



### Recent References (2010-2019) on the Administration of Antisense Oligonucleotides Using ALZET® Osmotic Pumps

**Q7231:** I. Michailidou, *et al.* Systemic inhibition of the membrane attack complex impedes neuroinflammation in chronic relapsing experimental autoimmune encephalomyelitis. *Acta Neuropathol Commun* 2018;6(1):36

**ALZET Comments:** Oligonucleotide, antisense; PBS; SC; Mice; 1002; 14 days; Dose (5 mg/kg); animal info (Male 7 to 8-week-old Biozzi AB/H mice, 26.93 ± 0.33 g); C6 antisense aka c6 Locked nucleic acid oligonucleotide; antisense (C6); immunology;

**Q6747:** N. Prakoura, *et al.* NFkappaB-Induced Periostin Activates Integrin-beta3 Signaling to Promote Renal Injury in GN. *J Am Soc Nephrol* 2017;28(5):1475-1490

**ALZET Comments:** Oligonucleotide, antisense; Saline; SC; Mice (knockout); 1002; Dose (0.25 ml/h or 150 pmol/day); animal info (SV129malewild-typemice aged 8–10 weeks); antisense (periostin).

**Q6600:** C. Mazur, *et al.* Development of a simple, rapid, and robust intrathecal catheterization method in the rat. *J Neurosci Methods* 2017;280(36-46)

**ALZET Comments:** Oligonucleotide, antisense; CSF/CNS (intrathecal); Rat; animal info (Sixteen male Sprague-Dawley rats); Publication describes the development of a rapid and robust intrathecal catheterization method for the testing of putative ASO therapeutics for diseases of the CNS.

**Q6035:** A. J. Donner, *et al.* Co-Administration of an Excipient Oligonucleotide Helps Delineate Pathways of Productive and Nonproductive Uptake of Phosphorothioate Antisense Oligonucleotides in the Liver. *Nucleic Acid Ther* 2017;27(4):209-220

**ALZET Comments:** Oligonucleotide, antisense; PBS; SC; Mice; 2001D; 1 day; Controls received mp w/ vehicle; animal info (C57BL/6); Therapeutic indication (hepatocytes); Dose (10 uL/body weight);

**Q5785:** S. devos. Tau reduction prevents neuronal loss and reverses pathological tau deposition and seeding in mice with tauopathy. *Science Translational Medicine* 2017;9(374):

**ALZET Comments:** Oligonucleotide, antisense (Tau-specific); Saline; CSF/CNS; Mice; 28 days, 4 weeks; Controls received mp w/ scrambled ASO, or vehicle; animal info (PS19 mice); antisense (Tau-specific ASO-12); neurodegenerative (Alzheimer's disease); Therapeutic indication (Alzheimer's disease, tauopathy); Dose (30 ug/day);

**Q5474:** A. Vikram, *et al.* Vascular microRNA-204 is remotely governed by the microbiome and impairs endothelium-dependent vasorelaxation by downregulating Sirtuin1. *Nat Commun* 2016;7(12565)

**ALZET Comments:** Oligonucleotide, anti-miR-204; Mice; 2006; 6 weeks; Controls received mp w/ scrambled oligonucleotides; animal info (male, eSirt1 -/- or C57BL6); cardiovascular; Dose (0.7 mg/kg/day);

**Q5207:** Y. Solomonov, *et al.* Reduction of cytosolic phospholipase A2alpha upregulation delays the onset of symptoms in SOD1G93A mouse model of amyotrophic lateral sclerosis. *J Neuroinflammation* 2016;13(1):134

**ALZET Comments:** Oligonucleotide, antisense anti-Cytosolic phospholipase A2 alpha; Saline; CSF/CNS; Mice (transgenic); 4 weeks; 6 weeks; Controls received mp w/ vehicle; animal info (male, B6.Cg-Tg(SOD1G93A)1Gur/J hemizygous transgenic, 10 weeks old, 25 g); ALZET brain infusion kit 3 used; antisense (oligonucleotide anti-Cytosolic phospholipase A2 alpha); neurodegenerative (amyotrophic lateral sclerosis); behavioral testing (rotarod test; ladder testing); pumps primed overnight in 37C saline; Dose (10 ug/day); Brain coordinates (right lateral cerebral ventricle (-1.0 mm mediolateral and -0.5 mm anteroposterior from Bregma));

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

**ALZET Comments:** Oligonucleotides, antisense; CSF/CNS; Mice (transgenic); 28 days; Controls received mp w/ saline or scrambled ASO; animal info (hTau transgenic or tau N279k transgenic, 3-4 months old); antisense (3R to 4R MAPT splicing ASO; 4R to 3R MAPT splicing ASO); neurodegenerative (Alzheimer's disease); behavioral testing (nesting behavior); cyanoacrylate adhesive; pumps primed in 37C saline overnight; Industry authored (Ionis Pharmaceuticals); Dose (14 ug/day)



for 3R to 4R MAPT splicing ASO; 25 ug/day for 4R to 3R MAPT splicing ASO); Brain coordinates (-1.1mm M/L, -0.5mm A/P, -2.5mm D/V from bregma supplement pg 5);.

**Q5622:** D. Kim. Anti-miR delivery strategies to bypass the blood-brain barrier in glioblastoma therapy. *Oncotarget* 2016;7(20):29400-11

**ALZET Comments:** Oligonucleotide, anti-miR, anti-let-7; Saline; CSF/CNS (intrathecal); Mice; 1004D; 7 days; 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  $\mu$ M, 50  $\mu$ M); 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. *Arch Med Res* 2016;47(6):419-426

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

**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

**ALZET Comments:** Oligonucleotides, scramble nontargeting; siRNA; Ethanol; CSF/CNS (Intrathecal); Rat; 2001; 7 days; 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), FABP5 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. *Antioxid Redox Signal* 2016;25(13):703-719

**ALZET Comments:** Oligonucleotide, phosphorothioate antisense (Rictor); Oligonucleotide, phosphorothioate sense (Rictor); Saline; SC; Mice; 2006; 5 weeks; 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);.

**Q5754:** R. Boukari, *et al.* Membrane progesterone receptor-beta, but not -alpha, in dorsal brain stem establishes sex-specific chemoreflex responses and reduces apnea frequency in adult mice. *J Appl Physiol* (1985) 2016;121(3):781-791

**ALZET Comments:** RNA, small interfering; CSF, artificial; CSF/CNS (fourth ventricle); Mice; 1002; 2 weeks, 14 days; 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);.

**Q4223:** X. Zhang, *et al.* Prosurvival NMDA 2A Receptor Signaling Mediates Postconditioning Neuroprotection in the Hippocampus. *Hippocampus* 2015;25(286-296

**ALZET Comments:** Oligonucleotide, antisense NR2A; Saline; CSF/CNS; Rat; 1007D; Controls received mp w/ scrambled oligonucleotide; animal info (male, Sprague Dawley, adult, 250-300g); antisense (oligonucleotide NR2A);.

**Q4648:** H. K. A. Wong, *et al.* The Cancer Genome Atlas Analysis Predicts MicroRNA for Targeting Cancer Growth and Vascularization in Glioblastoma. *MOLECULAR THERAPY* 2015;23(1234-1247

**ALZET Comments:** RNA, micro antisense inhibitors 2'-O-MOE-PO; CSF/CNS (striatum); Mice (nude); 2004; 30 days; 60 days; Animal info (nude, 8 weeks old); pumps replaced every 30 days; ALZET brain infusion kit 3 used; "To ensure efficient and continuous local delivery of either miR-31 or miR-148a inhibitors to the intracranial tumors, and avoid repeated neurosurgeries, we used osmotic pumps" pg 1236; picture of implanted pump pg 1238;.

**Q4640:** M. Wellman, *et al.* Knockdown of central ghrelin O-acyltransferase by vivo-morpholino reduces body mass of rats fed a high-fat diet. *PEPTIDES* 2015;70(17-22

**ALZET Comments:** Oligonucleotide, antisense vivo-morpholino; PBS; CSF/CNS; Rat; 2004; 4 weeks; Controls received mp w/ vehicle; animal info (male, Long Evans, 276-300g); Cannula placement verified via injection of dye;.



**Q5279:** Y. Sztainberg, *et al.* Reversal of phenotypes in MECP2 duplication mice using genetic rescue or antisense oligonucleotides. *Nature* 2015;528(7580):123-6

**ALZET Comments:** Oligonucleotide, antisense MECP2; Saline; CSF/CNS; mice; 1004; 28 days; Controls received mp w/ vehicle; animal info (FVB/N pure background); functionality of mp verified by EEG; ALZET brain infusion kit 3 used; ALZET brain infusion kit 3 used; good methods (pg. 6); gene therapy; Dose (500 ug); Brain coordinates; AP = - 0.2 mm, ML = 1 mm, DV = - 3 mm.

**Q4800:** K. B. a. T. E. Spencer. Biological Roles of Interferon Tau (IFNT) and Type I IFN Receptors in Elongation of the Ovine Conceptus1. *Biology of Reproduction* 2015;92(2)(47):1-10

**ALZET Comments:** oligonucleotides, antisense morpholino; PBS; Intrauterine; Sheep (ewe, pregnant); 2ML1; 7 days; Controls received mp w/ control oligonucleotides; animal info (female, Columbia Rambouillet); teratology; cyanoacrylate adhesive; used vinyl catheter tubing (0007760) to cannulate uterine lumen; pump affixed to mesosalpinx using cyanoacrylate glue;.

**Q4976:** F. A. Oladosu, *et al.* Mu Opioid Splice Variant MOR-1K Contributes to the Development of Opioid-Induced Hyperalgesia. *PLoS One* 2015;10(8):e0135711

**ALZET Comments:** RNA, small interfering 13 antisense; CSF, artificial; CSF/CNS (intrathecal); Mice; 7 days; Controls received mp w/ sense siRNA; animal info (C57BL6J or CXB7/ByJ, 8-12 weeks old, 20-30g);.

**Q5232:** M. McMillin, *et al.* Suppression of the HPA Axis During Cholestasis Can Be Attributed to Hypothalamic Bile Acid Signaling. *Mol Endocrinol* 2015;29(12):1720-30

**ALZET Comments:** Oligonucleotide, Vivo-morpholino; CSF/CNS (lateral ventricle); Rat; 3 days; Controls received mp w/ vehicle; brain infusion kit used; brain tissue distribution; Dose (1 mg/kg / d);.

**Q5229:** S. Maeda, *et al.* DNA Aptamer Raised against Advanced Glycation End Products Prevents Abnormalities in Electroretinograms of Experimental Diabetic Retinopathy. *Ophthalmic Res* 2015;54(4):175-80

**ALZET Comments:** AGE-aptamer; BSA; IP; Rat; 1004; 16 weeks; Controls received mp w/ control aptamer; animal info (Six-week-old male Wistar rats); functionality of mp verified by urine tests; pumps replaced every 4 weeks; antisense (AGE-aptamer versus control aptamer); diabetes; AGE-aptamer aka Advanced Glycation End Products Aptamer; Dose (6 ng/body weight/day);.

**Q4336:** K. E. Brooks, *et al.* Peroxisome Proliferator Activator Receptor Gamma (PPARG) Regulates Conceptus Elongation in Sheep. *BIOLOGY OF REPRODUCTION* 2015;92(U102-U114)

**ALZET Comments:** Oligonucleotide, antisense morpholino PPARG; oligonucleotide, antisense morpholino PPARG; PBS; Intrauterine (uterine horn); Sheep (ewe); 2ML1; 7 days; Controls received mp w/ control morpholino; animal info (Ovis aries, 7 days after mating); cyanoacrylate adhesive; used vinyl catheter tubing; pump glued to mesosalpinx and sutures; pumps primed in 37C sterile PBS for 24 hours.

**Q3642:** Q. G. Zhang, *et al.* Brain-derived estrogen exerts anti-inflammatory and neuroprotective actions in the rat hippocampus. *MOLECULAR AND CELLULAR ENDOCRINOLOGY* 2014;389(84-91)

**ALZET Comments:** Oligodeoxynucleotide, antisense; Saline; CSF/CNS; Rat; 1007D; 7 days; Controls received mp w/ control scrambled missense oligonucleotides; animal info (female, Sprague Dawley, 3 months old, ovariectomized); ALZET brain infusion kit 2 used; antisense (oligodeoxynucleotides); ischemia (global cerebral); gene therapy; immunology;.

**Q4752:** X. H. Yu, *et al.* Chemosensitization of Solid Tumors by Inhibition of Bcl-xL Expression Using DNAzyme. *ONCOTARGET* 2014;5(9039-9048)

**ALZET Comments:** DNAzyme oligonucleotide; Saline; IP; Mice (nude); 1002; 14 days; Animal info (female, Balb/C, 4 weeks old); functionality of mp verified by plasma levels and residual volumes; cancer (prostate adenocarcinoma); "Analysis showed that the DNAzyme was stable over the treatment period and the Alzet osmotic pump provided a consistent delivery of the DNAzyme in vivo " pg 9044;.



**Q3732:** A. Vinciguerra, *et al.* MicroRNA-103-1 Selectively Downregulates Brain NCX1 and Its Inhibition by Anti-miRNA Ameliorates Stroke Damage and Neurological Deficits. MOLECULAR THERAPY 2014;22(1829-1838

**ALZET Comments:** Oligonucleotide, anti-mir-103-1; oligonucleotide, anti-mir-107-1; CSF/CNS; Rat; 48 hours; ALZET brain infusion kit 1 used; "The 48-hour anti-miR infusion allowed us to overcome problems related to the short half-life of miRNA" pg 1836; half life (1-3.5 hours) pg 1836.

**Q3313:** J. R. Nadeau, *et al.* Induction of a reactive state in perineuronal satellite glial cells akin to that produced by nerve injury is linked to the level of p75NTR expression in adult sensory neurons. Glia 2014;62(5):763-777

**ALZET Comments:** Oligonucleotide, antisense p75; PBS; rat serum albumin; streptomycin; penicillin; CSF/CNS (intrathecal); Rat; 2001; 2 days; 3 days; 7 days; Controls received mp w/ control oligonucleotide; animal info (male, Wistar, 250-300g); functionality of mp verified by fluorescent tagged AS; antisense (oligonucleotide p75); post op. care (Temgesic SC 0.1-0.2 mg/kg); gene therapy; used silastic tubing; pumps and tubing primed overnight in PBS; 100U/ml streptomycin; 100U/ml penicillin; 1mg/ul rat serum albumin;.

**Q3754:** Y. Lu, *et al.* TRAF6 upregulation in spinal astrocytes maintains neuropathic pain by integrating TNF-alpha and IL-1beta signaling. Pain 2014;155(2618-2629

**ALZET Comments:** Oligonucleotide, antisense; oligonucleotide, mismatch; CSF/CNS (intrathecal); Mice; 1007D; 5 days; Animal info (ICR, adult, male, 8 wks old); PE8 catheter used; antisense (TRAF6); neuropathic pain.

**Q3735:** W. K. D. Ko, *et al.* RGS4 is involved in the generation of abnormal involuntary movements in the unilateral 6-OHDA-lesioned rat model of Parkinson's disease. NEUROBIOLOGY OF DISEASE 2014;70(138-148

**ALZET Comments:** Oligonucleotide, antisense; CSF/CNS (lateral striatum); Rat; 2004; Control animals received saline IP; animal info (male, Sprague Dawley); ALZET brain infusion kit used; antisense (RGS4).

**Q5598:** L. Winer, *et al.* SOD1 in cerebral spinal fluid as a pharmacodynamic marker for antisense oligonucleotide therapy. JAMA Neurol 2013;70(2):201-7

**ALZET Comments:** Oligonucleotide, antisense (333611); Saline; CSF/CNS (right lateral ventricle); Rat; 2004; 30 days; Controls received mp w/ vehicle; animal info (2 months old); antisense (333611); half-life (p.205); peptides; Therapeutic indication (Amyotrophic lateral sclerosis); Dose (100ug/d);.

**Q2462:** F. M. Uckun, *et al.* Rational design of an immunoconjugate for selective knock-down of leukemia-specific E2A-PBX1 fusion gene expression in human Pre-B leukemia. Integrative Biology 2013;5(1):122-132

**ALZET Comments:** Oligonucleotide, alpha CD 19; SC; Mice (SCID); 1002; 14 days; Control animals received mp w/ control oligonucleotide; antisense (E2A-PBX1 with mAb specific for CD 19 receptor); cancer (leukemia).

**Q2912:** C. Tosun, *et al.* Inhibition of the Sur1-Trpm4 Channel Reduces Neuroinflammation and Cognitive Impairment in Subarachnoid Hemorrhage. Stroke 2013;44(12):3522-3528

**ALZET Comments:** Glibenclamide; oligonucleotide, antisense; DMSO; IV; Rat; 2001; 1 week; 24 hours; Animal info (SAH model, Wistar, 300-350g); Sur1-Trpm4 channels are upregulated in cortex adjacent to SAH which induces abnormal BBB permeability and neuroinflammation.

**Q3166:** J. Qiu, *et al.* Neuroprotective Effects of MicroRNA-210 on Hypoxic-Ischemic Encephalopathy. BIOMED RESEARCH INTERNATIONAL 2013;;():U1-U5

**ALZET Comments:** Oligonucleotide, miR-210 mimic; inhibitor, miR-210; Saline; CSF/CNS; Rat (neonate); 1007D; 72 hours; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, P7); ischemia (hypoxic-ischemic encephalopathy); gene therapy;.

**Q3347:** E. D. Koval, *et al.* Method for widespread microRNA-155 inhibition prolongs survival in ALS-model mice. Human Molecular Genetics 2013;22(20):4127-4135

**ALZET Comments:** Antagomir, miR-155; Saline; CSF/CNS; Mice; 2004; 2006; 28 days; 42 days; Controls received mp w/ saline or control mi-RNA; animal info (C571BL6); antisense (oligonucleotide); neurodegenerative (ALS - Amyotrophic Lateral Sclerosis);.



**Q6679:** T. Kondo, *et al.* Activation of p38 MAPK through transient receptor potential A1 in a rat model of gastric distension-induced visceral pain. *Neuroreport* 2013;24(2):68-72

**ALZET Comments:** Antisense oligodeoxynucleotide; Mismatch oligodeoxynucleotide; Saline; CSF/CNS (Intrathecal); Rat; 2001; 3 days; Controls received mp w/ vehicle; animal info (male Sprague–Dawley rats weighing 190–260 g); antisense (oligodeoxynucleotide);.

**Q2986:** D. Kesanakurti, *et al.* Essential role of cooperative NF-kappaB and Stat3 recruitment to ICAM-1 intronic consensus elements in the regulation of radiation-induced invasion and migration in glioma. *ONCOGENE* 2013;32(43):5144-5155

**ALZET Comments:** Oligonucleotide, antisense; plasmid, scrambled vector, pSV; PBS; SC; Mice (nude); 2004; Cancer (glioblastoma); animal info (nu/nu mice).

**Q2603:** R. Kashimoto, *et al.* Phosphorylation of ezrin/radixin/moesin (ERM) protein in spinal microglia following peripheral nerve injury and lysophosphatidic acid administration. *Glia* 2013;61(3):338-348

**ALZET Comments:** Lysophosphatidic acid; oligonucleotide, antisense; Saline; CSF/CNS (intrathecal); Rat; 2001; 3 days; Control animals received mp w/ vehicle; animal info (Sprague Dawley, male, 200-250 g); antisense (locked nucleic acid, LNA); behavioral testing (mechanical sensitivity).

**Q2607:** D. R. Kapusta, *et al.* Central Nervous System Galphai(2)-Subunit Proteins Maintain Salt Resistance via a Renal Nerve-Dependent Sympathoinhibitory Pathway. *Hypertension* 2013;61(2):368-U319

**ALZET Comments:** Oligonucleotide, G alpha i2; Saline, isotonic; CSF/CNS; Rat; 2004; Control animals received mp w/ scrambled oligonucleotide; animal info (Sprague Dawley, male, 275-300 g).

**Q2931:** A. Gouaze, *et al.* Cerebral Cell Renewal in Adult Mice Controls the Onset of Obesity. *PLoS One* 2013;8(8):U971-U981

**ALZET Comments:** Uridine, bromodeoxy-; NaCl; SC; Mice; 1007D; 1 month; 1 week; Brain infusion kit (3) used; antisense (Arac); 65 mm tubing connected to mp allowed for delayed delivery of vehicle for 2 days after surgery; animal info. (seven week-old male, C57BL/6);.

**Q5642:** A. A. Eid, *et al.* Sestrin 2 and AMPK connect hyperglycemia to Nox4-dependent endothelial nitric oxide synthase uncoupling and matrix protein expression. *Mol Cell Biol* 2013;33(17):3439-60

**ALZET Comments:** Oligonucleotide, antisense (Nox4); SC; Rat; 2 weeks; animal info (200-225g); antisense (Nox4); diabetes; Therapeutic indication (Diabetes); Dose (90 ng/g of body weight/day);.

**Q2930:** S. L. DeVos, *et al.* Antisense Oligonucleotides: Treating Neurodegeneration at the Level of RNA. *Neurotherapeutics* 2013;10(3):486-497

**ALZET Comments:** Oligonucleotide, antisense, ASO; SC; Rat; Neurodegenerative (Parkinson's, Huntington, amyotrophic lateral sclerosis); paper only references ALZET. Paper provides a starting guide for designing basic ASO sequences (Fig. 4).

**Q3069:** S. L. DeVos, *et al.* Antisense Reduction of Tau in Adult Mice Protects against Seizures. *Journal of Neuroscience* 2013;33(31):12887-12897

**ALZET Comments:** Tau, ASO-3; Oligonucleotides, antisense scrambled; Saline; CSF/CNS; Mice; 28 days; Controls received mp w/ vehicle; animal info (C57BL6J, Tao -/-); antisense (oligonucleotides); neurodegenerative (Alzheimer's Disease); behavioral testing (elevated plus maze, Morris water maze, seizure score); gene therapy; brain tissue distribution;.

**Q5531:** L. O. Brandenburg, *et al.* CpG oligodeoxynucleotides induce the expression of the antimicrobial peptide cathelicidin in glial cells. *J Neuroimmunol* 2013;255(1-2):18-31

**ALZET Comments:** Oligodeoxynucleotide, antisense; Saline; CSF/CNS; Mice; 2004; 4 weeks; Controls received mp w/ Saline; animal info (TLR9-deficient, age: 2-3 months, weight: 19-23g); ALZET brain infusion kit 2 used; antisense (CpG); Therapeutic indication (Immunology);.

**Q2127:** J. C. Paisley, *et al.* Sexual responses of the male rat medial preoptic area and medial amygdala to estrogen I: Site specific suppression of estrogen receptor alpha. *Hormones and Behavior* 2012;62(1):50-57





**ALZET Comments:** Oligodeoxynucleotide, antisense; Saline, physiological; CSF/CNS (medial preoptic area)' CSF/CNS (medial amygdala); Rat; 28 days; Controls received mp w/ vehicle; animal info (Sprague Dawley, male, female, at least 65 days old); bilateral cannula used; antisense (ER alpha); bilateral infusion;.

**Q3032:** H. B. Kordasiewicz, *et al.* Sustained Therapeutic Reversal of Huntington's Disease by Transient Repression of Huntingtin Synthesis. *Neuron* 2012;74(1031-1044

**ALZET Comments:** Oligonucleotide, antisense, human, huntingtin; CSF/CNS; Mice; 2 weeks; Controls received mp w/ saline; animal info (BACHD mouse model of HD, 2 months); dose-response (Fig 1A); neurodegenerative (Huntington's disease); behavioral testing (accelerating rotarod, elevated-plus maze, open-field test, light/dark analysis).

**Q1883:** Y. Ishitobi, *et al.* Administration of antisense DNA for GPR39-1b causes anxiolytic-like responses and appetite loss in rats. *NEUROSCIENCE RESEARCH* 2012;72(3):257-262

**ALZET Comments:** Oligonucleotide, antisense; CSF/CNS; SC; Rat; 1007D; 2001; 5 days; Controls received mp w/ scrambled sequence oligonucleotides; animal info (Wistar, male, 5 wks old); multiple pumps (2) used; antisense (GPR39-1b); behavioral testing (elevated plus maze, black and white box, forced swim test).

**Q5664:** Y. Hua, *et al.* Antisense-mediated exon inclusion. *Methods Mol Biol* 2012;867(307-23

**ALZET Comments:** Oligonucleotides, antisense,; CSF/CNS; Mice; 1007D;

**Q1992:** G. A. Gil, *et al.* Controlling Cytoplasmic c-Fos Controls Tumor Growth in the Peripheral and Central Nervous System. *Neurochemical Research* 2012;37(6):1364-1371

**ALZET Comments:** Oligonucleotide, antisense; oligonucleotide, scrambled; CSF/CNS (caduate putamen); Mice (nude); 28 days; Controls received mp w/ vehicle; animal info (nu/nu, 4-6 wks old); antisense (c-Fos); cancer (glioblastoma).

**Q2354:** F. M. Drawnel, *et al.* Mutual antagonism between IP(3)RII and miRNA-133a regulates calcium signals and cardiac hypertrophy. *Journal of Cell Biology* 2012;199(5):783-798

**ALZET Comments:** Oligonucleotide, miR-133a antagomir; Saline; SC; Mice (transgenic); 1003D; Control animals received mp w/ vehicle; animal info (IP3RII, IP3-sponge tg).

**Q2689:** R. Barra, *et al.* Knockdown of alpha(2C)-adrenoceptors in the occipital cortex rescued long-term potentiation in hidden prenatally malnourished rats. *NEUROBIOLOGY OF LEARNING AND MEMORY* 2012;98(3):228-234

**ALZET Comments:** Oligonucleotide, antisense; oligonucleotide, mismatch, scrambled sequence; Saline; CSF/CNS (occipital cortex); Rat; 2002; 7 days; Control animals received mp w/ saline; animal info (Sprague Dawley, male); antisense.

**Q1406:** Y. Wu, *et al.* JWA regulates chronic morphine dependence via the delta opioid receptor. *Biochemical and Biophysical Research Communications* 2011;409(3):520-525

**ALZET Comments:** Oligonucleotide, sense, JWA; oligonucleotide, antisense JWA; CSF, artificial; CSF/CNS; Rat; Animal info (adult, male, Wistar, 190 g); antisense (JWA).

**Q1388:** Y. Wang, *et al.* Monocarboxylate Transporter 2 and Stroke Severity in a Rodent Model of Sleep Apnea. *Journal of Neuroscience* 2011;31(28):10241-10248

**ALZET Comments:** RNA, small interfering; oligonucleotide, scrambled; cinnamate, cyano-4 hydroxy,; chloromercuribenzene sulfonate, p-; Rat; 1002; 5 days; 72 hours; Controls received mp w/ scrambled nucleotide, vehicle; animal info (MCAO, male, Sprague Dawley, 200-225 g); ALZET brain infusion kit used; antisense (MCT2); compounds also known as 4-CN and pCMBS.

**Q2211:** M. E. Uhlmann, *et al.* Influence of osteopontin expression on the metastatic growth of CC531 rat colorectal carcinoma cells in rat liver. *Cancer Gene Therapy* 2011;18(11):795-805

**ALZET Comments:** Oligonucleotide, antisense; oligonucleotide, sense; oligonucleotide, nonsense; Saline, sterile; SC; Rat; 2002; 14 days; Animal info (male, WAG/Rij, 6-7 wks old, 120-160 g); antisense (Opn); cancer (colorectal).

**Q0912:** N. S. Qian, *et al.* Spinal toll like receptor 3 is involved in chronic pancreatitis-induced mechanical allodynia of rat. *Molecular Pain* 2011;7(;):U1-U11



**ALZET Comments:** Oligodeoxynucleotide, antisense; oligodeoxynucleotide, mismatch; CSF/CNS (intrathecal); Rat; 2001; 1 week; Negative controls received mp w/ mismatch oligodeoxynucleotide; animal info (male, Sprague-Dawley, 250-300 g, laminectomy); antisense (TLR3); PE-10 catheter used.

**Q2280:** S. Mathur, *et al.* THE TOLL-LIKE RECEPTOR 9 LIGAND CpG-C ATTENUATES ACUTE INFLAMMATORY CARDIAC DYSFUNCTION. SHOCK 2011;36(5):478-483

**ALZET Comments:** Oligonucleotide, CpG; IP; Mice; 1003D; 72 hours; Controls received mp w/ saline; animal info (male, C57BL/6, 25-30 g, 10-14 wks old).

**Q1662:** B. A. Dyck, *et al.* Medial prefrontal cortical synapsin II knock-down induces behavioral abnormalities in the rat: Examining synapsin II in the pathophysiology of schizophrenia. SCHIZOPHRENIA RESEARCH 2011;130(1-3):250-259

**ALZET Comments:** Oligonucleotide, antisense; CSF/CNS (medial prefrontal cortex); Rat; 2002; 14 days; Controls received mp w/ artificial CSF; animal info (Sprague Dawley, male, 250-300 g); multiple pumps used (2); antisense (synapsin II).

**Q1470:** L. C. Arocho, *et al.* Expression Profile and Role of EphrinA1 Ligand After Spinal Cord Injury. Cellular and Molecular Neurobiology 2011;31(7):1057-1069

**ALZET Comments:** Oligonucleotide, antisense; CSF/CNS (intrathecal); Rat; 2004; 28 days; Controls received mp w/ scrambled control oligonucleotide; animal info (female, Sprague-Dawley, 180-200 g); antisense (ephrinA1); behavioral testing (open field test); spinal cord injury.

**Q0497:** K. J. Yin, *et al.* miR-497 regulates neuronal death in mouse brain after transient focal cerebral ischemia. NEUROBIOLOGY OF DISEASE 2010;38(1):17-26

**ALZET Comments:** Oligonucleotide, antisense; CSF, artificial; CSF/CNS; Mice; 1003D; Negative controls received mp w/ miR-antagomir negative control or artificial CSF; antisense (miR-497); animal info (male, C57/Bl6); ischemia (focal cerebral).

**Q0086:** D. C. Silvestre, *et al.* Growth of Peripheral and Central Nervous System Tumors Is Supported by Cytoplasmic c-Fos in Humans and Mice. PLoS One 2010;5(3):U234-U243

**ALZET Comments:** Oligonucleotide, antisense; oligonucleotide, scrambled; CSF/CNS (caudate putamen); Mice; 2004; 28 days; Controls received mp w/ vehicle; antisense (C-Fos mRNA morpholino); animal info (4 months old, NPcis).

**Q1312:** P. Sapa, *et al.* Down-Modulation of Survivin Expression and Inhibition of Tumor Growth In Vivo by EZN-3042, A Locked Nucleic Acid Antisense Oligonucleotide. NUCLEOSIDES NUCLEOTIDES & NUCLEIC ACIDS 2010;29(2):97-112

**ALZET Comments:** Oligonucleotide, antisense; SC; Mice (nude); 7 days; Controls received mp w/ EZN-3046, scrambled control nucleotide; animal info (4-5 wks old); antisense (EZN-3042); cancer (lymphoma).

**Q0178:** K. Obata, *et al.* TRPA1 induced in sensory neurons contributes to cold hyperalgesia after inflammation and nerve injury (vol 115, pg 2393, 2005). Journal of Clinical Investigation 2010;120(1):394-394

**ALZET Comments:** SB203580; antibody, anti-NGF; oligodeoxynucleotide, antisense; oligodeoxynucleotide, missense; oligodeoxynucleotide, FITC-, antisense; Saline; DMSO; CSF/CNS (intrathecal); Rat; 2001; 7 days; Controls received mp w/ missense oligo; animal info (male, Sprague-Dawley, 200-250 g, SNL); antisense (TRPA1); enzyme inhibitor (p38 MAP kinase); 50% DMSO; behavioral testing (basal pain hypersensitivity, paw withdrawal latency, mechanical withdrawal threshold).

**Q1148:** X. P. Jiang, *et al.* Manipulation of Iron Transporter Genes Results in the Suppression of Human and Mouse Mammary Adenocarcinomas. Anticancer Research 2010;30(3):759-765

**ALZET Comments:** Oligonucleotide, mTFRCAS, phosphorothioated; oligonucleotide, antisense, mL-6RAS; HBSS; SC; Mice; 1002; 2 weeks; Controls received mp w/ HBSS or mL-6RAS; animal info (8 wks old, female, BALB/c); antisense (mL-6RAS); cancer.

**Q0494:** D. Ibi, *et al.* Piccolo knockdown-induced impairments of spatial learning and long-term potentiation in the hippocampal CA1 region. NEUROCHEMISTRY INTERNATIONAL 2010;56(1):77-83

**ALZET Comments:** Oligonucleotide, antisense; CSF/CNS; Mice; 1002; 7 days; Controls received mp w/ sense; antisense (piccolo); ALZET brain infusion kit 3 used; animal info (male, C57BL/6J, 8-10 wks old).



**Q1591:** Y. M. Hua, *et al.* Antisense correction of SMN2 splicing in the CNS rescues necrosis in a type III SMA mouse model. GENES & DEVELOPMENT 2010;24(15):1634-1644

**ALZET Comments:** Oligonucleotide, antisense; Saline; CSF/CNS; Mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info (SMA Type III, adult, 3-4 mo old); antisense (10-27); "Although the inability of ASOs to cross the BBB limits the utility of systemic administration, well-established implantable catheters and pump technology can overcome this obstacle." pg 1641 ; comparison of injections vs mp.

**Q0115:** D. Garcia-Galiano, *et al.* The Anorexigenic Neuropeptide, Nesfatin-1, Is Indispensable for Normal Puberty Onset in the Female Rat. Journal of Neuroscience 2010;30(23):7783-7792

**ALZET Comments:** Oligonucleotide, antisense, morpholino; oligonucleotide, missense, morpholino; Saline; CSF/CNS; Rat; 2001; 7 days; Controls received mp w/ missense oligo; antisense (Nucleobindin 2); animal info (female, Wistar, 28 days old, adult); endocrinology.

**Q0338:** N. Gabriele, *et al.* Knockdown of Mortalin Within the Medial Prefrontal Cortex Impairs Normal Sensorimotor Gating. Synapse 2010;64(11):808-813

**ALZET Comments:** Oligodeoxynucleotide; CSF/CNS (medial prefrontal cortex); Rat; 3 weeks; Controls received mp w/ control sense; animal info (naive, male, Sprague-Dawley); antisense (mortalin); guide cannula used; 0.5 ul/hr pump used; behavioral testing (prepulse inhibition, social interaction).

**Q1070:** G. L. Florant, *et al.* To eat or not to eat: the effect of AICAR on food intake regulation in yellow-bellied marmots (*Marmota flaviventris*). Journal of Experimental Biology 2010;213(12):2031-2037

**ALZET Comments:** AICAR; CSF/CNS (third ventricle); Squirrel (marmot); 1007D; Controls received mp w/ saline; animal info (adult, yellow-bellied); antisense; AICAR also known as 5-aminoimidazole-4-carboxamide 1 B-D-ribofuranoside is a AMPK (AMP-activated protein kinase) activator; pump connected to catheter after "several weeks" following cannula insertion; rate of infusion slowed due to torpor; Plastics One cannula used.

**Q0114:** V. Elazar, *et al.* Sustained delivery and efficacy of polymeric nanoparticles containing osteopontin and bone sialoprotein antisenses in rats with breast cancer bone metastasis. International Journal of Cancer 2010;126(7):1749-1760

**ALZET Comments:** Oligonucleotide, phosphorothioate antisense; oligonucleotide, phosphorothioate missense; PBS; SC; Rat (nude); 4 weeks; Controls received mp w/ nonsense oligo; antisense (osteopontin, bone sialoprotein); cancer (breast); animal info (RNU nude, 6-8 weeks old); comparison of polymeric nanoparticles vs mp; pumps replaced after 2 weeks.

**Q1026:** C. R. Dass, *et al.* Sequence-Related Off-Target Effect of Dz13 Against Human Tumor Cells and Safety in Adult and Fetal Mice Following Systemic Administration. OLIGONUCLEOTIDES 2010;20(2):51-60

**ALZET Comments:** Oligonucleotide, Dz13; SC; Mice (pregnant); 1002; 4 days; Animal info (Balb/C, E10); cancer; "In vivo, in general, no toxic effects were observed in... adult mice bolus and continuous systemic dosing studies." pg 59; 7 mm wound clips used.

**Q0974:** M. D. Benson, *et al.* Suppression of choroid plexus transthyretin levels by antisense oligonucleotide treatment. AMYLOID-JOURNAL OF PROTEIN FOLDING DISORDERS 2010;17(2):43-49

**ALZET Comments:** Oligonucleotide, antisense; CSF/CNS; Mice (transgenic); 2004; 4 weeks; Controls received mp w/ saline; animal info (Tg, TTR Ile84Ser); post op. care (Ibuprofen in drinking water).