Cannula placement verified via histologic analysis "There are no evident severe tissue alterations based on Nissl staining as compared to the corresponding contralateral area";.

**Q5190:** Y. H. Rhee, *et al.* Neural stem cells secrete factors facilitating brain regeneration upon constitutive Raf-Erk activation. *Sci Rep* 2016;6(32025)

**ALZET Comments:** Raf-Transducer cells, conditioned media; leukemia inhibitory factor; fibroblast growth factor 2; vascular endothelial growth factor; CSF, artificial; CSF/CNS; Mice; 1007D; 6 days; Controls received mp w/ vehicle or control media; animal info (male, C57Bl6, 50-100g); ALZET brain infusion kit 2 used; immunology; cyanoacrylate adhesive; Brain coordinates;.

**Q4876:** R. R. Reimann, *et al.* Differential Toxicity of Antibodies to the Prion Protein. *PLoS Pathog* 2016;12(1):1-19

**ALZET Comments:** Antibody, 31C6; antibody, POM1; PBS; CSF/CNS; Mice; 2004; 21 days; animal info (BL6.129-Prnp); post op. care (SC injections of buprenorphinum, funixin, and 5% glucose; Sulfadoxinum and sugar were added into water for 1 week post op); MRI; pumps primed in 37C PBS for 24 hours; used PEEK tubing;.

**Q5188:** R. L. Reeve, *et al.* Targeted activation of primitive neural stem cells in the mouse brain. *Eur J Neurosci* 2016;43(11):1474-85



**ALZET Comments:** Inhibitor, C-Kit; inhibitor, ErbB2; CSF/CNS; Mice; 1003D; 3 days; animal info (CD1); Brain coordinates; Dose (C-kit inhibitor 400 uM/3 days; ErbB2 inhibitor 130 uM/3 days);

**Q5179:** N. Petitdant, *et al.* Cerebral radiofrequency exposures during adolescence: Impact on astrocytes and brain functions in healthy and pathologic rat models. *Bioelectromagnetics* 2016;37(5):338-50

**ALZET Comments:** Endotoxin, LPS; CSF, artificial; CSF/CNS; Rat; 2004; 28 days; Controls received mp w/ vehicle; animal info (male, Sprague Dalwey, P32); behavioral testing (Open Field test; elevated plus maze; fear conditioning); Cannula placement verified via methylene blue dye; used Plastics One cannula; used PEEK cannula; rats exposed to radio frequency electromagnetic fields while pump implanted; Dose (1.25 ug/h); Brain coordinates;

**Q5177:** P. A. Pereira, *et al.* Effects of chronic alcohol consumption, withdrawal and nerve growth factor on neuropeptide Y expression and cholinergic innervation of the rat dentate hilus. *Neurotoxicology* 2016;54(153-60

**ALZET Comments:** Nerve growth factor; Methylene blue; BSA; CSF, artificial; CSF/CNS; Rat; 2002; 12 days; animal info (male, Wistar); functionality of mp verified by residual volume; ALZET brain infusion kit used; post op. care (SC injections of 0.9% saline (2ml)); pulsed delivery; used PE-60 tubing; used lynch coil;

**Q6056:** V. Peotta, *et al.* Neonatal growth restriction-related leptin deficiency enhances leptin-triggered sympathetic activation and central angiotensin II receptor-dependent stress-evoked hypertension. *Pediatr Res* 2016;80(2):244-51

**ALZET Comments:** Losartan; CSF, artificial; CSF/CNS; Mice (pregnant); 1002; 14 days; Controls received mp w/ vehicle; animal info (C57BL/6); Therapeutic indication (Hypertension); Dose (10 ug/uL);

**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.

**Q5173:** T. Padel, *et al.* Platelet-derived growth factor-BB has neurorestorative effects and modulates the pericyte response in a partial 6-hydroxydopamine lesion mouse model of Parkinson's disease. *Neurobiol Dis* 2016;94(95-105

**ALZET Comments:** Platelet-derived growth factor-BB; CSF, artificial; mouse serum albumin; gentamicin; CSF/CNS; Mice; 1004; 14 days; Controls received mp w/ vehicle; animal info (male, rgs5 GFP/+ KO/KI); ALZET brain infusion kit used; neurodegenerative (Parkinson's disease); cyanoacrylate adhesive; pumps removed after 14 days; catheter tubing sealed with glue after pump removal; Brain coordinates; Dose (36 ng/day PDGF-BB);

**Q6629:** M. Narushima, *et al.* The Metabotropic Glutamate Receptor Subtype 1 Mediates Experience-Dependent Maintenance of Mature Synaptic Connectivity in the Visual Thalamus. *Neuron* 2016;91(5):1097-1109

**ALZET Comments:** DHPG; Ro 67-4853: CPCCOEt; DMSO; Saline; CSF/CNS; Mice; 1007D; 7 days; Dose (10 mM CPCCOEt; mixture of 5 mM DHPG and 10 mM Ro 67-4853); 10% DMSO used; animal info (Male, wild-type, C57BL/6, P21, 8-10 g of weight); enzyme inhibitor (mGluR1); ALZET brain infusion kit 3 used; Brain coordinates (1.9-2.1 mm caudal and 1.9-2.1 mm lateral to Bregma to the point at 2.3-2.5 mm deep from the surface); cyanoacrylate adhesive;

**Q5420:** M. Morales-Cruz, *et al.* Combining Stimulus-Triggered Release and Active Targeting Strategies Improves Cytotoxicity of Cytochrome c Nanoparticles in Tumor Cells. *Mol Pharm* 2016;13(8):2844-54

**ALZET Comments:** Nanoparticles, Cytochrome C-based; Saline; CSF/CNS; Mice; 2004; 3 days; Controls received mp w/ vehicle; animal info (C57BL/6 mice bearing GL261 glioma tumors); functionality of mp verified by measurement of tumor size; ALZET brain infusion kit 3 used; cancer (Glioma tumor model); Test of therapeutic potential of Cyt c-based NP's (nanoparticles); Therapeutic indication (tumor growth); Dose (100 mg/mL);



**Q6620:** S. J. Min, *et al.* Positive feedback role of TRPC3 in TNF-alpha-mediated vasogenic edema formation induced by status epilepticus independent of ETB receptor activation. *Neuroscience* 2016;337(37-47)

**ALZET Comments:** TNFp55 receptor, soluble; SN50; CSF/CNS; Rat; 1007D; Controls received mp w/ vehicle; enzyme inhibitor (NFKB); ALZET brain infusion kit 1 used; Brain coordinates (1 mm posterior; 1.5 mm lateral; 3.5 mm depth to the bregma);

**Q4863:** E. A. Meyers, *et al.* Increased bone morphogenetic protein signaling contributes to age-related declines in neurogenesis and cognition. *NEUROBIOLOGY OF AGING* 2016;38(164-175)

**ALZET Comments:** Noggin; CSF/CNS; Mice; 1002; 14 days; Controls received mp w/ vehicle; animal info (male, C57BL6, 2 or 20 months old); behavioral testing (novel object recognition, novel location recognition, spontaneous alternation y maze);

**Q6624:** M. K. Lakshmana, *et al.* Neuroprotective Effects of Pomegranate Peel Extract after Chronic Infusion with Amyloid-β Peptide in Mice. *Plos One* 2016;11(11):e0166123

**ALZET Comments:** Amyloid protein, beta; HEPES; CSF/CNS; Mice; 1004; 35 days; Controls received mp w/ vehicle; animal info (Male C57Bl/6 mice); peptides; Brain coordinates (0.8 mm anteroposterior and 1.0 mm mediolateral to bregma and 2.0 mm dorsoventral to cranium);

**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);

**Q4836:** L. S. Hwa, *et al.* Dissociation of u-opioid receptor and CRF-R1 antagonist effects on escalated ethanol consumption and mPFC serotonin in C57BL/6J mice. *Addiction Biology* 2016;21(111-124)

**ALZET Comments:** CP154526; naltrexone; DMSO; CSF, artificial; CSF/CNS; Mice; 1002; 14 days; Controls received mp w/ vehicle; animal info (male, C58BL/6J, 8 weeks old); functionality of mp verified by IAA drinking test or morphine-sensitive tail withdrawal; ALZET brain infusion kit 3 used; 4% DMSO used; Cannula placement verified via Nissl staining;

**Q4899:** y. B. S. H. H.-W. WANG, y A. CHEN, M. AHMAD,, *et al.* ROLE OF BRAIN ALDOSTERONE AND MINERALOCORTICOID RECEPTORS IN ALDOSTERONE-SALT HYPERTENSION IN RATS. *Neuroscience* 2016;314(90-105)

**ALZET Comments:** Aldosterone; eplerenone; FAD286; CSF, artificial; acetonitrile; SC; CSF/CNS; Rat; 2004; 2 weeks, 3 weeks; Controls received mp w/ vehicle; animal info (male, Wistar, 200-250g); 4% acetonitrile used; Multiple pumps per animal; cardiovascular; bp measured using radiotelemetry; bp measured using radiotelemetry; dose (1.5 and 7.5 ug/kg/hr Aldosterone, 5ug/day Eplerenone, 25 ug/day FAD286).

**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 reflex); pumps primed overnight in 37C saline; used dental cement; Dose (3.6 ug/day);

**Q4894:** J. P. V. a. R. A. Gonzales. Chronic Intracerebroventricular Infusion of Monocyte Chemoattractant Protein-1 Leads to a Persistent Increase in Sweetened Ethanol Consumption During Operant Self-Administration But Does Not Influence Sucrose Consumption in Long-Evans Rats. *ALCOHOLISM-CLINICAL AND EXPERIMENTAL RESEARCH* 2016;40(1):

**ALZET Comments:** Monocyte chemoattractant protein-1, recombinant rat; CSF, artificial; water, distilled; albumin, rat serum; CSF/CNS; Rat; 1004; 5 weeks; Controls received mp w/ vehicle; animal info (male, Long Evans, 350g); functionality of mp verified by ELISA and manufacturers instructions see pg189; ALZET brain infusion kit 2 used; dose-response (pg.190); post op. care (bupivacane intradermally; bupivacaine and gentamicin dripped into wound); behavioral testing (alcohol self administration); stability verified by (ELISA pg 192); cyanoacrylate adhesive; "We chose the ICV method to simulate the presence of brain-induced MCP-1 and the method's ability to target the whole brain with molecules that do not readily cross the BBB" pg 188-189; pumps primed at 37C sterile saline; Dose (0.2, 20, 2000 ng/day);



**Q6041:** L. German-Castelan, *et al.* Intracellular Progesterone Receptor Mediates the Increase in Glioblastoma Growth Induced by Progesterone in the Rat Brain. *Arch Med Res* 2016;47(6):419-426

**ALZET Comments:** Oligodeoxynucleotide, antisense; Propylene glycol; CSF/CNS; Rat; 15 days; animal info (250-300g) ; tissue perfusion (brain tissue); Guide cannula used; Therapeutic indication (Astrocytomas, CNS tumor); Dose (0.5 ug/day);.

**Q6061:** K. J. Dixon, *et al.* EphrinB3 restricts endogenous neural stem cell migration after traumatic brain injury. *Stem Cell Res* 2016;17(3):504-513

**ALZET Comments:** EphrinB3-Fc; PBS; CSF/CNS; Mice; 1007D; 2 days; Controls received mp w/ vehicle; animal info (2-4 moths; C57Bl/6); Loctite used; Therapeutic indication (Controlled cortical impact (CCI) injury, Cortical cannula injury); brain injury ; Dose (140 µg/mL);.

**Q5789:** M. C. Didiot, *et al.* Exosome-mediated Delivery of Hydrophobically Modified siRNA for Huntingtin mRNA Silencing. *Mol Ther* 2016;24(10):1836-1847

**ALZET Comments:** Exosomes; RNA, hydrophobically-modified small interfering (anti-Huntingtin);; CSF, artificial; CSF/CNS; Mice; 1007D; 7 days; Controls received mp w/ vehicle; neurodegenerative (Huntingtin); "Pump implantation for the infusion of exosomes and hsiRNA-loaded exosomes have no statistically significant impact on innate immune response in vivo." Therapeutic indication (Huntingtin); Dose (p. 1884);.

**Q5757:** A. Cabrera-Pastor, *et al.* In vivo administration of extracellular cGMP normalizes TNF-alpha and membrane expression of AMPA receptors in hippocampus and spatial reference memory but not IL-1beta, NMDA receptors in membrane and working memory in hyperammonemic rats. *Brain Behav Immun* 2016;57(360-370

**ALZET Comments:** cGMP; Saline; CSF/CNS; Rat; 2004; 28 days, 4 weeks; Controls received mp w/ vehicle; animal info (weight: 120-140g); ALZET brain infusion kit 2 used; behavioral testing (8 arm radial maze); Therapeutic indication (Neuroinflammation, learning and memory); Dose (240 uM);.

**Q4910:** R. L. T. Baojian Xue, Yang Yu, Fang Guo, Terry G. Beltz, Robert B. Felder,, *et al.* Central Renin–Angiotensin System Activation and

Inflammation Induced by High-Fat Diet Sensitize

Angiotensin II–Elicited Hypertension. *Hypertension* 2016;67(163-170

**ALZET Comments:** Pentoxifylline; irbesartan; minocycline; angiotensin II; CSF, artificial; Na sodium bicarbonate; saline; CSF/CNS; Rat; 2004; 2002; 2001; 4 weeks; 2 weeks; 1 week; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 10-12 weeks old); cardiovascular; peptides; Dose (ICV - Pentoxifylline 10 ug/hr; irbesartan 125 ug/day; minocycline 5 ug/hr; SC AngII 120 ng/kg/min); brain coordinates;.