Recent References (2016-2018) on the Administration of siRNA Using ALZET® Osmotic Pumps

Agents: RNA, small interfering (Flt3, scrambled) Vehicle: Route: CSF/CNS(Intrathecal); Species: Mice; Pump: 1002; Duration: 6 days;
ALZET Comments: Dose (12.53 ng/ml); animal info: (C57BL/6 naive mice, Flt3KO mice 25–30 g.); behavioral testing (reflexive tail flick); spinal cord injury; stress/adverse reaction: (see pg. 10);

Q7151: D. S. Lee, et al. PDI-mediated S-nitrosylation of DRP1 facilitates DRP1-S616 phosphorylation and mitochondrial fission in CA1 neurons. Cell Death Dis 2018;9(9):869
Agents: RNA, small interfering (protein disulfide isomerase), L-NAME Vehicle: Saline; Route: CSF/CNS (right lateral ventricle); Species: Rats; Pump: 1007D; Duration: ALZET Comments: Dose (15 μg/μl L-NAME); animal info: (7-week-old male Sprague-Dawley rats); enzyme inhibitor (protein disulfide isomerase); ALZET brain infusion kit 1 used; Brain coordinates (right lateral ventricle, 1mm posterior; 1.5 mm lateral; 3.5 mm depth from bregma);

Agents: BzATP, OxATP, A740003, Compound C, 3-chloroacetyl indole, Mithramycin A, U0126, RNA, small interfering (Heat shock protein B1) Vehicle: Route: CSF/CNS (lateral ventricle); Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Dose: BzATP (5 mM), OxATP (5 mM) A740003 (10 μM), Comp C (100 nM), 3CAI (25 μM), MMA (25 μM), U0126 (25 μM); animal info: (Male, C57BL/6J, 25-30 g, 60-90 days old); BzATP is a P2RX7 agonist, OxATP and A740003 are P2RX7 antagonists; enzyme inhibitor (mitogen-activated protein kinase 1/2); ALZET brain infusion kit 3 used; Brain coordinates (lateral cerebral ventricle 1.0mm lateral to bregma); dependence; no stress: doses were well tolerated, and no signs of neurotoxicity (hind-limb paralysis, vocalization, food intake, or neuroanatomical damage) were observed;

Agents: RNA, small interfering; L-NAME; PACMA31 Vehicle: Saline; Route: CSF/CNS (Right lateral ventricle); Species: Rat; Pump: 1007D; Duration: 1 week;
ALZET Comments: Controls received mp w/ vehicle; animal info: (7 week old male Sprague-Dawley rats); enzyme inhibitor (PACMA31 is a selective PDI inhibitor); ALZET brain infusion kit 1 used; Brain coordinates (1 mm posterior; 1.5 mm lateral; 3.5 mm depth from bregma); Therapeutic indication (seizure);

Agents: RNA, small interfering (ASK1) Vehicle: siPORTNeoFX Transfection agent; Route: CSF/CNS (left lateral ventricle); Species: Mice; Pump: 1003D; Duration: 3 days;
ALZET Comments: Dose (1 lL/h/ day); animal info: (Adult,C57BL/6, male); enzyme inhibitor (apoptosis signal-regulating kinase 1); ALZET brain infusion kit used; ALZET brain infusion kit used; ischemia (Cerebral);

Agents: Colominic acid, RNA, small interfering (anti-Orf2p), cell-permeable peptide Penetratin-coupled siRNA Vehicle: Saline; Route: CSF/CNS; Species: Mice; Pump: 1003D; Duration: 3 days;
ALZET Comments: 0.9% sodium chloride used; Dose (1.5 ug/ul- colomic acid, 5 uM- En 1/2); Controls received mp w/ vehicle; animal info: (male, En1-het mice, ); Brain coordinates (-3.8 mm dorso/ventral); neurodegenerative (dopaminergic neurons);
Agents: RNA, small interfering Vehicle: Route: CSF/CNS (intratumoral); Species: mice (nude); Pump: 1002, 2002; Duration: 14 days;
ALZET Comments: animal info (athymic nude, 6-8 weeks old); ALZET brain infusion kit 3 used; cancer (glioblastoma);
“Because repeated surgery introduces stress and pain that may impact the survival of the experimental animals, we opted for the convection-enhanced delivery (CED) strategy using an Alzet osmotic pump to deliver a continuous supply of the nano RNAi combination…” pg E6151;

Agents: RNA, small interfering (Cdc2-like kinase 2) Vehicle: Saline; DMSO; Route: CSF/CNS (lateral ventricle); Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Dose (2 μg/day); 0.3% DMSO used; Controls received mp w/ vehicle; animal info (Eight-week-old male Swiss, db/db mice (Leprdb/Leprdb) and Leprdb/+ mice); Small interference RNA aka siCLK2;

Agents: RNA, small interfering Vehicle: Route: CSF/CNS (left lateral ventricle); Species: Rat; Pump: 1003D; Duration: 72 hours;
ALZET Comments: Dose (30 nmol); Controls received mp w/ vehicle; animal info (8-weeks-old male Sprague-Dawley rats); behavioral testing (Beam balance, Morris water maze);

Agents: RNA, small interfering; TRPC6; U0126 Vehicle: Route: CSF/CNS (right lateral ventricle); Species: Rat; Pump: 1007D; Duration: ALZET Comments: Controls received mp w/ vehicle; animal info (7 week old male Sprague- Dawley rats); U0126 is a selective ERK1/2 inhibitor; ALZET brain infusion kit 1 used; Brain coordinates (1 mm posterior; 1.5 mm lateral; - 3.5 mm depth to the bregma); Therapeutic indication (epilepsy);

Agents: RNA, small interfering (PDI; DTNB); bactracin; Immunoglobulin, anti-PDI; tunicamycin ; Vehicle: Route: CSF/CNS; Species: Rat; Pump: 1007D; Duration: 7 days, 14 days;
ALZET Comments: Controls received mp w/ vehicle or control siRNA or control IgG; animal info (male, Sprague Dawley, 7 weeks old); pumps replaced every week; ALZET brain infusion kit 1 used; behavioral testing (behavioral seizure severity); Brain coordinates;

Agents: RNA, small interfering (HSP25) Vehicle: Saline; Route: CSF/CNS (right lateral ventricle); Species: Rat; Pump: 1007D; Duration: 7 days, 1 week;
ALZET Comments: Controls received control siRNA ; animal info (7 months old); ALZET brain infusion kit 1 used; Electrophysiology; Therapeutic indication (Heat shock proteins, ER stress);

Agents: RNA, small interfering (Gastrin-specific) Vehicle: TransIT in vivo transfection reagent; Route: Kidney (subcapsular space); Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Controls received mp with mock (nonsilencing) siRNA; ALZET polyethylene tubing used ; Therapeutic indication (Nephrology, Hypertension, L-Dopa);
Dose (3 ug/day)
Q6011: S. Y. Cheon, et al. Regulation of Microglia and Macrophage Polarization via Apoptosis Signal-Regulating Kinase 1 Silencing after Ischemic/Hypoxic Injury. Front Mol Neurosci 2017;10(261
Agents: RNA, small interfering (ASK1) Vehicle: siPORTNeoFX Transfection agent; Route: CSF/CNS (Left ventricle); Species: Mice; Pump: 1003D; Duration: 3 days;
ALZET Comments: animal info (C57BL/6, 8-12 weeks) ; Therapeutic indication (Hypoxia, late inflammation, ischemic stroke);

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. Circ Heart Fail. 2016;9(1-10
Agents: AntagomiR-7b; RNA, small interfering GABBR1; angiotensin II Vehicle: 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; antiotensin II 1 ng/kg/min);

Agents: RNA, small interfering (Neu4) Vehicle: AteloGene transfection reagent; Route: CSF/CNS (third ventricle); Species: Rat; Pump: Duration: 7 days;
ALZET Comments: Controls received mp w/ vehicle;animal info (8-9 weeks); behavioral testing (Morris water mazex); AteloGene = in vivo siRNA transfection reagent; coordinates (AP = −4.2 mm; ML = 0.0 mm; DV = 4.6 mm)

Q4813: Kyoung Joo Cho, et al. Apoptosis signal-regulating kinase 1 mediates striatal degeneration via the regulation of C1q. SCIENTIFIC REPORTS 2016;6(1-11
Agents: Nitropropionic acid, 3-; RNA, small interfering ASK1 Vehicle: Transfection reagent; Route: SC; CSF/CNS (striatum); Species: Mice (transgenic); Pump: 1007D; Duration: 7 days;
ALZET Comments: Controls received mp w/ vehicle;animal info (male, C57BL6J or R6/2 HD tg, 10 weeks old); behavioral testing (rotarod apparatus);

Agents: RNA, small interfering/EHCO; PEGylated EHCO Vehicle: Route: Species: Mice (nude); Pump: Duration: 14 days;
ALZET Comments: Controls received treated with nonspecific PEGylated EHCO/siGFP nanoparticles (PEGGFP) and non-PEGylated EHCO/HIF-1α; cancer; gene therapy, RNA nanoparticle infusion; peptides; “These results indicate that PEGylation can significantly improve the stability of EHCO/siRNA nanoparticles during storage in solution, possibly by preventing the aggregation of the nanoparticles and providing better protection to the siRNA cargo from degradation” (pg 31);

Agents: Exosomes; RNA, hydrophobically-modified small interfering (anti-Huntingtin); Vehicle: CSF, artificial; Route: CSF/CNS; Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: 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);

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);