



### References on the Administration of Morpholinos Using ALZET® Osmotic Pumps

**Q7227:** M. McMillin, *et al.* FXR-Mediated Cortical Cholesterol Accumulation Contributes to the Pathogenesis of Type A Hepatic Encephalopathy. *Cell Mol Gastroenterol Hepatol* 2018;6(1):47-63  
**Agents:** Farnesoid X receptor morpholino, FXR mismatch, Cyclodextrin 2-hydroxypropyl-beta **Vehicle:** Endo-Porter solution;  
**Route:** CSF/CNS; **Species:** Mice; **Pump:** **Duration:** **ALZET Comments:** Dose (2-HbC, 6 mg/kg/day; FXR morpholino 1mg/kg; FXR mismatch 1 mg/kg); animal info (C57Bl/6 mice 25–30 g); ALZET brain infusion kit used; Brain coordinates (anteroposterior -0.34, mediolateral -1.0, and dorsoventricular -2.0);.

**Q4862:** Matthew McMillin, *et al.* Bile Acid Signaling Is Involved in the Neurological Decline in a Murine Model of Acute Liver Failure. *American Journal of Pathology* 2016;186(2):  
**Agents:** Vivo-morpholino **Vehicle:** **Route:** CSF/CNS (frontal cortex); **Species:** Mice; **Pump:** **Duration:** 3 days;  
**ALZET Comments:** Controls received mp w/ mismatched control morpholino; animal info (male, C57BL6, 25-30g); tissue perfusion (frontal cortex); tissue perfusion (frontal cortex);.

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

**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  
**Agents:** oligonucleotides, antisense morpholino **Vehicle:** PBS; **Route:** Intrauterine; **Species:** Sheep (ewe, pregnant); **Pump:** 2ML1; **Duration:** 7 days;  
**ALZET Comments:** 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;.

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

**Q4336:** K. E. Brooks, *et al.* Peroxisome Proliferator Activator Receptor Gamma (PPARG) Regulates Conceptus Elongation in Sheep. *BIOLOGY OF REPRODUCTION* 2015;92(U102-U114  
**Agents:** Oligonucleotide, antisense morpholino PPARG; oligonucleotide, antisense morpholino PPARG **Vehicle:** PBS; **Route:** Intrauterine (uterine horn); **Species:** Sheep (ewe); **Pump:** 2ML1; **Duration:** 7 days;  
**ALZET Comments:** 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.

**Q3601:** A. Pileggi, *et al.* MicroRNAs in islet immunobiology and transplantation. *Immunologic Research* 2013;57(1-3):185-196  
**Agents:** Morpholinos **Vehicle:** **Route:** Kidney (renal subcapsular space); **Species:** Rat; **Pump:** **Duration:** **ALZET Comments:** Gene therapy; diabetes; Used silicone catheter 3 french; morpholinos are DNA mimics, miRNA inhibitors.

**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



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