Recent References (2016-2020) on the Administration of Antisense Oligonucleotides Using ALZET® Osmotic Pumps

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);

Agents: G1; G36; Oligodeoxynucleotide, IL1RA antisense; Scrambled Missense Vehicle: DMSO; Saline; Route: SC; CNS/CSF (left lateral ventricle); Species: Rat; Pump: 2004; 2002; 2001; Duration: 14 days;
ALZET Comments: Dose (10 ug/day; 10 nmol/day); 1% DMSO, 0.9% saline used; Controls received mp w/ vehicle; animal info (Adult female Sprague-Dawley rats); G1 aka GPER agonist; G36 aka GPER antagonist; ALZET brain infusion kit Lot no 10331-14 used; Brain coordinates (anteroposterior, 0.8 mm; lateral, 1.5 mm; depth, 3.5 mm; from bregma); ischemia (GPER neuroprotective effects);

Q8501: D. Alarcon-Aris, et al. Anti-alpha-synuclein ASO delivered to monoamine neurons prevents alpha-synuclein accumulation in a Parkinson's disease-like mouse model and in monkeys. EBioMedicine 2020;59(102944)
Agents: Oligonucleotides, antisense Vehicle: CSF, Artificial; Route: CSF/CNS (lateral ventricle); Species: Mice; Primate; Pump: 1004; 2ML4; Duration: 28 days;
ALZET Comments: Dose (30 ug/day; 100 ug/day; 1 mg/day); Controls received mp w/ vehicle; animal info (Eight-week-old wild-type male C57BL/6J mice; male and female hensus macaques, 20 years or older); antisense oligonucleotides aka IND-ASO; ALZET brain infusion kit 3 used; Brain coordinates (antero-posterior -0.34, medial-lateral -1.0 and dorsal-ventral -2.2 in mm); neurodegenerative (Parkinson’s disease);

Q8332: D. Alarcon-Aris, et al. Anti-alpha-synuclein ASO delivered to monoamine neurons prevents alpha-synuclein accumulation in a Parkinson's disease-like mouse model and in monkeys. EBioMedicine 2020;59(102944)
Agents: Oligonucleotides, antisense Vehicle: CSF, Artificial; Route: CNS/CSF (lateral ventricle); Species: Mice; Primate; Pump: 1004; 2ML4; Duration: 28 days;
ALZET Comments: Dose (30 ug/day; 100 ug/day; 1 mg/day); Controls received mp w/ vehicle; animal info (Eight-week-old wild-type male C57BL/6J mice; male and female hensus macaques, 20 years or older); antisense oligonucleotides aka IND-ASO; ALZET brain infusion kit 3 used; Brain coordinates (antero-posterior -0.34, medial-lateral -1.0 and dorsal-ventral -2.2 in mm); neurodegenerative (Parkinson’s disease);

Agents: Antisense oligodeoxynucleotides Vehicle: Saline; Route: SC; Species: Rat; Pump: 2001; Duration: Not stated;
ALZET Comments: Dose (400 ng/h); Controls received mp w/ vehicle; animal info (Male, Wistar, 12-16 weeks old, 325-400 g); Antisense oligodeoxynucleotides aka AS-ODN ; antisense (Antisense oligodeoxynucleotides); neurodegenerative (Traumatic Brain Injury);

Agents: Epinephrine Vehicle: Saline; Route: SC; Species: Rat; Pump: 2004; Duration: 2 weeks;
ALZET Comments: Dose (5.4 mg/0.25 mL/h); Controls received mp w/ vehicle; animal info (adult male Sprague-Dawley rats, weighing 250 to 400 g (approximatem 8-12 weeks old)); antisense (intrathecal b2-adrenergic receptor antisense);

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<td>Agents: Oligonucleotide, antisense</td>
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<td>Agents: Oligonucleotide, anti-miR-204 Vehicle: Not Stated; Route: Not Stated; Species: Mice; Pump: 2006; Duration: 6 weeks; ALZET Comments: Controls received mp w/ scrambled oligonucleotides; animal info (male, eSirt1 -/- or C57BL6); cardiovascular; Dose (0.7 mg/kg/day);</td>
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<td>Agents: Oligonucleotide, antisense anti-Cytosolic phospholipase A2 alpha Vehicle: Saline; Route: CSF/CNS; Species: Mice (transgenic); Pump: Not Stated; Duration: 4 weeks; 6 weeks; ALZET Comments: 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</td>
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overnight in 37°C saline; Dose (10 μg/day); Brain coordinates (right lateral cerebral ventricle (−1.0 mm mediolateral and −0.5 mm anteroposterior from Bregma));

**Agents:** Oligonucleotides, antisense **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice (transgenic); **Pump:** Not Stated; **Duration:** 28 days;  
**ALZET Comments:** 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 37°C saline overnight; Industry authored (Ionis Pharmaceuticals); Dose (14 μg/day for 3R to 4R MAPT splicing ASO; 25 μg/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);

**Q5622:** D. Kim. Anti-miR delivery strategies to bypass the blood-brain barrier in glioblastoma therapy. Oncotarget 2016;7(20):29400-11  
**Agents:** Oligonucleotide, anti-miR, anti-let-7 **Vehicle:** Saline; **Route:** CSF/CNS (intrathecal); **Species:** Mice; **Pump:** 1004D; **Duration:** 7 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (6-7 weeks); ALZET brain infusion kit 3 used; “Among them, the osmotic pump system is one of the most useful convection-enhanced delivery methods for delivering drugs to brain tumors and bypassing the BBB” pg 29408; Dose (20 μM, 50 μM); good figures (p29402;

**Q6041:** L. German-Castelan, *et al.* Intracellular Progesterone Receptor Mediates the Increase in Glioblastoma Growth Induced by Progesterone in the Rat Brain. Archives of Medical Science 2016;47(6):419-426  
**Agents:** Oligodeoxynucleotide, antisense **Vehicle:** Propylene glycol; **Route:** CSF/CNS; **Species:** Rat; **Pump:** Not Stated; **Duration:** 15 days;  
**ALZET Comments:** animal info (250-300g) ; tissue perfusion (brain tissue); Guide cannula used; Therapeutic indication (Astrocytomas, CNS tumor); Dose (0.5 μg/day);

**Q5348:** J. D. Figueroa, *et al.* Fatty Acid Binding Protein 5 Modulates Docosahexaenoic Acid-Induced Recovery in Rats Undergoing Spinal Cord Injury. J Neurotrauma 2016;33(15):1436-49  
**Agents:** Oligonucleotides, scramble nontargeting; siRNA **Vehicle:** Ethanol; **Route:** CSF/CNS (Intrathecal); **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (Young adult female Sprague-dawley rats); good methods (pg 1443); spinal cord injury; “Pumps were primed with DHA-albumin complex (DHA), FABPS siRNA, and vehicle controls” (pg 1443); ALZET rat intrathecal catheter used;

**Q5805:** S. Eid, *et al.* mTORC2 Signaling Regulates Nox4-Induced Podocyte Depletion in Diabetes. Antioxidants & Redox Signaling 2016;25(13):703-719  
**Agents:** Oligonucleotide, phosphorothioate antisense (Rictor); Oligonucleotide, phosphorothioate sense (Rictor); **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2006; **Duration:** 5 weeks;  
**ALZET Comments:** Controls received mp w/ vehicle;animal info (17 weeks old)antisense (phosphorothioated Sense and Antisense for Rictor);diabetes;Therapeutic indication (Diabetes);Dose (90 ng*g body wt-1 * day-1);)

**Agents:** RNA, small interfering **Vehicle:** CSF, artificial; **Route:** CSF/CNS (fourth ventricle); **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks, 14 days;  
**ALZET Comments:** Controls received mp w/ vehicle;animal info (3-4 months old); antisense (siRNA against MPR-a or mPR-b); “Previous studies in adult mice showed that 2-wk infusion of nonviral siRNA in the third ventricle ensured efficient (~50%) and widespread (5–6 mm around the infusion point) knockdown of target genes in the brain (48).” Pg 782; Therapeutic indication (Sex steroids, Chemoreflex);