



**Recent References (2018-2020) on Diabetes Research
Using ALZET® Osmotic Pumps**

Q8217: T. Katahira, *et al.* Conversion of pancreatic alpha cells into insulin-producing cells modulated by beta-cell insufficiency and supplemental insulin administration. *Biochem Biophys Res Commun* 2020;521(1):178-183

Agents: Insulin **Vehicle:** Saline; **Route:** Not stated; **Species:** Mice; **Pump:** Not stated; **Duration:** 2 weeks;

ALZET Comments: Controls received mp w/ vehicle; animal info (C57BL/6J male mice, 6 or 7 weeks of age); diabetes;

Q7653: H. Zhu, *et al.* Insulin Therapy for Gestational Diabetes Mellitus Does Not Fully Protect Offspring From Diet-Induced Metabolic Disorders. *Diabetes* 2019;68(4):696-708

Agents: Insulin, recombinant human **Vehicle:** Saline; **Route:** SC; **Species:** Mice (Pregnant); **Pump:** 1007D; **Duration:** 1 week;

ALZET Comments: Dose (0.35 IU/day); Controls received mp w/ vehicle; animal info (6-8 weeks, female, ICR, 26-28g);

diabetes; Pumps were implanted on day 14.5 or 15 of pregnancy. Pups were fostered by normal females until the age of 3 weeks. "To maintain stable glycemic levels, INS dams received another injection of 0.1 units of long-acting insulin (Levemir; Novo Nordisk) ~1h before the fed state (darkness) during late gestation." p.697;

Q7646: Z. Yu, *et al.* Recombinant FGF21 Protects Against Blood-Brain Barrier Leakage Through Nrf2 Upregulation in Type 2 Diabetes Mice. *Mol Neurobiol* 2019;56(4):2314-2327

Agents: Fibroblast growth factor-21, recomb. human **Vehicle:** Not Stated; **Route:** IP; **Species:** Mice; **Pump:** Not Stated; **Duration:** 10 days;

ALZET Comments: "Dose (3 mg/kg/day); Controls were db/+ and received mp w/ vehicle; animal info (16 weeks, male, db/db); FGF21 is a robust regulator of metabolism through interactions with FGF receptor 1c and co-factor beta-Klotho.; diabetes; Therapeutic indication (obesity-induced reducing cognitive dysfunction and anxiety-like behavior through reducing glucose tolerance, insulin resistance, and hyperlipidemia); "

Q7159: X. J. Yu, *et al.* Chronic Intracerebroventricular Infusion of Metformin Inhibits Salt-Sensitive Hypertension via Attenuation of Oxidative Stress and Neurohormonal Excitation in Rat Paraventricular Nucleus. *Neurosci Bull* 2019;35(1):57-66

Agents: Metformin **Vehicle:** CSF, artificial; **Route:** CSF/CNS (lateral ventricle); **Species:** Rat; **Pump:** 2006; **Duration:** Not Stated;

ALZET Comments: Dose (25 ug/day); animal info (Eight-week-old male Dahl salt-sensitive rats); Brain coordinates (0.5 mm posterior to bregma, 1.5 mm lateral to the midline, and 2.7 mm below the skull surface); diabetes;

Q7516: W. Yin, *et al.* Protein kinase C and protein kinase A are involved in the protection of recombinant human glucagon-like peptide-1 on glomeruli and tubules in diabetic rats. *J Diabetes Investig* 2019;10(3):613-625

Agents: Peptide-1, recombinant human glucagon-like **Vehicle:** Saline; **Route:** IV; **Species:** Rat; **Pump:** 2004; **Duration:** 12 weeks;

ALZET Comments: "Dose (1.5 pmol/kg/min); Controls received mp w/ vehicle; animal info (Eight-week-old male/female Wistar rats weighing 300 – 10 g); diabetes; "

Q7634: B. P. Tooke, *et al.* Hypothalamic POMC or MC4R deficiency impairs counterregulatory responses to hypoglycemia in mice. *Mol Metab* 2019;20(194-204

Agents: Insulin; Melanotan **Vehicle:** PBS; **Route:** SC; CSF/CNS (Paraventricular Nucleus of Hypothalamus); **Species:** Mice; **Pump:** 2002; 1002; **Duration:** 14 days;

ALZET Comments: Dose (10 U/kg/day); Controls received mp w/ vehicle; Brain coordinates (bregma: anteroposterior, 0.70; mediolateral, 0.22; dorsoventral, 4.80 mm); bilateral cannula used; diabetes; BIK: Plastics1, 3280PD/V/SPC;

Q7665: R. Shoemaker, *et al.* Pancreatic AT1aR Deficiency Decreases Insulin Secretion in Obese C57BL/6 Mice. *American Journal of Hypertension* 2019;32(6):597-604

Agents: angiotensin II **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;



ALZET Comments: Dose (1,000 ng/kg/min); Controls contained functional AT1aR (pancreatic angiotensin type 1 receptor) gene; animal info (8-10 weeks, male, AT1aR(fl/fl) or AT1aR(pdx) transgenic); diabetes; All transgenic mice were of C57BL/6 origin. Mice were fed HF diet throughout this portion of the study;

Q7426: L. Poekes, *et al.* Activation of brown adipose tissue enhances the efficacy of caloric restriction for treatment of nonalcoholic steatohepatitis. *Lab Invest* 2019;99(1):4-16

Agents: CL-316,243 **Vehicle:** PBS; **Route:** Not Stated; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

ALZET Comments: Dose (1 mg/kg/day); Controls received mp w/ vehicle; animal info (Six-week-old C57Bl6J and db/db mice); diabetes;

Q7608: J. E. Oh, *et al.* Dexmedetomidine restores autophagy and cardiac dysfunction in rats with streptozotocin-induced diabetes mellitus. *Acta Diabetologica* 2019;56(1):105-114

Agents: Dexmedetomidine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2ML4, 2002; **Duration:** 28 days;

ALZET Comments: Dose (1 ug/kg/hr); animal info (Sprague Dawley, 8-10 weeks old); Dexmedetomidine aka DEX; diabetes;

Q8265: Y. Liu, *et al.* Expression levels of cathepsin L and cystatin C in a hyperglycemic environment were associated with aortic aneurysm development in a mouse model. *J Int Med Res* 2019;47(6):2499-2506

Agents: Angiotensin II **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

ALZET Comments: Dose (1000 ng/kg/min); animal info (ApoE -/-, C57BL/6, Male, 8-10 weeks old, 20-30g); diabetes;

Q7350: Y. Kimura, *et al.* Canagliflozin, a sodium-glucose cotransporter 2 inhibitor, normalizes renal susceptibility to type 1 cardiorenal syndrome through reduction of renal oxidative stress in diabetic rats. *J Diabetes Investig* 2019;

Agents: Canagliflozin **Vehicle:** DMSO, PEG; **Route:** SC; **Species:** SC; **Pump:** Not Stated; **Duration:** 2 weeks;

ALZET Comments: Dose (1 mg/kg/day); 1:1 DMSO:PEG used; animal info (Male LETO and OLETF age 25–30 weeks); functionality of mp verified by blood pressure and pulse rate via tail-cuff method; cardiovascular; diabetes; Therapeutic indication (type 2 diabetes mellitus);

Q8215: S. Kalinovic, *et al.* Comparison of Mitochondrial Superoxide Detection Ex Vivo/In Vivo by mitoSOX HPLC Method with Classical Assays in Three Different Animal Models of Oxidative Stress. *Antioxidants (Basel)* 2019;8(11):

Agents: Angiotensin II, Nitroglycerin **Vehicle:** NaCl, Citrate Buffer; **Route:** Not stated; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days, 4 days;

ALZET Comments: Dose (1.0 mg/kg/d or 6.6 ug/kg/min); 0.9% NaCl used; Controls received mp w/ vehicle; animal info (male Wistar Rats, 6 weeks, 300 g); Angiotensin II aka AT-II, Nitroglycerin aka GTN; diabetes;

Q8213: K. M. Jansen, *et al.* Dietary Calanus oil recovers metabolic flexibility and rescues postischemic cardiac function in obese female mice. *Am J Physiol Heart Circ Physiol* 2019;317(2):H290-H299

Agents: Incretin Mimetic Exenatide **Vehicle:** Not stated; **Route:** Not stated; **Species:** Mice; **Pump:** 1004; **Duration:** Not stated;

ALZET Comments: Dose (10 ug/kg/day); animal info (Seven week-old C57Bl/6J female mice); diabetes;

Q7343: X. Huang, *et al.* Resveratrol Promotes Diabetic Wound Healing via SIRT1-FOXO1-c-Myc Signaling Pathway-Mediated Angiogenesis. *Front Pharmacol* 2019;10(421)

Agents: EX-527; 10068-F4 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 4 weeks;

ALZET Comments: Dose (EX-527 5 mg/kg/day, 10068-F4 30mg/kg/day); Controls received mp w/ vehicle; animal info (BKS.Cg-Dock7mC=CLEprdb=J mice, 8 weeks old); enzyme inhibitor (EX-527 is an SIRT1 inhibitor, 10058-F4 is a c-Myc inhibitor); diabetes;

Q8204: A. P. Gupta, *et al.* Pancreastatin inhibitor PSTi8 attenuates hyperinsulinemia induced obesity and inflammation mediated insulin resistance via MAPK/NOX3-JNK pathway. *Eur J Pharmacol* 2019;864(172723)

Agents: Insulin Glargine, Pancreastatin Inhibitor **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;

ALZET Comments: Dose (1 mg/kg/day or 30 U/kg/day); Controls received mp w/ vehicle; animal info (male C57BL/6 male mice (20 ± 2 g)); Pancreastatin Inhibitor aka PSTi8; diabetes;



Q7289: R. Goto, *et al.* Mineralocorticoid Receptor May Regulate Glucose Homeostasis through the Induction of Interleukin-6 and Glucagon-Like peptide-1 in Pancreatic Islets. *J Clin Med* 2019;8(5):

Agents: Aldosterone, d- **Vehicle:** Ethanol; Propylene Glycol; Distilled Water; **Route:** Not Stated; **Species:** Rat; **Pump:** 2004; **Duration:** 4 weeks;

ALZET Comments: Dose (2.9 mg/mL); 9% ethanol, 87% propylene glycol, 4% dH₂O used; Controls received mp w/ vehicle; animal info (Male Sprague-Dawley rats); diabetes;

Q8000: K. Furuyama, *et al.* Diabetes relief in mice by glucose-sensing insulin-secreting human alpha-cells. *Nature* 2019;567(7746):43-48

Agents: Anti-GCGR monoclonal antibody **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Dose (3 mg/ml); Controls received mp w/ vehicle; animal info (2-4 months old); diabetes;

Q7999: I. C. Furigo, *et al.* Suppression of Prolactin Secretion Partially Explains the Antidiabetic Effect of Bromocriptine in ob/ob Mice. *Endocrinology* 2019;160(1):193-204

Agents: Prolactin **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

ALZET Comments: Dose (18 ug/day); Controls received mp w/ vehicle; animal info (5 months old, ob/ob, 56 g); Prolactin aka Prl ; diabetes;

Q7960: B. P. Dieter, *et al.* Serum amyloid A and Janus kinase 2 in a mouse model of diabetic kidney disease. *PLoS One* 2019;14(2):e0211555

Agents: Angiotensin II **Vehicle:** saline, sterile; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

ALZET Comments: Dose (700 ng/min/kg); Controls received mp w/ agent; animal info (129S6 Akita); diabetes; mp used to accelerate kidney damage;

Q7440: H. Cao, *et al.* Urinary mitochondrial DNA: A potential early biomarker of diabetic nephropathy. *Diabetes Metab Res Rev* 2019;35(4):e3131

Agents: Mitochondrial DNA **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 28 days;

ALZET Comments: Dose (30 ug/kg/day); animal info (Male, CD-1, 18-22 g); diabetes;

Q7410: H. Cao, *et al.* Urinary mitochondrial DNA: A potential early biomarker of diabetic nephropathy. *Diabetes/Metabolism Research and Reviews* 2019;35(4):e3131

Agents: Mitochondrial DNA **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 28 Days;

ALZET Comments: Dose (30 ug/kg/day); animal info (Male, CD-1, 18-22 g); diabetes;

Q7961: Y. Birnbaum, *et al.* DPP-4 inhibition by linagliptin prevents cardiac dysfunction and inflammation by targeting the Nlrp3/ASC inflammasome. *Basic Res Cardiol* 2019;114(5):35

Agents: Exendin-4 **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 2 weeks;

ALZET Comments: Dose (24 nmol/kg/day); Controls received sham surgery; animal info (10 weeks, male, C57BL/6J and db/db); ischemia (coronary artery occlusion); cardiovascular; diabetes; "As there has been no published protocol for long-term EX administration in mice, we followed the initial EX injection with prolonged Exendin-4 administration via osmotic pump for 2 weeks" p.35-36;

Q7977: F. Adel, *et al.* Insulin Therapy in a Rat Model of Diabetic Cardiomyopathy Is Associated with Attenuation of the Cgmp System. *Journal of the American College of Cardiology* 2019;73(9):

Agents: insulin **Vehicle:** saline; **Route:** SC; **Species:** Rat; **Pump:** Not stated; **Duration:** 1 month;

ALZET Comments: Dose (11.5 ug/kg/day); Controls received mp w/ vehicle; animal info (male, Wistar); cardiovascular; diabetes;

Q6987: J. Zhou, *et al.* Activation of brown adipocytes by placental growth factor. *Biochemical and Biophysical Research Communications* 2018;504(2):470-477

Agents: Placenta Growth Factor **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 6 weeks;



ALZET Comments: Controls received mp w/ vehicle; animal info (8-week old Diabetic db mice);

Q7041: J. Yin, *et al.* Apelin inhibited epithelial-mesenchymal transition of podocytes in diabetic mice through downregulating immunoproteasome subunits beta5i. *Cell Death & Disease* 2018;9(10):1031

Agents: Apelin-13, F13A **Vehicle:** Saline; **Route:** IP; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

ALZET Comments: Dose (Apelin-13 at 30 µg/kg/d and F13A at 25 µg/kg/d); Controls received mp w/ vehicle; animal info (8-week old Male kkAy mice and control C57BL/6J mice); F13A is an Apelin-13 antagonist; diabetes;

Q7318: Y. Wang, *et al.* Valsartan Alleviates Insulin Resistance in Skeletal Muscle of Chronic Renal Failure Rats. *Med Sci Monit* 2018;24(2413-2419)

Agents: Angiotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** Pump model not stated; **Duration:** Not Stated;

ALZET Comments: Dose (200 ng/kg/min); Controls received mp w/ vehicle; animal info (Male, Wistar, 6-8 weeks old, 180-220 g); diabetes;

Q7319: Q. Wang, *et al.* Danhong Injection Alleviates Mechanical Allodynia via Inhibiting ERK1/2 Activation and Elevates BDNF Level in Sciatic Nerve in Diabetic Rat. *Evidence-Based Complementary and Alternative Medicine* 2018;2018(5798453)

Agents: U0126 **Vehicle:** DMSO; CSF, artificial; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1007D; **Duration:** 1 week;

ALZET Comments: Dose (0.5 µg/ul/hr); 10% DMSO used; Controls received mp w/ vehicle; animal info (Male, Sprague-Dawley, 180-200 g); behavioral testing (Stimulus test); U0216 is a Mitogen-activated protein kinase (MAPK) kinase 1/2 inhibitor; enzyme inhibitor (Mitogen-activated protein kinase); Intrathecal catheters were inserted into subarachnoid spaces through atlantooccipital membrane; diabetes;

Q7840: M. Waldman, *et al.* PARP-1 inhibition protects the diabetic heart through activation of SIRT1-PGC-1alpha axis. *Experimental Cell Research* 2018;373(1-2):112-118

Agents: angiotensin II; INO-1001 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 4 weeks;

ALZET Comments: "Dose ((AngII 1000 ng/kg/min), (INO-1001 5 mg/kg/day)); Controls received no pump; animal info (12-14 weeks, male, C57BLKS/J and C57BLKS/J-leprdb/leprdb); Multiple pumps per animal (2 for AT + INO group); INO-1001 is an enzyme inhibitor (PARP-1); diabetes; Therapeutic indication (PARP-1 inhibition by INO1001 promoted weight loss in the diabetic mice stressed with AT. It attenuated cardiac fibrosis and hypertension in diabetic mice and prevented oxidative stress.); "

Q7157: S. Tauscher, *et al.* beta Cell-specific deletion of guanylyl cyclase A, the receptor for atrial natriuretic peptide, accelerates obesity-induced glucose intolerance in mice. *Cardiovascular Diabetology* 2018;17(1):103

Agents: B-type natriuretic peptide **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (2 ng/h/g); Controls received mp w/ vehicle; diabetes;

Q7844: Z. Qing, *et al.* Vitamin C deficiency aggravates tumor necrosis factor alpha-induced insulin resistance. *European Journal of Pharmacology* 2018;829(1-11)

Agents: Tumor necrosis factor, alpha **Vehicle:** Saline, BSA Buffered; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

ALZET Comments: Dose (6.44 µg/ml at 1 µl/h); Controls received mp w/ vehicle; animal info (9 weeks, male, Gulo(-/-)); diabetes;

Q8154: S. Park, *et al.* The combination of luteolin and l-theanine improved Alzheimer disease-like symptoms by potentiating hippocampal insulin signaling and decreasing neuroinflammation and norepinephrine degradation in amyloid-beta-infused rats. *Nutr Res* 2018;60(116-131)

Agents: Amyloid-B(25-35) **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** Not stated; **Duration:** 14 days;

ALZET Comments: Dose (3.6 nmol/day); animal info (Sprague Dawley, 202 g,); diabetes;

Q8144: G. Navarro, *et al.* Androgen excess in pancreatic beta cells and neurons predisposes female mice to type 2 diabetes. *JCI Insight* 2018;3(12):



Agents: Dihydrotestosterone **Vehicle:** Not stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** Not stated; **Duration:** 4 weeks;

ALZET Comments: Controls received mp w/ vehicle; animal info (8 weeks old, Female, C57BL/6J); Dihydrotestosterone aka DHT, nonaromatizable AR agonist ; Brain coordinates (L +1 mm, AP –0.2 mm, DV –2 mm); bilateral cannula used; diabetes;

Q7730: G. Navarro, *et al.* Androgen excess in pancreatic beta cells and neurons predisposes female mice to type 2 diabetes. *JCI Insight* 2018;3(12):

Agents: Dihydrotestosterone **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: Controls received mp w/ vehicle; animal info (littermate mice aged 10–16 weeks.); dihydrotestosterone aka DHT; Brain coordinates ((coordinates compared with the bregma L +1 mm, AP –0.2 mm, DV –2 mm)); diabetes;

Q6958: C. L. Montgomery, *et al.* Mechanisms Underlying Early-Stage Changes in Visual Performance and Retina Function After Experimental Induction of Sustained Dyslipidemia. *Neurochem Res* 2018;43(8):1500-1510

Agents: Poloxamer 407 **Vehicle:** Saline; **Route:** SC; IP; **Species:** Mice; **Pump:** 2004; **Duration:** 1 month;

ALZET Comments: Controls received mp w/ vehicle; animal info (C57BL/6Crl mice); IP delivery via a cannula connected to SC pump; functionality of mp verified by total cholesterol and true triglyceride plasma concentrations; “To more easily maintain a sustained atherogenic plasma lipid profile without the increased stress and risk of animal loss associated with repeated intraperitoneal injections, we employed implantable osmotic pumps to continuously deliver P-407 at a defined rate to mice for 1 month. ” pg. 1502; Therapeutic indication (Diabetic retinopathy);

Q7234: M. Mizuno, *et al.* Empagliflozin normalizes the size and number of mitochondria and prevents reduction in mitochondrial size after myocardial infarction in diabetic hearts. *Physiol Rep* 2018;6(12):e13741

Agents: Empagliflozin **Vehicle:** DMSO, PEG; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 2 weeks;

ALZET Comments: Dose (10 mg/kg per day); DMSO:PEG, 50:50 used; Controls received mp w/ vehicle; animal info (25–30 weeks); diabetes;

Q6960: J. Miao, *et al.* Resistin inhibits neuronal autophagy through Toll-like receptor 4. *J Endocrinol* 2018;238(1):77-89

Agents: Resistin **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** 2002; **Duration:** 3 days;

ALZET Comments: Dose (1.2 µg/12 µL/day); Controls received mp w/ vehicle; animal info (male C57BL6J mice (27–32 g) and TLR-4-knockout mice); Obesity and diabetes;

Q8076: J. Li, *et al.* Diabetes Reduces Severity of Aortic Aneurysms Depending on the Presence of Cell Division Autoantigen 1 (CDA1). *Diabetes* 2018;67(4):755-768

Agents: Angiotensin II **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

ALZET Comments: Dose (1 ug/min/kg); animal info (C57BL/6); diabetes;

Q8056: D. Kumar, *et al.* Chronic hyperinsulinemia promotes meta-inflammation and extracellular matrix deposition in adipose tissue: Implications of nitric oxide. *Mol Cell Endocrinol* 2018;477(15-28)

Agents: Insulin **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 8 weeks;

ALZET Comments: Controls received mp w/ vehicle; animal info (8-10 weeks old, 20-24 g, C57BL/6J, Male); pumps replaced every 4 weeks; diabetes;

Q7928: M. Kamitani, *et al.* Heterogeneity of autophagic status in pancreatic beta cells under metabolic stress. *Biochemical and Biophysical Research Communications* 2018;496(2):328-334

Agents: S961 **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** 1007d; **Duration:** 1 week;

ALZET Comments: dose-response (5 nmol/week or 10 nmo/lweek); Controls received mp w/ vehicle; animal info (Male, C57BL/6J); diabetes;

Q7925: N. D. Jayaraj, *et al.* Reducing CXCR4-mediated nociceptor hyperexcitability reverses painful diabetic neuropathy. *J Clin Invest* 2018;128(6):2205-2225

Agents: Clozapine-N-Oxide **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 4 weeks;



ALZET Comments: Dose (10 mg/kg/day); Controls received mp w/ vehicle; Clozapine-N-oxide aka CNO; diabetes;

Q7758: B. M. Inouye, *et al.* Diabetic bladder dysfunction is associated with bladder inflammation triggered through hyperglycemia, not polyuria. *Res Rep Urol* 2018;10(219-225)

Agents: phlorizin **Vehicle:** propylene glycol; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 11 weeks;

ALZET Comments: Dose (120 mg/kg/day); 40% w/v of agent in propylene glycol used; Controls received mp w/ agent; animal info (4 weeks, female, C57BL/6 or Akita); pumps replaced every 4 weeks; phlorizin is an inhibitor of sodium-glucose linked transporter types 1 and 2 that prevents glucose reabsorption in the kidney; enzyme inhibitor (sodium-glucose linked transporter types 1 and 2 (SGLT1 and SGLT2)); diabetes; Therapeutic indication (normalized serum glucose in diabetic-prone mice while increasing the urine output and reducing inflammation in the bladder);

Q7021: H. Hvid, *et al.* Activation of insulin receptors and IGF-1 receptors in COLO-205 colon cancer xenografts by insulin and insulin analogue X10 does not enhance growth under normo- or hypoglycaemic conditions. *Diabetologia* 2018;61(11):2447-2457

Agents: Insulin, human; X10 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice (nude); **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: Dose (insulin at 27 nmol/kg/d; X10 at 41 nmol/kg/d); Controls received mp w/ vehicle; animal info (male BALB/c nude mice); X10 is an insulin analog; cancer (colon); diabetes;

Q7183: P. Huehnchen, *et al.* Fingolimod therapy is not effective in a mouse model of spontaneous autoimmune peripheral polyneuropathy. *Sci Rep* 2018;8(1):5648

Agents: Fingolimod **Vehicle:** Saline; **Route:** IP; **Species:** Mice; **Pump:** 1004; **Duration:** 8 weeks;

ALZET Comments: Dose (1 mg/kg/day); Controls received mp w/ vehicle; animal info (CD86^{-/-} non-obese diabetic (NOD) mice); pumps replaced every 4 weeks; long-term study; Fingolimod is a sphingosine-1-phosphate analogue; neurodegenerative (autoimmune polyneuropathy); stress/adverse reaction: (see pg. 2);

Q7755: R. W. Holdcraft, *et al.* A model for determining an effective in vivo dose of transplanted islets based on in vitro insulin secretion. *Xenotransplantation* 2018;25(6):e12443

Agents: Insulin, recomb. human **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 3-5 days;

ALZET Comments: Dose ((female 1.5-2.0 U/day), (males 3.0-4.5 U/day)); Controls consisted of rats that did not become diabetic during the initial study period; animal info (male and female, BioBreeding diabetes-prone); Multiple pumps per animal (2 if hyperglycemic state observed. see p.4); comparison of macrobead implant vs mp; diabetes; Pilot study for CGM calibration 3-5 days followed by 1 or 3 month study using microbeads. Pump models not stated but duration length was listed at 7 or 14 days;

Q7750: I. Gonzalez-Mariscal, *et al.* Absence of cannabinoid 1 receptor in beta cells protects against high-fat/high-sugar diet-induced beta cell dysfunction and inflammation in murine islets. *Diabetologia* 2018;61(6):1470-1483

Agents: S961 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2001; **Duration:** 6 days;

ALZET Comments: Dose (1.2 nmol/day); Controls received mp w/ vehicle; animal info (10-12 weeks, male, beta-CB1R^{+/+}, beta-CB1R^{-/-} or MIPCre/ERT); S961 is an insulin receptor antagonist; diabetes; Vehicle used but identity not stated.;

Q7814: M. Gao, *et al.* Redox signal-mediated TRPM2 promotes Ang II-induced adipocyte insulin resistance via Ca(2+)-dependent CaMKII/JNK cascade. *Metabolism* 2018;85(313-324)

Agents: angiotensin II; anthranilic acid, N-(p-aminocinnamoyl)- **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 4 weeks;

ALZET Comments: Dose ((AngII 1.5 mg/kg/d), (ACA 25 mg/kg/d)); Controls received mp w/ vehicle; animal info (8 weeks, male, C57BL/6J); ACA aka N-(p-aminocinnamoyl)anthranilic acid; diabetes; Therapeutic indication (insulin sensitivity increased in ACA-treated hypertensive mice);

Q7126: A. A. da Silva, *et al.* Control of appetite, blood glucose, and blood pressure during melanocortin-4 receptor activation in normoglycemic and diabetic NPY-deficient mice. *American Journal of Physiology Regulatory, Integrative, and Comparable Physiology* 2018;314(4):R533-R539

Agents: Melanotan II **Vehicle:** Saline; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;



ALZET Comments: Dose (200 ug/kg/day); Controls received mp w/ vehicle; animal info (male, 20-24 week old); antagonist aka melanocortin 3/4; diabetes;

Q7119: S. Clotet-Freixas, *et al.* Sex dimorphism in ANGII-mediated crosstalk between ACE2 and ACE in diabetic nephropathy. *Lab Invest* 2018;98(9):1237-1249

Agents: Angiotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

ALZET Comments: Dose (1.44 ug/day/g); 0.9% sodium chloride used; animal info (10 week old, female and male, C57BL/6); diabetes;

Q7790: A. Citro, *et al.* Anti-Inflammatory Strategies in Intrahepatic Islet Transplantation: A Comparative Study in Preclinical Models. *Transplantation* 2018;102(2):240-248

Agents: Reparixin **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

ALZET Comments: Dose (5.4 mg/h/kg); animal info (Male, C57BL/6, Balb/c, 8-9 weeks old, 24-6 g); Reparixin aka CXCR1/2 inhibitor; enzyme inhibitor (CXCR1/2 inhibitor); diabetes;

Q7764: V. Cigliola, *et al.* Pancreatic islet-autonomous insulin and smoothed-mediated signalling modulate identity changes of glucagon(+) alpha-cells. *Nat Cell Biol* 2018;20(11):1267-1277

Agents: S961 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: Dose (40 nmol/week); S961 is a insulin receptor antagonist; diabetes;

Q7761: J. Chilloux, *et al.* Microbiome Inhibition of IRAK-4 by Trimethylamine Mediates Metabolic and Immune Benefits in High-Fat-Diet-induced Insulin Resistance. *bioRxiv* 2018;

Agents: Trimethylamine; PF06650833 **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2006; **Duration:** 6 weeks;

ALZET Comments: Dose (TMA 0.1 mM in circulation or PF06650833 50 nM in circulation); Controls received mp w/ vehicle; animal info (Five-week-old C57BL/6J mice); diabetes;

Q8179: S. Cechova, *et al.* MYH9 E1841K Mutation Augments Proteinuria and Podocyte Injury and Migration. *J Am Soc Nephrol* 2018;29(1):155-167

Agents: Angiotensin II **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;

ALZET Comments: Dose (Ang II 1000 ng/kg per minute); animal info (E1841K mutation); diabetes;

Q7741: E. Candeias, *et al.* Brain GLP-1/IGF-1 Signaling and Autophagy Mediate Exendin-4 Protection Against Apoptosis in Type 2 Diabetic Rats. *Mol Neurobiol* 2018;55(5):4030-4050

Agents: Exendin-4 **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 28 days;

ALZET Comments: Dose (5 ug/kg/day); Controls received mp w/ vehicle; animal info (6 male Wistar and 12 GK rats (8 months old)); Ex-4 aka Exendin-4; diabetes; Therapeutic indication (Alzheimer's disease);

Q7088: N. C. Boisvert, *et al.* Hyperfiltration in ubiquitin C-terminal hydrolase L1-deleted mice. *Clinical Science* 2018;132(13):1453-1470

Agents: Insulin (Humulin R) **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

ALZET Comments: Dose (8.33 umol/ml); Controls received mp w/ vehicle; animal info (Uchl1-/-mice, 9-11-week-old, male); diabetes;