



**Recent References (2021-Present) on the Intracerebroventricular Administration of Agents to Mice Using ALZET® Osmotic Pumps**

**Q11354:** H. Liu, *et al.* Restoring carboxypeptidase E rescues BDNF maturation and neurogenesis in aged brains. *Life Medicine* 2023;2(2):

**Agents:** Carboxypeptidase E **Vehicle:** Not Stated; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Strain:** Not Stated; **Pump:** 1007D; **Duration:** 24 hours;

**ALZET Comments:** animal info (18 months old); brain coordinates: (antero-posterior, 0.5 mm; lateral, 1.3 mm; depth, 2.9 mm relative to bregma and the surface of the brain); neurodegenerative (neurogenesis); aging

**Q11326:** S. Kitaoka, *et al.* Repeated Social Defeat Stress Induces HMGB1 Nuclear Export in Prefrontal Neurons, Leading to Social Avoidance in Mice. *Cells* 2023;12(13):

**Agents:** IgG, control; antibody, monoclonal HMGB1 **Vehicle:** PBS; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** C57BL/6N; **Pump:** 1002; **Duration:** 11 days;

**ALZET Comments:** Dose: 5 ng/day, 22.5 ng/day; animal info (9-week-old male); ALZET brain infusion kit 3 used; brain coordinates (0.2 mm posterior from the bregma, 1.0 mm lateral from the midline, and 2.3 mm below the skull surface at the bregma); dental cement used; behavioral testing (Repeated Social Defeat Stress and Social Interaction Test);

**Q11003:** H. L. Song, *et al.* Monoclonal antibody Y01 prevents tauopathy progression induced by lysine 280-acetylated tau in cell and mouse models. *Journal of Clinical Investigation* 2023;133(8):

**Agents:** Monoclonal antibody Y01 **Vehicle:** PBS; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** tau-P301L; **Pump:** Not Stated; **Duration:** 28 days;

**ALZET Comments:** Dose (1.9 mg/ml); Controls received mp w/ vehicle; animal info: 8 months; comparison of ip injection vs mp; ALZET brain infusion kit used; Brain coordinates: 0.58 mm posterior to bregma, 1 mm lateral to the midline, and 2 mm from the skull surface; behavioral testing (Nest building test; Y maze; Morris water maze); (Alzheimer's disease

**Q10992:** A. Saoudi, *et al.* Investigating the Impact of Delivery Routes for Exon Skipping Therapies in the CNS of DMD Mouse Models. *Cells* 2023;12(6):

**Agents:** Oligonucleotides, antisense **Vehicle:** Not Stated; **Route:** CSF/CNS (intracerebroventricular); **Species:** Mice; **Strain:** hDMD; mdx52; **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** Dose (~700 nmol); animal info: 6–8-week-old mdx52 and WT mice; comparison of bolus injection vs mp; neurodegenerative (neurological disorder); brain tissue distribution

**Q10988:** J. G. Rosa, *et al.* BDNF is altered in a brain-region specific manner and rescues deficits in Spinocerebellar Ataxia Type 1. *Neurobiology of Disease* 2023;178(106023

**Agents:** Brain-derived neurotrophic factor, recombinant **Vehicle:** CSF, artificial; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** Atxn154Q/2Q; **Pump:** 1004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (0.71 µg/day); Controls received mp w/ vehicle; animal info: 7 week old mice; Brain coordinates ((A/P 1.1 mm; M/L 0.5 mm; D/V -2.5 mm from Bregma); behavioral testing (Cognitive testing; Barnes maze; Contextual fear conditioning); neurodegenerative, Spinocerebellar ataxia type-1;

**Q10657:** M. V. Rao, *et al.* Autophagy is a Novel Pathway for Neurofilament Protein Degradation in Vivo. *Autophagy* 2023;19(4):1277-1292

**Agents:** 3-methyladenine **Vehicle:** DMSO; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6J; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** "Dose: 3-MA (09 mg/ml); 50% DMSO vehicle used; Controls received mp w/ vehicle; animal info: 9-month-old mice; 3-methyladenine aka (3-MA) Brain coordinates (placement in the lateral ventricle were AP -0.3 mm to Bregma, ML 1.0 mm to Bregma, and DV 2.5 mm to cranium);"



**Q10972:** P. Pakataridis, *et al.* EVIDENCE FOR BIOLOGICAL EFFECTS OF THE HEXAPEPTIDE NOVOKININ. *Journal of Chemical Technology and Metallurgy* 2023;58(3):608-614

**Agents:** Novokinin **Vehicle:** Saline, sterile; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** SHR; **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** Dose: 0.3 ug/rat/day; Controls received mp w/ vehicle; animal info: 2-month-old female 220 - 280g; receptor agonist (angiotensin AT2 receptor agonist novokinin aggravates some diabetes mellitus-induced alterations in Wistar); ALZET brain infusion kit 2 used; Brain coordinates (1.5 mm lateral (right) to the sagittal suture, 1 mm caudal to bregma, and a depth of 3 mm); behavioral testing Open field test; Elevated plus maze test; Paw pressure test; T-maze rewarded alternating test; Novel object recognition; anxiety; memory

**Q10961:** S. Meng, *et al.* Catalpol Mitigates Alzheimer's Disease Progression by Promoting the Expression of Neural Stem Cell Exosomes Released miR-138-5p. *Neurotoxicity Research* 2023;41(1):41-56

**Agents:** miR-138-5p inhibitor; scramble RNA, negative control **Vehicle:** Not Stated; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 1004; **Duration:** Not Stated;

**ALZET Comments:** Dose (0.2 ml/minute); animal info: WT C57BL/6 mice; Brain coordinates (bregma: - 0.22 mm; dorsoventral: 3 mm; lateral: 1 mm); neurodegenerative (Alzheimer's disease);

**Q11057:** M. McNicholas, *et al.* A Compendium of Syngeneic, Transplantable Pediatric High-Grade Glioma Models Reveals Subtype-Specific Therapeutic Vulnerabilities. *Cancer Discovery* 2023;13(7):1592-1615

**Agents:** Trametinib; alpelisib **Vehicle:** Elacridar; saline, SBE-B-CD; **Route:** CSF/CNS (fourth ventricle); **Species:** Mice; **Strain:** C57BL/6J; **Pump:** 2002; **Duration:** 15 days;

**ALZET Comments:** Dose: (30mg/kg); controls received mp w/ vehicle; animal info: 8-week-old; comparison of oral gavage vs mp; ALZET brain infusion kit 2 used; brain coordinates (0.5 mm anterior and 1.8 mm lateral from bregma for striatal targeting, and 0.8 mm posterior 761 and 1.1 mm lateral from lambda for pontine targeting); cyanoacrylate adhesive; (loctite); cancer (Pediatric High-Grade Glioma);

**Q11055:** Y. Madokoro, *et al.* Direct Enhancement Effect of Hippocampal Cholinergic Neurostimulating Peptide on Cholinergic Activity in the Hippocampus. *International Journal of Molecular Sciences* 2023;24(10):

**Agents:** Hippocampal cholinergic neurostimulating peptide **Vehicle:** Bicarbonate buffer; **Route:** CSF/CNS (cerebral ventricle); **Species:** Mice; **Strain:** HCNP-pp cKO; **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** animal info: 87-91 weeks; brain coordinates (0.6 mm posterior and 1.2 mm lateral from the bregma); dental cement used; neurodegenerative (Alzheimer's disease and Lewy body dementia.);

**Q11088:** A. Lozano-Urena, *et al.* IGF2 interacts with the imprinted gene Cdkn1c to promote terminal differentiation of neural stem cells. *Development* 2023;150(1):

**Agents:** Insulin-like growth factor 2 **Vehicle:** PBS; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Male; 2-4 months old); Brain coordinates (Anteroposterior -0.1 mm; Mediolateral -0.8 mm from bregma; Dorsoventral -3 mm from skull surface);

**Q11134:** L. Y. Li, *et al.* Brain blood vessel autoantibodies in patients with NMDA and GABA(A) receptor encephalitis: identification of unconventional Myosin-X as target antigen. *Frontiers in Cellular Neuroscience* 2023;17(1077204

**Agents:** 011-138 mouse antibody; GO53 control mouse antibody **Vehicle:** Not Stated; **Route:** CSF/CNS (right ventricle); **Species:** Mice; **Strain:** C57BL6/J; **Pump:** 1002; **Duration:** 7 days; 14 days;

**ALZET Comments:** Dose (100 ug/7 days); Controls received mp w/ vehicle; animal info (10-12 weeks old); brain coordinates: 0.2 mm posterior and ± 1.00 mm lateral from bregma, depth 2.2 mm



**Q11170:** J. Lee, *et al.* Noggin-mediated effects on metabolite profiles of microglia and oligodendrocytes after ischemic insult. *Journal of Pharmaceutical and Biomedical Analysis* 2023;224(115196)

**Agents:** Noggin, recombinant human **Vehicle:** CSF, artificial; **Route:** CSF/CNS (ipsilateral lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** Not Stated; **Duration:** 2 weeks;

**ALZET Comments:** Dose (1 µg/day); Controls received mp w/ vehicle; animal info (Male mice; 10-11 weeks old); ALZET brain infusion kit 3 used; Brain coordinates (0.5 mm anterior to bregma, 1 mm lateral from midline, 3 mm below surface of skull);

**Q11082:** J. E. Kim, *et al.* PLPP/CIN inhibits dopamine D1 receptor-mediated seizure activity via DARPP-32 serine 97 dephosphorylation in the mouse hippocampus. *Neuropharmacology* 2023;228(109462)

**Agents:** TMCB **Vehicle:** Not Stated; **Route:** CSF/CNS (ventricle); **Species:** Mice; **Strain:** PLPP/CIN-/-; PLPP/CINTg; **Pump:** 1007D; **Duration:** Not Stated;

**ALZET Comments:** Dose (0.5 µM); Controls received mp w/ vehicle; animal info (Male; 8 weeks old); ALZET brain infusion kit 3 used; Brain coordinates (0 mm posterior; 0 mm lateral; 2 mm depth from bregma); epilepsy (seizure)

**Q11298:** T. P. Kilpelainen, *et al.* Nonpeptidic Oxazole-Based Prolyl Oligopeptidase Ligands with Disease-Modifying Effects on alpha-Synuclein Mouse Models of Parkinson's Disease. *Journal of Medicinal Chemistry* 2023;66(11):7475-7496

**Agents:** KYP-2047; HUP-55 **Vehicle:** DMSO; PBS; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** Transgenic; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Dose: 10 mg/kg/day; 0.2% dimethyl sulfoxide (DMSO); 5% Tween used; controls received mp w/ vehicle; post op care: Topical lidocaine (10 mg/ mL), buprenorphine, (0.1 mg/kg) and carprofen (5 mg/kg) s.c. injections were provided as pre- and postoperative pain management; brain coordinates: 0.7 mm anterior and 1.4 mm lateral to bregma, 2.5 mm deep; ALZET BIK 3 used; behavioral testing (Cylinder test); neurodegenerative (Parkinson's);

**Q11045:** T. P. Kilpelainen, *et al.* Nonpeptidic Oxazole-Based Prolyl Oligopeptidase Ligands with Disease-Modifying Effects on alpha-Synuclein Mouse Models of Parkinson's Disease. *Journal of Medicinal Chemistry* 2023;66(11):7475-7496

**Agents:** KYP-2047; HUP-55 **Vehicle:** DMSO; Tween 20; **Route:** IP; CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6JRcCHsd; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Dose: 10 mg/kg/day; 0.2% dimethyl sulfoxide; 5% Tween in saline used; animal info (10 to 11 weeks old male); post op. care: Topical lidocaine (10 mg/mL), buprenorphine, (0.1 mg/kg) and carprofen (5 mg/kg) s.c. injections; KYP-2047 is a peptide-like PREP inhibitor; ALZET brain infusion kit 3 used; brain coordinates: 0.7 mm anterior and 1.4 mm lateral to bregma; behavioral testing (Cylinder Test.); neurodegenerative (Parkinson's);

**Q10955:** A. Kaur, *et al.* A protocol for collection and infusion of cerebrospinal fluid in mice. *STAR Protocols* 2023;4(1):102015

**Agents:** CSF, artificial **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** animal info: (18–22 months old) post op. care: (Buprenorphine slow release (analgesic, 1 mg/kg) and Baytril (antibiotic, 5 mg/kg) prior to surgery per animal protocol.); keep the mouse on a warm surface area (37degC); lynch coil method: catheter; 1.5 cm catheter to connect to the pump; ALZET brain infusion kit 3 used; cyanoacrylate adhesive; Loctite glue; good methods: detailed, includes troubleshooting tips

**Q10954:** K. Karino, *et al.* Inhibitor of NF-kappaB Kinase Subunit epsilon Contributes to Neuropsychiatric Manifestations in Lupus-Prone Mice Through Microglial Activation. *Arthritis & Rheumatology* 2023;75(3):411-423

**Agents:** MCCK1 **Vehicle:** PBS; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** MRL/lpr; **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info: 6 week old; ALZET brain infusion kit III used; Brain coordinates (1.1 mm lateral, -0.5 mm anterioposterior to the bregma, and 2.5 mm deep to target the right lateral ventricle); behavioral testing (Open field; Novel objective recognition; Object location); MCCK1 is an IKK $\beta$  inhibitor; immunology; (lupus)



- Q11079:** A. Huang, *et al.* Modulation of foraging-like behaviors by cholesterol-FGF19 axis. *Cell & Bioscience* 2023;13(1):20  
**Agents:** Fibroblast growth factor 19 **Vehicle:** CSF, artificial; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 2006; **Duration:** 2 weeks;  
**ALZET Comments:** Dose: FGF19 (15 ng/0.5 ul/h); Controls received mp w/ vehicle; animal info (Male; 5 months old); peptides; pumps replaced twice; functionality of mp verified by measuring residual volume; Brain coordinates: (Anteroposterior -0.3 mm to bregma, lateral 1 mm to bregma, -2.5 mm below skull); vinyl tubing used; behavioral testing (Open field);
- Q11312:** H. Hong, *et al.* A novel role of lactate: Promotion of Akt-dependent elongation of microglial process. *International Immunopharmacology* 2023;119(110136)  
**Agents:** LY294002 **Vehicle:** DMSO; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Strain:** C57BL/J; **Pump:** 2002; 1003D; **Duration:** Not Stated;  
**ALZET Comments:** Dose (5 ug/ml); Controls received mp w/ vehicle; 3% DMSO used; animal info (Male; 8 weeks old); behavioral testing (Tail Suspension; Forced Swim); brain coordinates: (-0.2 mm anteriorly, 1.0 mm laterally relative to bregma, 2.3 mm below the cranial surface); immunology; "The results showed that intracerebroventricular infusion of LY294002 abolished the preventive effect of lactate on LPS-induced increase in immobility time in TST (Fig. 9I) and FST (Fig. 9J)
- Q10534:** C. Grijota-Martinez, *et al.* Intracerebroventricular High Doses of 3,3',5-Triiodothyroacetic Acid at Juvenile Stages Improve Peripheral Hyperthyroidism and Mediate Thyromimetic Effects in Limited Brain Regions in a Mouse Model of Monocarboxylate Transporter 8 Deficiency. *Thyroid* 2023;  
**Agents:** Artificial cerebrospinal fluid **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** MCT8-DIO2-deficient; Wild-type; **Pump:** 2002; **Duration:** Not Stated;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (Male; Mice; 3 months old; ); catheter; ALZET brain infusion kit 3 used; Brain coordinates (Bregma -0.5 mm; 1 mm lateral in skull);
- Q11077:** A. G. George, *et al.* Sudden unexpected death in epilepsy is prevented by blocking postictal hypoxia. *Neuropharmacology* 2023;231(109513)  
**Agents:** Nicardipine **Vehicle:** DMSO; PEG; EtOH; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Strain:** Kcna1-/-; **Pump:** 2006; **Duration:** 42 days;  
**ALZET Comments:** Dose (2 mg/mL); 50:40:10 DMSO:PEG:EtOH; Controls received mp w/ vehicle; animal info (Male and female; 4-10 weeks old; Weighed 23-31 g); post op. care: buprenorphine injection (0.05 mg/kg) every 12 h for 3 days; Cannula placement verified via methylene blue dye; Brain coordinates: (AP) +0.3, (ML) -1.0, (DV) -3.0; epilepsy
- Q11266:** N. Genet, *et al.* Connexin 43-mediated neurovascular interactions regulate neurogenesis in the adult brain subventricular zone. *Cell Reports* 2023;42(4):112371  
**Agents:** Cytosine-B-D-arabinoside **Vehicle:** Saline; **Route:** CSF/CNS (ipsilateral ventricle); **Species:** Mice; **Strain:** Cx43EC iKO; Cx43 fl/fl; **Pump:** 1007D; **Duration:** 6 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (Male and female; 8 weeks old); ALZET brain infusion kit 3 used; Brain coordinates (1.4 mm lateral and 0.5 mm rostral to bregma); ICV injection coordinates verified w/ Fast Green dye
- Q11272:** M. D. Dorfman, *et al.* Central androgen action reverses hypothalamic astrogliosis and atherogenic risk factors induced by orchietomy and high-fat diet feeding in male mice. *American Journal of Physiology: Endocrinology and Metabolism* 2023;324(5):E461-E475  
**Agents:** Testosterone; dihydrotestosterone **Vehicle:** Cyclodextrin, 2-hydroxypropyl-Beta-; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6J; **Pump:** 1004; **Duration:** 28 days;  
**ALZET Comments:** Dose (Testosterone 0.9 ug/uL; DHT 0.2 ug/uL); Controls received mp w/ vehicle; animal info (Male; 12-16 weeks old); ALZET brain infusion kit used; Brain coordinates (0.7 mm posterior to bregma, 1.3 mm lateral, 2.1 mm below skull surface); "Chronic central infusion of testosterone (T) and dihydrotestosterone (DHT) reduces hypothalamic astrogliosis and peripheral risk markers in orchietomized (ORX) mice exposed to high-fat, high-sucrose diet (HFHS)." p. 10



**Q10927:** M. M. A. de Almeida, *et al.* Fractalkine enhances oligodendrocyte regeneration and remyelination in a demyelination mouse model. *Stem Cell Reports* 2023;18(2):519-533

**Agents:** FKN-647 **Vehicle:** BSA; PBS; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** Wildtype, C57BL/6J; **Pump:** 1007D; 1004; **Duration:** 3 days; 7 days;

**ALZET Comments:** 200 ng/day; Controls received mp w/ vehicle; animal info (2- to 3-month-old mice); Brain coordinates (coordinates relative to bregma: -1.0 ML, -0.3 AP, -2.5 DV.); cyanoacrylate glue; brain tissue distribution;

**R0438:** G. Canet, *et al.* The pathomimetic oAbeta(25-)(-)(35) model of Alzheimer's disease: Potential for screening of new therapeutic agents. *Pharmacology & Therapeutics* 2023;245(108398)

**Agents:** Galantamine memantine hybrid **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** Not Stated; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Dose (2.5. or 7.5 µg/day); peptides; Alzheimer's disease; review of different approaches for AD prevention and therapy

**Q11255:** A. N. Campero-Romero, *et al.* Extracellular vesicles from neural progenitor cells promote functional recovery after stroke in mice with pharmacological inhibition of neurogenesis. *Cell Death Discovery* 2023;9(1):272

**Agents:** Cytosine-β-D-arabinofuranosid **Vehicle:** Saline; **Route:** CSF/CNS (intracerebroventricular); **Species:** Mice; **Strain:** CD1; **Pump:** 1002; **Duration:** 16 days;

**ALZET Comments:** 0.9% NaCl used; controls received mp w/ vehicle; animal info: young adult 8-week old; 25 g; Brain coordinates ( AP + 0.5, L + 1.1 from Bregma, and V + 2 from dura; ischemia (stroke); behavioral testing; neurological tests for body posture and movement control

**Q11069:** J. A. Bonds, *et al.* Why Some Mice Are Smarter than Others: The Impact of Bone Morphogenetic Protein Signaling on Cognition. *eNeuro* 2023;10(1):

**Agents:** Noggin; BMP4 **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 1002; **Duration:** 15 days;

**ALZET Comments:** Dose (Noggin 50 ng/ul; BMP4 30 ng/ul); animal info (Wild-type; Male); Brain coordinates (-0.4 mm and 1 mm lateral to bregma); behavioral testing (Novel object recognition; Y-maze); neurodegenerative (cognition)

**Q11248:** M. Bolborea, *et al.* Loss of hypothalamic MCH decreases food intake in amyotrophic lateral sclerosis. *Acta Neuropathologica* 2023;145(6):773-791

**Agents:** Melanin-concentrating hormone **Vehicle:** Saline; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** Sod1G86R; WT; **Pump:** Not Stated; **Duration:** 15 days;

**ALZET Comments:** Dose (1.2 µg/day); 0.9% NaCl used; Controls received mp w/ vehicle; animal info (75 days old); post op. care (Buprenorphine inject, meloxicam in water); ALZET brain infusion kit 3 used; Brain coordinates (Bregma -0.8 mm; Midline 0.4 mm; Dorsal surface -2 mm); cyanoacrylate adhesive; neurodegenerative (ALS)

**Q11091:** K. Barth, *et al.* EGFL7 loss correlates with increased VEGF-D expression, upregulating hippocampal adult neurogenesis and improving spatial learning and memory. *Cellular and Molecular Life Sciences* 2023;80(2):54

**Agents:** VEGF-D, recombinant purified **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6J; **Pump:** 2001; **Duration:** 7 days;

**ALZET Comments:** Dose (1 µg/d); animal info (Male; 8 weeks old); catheter; Brain coordinates (0 mm anteroposterior, 0.8 mm lateral to bregma); behavioral testing (Morris Water Maze; Barnes Maze);

**Q11065:** Y. Bai, *et al.* Single-nucleus RNA sequencing unveils critical regulators in various hippocampal neurons for anti-N-methyl-D-aspartate receptor encephalitis. *Brain Pathology* 2023;33(4):e13156

**Agents:** Anti-N-methyl-D-aspartate receptor antibody **Vehicle:** Saline; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 2002; **Duration:** Not Stated;

**ALZET Comments:** Dose (2 µg/ml); animal info (Female; 8-10 weeks old); behavioral testing (Shuttle box active escape experiment; Elevated plus-maze test; Open-field test; 3 chamber test; Forced swimming test; Marble burying test; Novel object recognition; Nest building test); ALZET brain infusion kit 3 used; good methods pg. 3; immunology





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

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

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

**Q10895:** J. Zheng, *et al.* cPKCgamma Deficiency Exacerbates Autophagy Impairment and Hyperphosphorylated Tau Buildup through the AMPK/mTOR Pathway in Mice with Type 1 Diabetes Mellitus. Neuroscience Bulletin 2022;38(10):1153-1169

**Agents:** Rapamycin **Vehicle:** DMSO; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** Wild-type (cPKCy<sup>-/-</sup>); cPKCc knockout (cPKCc<sup>-/-</sup>) C57BL/6; **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Dose: (0.2 mg/kg); Controls received mp w/ vehicle; animal info: Adult male mice (18 g–22 g, 6–8 weeks) diabetes mellitus; behavioral testing: Morris Water Maze (MWM) Test; Brain coordinates (AP - 0.5 mm, ML + 1.0 mm, and DV - 2.8 mm relative to bregma); diabetes;

**Q10831:** L. Xu, *et al.* Fibroblasts Repair Blood-Brain Barrier Damage and Hemorrhagic Brain Injury Via TIMP2. Cell Reports 2022;41(8):111709

**Agents:** Diphtheria toxin; TIMP2 **Vehicle:** Saline, sterile; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** FKO; **Pump:** 1002; **Duration:** 5 days; 4 days;

**ALZET Comments:** Dose: 1500ng DT; Controls received mp w/ vehicle; animal info ( mice); post op. care (Treated with carprofen (5mg/kg of body weight subcutaneously); Diphtheria toxin aka (DT);ALZET brain infusion kit used; Brain coordinates (0.2mm posterior to bregma, 2.4mm lateral from the midline, and 3.7mm in depth);

**Q10696:** S. A. Tapanes, *et al.* Inhibition of Glial D-Serine Release Rescues Synaptic Damage After Brain Injury. Glia 2022;70(6):1133-1152

**Agents:** BMS-466442; L-4-Chlorophenylglycine **Vehicle:** PBS; **Route:** CSF/CNS (contralateral lateral ventricle); **Species:** Mice; **Strain:** Not Stated; **Pump:** 1007D; 2002; **Duration:** 7 days; 14 days;

**ALZET Comments:** Dose (250 µM); Controls received mp w/ vehicle; animal info (Male; 2-4 months old); behavioral testing (Fear-conditioning); (L-4-chlorophenylglycine is a selective Slc1a4 inhibitor; BMS is selective noncompetitive Slc7a10 inhibitor); Brain infusion kit 3 used; Brain coordinates (-2.0 mm from dura); gene therapy; Therapeutic indication (Traumatic brain injury);

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

**Agents:** Oligonucleotide, antisense **Vehicle:** PBS; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** C9BAC; **Pump:** 1007D; **Duration:** 10 days;

**ALZET Comments:** Dose (2.5-20 nmol/day); dose-response (dose-dependent reduction in V1 and V3 repeat-containing transcripts in both the cortex and spinal cord regions after being treated with ASO3 and ASO5); animal info (transgenic mice); antisense oligonucleotides aka ASO; antisense (oligonucleotide); ALZET brain infusion kit 3 used; bilateral cannula used; 2.5-20 nmol/day of each ASO were continuously infused over 10 d into the right lateral ventricle of age-matched heterozygous C9BAC mice through a cannula using an implanted Alzet osmotic pump tissue perfusion (brain); neurodegenerative (ALS);(FTD) Therapeutic indication (ALS, FTD); "In our C9BAC mice, we were not able to safely perform ICV bolus injections with more than 10 nmol of LNA-modified ASO3 due to induction of severe motor phenotypes. To overcome this limitation, we use osmotic pumps to compare the potency of ASO3 and ASO5" pg3; gene therapy



**Q10671:** A. Sancho-Balsells, *et al.* Meridianins Inhibit GSK3beta In Vivo and Improve Behavioral Alterations Induced by Chronic Stress. *Marine Drugs* 2022;20(10):

**Agents:** Meridianins **Vehicle:** Saline; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Strain:** C57BL/6JOLAHSd; **Pump:** 1002; **Duration:** 28 days;

**ALZET Comments:** "Dose (0.11 uL/hr); Controls received mp w/ vehicle; ALZET brain infusion kit 2 used; Brain coordinates ((0.1 mm posterior to bregma, 0.8 mm lateral to the midline, and -2.5 mm ventral to the parenchyma surface); cyanoacrylate adhesive; (Loctite 454); behavioral testing (Open-field; Forced swim test); Therapeutic indication (Chronic stress);

**Q10665:** A. Romero-Pico, *et al.* Kappa-Opioid Receptor Blockade Ameliorates Obesity Caused by Estrogen Withdrawal via Promotion of Energy Expenditure through mTOR Pathway. *International Journal of Molecular Sciences* 2022;23(6):

**Agents:** PF-04455242 **Vehicle:** Not Stated; **Route:** CSF/CNS (intracerebroventricular); **Species:** Mice; **Strain:** C57/BL6 Wild-type; Oprk1-/-; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose (3.4 nmol/day); Controls received mp w/ vehicle; animal info (Female 8-10 weeks old); ALZET brain infusion kit 3 used; Therapeutic indication (Metabolic disorders);

**Q10653:** M. Radosevic, *et al.* Allosteric Modulation of NMDARs Reverses Patients' Autoantibody Effects in Mice. *Neurology Neuroimmunology & Neuroinflammation* 2022;9(1):

**Agents:** CSF, patient; CSF, control **Vehicle:** Not Stated; **Route:** CSF/CNS (intracerebroventricular); **Species:** Mice; **Strain:** C57BL/6J; **Pump:** 1002; **Duration:** 14 days;

**ALZET Comments:** animal info (141 male ; 8-10 weeks old); immunology; Therapeutic indication (Anti-NMDAR encephalitis);

**Q10637:** N. Orti-Casan, *et al.* A TNF Receptor 2 Agonist Ameliorates Neuropathology and Improves Cognition in an Alzheimer's Disease Mouse Model. *Proceedings of the National Academy of Sciences* 2022;119(37):e2201137119

**Agents:** NewStar2 **Vehicle:** PBS; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6 (background); **Pump:** 2006; **Duration:** 6 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; animal info; Male mice 6 mo of age behavioral testing: EPM; Y-Maze spontaneous alternation; MWM; stability of compound verified by cytotoxicity assay; Brain coordinates (anteroposterior, 0.05 mm; lateral, 0.1 mm; dorsoventral, 0.25 mm); dental cement used; neurodegenerative (Alzheimer's disease); "

**Q11193:** L. L. Liu, *et al.* Copper Modulates Adult Neurogenesis in Brain Subventricular Zone. *International Journal of Molecular Sciences* 2022;23(17):

**Agents:** D-penicillamine **Vehicle:** Saline; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 1007D; 1004; **Duration:** 7 days; 28 days;

**ALZET Comments:** Dose: 0.075 ug/hr, 0.75 ug/h; Controls received mp w/ vehicle; animal info: 3 months; post op. care: heat pad; ALZET brain infusion kit 3 used; Brain coordinates: 1.0 mm left and 0.2 mm posterior to the bregma, lateral/medial: 1.0 mm; anterior/posterior: -0.2 mm; neurodegenerative; good methods (icv cannulation) pg. 25-26

**Q11189:** C. Liu, *et al.* EphA4 regulates white matter remyelination after ischemic stroke through Ephexin-1/RhoA/ROCK signaling pathway. *Glia* 2022;70(10):1971-1991

**Agents:** EphA4 Fc chimera; immunoglobulin G **Vehicle:** Not Stated; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** C57BL/6J; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Dose (10 µg/day); animal info: Adult male; Brain coordinates (relative to the bregma: AP -0.26, ML +1.0, and DV -2.8); ischemia (Stroke); behavioral testing (Longa test; beam balance test; rotarod test); ALZET Brain Infusion Kit 3 used; Therapeutic indication (EphA4) ischemic stroke

**Q11180:** Y. Li, *et al.* Hepatoma Derived Growth Factor Enhances Oligodendrocyte Genesis from Subventricular Zone Precursor Cells. *American Society for Neurochemistry* 2022;14(17590914221086340

**Agents:** Hepatoma derived growth factor **Vehicle:** PBS; BSA; **Route:** CSF/CNS (right ventricle); **Species:** Mice; **Strain:** NestinCreERT2;RosaYFPSTOP/+; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose: (0.83 ng/ml); 0.2% BSA vehicle used; Controls received mp w/ vehicle; animal info: 3-month old; Brain coordinates (-1.000 medio-lateral, -0.300 anterior-posterior, -2.500 dorso-ventral.); neurodegenerative (Oligodendrocyte);



**Q11176:** T. Li, *et al.* BMP4 Exerts Anti-Neurogenic Effect via Inducing Id3 during Aging. *Biomedicines* 2022;10(5):

**Agents:** BMP4; noggin **Vehicle:** Saline; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Strain:** WT; C57BL/6N

**Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose: BMP4 300, 500; 800 ng/d; Noggin 150, 300; 500 ng/d; dose dependent; 0.9% NaCl vehicle used; Controls received mp w/ vehicle; animal info: mice at the age of 8–9 mo; ALZET BIK 3 used; Brain coordinates (AP, 0.5 mm; L -1.3 mm; D 2.9 mm relative to bregma and the surface of the brain; noggin is a potent BMP inhibitor; aging, neurogenesis

**Q10560:** B. Joubert, *et al.* Human CASPR2 Antibodies Reversibly Alter Memory and the CASPR2 Protein Complex. *Annals of Neurology* 2022;91(6):801-813

**Agents:** CSF **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL6/J; **Pump:** 1002;

**ALZET Comments:** animal info (; Male; 55 total; 8-10 weeks old; Weighed 25-30 g); behavioral testing (Novel object location; Locomotor activity; Sucrose preference; Open field; Rotarod test); multiple pumps per animal (2); bilateral catheters used; brain coordinates: (0.02 mm anterior and 1.00 mm lateral from bregma, depth 0.22 mm); cannula placement verified via methylene blue; dental cement used

**Q10758:** Y. Ito, *et al.* Protein Tyrosine Phosphatase 1B Deficiency Improves Glucose Homeostasis in Type 1 Diabetes Treated With Leptin. *Diabetes* 2022;71(9):1902-1914

**Agents:** Leptin, recombinant **Vehicle:** Saline; **Route:** CSF/CNS (cerebral lateral ventricle); **Species:** Mice; **Strain:** T1D WT; T1D KO; **Pump:** 1002; **Duration:** 10 days;

**ALZET Comments:** Dose: (0.25 mg/day) Controls received mp w/ vehicle; animal info: mice Brain coordinates anterior-posterior 0.50 mm, medial-lateral ±1.3 mm, dorsal-ventral 2.3 mm; diabetes (Type 1)

**Q10947:** T. Iram, *et al.* Young CSF restores oligodendrogenesis and memory in aged mice via Fgf17. *Nature* 2022;605(7910):509-515

**Agents:** CSF, young mouse; aCSF; CSF, human; Fibroblast growth factor 17; Fibroblast growth factor 8b, recombinant carrier-free human; anti-Fgf17 blocking antibody **Vehicle:** CSF, artificial; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 1007D; 1004; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info: Aged C57BL/6 mice (18–22 months old); post op. care: buprenorphine and Baytril; ALZET brain infusion kit 3 used; good methods; lynch coil technique p. 8; Brain coordinates +1 mm medio-lateral, 0 mm anterior– and –3 mm dorso-ventral relative to the bregma; neurodegenerative (aging, memory)

**Q10551:** Y. Inoue, *et al.* alpha-E nolase reduces cerebrovascular Abeta deposits by protecting Abeta amyloid formation. *Cellular and Molecular Life Sciences* 2022;79(8):462

**Agents:** alpha-E nolase **Vehicle:** Tris-HCL; MgSO4; Glycerol; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** APP23; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** "Dose: (20 uM) Controls received mp w/ vehicle; animal info: male mice; behavioral testing: Y-maze; testα-E nolase aka (ENO1); ALZET BIK 3 used; Brain coordinates (relative to bregma: anteroposterior: – 2.5 mm, lateral (right): + 2.0 mm, dorsoventral: – 2.8 mm); neurodegenerative (Cerebral amyloid angiopathy); "

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

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

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





**Q10934:** L. K. Hamilton, *et al.* Stearoyl-CoA Desaturase inhibition reverses immune, synaptic and cognitive impairments in an Alzheimer's disease mouse model. *Nature Communications* 2022;13(1):2061

**Agents:** ab142089 **Vehicle:** DMSO; aCSF; **Route:** CSF/CNS (lateral ventricles); **Species:** Mice; **Strain:** 3xTg/ WT; **Pump:** 1004; **Duration:** 1 month;

**ALZET Comments:** Dose: (80 uM); 0.8% DMSO vehicle used; Controls received mp w/ vehicle; animal info: 9-month-old female mice; behavioral testing; Open field test; Elevated plus maze; Light dark box; Morris water maze; SCD inhibitor; Brain coordinates (0.0 mm antero-posterior and 0.9 mm lateral to Bregma); pumps primed 48h; neurodegenerative (Alzheimer's disease, learning, memory);

**Q10379:** L. A. Ezerskiy, *et al.* Astrocytic 4R tau expression drives astrocyte reactivity and dysfunction. *JCI Insight* 2022;7(1):

**Agents:** Oligonucleotide, antisense **Vehicle:** Not Stated; **Route:** CSF/CNS (right ventricle); **Species:** Mice; **Strain:** hTau; **Pump:** Not Stated; **Duration:** Not Stated;

**ALZET Comments:** Dose (15 ug/d); Brain coordinates (1.1 mm lateral; 0.5 mm posterior; 2.5 mm ventral from bregma); neurodegenerative; Therapeutic indication (neurodegenerative diseases); gene therapy

**Q10430:** M. Crespo-Masip, *et al.* Elimination of Vitamin D Signaling Causes Increased Mortality in a Model of Overactivation of the Insulin Receptor: Role of Lipid Metabolism. *Nutrients* 2022;14(7):

**Agents:** Glucose, D-(+); Mannitol, D- **Vehicle:** Not Stated; **Route:** CSF/CNS (intracerebroventricular); **Species:** Mice; **Strain:** Cre-negative; VDR-KO; PTEN-KO; **Pump:** 2006; **Duration:** 42 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info: Twenty-one days after birth, dependence; Taken together, the results shown in the present paper point to the paramount role of an adequate (vitamin D) signaling pathway in hypoglycemia induced by overactivation of the insulin receptor. Thus, in T1 diabetic patients, especially in the lean phenotype, maintaining correct levels of vitamin D could support proper lipid metabolism and decrease deaths induced by insulin dosing errors. (pg.13)"; diabetes

**Q10455:** J. Cheng, *et al.* Diet-induced inflammation in the anterior paraventricular thalamus induces compulsive sucrose-seeking. *Nature Neuroscience* 2022;25(8):1009-1013

**Agents:** Palmitic Acid **Vehicle:** NaOH; BSA; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** Not Stated; **Pump:** 2002; **Duration:** Not Stated;

**ALZET Comments:** Dose: (5 mg kg) Controls received mp w/ vehicle; animal info: Male mice behavioral testing: Open field test; Elevated plus maze test; Pain threshold test; Cued fear memory test; Clozapine-N-oxide aka (CNO); Brain coordinates (-0.45 mm AP, -1.0 mm ML, -2.5 mm DV); cannula placement verified via injection of 1% methylene blue solution and detecting the staining on the ventricular surface at the end of the behavioral experiments; dental cement used; cyanoacrylate adhesive;

**Q10418:** A. B. Caglayan, *et al.* The Unconventional Growth Factors Cerebral Dopamine Neurotrophic Factor and Mesencephalic Astrocyte-Derived Neurotrophic Factor Promote Post-ischemic Neurological Recovery, Perilesional Brain Remodeling, and Lesion-Remote Axonal Plasticity. *Translational Stroke Research* 2022;

**Agents:** Cerebral dopamine neurotrophic factor, recombinant human; Mesencephalic astrocyte-derived neurotrophic factor, recombinant human **Vehicle:** NaCl; **Route:** CSF/CNS (left ventricle); **Species:** Mice; **Strain:** C57Bl6/j; **Pump:** 2004 **Duration:** 28d

**ALZET Comments:** "Dose: (1 ug/day); (0.9% NaCl), vehicle used; Controls received mp w/ vehicle; animal info: male mice (8-10 weeks) behavioral testing: RotaRod test, Grip strength; Open field test; Elevated o maze test; ALZET BIK 3 used; Brain coordinates (contralateral motor cortex (0.5 mm rostral and 2.5 mm lateral to the bregma); neurodegenerative (stroke);

**Q10414:** L. Bourhy, *et al.* Silencing of amygdala circuits during sepsis prevents the development of anxiety-related behaviours. *Brain* 2022;145(4):1391-1409

**Agents:** Levetiracetam **Vehicle:** Saline; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** C57Bl/6Jrj; **Pump:** 1003D; **Duration:** 3 days;

**ALZET Comments:** Dose: (1 µl/h); Controls received mp w/ vehicle; animal info: Adult 2-5months old wild-type male mice and adult male and female FOS-CreERT2; post op. care: treated with (0.1 mg/kg) buprenorphine 30 mins. before surgery; behavioral testing (Morris water maze; novel object location/recognition; Open field test; Light/dark box test; olfactory habituation; fear conditioning); ALZET BIK3 used; Brain coordinates (stereotaxic coordinates relative to bregma, AP: -0.5 mm; ML: 1 mm; DV: 2.5 mm); dental cement used; liquid bonding resin; dental acrylic; neurodegenerative (anxiety; PTSD); immunology



- Q10497:** Q. Bi, *et al.* Microglia-derived PDGFB promotes neuronal potassium currents to suppress basal sympathetic tonicity and limit hypertension. *Immunity* 2022;55(8):1466-1482 e9  
**Agents:** Diphtheria toxin; Growth factor, platelet-derived **Vehicle:** PBS; **Route:** CSF/CNS (intracerebroventricular);  
**Species:** Mice; **Strain:** CD11b- DTR; **Pump:** 1002; **Duration:** 2 weeks;  
**ALZET Comments:** Dose: (Diphtheria toxin 0.5 ng/g/day; PDGF 2.5 ng/g/day); animal info: mice; Blood pressure measured via: Tail cuff; Blood pressure measurement (p.1468) see fig.1F; ALZET BIK3 used; Brain coordinates (0.3-0.5 mm post Bregma; 1-1.5 mm lateral to the midline; 3 mm ventral to the dura); bio-adhesive glue; immunology;
- Q10407:** S. L. Baringer, *et al.* Regulation of brain iron uptake by apo- and holo-transferrin is dependent on sex and delivery protein. *Fluids Barriers CNS* 2022;19(1):49  
**Agents:** Apotransferrin; Holo-transferrin **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** Wild-type; **Pump:** 2004;  
**Duration:** 48 hours;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (3 months old; ); post op. care: The incision was then sutured with nylon sutures. The mice were then placed in a heated recovery chamber until they regained consciousness; Brain coordinates (1 mm lateral to Bregma; 0.5 mm posterior to lateral ventricle); dependence;
- Q10489:** B. Anand, *et al.* Significance of native PLGA nanoparticles in the treatment of Alzheimer's disease pathology. *Bioactive Materials* 2022;17(506-525  
**Agents:** PLGA **Vehicle:** CSF; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Strain:** 5xFAD, wild-type; **Pump:** 2004;  
**Duration:** 28 days;  
**ALZET Comments:** Dose: (25 uM)); animal info: Three-month old mice along with age-matched) control mice; behavioral testing: Novel-object recognition test; PLGA aka Acidic poly(D,L-lactide-co-glycolide) nanoparticles; ALZET Brain Infusion Kit used; Brain coordinates (right ventricle (-0.8 mm mid/lateral, -0.1 mm antero/posterior and -3.0 mm dorso/ventral from Bregma); neurodegenerative (Alzheimer's);
- Q10437:** A. Abot, *et al.* How does apelin affect LH levels? An investigation at the level of GnRH and KNDy neurons. *Molecular and Cellular Endocrinology* 2022;557(111752  
**Agents:** aCSF; Apelin-13; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 2004; **Duration:** 2 weeks;  
**ALZET Comments:** animal info (16 total; Male; 9 weeks old); peptides; ALZET brain infusion kit 3 used; Brain coordinates (-1 mm lateral; -0.2 mm anteroposterior from bregma; 1.7 mm below skull surface);