



Recent References (2016-Present) on the Administration of Peptides to the CNS
Using ALZET® Osmotic Pumps

Q11270: W. Dong, *et al.* A designer peptide against the EAG2-Kvbeta2 potassium channel targets the interaction of cancer cells and neurons to treat glioblastoma. *Nature Cancer* 2023;4(10):1418-1436

Agents: K90-114 **Vehicle:** DPBS; **Route:** CSF/CNS (intratumoral); **Species:** Mice; **Strain:** NSG; **Pump:** 1002; 1007D; **Duration:** 14 days;

ALZET Comments: Dose (300 µg); animal info: 6–12-week-old female; peptides; brain coordinates (1.5 mm lateral to midline, 2 mm posterior to bregma and –3 mm deep to the cranial surface); cancer (Glioblastoma); brain tissue distribution; "We utilized an osmotic pump with a cannula to infuse peptide intratumorally (Fig. 5c), a delivery route that bypasses the blood–brain barrier and increases peptide local concentration." p. 8

Q11243: K. A. Alkadhi. A rat model of pre-clinical Alzheimer's disease. *Handbook of Animal Models in Neurological Disorders* 2023;43-55

Agents: Amyloid beta (1-42) **Vehicle:** Acetonitrile; trifluoroacetic acid; **Route:** CSF/CNS (lateral ventricle); **Species:** Rat; **Strain:** Wistar; **Pump:** Not Stated; **Duration:** 2 weeks;

ALZET Comments: Dose (160pmol/day); 35% acetonitrile/0.1% trifluoroacetic acid used; post op. care: wound clips used; triple antibiotic ointment; peptides; catheter; Brain coordinates (AP: -0.3, L: 1.2, V: 4.5); dental cement used; behavioral testing: Radial arm water maze task; Short term memory; Long term memory; neurodegenerative (Alzheimer's); good methods p. 44-45

Q11086: C.-W. Lin, *et al.* Monascus-fermented metabolites repressed amyloid β-peptide-induced neurotoxicity and inflammatory response in in vitro and in vivo studies. *Journal of Functional Foods* 2023;104

Agents: Amyloid beta-peptide-40 **Vehicle:** Acetonitrile; trifluoroacetic acid; **Route:** CSF/CNS (left ventricle); **Species:** Rat; **Strain:** Sprague-Dawley; **Pump:** Not Stated; **Duration:** 28 days;

ALZET Comments: 35% acetonitrile solution; Controls received mp w/ vehicle; animal info (Male; 6-8 weeks old); peptides; ALZET brain infusion kit 2 used; dental cement used; Alzheimer's

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);

R0438: G. Canet, *et al.* The pathomimetic oAβ(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

Q10868: T. Zhang, *et al.* Mitigation of Memory Impairment with Fermented Fucoïdan and lambda-Carrageenan Supplementation through Modulating the Gut Microbiota and Their Metagenome Function in Hippocampal Amyloid-beta Infused Rats. *Cells* 2022;11(15):

Agents: Amyloid-Beta (25-35) **Vehicle:** Water, distilled; **Route:** CSF/CNS (hippocampus); **Species:** Rat; **Strain:** Sprague-Dawley; **Pump:** Not Stated; **Duration:** 3 weeks;

ALZET Comments: Dose (0.005 mg in 300 ul); Controls received mp w/ vehicle; animal info (Male; Weighed about 267 g); peptides; Brain coordinates (lateral -3.3 mm from bregma; posterior 2 mm from midline; ventral -2.5 mm from dura); bilateral cannula used; neurodegenerative;



- Q10680:** P. K. Singh, *et al.* Specific Inhibition of NADPH Oxidase 2 Modifies Chronic Epilepsy. *Redox Biology* 2022;58(102549)
Agents: Gp91ds-tat **Vehicle:** Not Stated; **Route:** CSF/CNS (right lateral ventricle); **Species:** Rat; **Strain:** Sprague–Dawley;
Pump: 2002; **Duration:** 2 weeks;
ALZET Comments: "Dose (800 ng/kg/day); Controls received mp w/ vehicle; animal info (Naïve male and female rats (200–250 g); post op. care (Before initiating the surgery, rats were injected with buprenorphine (0.2 mg/kg; SC) and Metacam (1 mg/kg; SC) for pain relief); After surgery rats were injected with 3–5 ml of warmed Ringer's solution and amoxicillin (Betamox LA, 100 mg/kg); peptides; catheter; ALZET brain infusion kit 2 used; Brain coordinates (vinyl catheter tube was implanted into the right lateral ventricle of brain [1 mm posterior, 1.2 mm lateral, 4.5 mm ventral from the bregma); dental cement used; neurodegenerative (Epilepsy); "
- Q10579:** J. Kopecky, *et al.* Intratumoral Administration of the Antisecretory Peptide AF16 Cures Murine Gliomas and Modulates Macrophage Functions. *Scientific Reports* 2022;12(1):4609
Agents: Temozolomide; AF16 **Vehicle:** Not Stated; **Route:** CSF/CNS (intratumoral); **Species:** Mice; **Strain:** C57BL/6; **Pump:** 1003D; **Duration:** 3 days;
ALZET Comments: Dose (180 mg/72 ul; 300 ug/72 ul); animal info (Female; 8-10 weeks old); peptides; immunology; cancer (Glioblastoma);
- 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 **Vehicle:** Not Stated; **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);
- Q11334:** C. Tohda, *et al.* A Novel Heptapeptide, GPPGPAG Transfers to the Brain, and Ameliorates Memory Dysfunction and Dendritic Atrophy in Alzheimer's Disease Model Mice. *Frontiers in Pharmacology* 2021;12(680652)
Agents: GPPGPAG **Vehicle:** CSF, artificial; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Strain:** 5XFAD; WT; **Pump:** 1004; **Duration:** 28 days;
ALZET Comments: Dose: (1.64 uM); Controls received mp w/ vehicle; animal info: male or female, 5–7 months; peptides; stability of drug in saline, mouse plasma, mouse cerebral cortex confirmed by LC-MS quantification; ALZET brain infusion kit 3 used; Brain coordinates (left ventricle (bregma: -0.2 mm, lateral: 1.0 mm, depth: -3.0 mm); behavioral testing: object recognition test; neurodegenerative (Alzheimer's disease); "Direct infusion of GPPGPAG into the lateral ventricle of 5XFAD mice for 28 days improved object recognition memory."
- Q10739:** V. Zhuravleva, *et al.* Rab35 and Glucocorticoids Regulate APP and BACE1 Trafficking to Modulate Abeta Production. *Cell Death & Diseases* 2021;12(12):1137
Agents: Amyloid-beta, 1-40 **Vehicle:** Saline; **Route:** CSF/CNS (intracerebroventricular); **Species:** Rat; **Strain:** Wistar; **Pump:** 2002; **Duration:** 14 days;
ALZET Comments: animal info (12-months old; male rats); AB1-40 aka toxic amyloid beta peptides; ALZET brain infusion kit used; Brain coordinates (-0.6 mm anteroposterior; -1.4 mm mediolateral; -3.5 mm dorsoventral); neurodegenerative (Alzheimer's disease);
- Q8744:** S.-K. Mun, *et al.* MicroRNAs Related to Cognitive Impairment After Hearing Loss. *Clinical and Experimental Otorhinolaryngology* 2021;14(1):76-81
Agents: Amyloid protein, beta (1-42) **Vehicle:** Acetonitrile; Trifluoroacetic Acid; **Route:** CSF/CNS (right lateral ventricle); **Species:** Rat; **Strain:** Wistar; **Pump:** 2002; **Duration:** 2 weeks;
ALZET Comments: Dose (160 pmol/day); 35% Acetonitrile, 0.1% Trifluoroacetic Acid used; animal info (rats, 200-250 g, 7 weeks old); behavioral testing (Y-maze test, object-in-place task (OPT), novel object recognition task (NOR), object location task); peptides; ALZET brain infusion kit 2 used; Brain coordinates (anteroposterior, -0.3; lateral, 1.2; vertical, 4.5); neurodegenerative (Hearing loss);



T0015: R. Koyama. The role of pannexin 1-mediated ATP signaling in the trigeminal spinal subnucleus caudalis in tongue cancer pain. Proceedings of the National Academy of Sciences 2021;

Agents: 10Panx; Brilliant blue G; BzATP **Vehicle:** PBS; **Route:** CSF/CNS (cisterna magna); **Species:** Rat; **Strain:** Fischer; **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: Dose: PBS and 10Panx (20 nmol/0.5 µL/h), Brilliant Blue G (7 pmol/0.5 µL/h), or BzATP (20 pmol/0.5 µL/h); Controls received mp w/ vehicle; animal info: male (weighing 200–250 g)post op. care: (e.g., buprenorphine, meloxicam, ketoprofen, carprofen, or tramadol); peptides; BBG is an antagonist of P2X7Rs; BzATP is a specific agonist of P2X7Rs; 10Panx is an inhibitory peptide for PAXX1 channels; PAXX1 is a therapeutic target for the development of appropriate drugs to prevent tongue cancer pain

Q10182: S. Hirose, *et al.* Impact of a Demyelination-Inducing Central Nervous System Virus on Expression of Demyelination Genes in Type 2 Lymphoid Cells. Journal of Virology 2021;95(4):

Agents: Interleukin 2 **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: animal info: C57BL/6 mice; Interleukin-2 aka (IL-2); peptides; immunology;

Q9204: L. S. Dalboge, *et al.* Evaluation of VGF peptides as potential anti-obesity candidates in pre-clinical animal models. Peptides 2021;136(170444)

Agents: NERP-1; HHPD-41; TLQP-21; PGH-NH2; NERP-2; TLQP-62; Glucagon-like peptide-1 (7-37); Ghrelin **Vehicle:** Not Stated; **Route:** CSF/CNS (intracerebral); IV; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (2 nmol/mouse/day Glucagon-like peptide-1 (7-37); 3 nmol/mouse/day Ghrelin); Controls received mp w/ vehicle; animal info (male and female C57BL/6J mice, 13 weeks old); Glucagon-like peptide-1 aka GLP-1 (7-37); peptides; Brain coordinates (-0.7 mm posterior, -1.2 mm lateral [left], and -2.0 mm ventral); dependence;

Q9201: A. A. da Silva, *et al.* Chronic CNS-mediated cardiometabolic actions of leptin: potential role of sex differences. American Journal of Physiology Regulatory, Integrative Comparative Physiology 2021;320(2):R173-R181

Agents: Leptin **Vehicle:** Not Stated; **Route:** CSF/CNS (intracerebral); IV; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Dose (0.62 µg/h); animal info (male and female Sprague-Dawley rats, 12 weeks old); Blood pressure measured via BP telemeter device; 95 mmHg - 110 mmHg; peptides; diabetes;

Q9040: J. Zhu, *et al.* Apelin-36 mediates neuroprotective effects by regulating oxidative stress, autophagy and apoptosis in MPTP-induced Parkinson's disease model mice. Brain Research 2020;1726(146493)

Agents: Apelin-36 **Vehicle:** Saline; **Route:** CSF/CNS (substantia nigra); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (0.1, 0.3 and 0.5 µg/ mice/day); Controls received mp w/ vehicle; animal info (Nine- to eleven-week old male C57BL/6 mice, 23–27 g); peptides; ALZET BIK 2 used; Brain coordinates (AP: -3.1 mm; ML: 1.3 mm; DV: -4.25 mm);

Q9829: L. Zheng, *et al.* Rhythmic light flicker rescues hippocampal low gamma and protects ischemic neurons by enhancing presynaptic plasticity. Nature Communications 2020;11(1):3012

Agents: GK23; GK13; Conotoxin, w-; **Vehicle:** CSF, Artificial; **Route:** CSF/CNS (intracerebral); IV; **Species:** Mice; **Pump:** 1003D;

Duration: 3 days;

ALZET Comments: Dose (2 mg/kg/day GK23, GK13; 2.28 ng/kg/day w-Conotoxin); animal info (Adult male C57Bl/6 mice (3-months-old)); behavioral testing (Open field test; Morris water maze; Y-maze test); peptides; ALZET brain infusion kit 3 used; Brain coordinates (coordinates from bregma: anterior-posterior = -0.5 mm; lateral = 1.0 mm); dental cement used;

Q9564: W. Xu, *et al.* Blockade of Nogo-A/Nogo-66 receptor 1 (NgR1) Inhibits Autophagic Activation and Prevents Secondary Neuronal Damage in the Thalamus after Focal Cerebral Infarction in Hypertensive Rats. Neuroscience 2020;431(103-114)

Agents: NEP1-40 **Vehicle:** PBS; **Route:** CSF/CNS (right lateral ventricle); **Species:** Rat; **Pump:** Not Stated; **Duration:** 3 days;

ALZET Comments: Dose (270 µg/kg); Controls received mp w/ vehicle; animal info (male Sprague-Dawley rats, weighing 60–90 g); behavioral testing (adhesive removal test); NEP1-40 aka Nogo-66 receptor antagonist peptide; peptides; Brain coordinates (relative to bregma: -1.0 mm anteroposterior, 1.4 mm lateral, and -4.0 mm dorsoventral); ischemia (cerebral);



Q8370: M. Popek, *et al.* Physiology and Morphological Correlates of Excitatory Transmission are Preserved in Glutamine Transporter SN1-Depleted Mouse Frontal Cortex. *Neuroscience* 2020;446(124-136

Agents: Anti-SN1 vivo-morpholinos oligonucleotides **Vehicle:** Saline; **Route:** CNS/CSF; **Species:** Mice; **Pump:** 1002; **Duration:** Not stated;

ALZET Comments: Dose (1.2 mg/kg/day); Controls received mp w/ vehicle; animal info (Male, C57Bl6, 30 g); peptides; Brain coordinates (AP + 2.0, ML 0.8, DV 1.5)); neurodegenerative (Glutamatergic transmission);

Q10048: M. A. Nunes, *et al.* Kinin B2 Receptor Activation Prevents the Evolution of Alzheimer's Disease Pathological Characteristics in a Transgenic Mouse Model. *Pharmaceuticals (Basel)* 2020;13(10):

Agents: Amyloid Beta 1-42 **Vehicle:** CSF, Artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** 8 weeks;

ALZET Comments: Dose (10 nmol/kg/h); Controls received mp w/ vehicle; animal info (Twelve-month-old transgenic mice); pumps replaced every 4 weeks; Amyloid Beta 1-42 aka AB peptide; peptides; neurodegenerative (Alzheimer's Disease);

Q9999: J. Lee, *et al.* Antagonistic interaction between central glucagon-like Peptide-1 and oxytocin on diet-induced obesity mice. *Heliyon* 2020;6(10):e05190

Agents: Glucagon-like peptide-1 **Vehicle:** Saline **Route:** CNS/CSF (third ventricle) **Species:** Mice **Pump:** 1002D **Duration:** 26d

ALZET Comments: Dose (16.01 nmol/d); 0.9% Saline used; Controls received mp w/ vehicle; animal info (5 to 6-week-old male C57BL6/J mice); Glucagon-like peptide-1 aka GLP-1; peptides; Brain coordinates (1.79 mm caudal to bregma); dental cement used; dependence;

Q8578: J. E. Kim, *et al.* Epigallocatechin-3-Gallate and PEDF 335 Peptide, 67LR Activators, Attenuate Vasogenic Edema, and Astroglial Degeneration Following Status Epilepticus. *Antioxidants (Basel)* 2020;9(9):

Agents: NU335; Epigallocatechin-3-O-gallate **Vehicle:** Not stated; **Route:** CSF/CNS (right lateral ventricle); **Species:** Rat; **Pump:** 1003D; 1007D; **Duration:** 3 days;

ALZET Comments: Dose (50 uM Epigallocatechin-3-O-gallate; 1 uM NU335); Controls received mp w/ vehicle; animal info (Adult male Sprague-Dawley rats, 7 weeks old); Epigallocatechin-3-O-gallate; NU335 aka pigment epithelium-derived factor-derived peptide; peptides; ALZET brain infusion kit 1 used; Brain coordinates (1 mm posterior; 1.5 mm lateral; -3.5 mm depth to the bregma); neurodegenerative (Epilepsy);

Q8850: L. Hyland, *et al.* Ghrelin infused into the dorsomedial hypothalamus of male mice increases food intake and adiposity. *Physiology & Behavior* 2020;220(112882

Agents: Ghrelin; JMV2959 **Vehicle:** Saline; **Route:** CSF/CNS (dorsomedial hypothalamus); **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

ALZET Comments: Dose: Ghrelin (10 µg/day); JMV2959 (20 µg/day) Controls received mp w/ vehicle; animal info (adult male C57BL/6 mice); "post op. care: Polysporin and Lidocaine were administered to the surgical site to prevent bacterial infection and limit pain. Mice were then allowed to recover in a clean cage supplied with a heating pad, and Meloxicam (2 mg/kg) was injected subcutaneously once per day for three days to provide postoperative analgesia."; JMV2959 aka growth hormone secretagogue receptor antagonist; peptides; ALZET brain infusion kit used; Brain coordinates (AP 1.6 mm, ML 0.4 mm, and DV 5.25 mm); dental cement used; replacement therapy (Ghrelin infusion); "stress/adverse reaction: (see pg.4); Three mice did not survive the surgery and their baseline data were removed from the analyses. Six additional mice were removed from the data analyses due to incorrect cannula placements, and one mouse was removed because of abnormal cage behavior."

Q10183: S. Hirose, *et al.* Type 2 Innate Lymphoid Cells Induce CNS Demyelination in an HSV-IL-2 Mouse Model of Multiple Sclerosis. *iScience* 2020;23(10):101549

Agents: Interleukin-2 **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: animal info: wild-type (WT) HSV-1Interleukin -2 aka (IL-2)peptides; immunology;



Q8517: F. Gulcu Bulmus, *et al.* Kisspeptin and RF9 prevent paroxetine-induced changes in some parameters of seminal vesicle fluid in the male rats. *Andrologia* 2020;52(4):e13538

Agents: Kisspeptin; RFamid Peptide **Vehicle:** Saline; **Route:** CSF/CNS (intracerebral); IV; **Species:** Rat; **Pump:** Not stated; **Duration:** 10 days;

ALZET Comments: Dose (1 nmol Kisspeptin and 20 nmol RF9); Controls received mp w/ vehicle; animal info (male Sprague Dawley rats (21-day-old) weighing 40 ± 2 g); RFamide Peptide aka RF9; peptides; Brain coordinates (according to the bregma, in the anterior– posterior plane: 0.90 mm; in the lateral plane: 1.4 mm; and 4 mm on the vertical plane); dependence;

Q8899: J. Gao, *et al.* TDP-43 inhibitory peptide alleviates neurodegeneration and memory loss in an APP transgenic mouse model for Alzheimer's disease. *BBA - Molecular Basis of Disease* 2020;1866(1):165580

Agents: CPM / PM1 **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** Not Stated;

ALZET Comments: Dose (0.5 mg/kg/day); animal info (Female); behavioral testing (Open Field Test, Rotarod and Footprint Test, Grip Strength Test, Barnes Maze Test); cPM or PM1 aka Inhibitory Peptide ; peptides; neurodegenerative (Alzheimer's Disease);

Q8434: A. de Boer, *et al.* Environmental enrichment during the chronic phase after experimental stroke promotes functional recovery without synergistic effects of EphA4 targeted therapy. *Human Molecular Genetics* 2020;29(4):605–617

Agents: APY-d3 **Vehicle:** CSF, artificial **Route:** CSF/CNS (ipsilesional lateral ventricle) **Species:** Mice **Pump:** 1002 **Duration:** 2wk

ALZET Comments: Dose (5 mm); animal info (In-bred C57BL/6J male mice, 10–12 weeks of age); behavioral testing (accelerating rotarod; horizontal ladder task); APY-d3 aka peptide solution, β APYCVYR β ASWSC; peptides; ALZET brain infusion kit 3 used; Brain coordinates (0.1 mm caudal and 1.0 mm lateral of bregma); cyanoacrylate adhesive; gene therapy;

Q10410: N. D. Beckmann, *et al.* Multiscale causal networks identify VGF as a key regulator of Alzheimer's disease. *Nature Communications* 2020;11(1):3942

Agents: TLQP-62 **Vehicle:** CSF, artificial; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** Not Stated; **Duration:** 28d

ALZET Comments: Dose: (15 μ g/day) animal info: Mice at 3,7, 8-month old; behavioral testing; Barnes Maze test; Cerebrospinal fluid aka (CSF); Brain coordinates lateral ventricle [AP=–0.1, ML=±1.0 and DV: –3.0 from bregma (mm)]; peptides; neurodegenerative (Alzheimer's disease);

Q8330: E. Akyuz, *et al.* Unraveling the Role of Inwardly Rectifying Potassium Channels in the Hippocampus of an Abeta(1-42)-Infused Rat Model of Alzheimer's Disease. *Biomedicines* 2020;8(3):

Agents: Amyloid beta 1-42 **Vehicle:** Saline; **Route:** CNS/CSF (right hippocampus) **Species:** Rat **Pump:** 2002 **Duration:** 14 days

ALZET Comments: Dose (300 pmol/day); 0.9% NaCl saline used; Controls received mp w/ vehicle; animal info (Adult female Sprague–Dawley rats, 6-month-old); Amyloid beta 1-42 aka AB 1-42; peptides; Brain coordinates (coordinates from bregma: –3.60 mm anteroposterior; –2.00 mm lateral; –4.00 mm vertical); dental cement used; neurodegenerative (Alzheimer's Disease);

Q9082: M. Telles-Longui, *et al.* Alpha7 nicotinic ACh receptors are necessary for memory recovery and neuroprotection promoted by attention training in amyloid-beta-infused mice. *British Journal of Pharmacology* 2019;176(17):3193–3205

Agents: (1-42) AB Peptide; (1--42) AB Peptide; Methyllycaconitine **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

ALZET Comments: Dose (0.11 ul/hr); Controls received mp w/ vehicle; animal info (C57BL/6, 2 months old); post op. care (Indomethacin); Methyllycaconitine aka MLA; peptides; ALZET brain infusion kit 1 used; Brain coordinates (–0.8 mm anteroposterior, –1.4 mm mediolateral to the bregma, and –3.5 mm dorsoventral to the cranium ()); bilateral cannula used; neurodegenerative (Alzheimer's Disease);



Q9985: L. Sun, *et al.* Inhibition of microRNA-155 Alleviates Neurological Dysfunction Following Transient Global Ischemia and Contribution of Neuroinflammation and Oxidative Stress in the Hippocampus. *Current Pharmaceutical Design* 2019;25(40):4310-4317

Agents: miR-155 Inhibitor **Vehicle:** Not Stated; **Route:** CNS/CSF; **Species:** Rat; **Pump:** **Duration:** 24, 96 hours;
ALZET Comments: Dose (0.25 ul/hr); animal info (Male, Sprague Dawley, 200-250 g); peptides; ALZET brain infusion kit Not Stated used; Brain coordinates (3.7 mm posterior to the bregma, 4.1 mm lateral to the midline, and 3.5 mm under the dura); bilateral cannula used; dental cement used; ischemia (Global);

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

Agents: Amyloid B (1-40) **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2004; **Duration:** 4 weeks;
ALZET Comments: Dose (10, 50, or 100 mg/kg/day); Controls received mp w/ vehicle; animal info (Male, Wistar, 8 weeks old, 200-300g); behavioral testing (Morris Water Maze Test, Spatial Memory Test, Working Memory Test); Alpha B (1-40) aka AB; peptides; ALZET brain infusion kit 3 used; Brain coordinates (relative to bregma; 0.8 mm posterior, 1.4 mm lateral); dental cement used; neurodegenerative (Alzheimer's Disease);

Q8876: Y. Li, *et al.* Activation of Nrf2 signaling by sitagliptin and quercetin combination against beta-amyloid induced Alzheimer's disease in rats. *Drug Development Research* 2019;80(6):837-845

Agents: Peptide, beta-amyloid (1-42) **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Rat; **Pump:** Not Stated; **Duration:** 14 days;
ALZET Comments: Dose (300 pmol/day); Controls received mp w/ vehicle; animal info (Male, Sprague-Dawley, 250-300 g); behavioral testing (Morris Water Maze Test,); B-amyloid (1-42) peptide aka AB amyloid (1-42); peptides; Brain coordinates (Relative to bregma: A, 0.8; L, 1.4; V, 4.5); neurodegenerative (Alzheimer's Disease);

Q7987: S. Dyck, *et al.* LAR and PTPsigma receptors are negative regulators of oligodendrogenesis and oligodendrocyte integrity in spinal cord injury. *Glia* 2019;67(1):125-145

Agents: peptide, intracellular LAR; peptide, intracellular sigma **Vehicle:** saline, BSA buffered; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2001D, 1003D, 2001, 2002, and 2004; **Duration:** 1, 3, 5, 7, 14, 28 days;
ALZET Comments: Dose ((ILP 10 µg/day), (ISP 10 µg/day)); 0.1% BSA in saline used; Controls received mp w/ vehicle; animal info (female, Sprague-Dawley, 250g); ILP (NH2-GRKKRRRQRRCDLADNIERLKANDGLKFSQEYESI-NH2) and ISP (NH2-GRKKRRRQRRCDMAEHMERLKANDSLKLSQEYESI-NH2) are peptides against LAR and PTPsigma; enzyme inhibitor (LAR and PTPsigma receptor); peptides; spinal cord injury; Therapeutic indication (inhibition of PTPsigma and LAR receptors promotes oligodendrogenesis by endogenous precursor cells, attenuates caspase 3-mediated cell death in mature oligodendrocytes, and preserves myelin);

Q7052: I. Rossetti, *et al.* Calcitonin gene-related peptide decreases IL-1beta, IL-6 as well as Ym1, Arg1, CD163 expression in a brain tissue context-dependent manner while ameliorating experimental autoimmune encephalomyelitis. *J Neuroimmunol* 2018;323(94-104

Agents: Calcitonin gene-related peptide **Vehicle:** CSF, artificial; **Route:** CSF/CNS (intrathecal); **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (7-8 week old C57BL/6 female mice); peptides;

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

Agents: PrRP palmitoylated analogs, Leptin, Amylin, Cyclic AC253, Exendin 4 **Vehicle:** Not Stated; **Route:** SC, CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** Not Stated; **Duration:** 2 months; 28 days; 5 weeks, 5 months, 16 weeks;
ALZET Comments: Dose: Palm11-PrRP (5 mg/kg/day), Leptin (2.4 nmol/day), Amylin (0.24 mg/kg/day), Exendin-4 (3.5 pmol/kg/min); animal info (7 month old THY-Tau22 mice; 5 month old APP/PS1 mice; 6 month old AMP8 mice); behavioral testing (Y-maze); neurodegenerative (Alzheimer's); This review summarizes current information on the potential neuroprotective properties of food intake-lowering (anorexigenic) peptides that have been tested in experimental models of AD-like pathology.



Q10130: S. W. Carlson, *et al.* Central Infusion of Insulin-Like Growth Factor-1 Increases Hippocampal Neurogenesis and Improves Neurobehavioral Function after Traumatic Brain Injury. *Journal of Neurotrauma* 2018;35(13):1467-1480

Agents: Recombinant human IGF-1 **Vehicle:** PBS; Acetic acid; **Route:** CSF/CNS (intracerebroventricular); **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose, (10 ug/day); Controls received mp w/ vehicle; Sham surgery; animal info (Adult male C57BL/6J 10 wks, 25–30 g); Recombinant human IGF-1 aka (hIGF); peptides; Alzet brain infusion kit 3 used; Brain coordinates (AP -0.5mm bregma, ML -1.0 mm, DV -3.0mm53); bilateral cannula used; dental cement used; neurodegenerative (Traumatic brain injury);

Q10115: T. Borner, *et al.* Brainstem GLP-1 signaling contributes to cancer anorexia-cachexia syndrome in the rat. *Neuropharmacology* 2018;131(282-290

Agents: Exendin-9 **Vehicle:** Saline; **Route:** CSF/CNS (left ventricle); **Species:** Rat; **Pump:** 2ML2; **Duration:** 11 days;

ALZET Comments: Dose EX-9 (100 ug/day); Controls received mp w/ vehicle; Animal info: (Male Buffalo 250-280g); GLP-1R antagonist; Brain coordinates (bregma-11.6 mm, lateral 0.0 mm, dorsoventral-7.2 mm); Cancer; anorexia-cachexia syndrome

Q10094: N. A. Benton, *et al.* Food restriction-induced changes in motivation differ with stages of the estrous cycle and are closely linked to RFamide-related peptide-3 but not kisspeptin in Syrian hamsters. *Physiology & Behavior* 2018;190(43-60

Agents: Peptide, Rat RF amide-related **Vehicle:** Saline; **Route:** CNS/CSF (lateral ventricle); **Species:** Hamster; **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: Dose (50 ng/h); Controls received mp w/ vehicle; animal info (Adult, female Syrian hamsters); behavioral testing (food consumption); RFRP-3 aka Rat RFamide-related peptide; peptides; Brain coordinates (1.1 mm anterior to bregma, 1.0 mm lateral to the midline, and 4.0 mm ventral to dura); dental cement used;

Q7093: K. A. Alkadhi. Delayed effects of combined stress and Abeta infusion on L-LTP of the dentate gyrus: Prevention by nicotine. *Neurosci Lett* 2018;682(10-15

Agents: Amyloid peptide, beta (1-40); Amyloid peptide, beta (1-42) **Vehicle:** Acetonitrile, Trifluoacetic acid; **Route:** CSF/CNS (lateral ventricle); **Species:** Rat; **Pump:** Not Stated; **Duration:** 14 days;

ALZET Comments: Dose (300 pmol peptides/day); 35% acetonitrile, 0.1% trifluoacetic acid (TFA); animal info (Adult male Wistar, 7 weeks old, 200-225 g); dependence;

Q10079: K. A. Alkadhi, *et al.* Exercise decreases BACE and APP levels in the hippocampus of a rat model of Alzheimer's disease. *Molecular and Cellular Neuroscience* 2018;86(25-29

Agents: Peptide, amyloid beta 1-42 **Vehicle:** Water, distilled; Acetonitrile; TFA; **Route:** SC; CSF/CNS (right lateral cerebral ventricle); **Species:** Rat; **Pump:** Not Stated; **Duration:** 4 weeks;

ALZET Comments: Dose (250 pmol/day); 64.9% distilled water, 35% acetonitrile, 0.1% trifluoroacetate (TFA) used; 2 control groups, 1 mp w/ agent, 1 mp w/ vehicle; animal info (adult male Wistar rats, 7 weeks, 200-225g); post op. care (wound clips used and triple antibiotic ointment); peptides; Brain coordinates (AP, -0.3, L, 1.2, V, 4); Cannula placement verified via rat brain atlas; dental cement used; neurodegenerative (alzheimers); "Since our AD model was created by infusion of A β 1-42, we wanted to ascertain the possible effects of exogenous introduction of A β peptide on the endogenous system that produces AD-related peptides and whether regular exercise would be able to prevent these changes. The current and recent experiments showed that exercise might be beneficial for managing the ravages of AD probably through increasing endogenous BDNF." Therapeutic indication (exercise to increase production of BDNF);

Q10353: K. A. Alkadhi. Delayed effects of combined stress and Abeta infusion on L-LTP of the dentate gyrus: Prevention by nicotine. *Neuroscience Letters* 2018;682(10-15

Agents: Peptides, Amyloid Beta 1-40; Amyloid Beta 1-42; Amyloid Beta 42-1 **Vehicle:** Acetonitrile, TFA; **Route:** CSF/CNS (intracerebroventricular); **Species:** Rat; **Pump:** Not Stated; **Duration:** 6 weeks;

ALZET Comments: Dose (50/50 A β 1-40/A β 1-42 300 pmol/day); 35% acetonitrile, 0.1% trifluoacetic acid (TFA) used; Controls received mp w/ A β 42-1; animal info (Adult male Wistar 7 weeks, 200-225g); behavioral testing (psychosocial stress and nicotine); peptides; ALZET brain infusion kit used; neurodegenerative (Alzheimers); Pumps implanted 4 weeks into study, chronic stress exacerbates the effect of A β on synaptic plasticity, therefore, chronic stress should be considered a risk factor in hastening the development of AD pathology. Found that nicotine prevents the deleterious effects of A β on synaptic plasticity, this supports epidemiological studies that report an inverse relationship between smoking and AD; "



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

Agents: Interleukin 17 receptor A **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Mice (knockout);

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

Q6067: K. Rasri-Klosen, *et al.* Differential response patterns of kisspeptin and RFamide-related peptide to photoperiod and sex steroid feedback in the Djungarian hamster (*Phodopus sungorus*). *J Neuroendocrinol* 2017;29(9):

Agents: kisspeptin-10, RFamide-related peptide **Vehicle:** CSF, artificial; **Route:** CSF/CNS (lateral ventricle); **Species:** Hamster;

Pump: 1004; **Duration:** 4 weeks;

ALZET Comments: Dose (0.25 nmol/h); animal info (4-6 month old Djungarian hamsters); peptides;

Q5891: K. T. Santhosh, *et al.* Design and optimization of PLGA microparticles for controlled and local delivery of Neuregulin-1 in traumatic spinal cord injury. *J Control Release* 2017;261(147-162)

Agents: Neuregulin-1, human recombinant **Vehicle:** CSF, artificial; BSA; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1003D; 2001; 2002; 2004; **Duration:** 3 days, 7 days, 14 days, 28 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 250g); Dose (500ng/day); 1% BSA used; comparison of microparticles vs mp; spinal cord injury; peptides; Dose (500ng/day);

Q6743: H. Pierce, *et al.* Cholinergic Signals from the CNS Regulate G-CSF-Mediated HSC Mobilization from Bone Marrow via a Glucocorticoid Signaling Relay. *Cell Stem Cell* 2017;20(5):648-658 e4

Agents: Pirenzepine; Scopolamine hydrobromide; Metyrapone; luteinizing hormone; ACTH **Vehicle:** PBS; **Route:** CSF/CNS (Third ventricle); **Species:** Mice (knockout); **Pump:** 1002; **Duration:** Not Stated;

ALZET Comments: Dose (0.6 mg/kg/day Pirenzepine; 1.0 mg/kg Scopolamine hydrobromide; 100mg/kg/day Metyrapone; 2.8 mg/kg/day ACTH; 16ug/day LH); Controls received mp w/ vehicle; animal info (wild-type and Chrm1-/-); Brain coordinates (A/P -1.6 mm posterior to bregma, D/V -4.7 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

Agents: Angiotensin (1-7); A-779 **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

ALZET Comments: 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);

Q5209: C. H. Su, *et al.* MRI/DTI of the Brain Stem Reveals Reversible and Irreversible Disruption of the Baroreflex Neural Circuits: Clinical Implications. *Theranostics* 2016;6(6):837-48

Agents: Angiotensin II **Vehicle:** Not Stated; **Route:** CSF/CNS (ventricle); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: animal info (male, C57BL6, adult); cardiovascular; peptides; bp measured using radiotelemetry (DSI); Dose (7.5 ug/hr);

Q5343: Sophie Dutheil, *et al.* BDNF Signaling Promotes Vestibular Compensation by Increasing Neurogenesis and Remodeling the Expression of Potassium-Chloride Cotransporter KCC2 and GABAA Receptor in the Vestibular Nuclei. *Journal of Neuroscience* 2016;36(23):6199-6212

Agents: Brain-derived neurotrophic factor, K252a **Vehicle:** Saline; CSF, artificial; **Route:** CSF/CNS (ventricles); **Species:** Cat; **Pump:** 2ML4; **Duration:** 30 days;

ALZET Comments: Controls received mp w/ saline; animal info (adult, male cat, 4-5 kg); dose-response (pg 6205, 6206); behavioral testing (rotating beam experimental device test); peptides;



Q4900: P. Q. H. Renjun Wang, MD; Rui Zhou, BSc; Zengxiang Dong, PhD; *et al.* Sympathoexcitation in Rats With Chronic Heart Failure Depends on Homeobox D10 and MicroRNA-7b Inhibiting GABBR1 Translation in Paraventricular Nucleus. *Circulation: Heart Failure* 2016;9(1-10)

Agents: AntagomiR-7b; RNA, small interfering GABBR1; angiotensin II **Vehicle:** Not Stated; **Route:** CSF/CNS (paraventricular nucleus); **Species:** Rat; **Pump:** 1004; 1002; **Duration:** 4 weeks; 2 weeks;

ALZET Comments: animal info (male, Wistar, 180-200g); pumps replaced after 4 weeks; bilateral cannula used; tissue perfusion (paraventricular nucleus); cardiovascular; peptides; bilateral infusion; Dose (AntagomiR-7b or Ad-siGABBR1 40 ng/h; angiotensin II 1 ng/kg/min);

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

Agents: Amyloid protein, beta **Vehicle:** HEPES; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** 35 days;

ALZET Comments: 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);