References on the Intravenous Administration of Agents in Mice Using ALZET® Osmotic Pumps

Q10514: L. B. James-Allan, *et al.* A Novel Technique Using Chronic Infusion Of Small Extracellular Vesicles From Gestational Diabetes Mellitus Causes Glucose Intolerance In Pregnant Mice. Clinical Science (Lond) 2022;136(21):1535-1549
Agents: Vesicle, human small extracellular **Vehicle:** PBS; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1003D; **Duration:** 4 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (Pregnant female C57BL6 mice); jugular catheter used; gestational diabetes mellitus

Q10781: Z. J. Wang, *et al.* Adipokine Omentin-1 Enhances Atherosclerotic Plaque Stability by Binding to Macrophage Integrin Receptor. European Heart Journal 2020;
Agents: Adipokine omentin-1 **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice;
ALZET Comments: animal info: ApoE−/−mouse; immunology

Q9530: F. Wang, *et al.* Soluble (pro)renin receptor treats metabolic syndrome in mice with diet-induced obesity via interaction with PPARgamma. JCI Insight 2020;5(7):
Agents: Renin receptor, human recombinant soluble; PF429242 **Route:** IV (external jugular); **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks;
ALZET Comments: Dose (30 ug/kg/d); Controls received mp w/ vehicle; animal info (Male 36-week-old DIO C57/BL6 mice); Multiple pumps per animal (2 pumps); human recombinant soluble renin receptor aka sPRR, PF429242 aka PF; dependence;

Q8861: L. B. James-Allan, *et al.* Regulation of glucose homeostasis by small extracellular vesicles in normal pregnancy and in gestational diabetes. FASEB Journal 2020;34(4):5724-5739
Agents: Small extracellular vesicles, human **Vehicle:** PBS; **Route:** IV (right jugular vein); **Species:** Mice; **Pump:** 1003D; **Duration:** 4 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (Nonpregnant female C57BL/6 mice); human small extracellular vesicles aka human sEVs; diabetes;

Q8537: M. Hecker, *et al.* Immunomodulation by an Omega-6 Fatty Acid Reduced Mixed Lipid Emulsion in Murine Acute Respiratory Distress Syndrome. Journal of Clinical Medicine 2020;9(7):
Agents: Triglycerides, long-chain; Triglycerides, medium chain **Vehicle:** Saline; **Route:** IV (external jugular); **Species:** Mice; **Pump:** Not stated; **Duration:** 3 days;
ALZET Comments: Dose (1.5 mg/kg/day); Controls received mp w/ vehicle; animal info (13-15 week old mice, 22-24 g); long-chain Triglycerides aka LCT; medium chain Triglycerides aka SMOF; dependence;

Q8472: T. Fujimura, *et al.* The pain-relieving effects of lactoferrin on oxaliplatin-induced neuropathic pain. Journal of Veterinary Medical Science 2020;
Agents: Lactoferrin, human recombinant **Vehicle:** PBS; **Route:** IV (external jugular); **Species:** Mice; **Duration:** 2 weeks;
ALZET Comments: Dose (10 mg/kg/day); Controls received mp w/ vehicle; animal info (five-week-old male ICR mice); human recombinant lactoferrin aka rhLf; dependence;

Q7500: F. Wang, *et al.* Site-1 protease-derived soluble (pro)renin receptor targets vasopressin receptor 2 to enhance urine concentrating capability. JCI Insight 2019;4(7):
Agents: Histidine-tagged sPRR **Vehicle:** Not stated; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;
ALZET Comments: Dose (30 µg/kg/day); Controls received mp w/ vehicle; animal info (experiments. Male 10- to 12-week-old C57/BL6 mice);

Q7573: R. Lin, *et al.* Systemic Factors Trigger Vasculature Cells to Drive Notch Signaling and Neurogenesis in Neural Stem Cells in the Adult Brain. Stem Cells 2019;37(3):395-406
Agents: Biotin, recombinant vascular endothelial growth factor 165 **Vehicle:** Saline; **Route:** IV (Femoral); **Species:** Mice; **Pump:** Not Stated; **Duration:** 3 days;
ALZET Comments: Dose (1 mg/kg); Controls received mp w/ vehicle; animal info (9-week old CD-1 mice);

Q6881: W. Deng, *et al.* Insulin ameliorates pulmonary edema through the upregulation of epithelial sodium channel via the PI3K/SGK1 pathway in mice with lipopolysaccharideinduced lung injury. Mol Med Rep 2019;
Agents: Insulin, human **Vehicle:** PBS; **Route:** IV (jugular); **Species:** Mice; **Pump:** Not Stated; **Duration:** 24 hours;
ALZET Comments: Dose (Human Insulin (.01 U/kg/day); Controls received mp w/ vehicle; animal info (C3H/HeN mice, aged 7-9 weeks); ALZET internal jugular vein catheter used; cardiovascular;

Q7161: X. Yu, *et al.* Zinc Metallochaperones Reactivate Mutant p53 Using an ON/OFF Switch Mechanism: A New Paradigm in Cancer Therapeutics. Clin Cancer Res 2018;24(18):4505-4517
Agents: Zinc metallochaperone 1 **Vehicle:** DMSO; **Route:** IV (jugular); **Species:** Mice (nude); **Pump:** 2001; **Duration:** 7, 17 days;
ALZET Comments: Dose (1 mg/kg/d); Controls received mp w/ vehicle; animal info (8-12 week old mice); pumps replaced after 1 week; comparison of IV bolus injection vs continuous pump infusion; half-life: <30 min (p. 4505); cancer (therapeutics);

Q6901: T. Vajen, *et al.* Blocking CCL5-CXCL4 heteromerization preserves heart function after myocardial infarction by attenuating leukocyte recruitment and NETosis. Sci Rep 2018;8(1):10647
Agents: MKEY; MKEY, scrambled **Vehicle:** Formic acid; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;
ALZET Comments: Dose (1.3 mg/kg/day); animal info (C57BL/6 mice); cardiovascular;

Q7915: A. K. E. Hornsby, *et al.* Circulating unacylated-ghrelin impairs hippocampal neurogenesis and memory in mice and is altered in human Parkinson's disease dementia. Cell Reports Medicine 2018;1(7):100120
Agents: Ghrelin, unacylated **Vehicle:** Saline, sterile, heparinized; BSA, buffered; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;
ALZET Comments: Dose (48µg/day); sterile isotonic saline containing BSA (1mg/ml) and heparin (5U/ml) used; Controls received mp w/ vehicle; animal info (6 months, C57BL/6 and GOAT-null); UAG is considered an inactive precursor to acyl-ghrelin; neurodegenerative (Parkinson's); replacement therapy (ghrelin);

Q4901: M. Zenggeng Wang, *et al.* Infusion of esmolol attenuates lipopolysaccharide-induced myocardial dysfunction. Journal of Surgical Research 2016;200(283-289
Agents: Esmolol **Vehicle:** Saline; **Route:** IV (jugular); **Species:** Mice; **Pump:** Not Stated; **Duration:** 6 hours;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, C57BL6J, 8-12 weeks old); cardiovascular; immunology; Dose (6.7 ug/kg/min);

Q6527: H. Vogel, *et al.* GLP-1 and estrogen conjugate acts in the supramammillary nucleus to reduce food-reward and body weight. Neuropharmacology 2016;110(Pt A):396-406
Agents: Not Stated **Vehicle:** Not Stated; **Route:** IV; **Species:** Mice; **Pump:** Jugular vein catheter; **Duration:** Not Stated;
ALZET Comments: animal info (Adult Sprague-Dawley rats weighing 200-250 g); ALZET jugular catheter used

Q6661: R. Shainer, *et al.* PreImplantation factor (PIF) therapy provides comprehensive protection against radiation induced pathologies. ONCOTARGET 2016;7(37):58975-58994
Agents: PreImplantation Factor **Vehicle:** DMSO; PBS, Dulbecco's; **Route:** IV; **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks;
ALZET Comments: Dose (1 mg/kg/day); 0.2% DMSO used; Controls received mp w/ vehicle; animal info (C57BL/6 mice); PreImplantation Factor aka PIF; peptides; Therapeutic indication (acute radiation syndrome);

P5241: T. Nakamachi, *et al.* PACAP suppresses dry eye signs by stimulating tear secretion. Nat Commun 2016;7(12034
Agents: Pituitary adenylate cyclase-activating polypeptide; PACAP38 **Vehicle:** BSA; saline; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1007D; **Duration:** 4 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (8 – 12 weeks old, Adcyap1-/- mice, C57BL/6 background); functionality of mp verified by tear volume; 0.1% BSA used; PE10 polyethylene catheter used; Therapeutic indication (dry eye syndrome); Dose (PACAP38 32 pmol/ul, PACAP6-38 320 pmol/ul);

Q6580: J. Kübler, *et al.* The HIV-derived protein Vpr52-96 has anti-glioma activity in vitro and in vivo. ONCOTARGET 2016;7(29):45500-45512
Agents: HIV Viral Protein R **Vehicle:** Water; **Route:** IV (jugular); **Species:** Mice; **Pump:** 2001; **Duration:** 1 week;
ALZET Comments: Dose (60 mg/kg/week); Therapeutic indication (HIV);

Q5320: M. Benlloch, *et al.* Pterostilbene Decreases the Antioxidant Defenses of Aggressive Cancer Cells In Vivo: A Physiological Glucocorticoids- and Nrf2-Dependent Mechanism. Antioxidants & Redox Signaling 2016;24(17):974-90
Agents: Pterostilbene, Corticosterone **Vehicle:** DMSO, Ethanol; PEG400; **Route:** IV (jugular); **Species:** Mice; **Duration:** 35 days;
ALZET Comments: Controls received mp w/ vehicle; animal info Female nu/nu nude mice (6–8 weeks); Vehicle solution DMSO and ethanol at 2:1 ratio; functionality of mp verified by plasma levels, pg 979; functionality of mp verified by plasma levels, pg 979; Pterostilbene is a natural dimethoxylated analog of resveratrol; Mice xenograft models; Dose (50 mg/ml Pter; 0.3 ug/hr corticosterone); Resultant plasma level (pg. 979);

Q4549: T. Nojiri, *et al.* Atrial natriuretic peptide prevents cancer metastasis through vascular endothelial cells. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 2015;112(4086-4091
Agents: Atrial natriuretic peptide **Vehicle:** Saline; **Route:** IV (jugular); **Species:** Mice (nude); **Pump:** 1002; 2004; **Duration:** 4 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (BALB/c nu/nu, 6 weeks old); cancer (lung); cardiovascular; immunology; used mouse jugular catheter (#7702); bp measured using tail cuff;

Q4447: M. Hecker, *et al.* Immunomodulation by lipid emulsions in pulmonary inflammation: a randomized controlled trial. Critical Care 2015;19(U1-U13
Agents: Fish oil-based lipid emulsion; Soybean oil-based lipid emulsion; **Route:** IV (jugular); **Species:** Mice; **Duration:** 24 hours;
ALZET Comments: Controls received mp w/ saline; animal info (ChemR23 -/- or WT Sv129/S1); 10% emulsion used; immunology;

Q4187: M. Xia, *et al.* Endothelial NLRP3 Inflammasome Activation and Enhanced Neointima Formation in Mice by Adipokine Visfatin. American Journal of Pathology 2014;184(1617-1628
Agents: Visfatin **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, C57BL6J or Asc -/-, 8 weeks old); cardiovascular; immunology; visfatin is an adipokine;

Q4021: C. Ning, *et al.* Excess adenosine A2B receptor signaling contributes to priapism through HIF-1alpha mediated reduction of PDE5 gene expression. FASEB Journal 2014;28(2725-2735
Agents: Not Stated **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;
ALZET Comments: catheter was heparinized 250 U/ml; jugular catheter only;

Q4004: K. Miyamoto, *et al.* PACAP38 Suppresses Cortical Damage in Mice with Traumatic Brain Injury by Enhancing Antioxidant Activity. Journal of Molecular Neuroscience 2014;54(370-379
Agents: PACAP38 **Vehicle:** Saline; BSA; **Route:** IV (femoral); **Species:** Mice; **Pump:** Not Stated; **Duration:** 24 hours;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, C57BL6J, 10-12 weeks old, 21-26g); 0.1% BSA used; ischemia (cerebral); cardiovascular; peptides; used PE-10;

Q5046: I. Ibrahim-Zada, *et al.* Inhibition of sepsis-induced inflammatory response by beta1-adrenergic antagonists. J Trauma Acute Care Surg 2014;76(2):320-7; discussion 327-8
Agents: Esmolol **Vehicle:** saline; **Route:** IV (jugular); **Species:** mice; **Pump:** Not Stated; **Duration:** 1 week;
ALZET Comments: Controls received mp w/ saline vehicle; animal info (Male C57BL/6J mice aged 8 weeks to 12 weeks); functionality of mp verified by monitoring of animal response using transthoraic echocardiography; dose-response (pg 321, 322 dose response curve); good methods (pg 321); post op. care (buprenorphine 0.025 mg in 1 mL of normal saline injected SC); observation of animals every 12 hours; Dose: esmolol 6.7 ug/kg/min (pg. 321) [10mg/mL];

Q3503: M. Hecker, *et al.* Immunomodulation by fish-oil containing lipid emulsions in murine acute respiratory distress syndrome. Critical Care 2014;18(U648-U658Triglycerides, long-chain; triglycerides, medium chain; fish oil
Agents: Triglycerides, long-chain; triglycerides, medium chain; fish oil **Route:** IV (jugular); **Species:** Mice; **Duration:** 3 days;
ALZET Comments: Controls received mp w/ saline; animal info (BALB/c, 13-15 weeks old, 22-24g); functionality of mp verified by plasma concentration; pumps replaced every 7 days; immunology; mice injected with low dose unfractionated heparin SC;

Q3039: N. Farhat, *et al.* Angiopoietin-Like 2 Promotes Atherogenesis in Mice. JOURNAL OF THE AMERICAN HEART ASSOCIATION 2013;2(3):U137-U149
Agents: Angiopoietin like -2 **Vehicle:** TBSE; **Route:** IV; **Species:** Mice (transgenic); **Pump:** 1004; **Duration:** 1 month;
ALZET Comments: Control animals received mp w/ vehicle; animal info (3 mo old, ATX)

Q2907: M. J. C. Dane, *et al.* Glomerular Endothelial Surface Layer Acts as a Barrier against Albumin Filtration. American Journal of Pathology 2013;182(5):1532-1540
Agents: Bovine testicular Hyaluronidase **Vehicle:** Saline; **Route:** IV; **Species:** Mice; **Pump:** Not Stated; **Duration:** 4 Days;
ALZET Comments: Controls received mp w/ heat inactivated hyaluronidase; peptides; animal info. (C57B1/6, 14 weeks)

Q2387: C. Ning, *et al.* Excessive Penile Norepinephrine Level Underlies Impaired Erectile Function in Adenosine A1 Receptor Deficient Mice. Journal of Sexual Medicine 2012;9(10):2552-2561
Agents: Not Stated **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;
ALZET Comments: Animal info (Adora1 -/-, wt, 12 wks old); ALZET mouse jugular catheter used, inserted into the right corpus cavernosum

Q2183: S. F. Knight, *et al.* Folate Receptor-Targeted Antioxidant Therapy Ameliorates Renal Ischemia-Reperfusion Injury. Journal of the American Society of Nephrology 2012;23(5):793-800
Agents: Tempol **Vehicle:** Saline; folate; **Route:** IV (jugular); **Species:** Mice; **Pump:** Not Stated; **Duration:** 48 hours;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, C57BL/6, 11 wks old); ischemia (renal); 7-day pump used; post op. care (buprenorphine in saline)

Q1702: N. J. Willett, *et al.* Redox Signaling in an In Vivo Murine Model of Low Magnitude Oscillatory Wall Shear Stress. Antioxidants & Redox Signaling 2011;15(5):1369-1378
Agents: Tempol; ebselen **Vehicle:** DMSO; saline; **Route:** SC; IV (jugular); **Species:** Mice; **Pump:** 2ML1; 1007D; **Duration:** 4 days;
ALZET Comments: Animal info (male, 11-13 wks old, C57BL/6, P47 phox -/-); 50% DMSO used

Q1389: A. N. Wansapura, *et al.* Mice expressing ouabain-sensitive alpha1-Na,K-ATPase have increased susceptibility to pressure overload-induced cardiac hypertrophy. American Journal of Physiology Heart and Circulatory Physiology 2011;300(1):H347-H355
Agents: Digibind **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;
ALZET Comments: Animal info (alpha1s/s alpha2s/s, alpha1r/r alpha2r/r)

Q1234: L. Mirandola, *et al.* Galectin-3C Inhibits Tumor Growth and Increases the Anticancer Activity of Bortezomib in a Murine Model of Human Multiple Myeloma. PLoS One 2011;6(7):U173-U186
Agents: Galectin-3C **Vehicle:** PBS; **Route:** IP; IV; **Species:** Mice (NOD/SCID); **Pump:** 2002; **Duration:** 16 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (female, 6 wks old, NOD/SCID); cancer (multiple myeloma); half-life, 3 hours (p. e21811); "Our data suggest that sustained delivery may be preferable (over injections intramuscularly twice daily) for maximal response to treatment" pg e21811; galectin-3C is an N-terminally truncated form of galectin-3

Q1457: J. Y. Li, *et al.* Therapeutic Angiogenesis of Human Early Endothelial Progenitor Cells Is Enhanced by Thrombomodulin. Arteriosclerosis, Thrombosis, and Vascular Biology 2011;31(11):2518-U403
Agents: TMD23 **Vehicle:** Not Stated; **Route:** IV; **Species:** Mice (nude); **Pump:** 2ML4; **Duration:** Not Stated;
ALZET Comments: Controls received mp w/ PBS; animal info (BALB/c, female, athymic, nude, 18-22 g, 8 wks old); incorrectly listed Model 2ML4 for use in mice; TMD23 also known as thrombomodulin domains 2 and 3

Q0728: T. Ebrahimian, *et al.* Mitogen-Activated Protein Kinase-Activated Protein Kinase 2 in Angiotensin II-Induced Inflammation and Hypertension Regulation of Oxidative Stress. Hypertension 2011;57(2):245-U220
Agents: Angiotensin II **Vehicle:** Not Stated; **Route:** IV; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days;
ALZET Comments: Animal info (14-17 wks old, male, Mk2 KO); peptides; blood pressure measured via radiotelemetry (PAC-10, DSI)

Q1037: J. M. do Carmo, *et al.* Control of Blood Pressure, Appetite, and Glucose by Leptin in Mice Lacking Leptin Receptors in Proopiomelanocortin Neurons. Hypertension 2011;57(5):918-U125
Agents: Leptin **Vehicle:** Saline; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (LepRflox/flox/POMC-Cre, LepRflox/flox, POMC-Cre, wt); "At the end of the leptin infusion period, the catheter connecting the minipump to the jugular vein was severed and sealed, and the mice were followed for an additional 5-day posttreatment period." pg 920

Q0100: S. Tateya, *et al.* An Increase in the Circulating Concentration of Monocyte Chemoattractant Protein-1 Elicits Systemic Insulin Resistance Irrespective of Adipose Tissue Inflammation in Mice. Endocrinology 2010;151(3):971-979
Agents: Monocyte Chemoattractant Protein-1, recomb. mouse **Vehicle:** PBS; BSA; **Route:** SC; IV (jugular); **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;
ALZET Comments: Controls received mp w/ saline; Peptides; Animal info (C57BL/6, 11 wks old)

Q0925: V. Rudolph, *et al.* Myeloperoxidase acts as a profibrotic mediator of atrial fibrillation. Nature Medicine 2010;16(4):470-474
Agents: Angiotensin II; myeloperoxidase **Vehicle:** Saline; **Route:** SC; IV (jugular); **Species:** Mice; **Duration:** 7, 14 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, C57BL/6J, Mpo -/-, 12-15 wks old); peptides

Q1608: V. S. Nikam, *et al.* Treprostinil inhibits the recruitment of bone marrow-derived circulating fibrocytes in chronic hypoxic pulmonary hypertension. European Respiratory Journal 2010;36(6):1302-1314
Agents: Treprostinil **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice (transgenic); **Pump:** 2004; **Duration:** 4 weeks;
ALZET Comments: Controls received mp w/ sterile saline; animal info (C57BL/6TgN Tg, hypoxic); post op. care (buprenorphine)

Q0770: M. C. Meuwese, *et al.* Endothelial Surface Layer Degradation by Chronic Hyaluronidase Infusion Induces Proteinuria in Apolipoprotein E-Deficient Mice. PLoS One 2010;5(11):U104-U110
Agents: Hyaluronidase, testicular **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice; **Duration:** 4 weeks;
ALZET Comments: Controls received mp w/ heat-inactivated hyaluronidase; animal info (14 wks old, ApoE-/-,); ALZET mouse jugular catheter used; pump infused at 0.25 ul/hr; "it cannot be excluded that hyaluronidase remains stable in the subcutaneous Alzet minipump, which may have resulted in an underestimation of the effect of hyaluronidase during the 4 week course of the experiment. " pg e14262

Q0402: S. V. Kozin, *et al.* Recruitment of Myeloid but not Endothelial Precursor Cells Facilitates Tumor Regrowth after Local Irradiation. Cancer Research 2010;70(14):5679-5685
Agents: AMD 3100 **Vehicle:** Not Stated; **Route:** IV; **Species:** Mice (nude); **Pump:** Not Stated; **Duration:** 2 weeks;
ALZET Comments: Animal info (mice athymic NCr/Sed nude (nu/nu) mice, female syngeneic FVB)

Q0589: T. Iwasa, *et al.* Marked anti-tumour activity of the combination of YM155, a novel survivin suppressant, and platinum-based drugs. British Journal of Cancer 2010;103(1):36-42
Agents: YM-155; cisplatin; carboplatin **Vehicle:** DMSO; **Route:** IV; **Species:** Mice (nude); **Pump:** 1007D; **Duration:** 7 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, nude, BALB/cAnNCrj-nu/nu, 5 weeks old); 0.1% DMSO used; cancer

Q0123: J. Hunt, *et al.* Cyclosporin A Has Direct Effects on Adult Neural Precursor Cells. Journal of Neuroscience 2010;30(8):2888-2896
Agents: Cyclosporin A **Vehicle:** Not Stated; **Route:** IV; SC; **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;
ALZET Comments: Controls received mp w/ saline; animal info (male, CD1, 6-8 weeks old, 25-30 g)

Q1020: C. D. Cox, *et al.* Discovery of Allosteric Inhibitors of Kinesin Spindle Protein (KSP) for the Treatment of Taxane-Refractory Cancer: MK-0731 and Analogs. Anti-Cancer Drugs 2010;10(9):697-712
Agents: MK-0731 **Vehicle:** Not Stated; **Route:** IV; **Species:** Mice (nude); **Pump:** Not Stated; **Duration:** 24 hours;
ALZET Comments: Animal info (naive); dose-response, Fig 12 ; half-life 4-10 hours (p. 710); MK-0731 is a KSP inhibitor (kinesin spindle protein); maximum tolerated dose (MTD) is 12 mg/kg

P9964: M. H. Bi, *et al.* INDUCTION OF LYMPHOCYTE APOPTOSIS IN A MURINE MODEL OF ACUTE LUNG INJURY-MODULATION BY LIPID EMULSIONS. SHOCK 2010;33(2):179-188
Agents: Soybean oil emulsion; olive oil emulsion **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;
ALZET Comments: Controls received mp w/ saline; animal info (male, BALB/c, 10-16 wks old, 22-25 g); external pump application

P9819: R. Savai, *et al.* Evaluation of Angiogenesis Using Micro-Computed Tomography in a Xenograft Mouse Model of Lung Cancer. NEOPLASIA 2009;11(1):48-56
Agents: Bevacizumab **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice (nude); **Pump:** 2002; **Duration:** 14 days;
ALZET Comments: Controls received mp w/ distilled water; animal info (female, C57BL/6, 5-7 wks old, BALB/c, nu/nu, 7-8 wks old); pump implanted IP; bevacizumab is an anti-VEGF antibody; "This delivery (using ALZET pumps) mimics local delivery of antivascular agents and can be used effectively alone or in combination with cytotoxic chemotherapy for site-specific drug delivery for lung cancer treatment. As expected, continuous infusion of bevacizumab decreased lung tumor volume and tumor perfusion, with an added survival advantage compared to the untreated group." pg 55; cancer (lung); antibody

Q0602: P. Beauparlant, *et al.* Preclinical development of the nicotinamide phosphoribosyl transferase inhibitor prodrug GMX1777. Anti-Cancer Drugs 2009;20(5):346-354
Agents: GMX1777 **Vehicle:** NaCl; **Route:** IV (jugular); **Species:** Mice (nude; SCID); **Pump:** 2001D; **Duration:** 24 hours;
ALZET Comments: Controls received mp w/ vehicle; animal info (BalbC nude, CB17, SCID/SCID, female); comparison of 72 h infusion pump vs 24 h mp; cancer (refractory solid tumors and lymphomas); "The 24 h infusion was the most effective administration schedule identified in mouse xenograft models" pg 352-353; cancer; chemotherapeutic

P9202: M. Tejeda, *et al.* Continuous Administration of the Somatostatin Structural Derivative /TT-232/ by Subcutaneously Implanted Osmotic Pump Improves the Efficacy and Potency of Antitumor Therapy in Different Mouse and Human Tumor Models. Anticancer Research 2008;28(5A):2769-2774
Agents: TT-232 **Vehicle:** Water, distilled; acetic acid; sodium acetate; mannitol; **Route:** SC; IV (jugular); **Species:** Mice; **Pump:** 2001; 2002; **Duration:** 7; 14; 28 days;
ALZET Comments: Comparison of IP and SC injections vs. SC and IV mp; pumps replaced after 2 weeks; PE-10 tubing used; "The frequent and long-lasting repetition of TT-232 injection enhanced its therapeutic efficacy; however, serial injection causes significant stress to animals and adequate precautions are required. To this end, an ALZET osmotic minipump inserted s.c. and i.v. was used." pg 2773; "The results obtained from this study suggest that TT-232 is a good candidate for delivery by continuous (infusion) therapy; cancer

P9825: J. A. Rodriguez-Feo, *et al.* Caveolin-1 Influences Vascular Protease Activity and Is a Potential Stabilizing Factor in Human Atherosclerotic Disease. PLoS One 2008;3(7):U567-U579
Agents: Caveolin-1; caveolin-1, scrambled **Vehicle:** DMSO; saline; **Route:** IV (jugular); **Species:** Mice; **Pump:** 2002;
ALZET Comments: Peptides; animal info (BALB/C, Cav-1 null, wt); 30% DMSO used

P8479: E. J. Whalen, *et al.* Regulation of beta-adrenergic receptor signaling by S-nitrosylation of G-protein-coupled receptor kinase 2. Cell 2007;129(3):511-522
Agents: Isoproterenol; GSNO **Vehicle:** PBS; **Route:** IV (jugular); **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;
ALZET Comments: Cardiovascular; agent is also known as nitrosoglutathione

P8224: J. Menon, *et al.* Angiotensin-(1-7) inhibits growth of human lung adenocarcinoma xenografts in nude mice through a reduction in cyclooxygenase-2. Cancer Research 2007;67(6):2809-2815
Agents: Angiotensin (1-7) **Vehicle:** Saline; Heparin; **Route:** IV (jugular); **Species:** Mice (nude); **Pump:** 2004; **Duration:** 28 days;
ALZET Comments: Controls received mp w/ vehicle; no stress (see pg. 2810); cancer (lung); peptides; animal info (male, athymic, 2-4 weeks old, 15-20 grams); "During the infusion period, the animals maintained their body weight as well as food and water consumption and showed no evidence of reduced motor function. Additionally, no gross pathological abnormalities were observed in major organs indicating a lack of toxic side effects." (p. 2810)

P8338: M. B. Schaefer, *et al.* Immunomodulation by n-3- versus n-6-rich lipid emulsions in murine acute lung injury - Role of platelet-activating factor receptor. Critical Care Medicine 2006;35(2):544-554
Agents: Saline, physiological; Lipoven; Omegaven; **Route:** IV (jugular); **Species:** Mice; **Pump:** Not Stated; **Duration:** 10 days;
ALZET Comments: Controls received mp w/ saline, physiological; pumps replaced after 7 days of saline infusion; animal info (BALB/C wt, 8-12 weeks old, 18-21 grams, LPS induced acute lung injury and IP inflammation); external pump application; lipoven 10% (soybean oil); omegaven 10% (fish oil); lipid emulsion

P7871: H. Ohtaki, *et al.* Pituitary adenylate cyclase-activating polypeptide (PACAP) decreases ischemic neuronal cell death in association with IL-6. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 2006;103(19):7488-7493
Agents: Pituitary adenylate cyclase-activating polypeptide, 6-38; pituitary adenylate cyclase-activating polypeptide 38; pituitary adenylate cyclase-activating polypeptide **Vehicle:** Saline; BSA; **Route:** IV (jugular); **Species:** Mice; **Duration:** 4, 8 hours;
ALZET Comments: Controls received mp w/ vehicle; peptides; ischemia (cerebral); animal info (BALB/C, IL-6 -/-, +/-, wt); partial or total middle cerebral artery occlusion

P6894: M. Tejeda, *et al.* Growth Inhibitory Effect of the Somatostatin Structural Derivative (TT-232) on Leukemia Models. Anticancer Research 2005;25(325-330
Agents: TT-232 **Vehicle:** Acetic acid; sodium acetate; water; mannitol; **Route:** IV; SC; **Species:** Mice; **Pump:** 2002; **Duration:** 14, 28 days;
ALZET Comments: Dose-response (p. 328, fig 1); comparison of IP/SC injections vs. SC/IV mp; pumps replaced at day 14 for 28 day group; stability verified, 37 degrees Celsius for over 3 weeks; cancer (leukemia); TT-232 is a novel somatostatin analog; "The IV infusion for 28 days resulted in 82% growth inhibition." (p. 328); "The infusion of TT-232 by ALZET osmotic minipump resulted in 70-80% tumor growth inhibition and 20% tumor free survival." (p. 329); "...serial injections represent significant stress to the animals..." "To reduce and eliminate the above mentioned problem [stress] we used an ALZET osmotic minipump..." "Infusion from inserted ALZET minipumps maintains a constant drug level, resulting in a well-defined, consistent pattern of drug exposure throughout the period of drug administration." "These studies suggest that TT-232 is a potent inhibitor of leukemia tumor in vitro and in vivo and suggest infusion treatment as a beneficial application in clinical practice." (p. 330); oligopeptide; enzyme inhibitor (tyrosine kinase); animal info (CBA/ca, immunosuppressed, female)

P7135: M. Benlloch, *et al.* Acceleration of glutathione efflux and inhibition of gamma-glutamyltranspeptidase sensitize metastatic B16 melanoma cells to endothelium-induced cytotoxicity. Journal of Biological Chemistry 2005;280(8):6950-6959
Agents: Acivicin; Verapamil **Vehicle:** Not Stated; **Route:** IV; **Species:** Mice; **Pump:** 2001D; **Duration:** 7 hours;
ALZET Comments: Controls received mp w/ physiological saline; cancer (melanoma)

P7052: M. C. Alley, *et al.* SJG-136 (NSC 694501), a novel rationally designed DNA minor groove interstrand cross-linking agent with potent and broad spectrum antitumor activity. Part 2: Efficacy evaluations. Cancer Research 2004;64(18):6700-6706
Agents: SJG-136 **Vehicle:** DMSO; PEG; **Route:** IV (jugular); **Species:** Mice (nude); **Pump:** 2001; **Duration:** 5 days;
ALZET Comments: Controls received mp w/ vehicle; comparison of IV injections vs. mp; no stress (see pg. 6706); cancer (melanoma); agent also known as NSC 694501; 50% DMSO; "It is noteworthy that 5-day continuous infusions are highly effective in the LOX IMVI tumor model...continuous infusions were highly active and the lower peak plasma concentrations afforded by them may render infusion a useful mode for SJG-136 delivery in man." (pg. 6704-5)

P6131: M. Tejeda, *et al.* The antitumor effect of the somatostatin analogue TT-232 depends on the e treatment regimen. Cancer Epidemiology 2003;27(2):155-162
Agents: TT-232 **Vehicle:** Acetic acid; sodium acetate; mannitol; **Route:** SC; IV (jugular); **Species:** Mice; **Pump:** 2001; 2002; **Duration:** 1,2,4 weeks;
ALZET Comments: Comparison of SC + IV injections vs. mp; 2002 pumps replaced after 14 days; cancer (sarcoma colon, breast lymphoma); somatostatin analog; PE-10 tubing used for IV group; "The infusion treatment with ALZET Osmotic Pumps proved to be superior to both twice daily injections or intravenous injections." (p. 155)

P5949: B. Szende, *et al.* TT-232: a somatostatin structural derivative as a potent antitumor drug candidate. Anti-Cancer Drugs 2003;14(8):585-588
Agents: TT-232 **Vehicle:** Not Stated; **Route:** SC; IV; **Species:** Mice (SCID); **Pump:** 2002; **Duration:** 14 days;
ALZET Comments: Comparison of SC injections vs. mp; cancer (sarcoma, lymphoid, colon, breast); peptides; TT-232 is a somatostatin analog; "the infusion treatment using implanted ALZET-type osmotic mini-pumps proved to be superior to both S.C. and I.V. infusion applied twice a day for 2 weeks." (p. 586)

P6035: B. T. Ameredes, *et al.* Low-dose carbon monoxide reduces airway hyperresponsiveness in mice. American Journal of Physiology Lung Cellular and Molecular Physiology 2003;285(6):L1270-L1276
Agents: Rp-8-BrcGMP **Vehicle:** Saline; **Route:** IV (jugular); **Species:** Mice; **Pump:** Not Stated; **Duration:** 10 days;
ALZET Comments: Rp-8-BrcGMP is an inhibitor of cGMP production; pump model not listed

P5314: H. X. Sheng, *et al.* Effects of metalloporphyrin catalytic antioxidants in experimental brain ischemia. Free Radical Biology and Medicine 2002;33(7):947-961
Agents: AEOL 10150 **Vehicle:** PBS; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1003D; **Duration:** 3 days;
ALZET Comments: Controls received mp w/ vehicle; plasma levels of AEOL 10150 determined by HPLC; ischemia (cerebral); MCAO

P5554: R. P. Bowler, *et al.* A catalytic antioxidant (AEOL 10150) attenuates expression of inflammatory genes in stroke. Free Radical Biology and Medicine 2002;33(8):1141-1152
Agents: AEOL 10150 **Vehicle:** PBS; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1003D; **Duration:** 6 hours;
ALZET Comments: Controls received mp w/ vehicle; AEOL 10150 is a catalytic antioxidant metalloporphyrin; ischemia (cerebral); MCAO

P6973: W. Arap, *et al.* Targeting the prostate for destruction through a vascular address. PNAS 2002;99(3):1527-1531
Agents: SMSIARL, phage **Vehicle:** Not Stated; **Route:** IV; **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;
ALZET Comments: Comparison of pellets vs. mp; peptides; cancer

P4485: M. Tejeda, *et al.* Influence of various administration routes on the antitumor efficacy of TT-232, a novel somatostatin analog. Anticancer Research 2000;20(1023-1028
Agents: TT-232 **Vehicle:** Acetic acid; Water, distilled; Sodium acetate; Marmite;; **Route:** SC; IV; **Species:** Mice; **Pump:** 2001; 2002; **Duration:** 1, 2 weeks;
ALZET Comments: comparison of IV + SC injections vs. mp infusion; cancer; peptides; "continuous infusion using an implantable minipump proved to be the most effective route of treatment in both SC or IV administration against S-180 sarcoma." (P. 1026)

P5249: E. M. Sharkey, *et al.* Pharmacokinetics and antitumor properties in tumor-bearing mice of an enediol analogue inhibitor of glyoxalase I. Cancer Chemotherapy and Pharmacology 2000;46(2):156-166
Agents: Glutathione, S-(N-p-chlorophenyl-N-hydroxycarbamoyl) **Vehicle:** Cyclodextrin, B-; **Route:** IV (jugular); **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;
ALZET Comments: Comparison of IV injections vs. mp; enzyme inhibitor; 20% hydroxypropyl-beta-cyclodextrin used; CHG (Et)2 is an enediol analog inhibitor of glycoxalase in its ester prodrug form; colon adenocarcinoma and prostate cancer

P8575: P. A. Pavco, *et al.* Antitumor and antimetastatic activity of ribozymes targeting the messenger RNA of vascular endothelial growth factor receptors. Clinical Cancer Research 2000;6(5):2094-2103
Agents: Ribozyme, anti-Flt-1; Ribozyme, anti-KDR; Ribozyme, attenuated **Vehicle:** Saline; **Route:** IV (jugular); SC; **Species:** Mice; Mice (nude); **Pump:** 2002; **Duration:** 14,28 days;
ALZET Comments: Controls received mp w/ vehicle or attenuated control; dose-response (fig. 2); pumps replaced after 18 days; stress/adverse reaction (see pg. 2096); <10% of animals removed from study due to catheter failure or animal not surviving pump implantation; half-life (p. 2100) IV and SC similar; cancer (lung carcinoma, colorectal carcinoma, liver metastasis); animal info (female, C57BL/6, 6-8 weeks old, male, nude, 6-8 weeks old); antiangiogenic, 80% bioavailable after SC administration; targets VEGF receptor mRNA; anti-Flt-1 ribozyme also known as angiozyme; good methods

P5566: R. Dono, *et al.* Impaired cerebral cortex development and blood pressure regulation in FGF-2-deficient mice. EMBO J 1998;17(15):4213-4225
Agents: Angiotensin II **Vehicle:** Not Stated; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1007D; **Duration:** 6 days;
ALZET Comments: Cardiovascular; peptides

P3363: Y. Tu, *et al.* The synergistic effects of cyclosporine, sirolimus, and brequinar on heart allograft survival in mice. Transplantation 1995;59(2):177-183
Agents: Cyclosporin A; Rapamycin **Vehicle:** Cremophor; Dimethylacetamide; Tween 80; PEG 400; **Route:** IV (jugular); **Species:** Mice; **Pump:** 1007D; **Duration:** 7, 14 days;
ALZET Comments: Pumps replaced after 7 days; immunology; CSA and rapamycin given singly and via same pump

P2048: S. M. Stepkowski, *et al.* Blocking of heart allograft rejection by intercellular adhesion molecule-1 antisense oligonucleotides alone or in combination with other immunosuppressive modalities. J. Immunol 1994;153(5336-5346
Agents: Oligodeoxynucleotide, phosphorothioate antisense; Cyclosporin A; Rapamycin; Oligodeoxynucleotide, scrambled **Vehicle:** Cremophor; Tween 80; Dimethylacetamide; PEG 400; **Route:** IV (jugular); **Species:** Mice; **Duration:** 7,14 days;
ALZET Comments: Oligo of interest was IP-3082; controls received no treatment, unrelated oligo IP-1082, or scrambled oligo IP-4189; immunology; "...this study reports the first example of pharmacologic activity of an antisense PS-oligo by i.v. systemic administration in a model of a complex inflammatory process"

P2096: S. M. Redwood, *et al.* Abrogation of the invasion of human bladder tumor cells by using protease inhibitor(s). Cancer 1992;69(5):1212-1219
Agents: E-64 **Vehicle:** PBS; **Route:** IV (jugular); **Species:** Mice (nude); **Pump:** Not Stated; **Duration:** Not Stated;
ALZET Comments: Cancer; immunology; enzyme inhibitor (cysteine protease)

P1464: T. Nesbitt, *et al.* Abnormal adenosine 3'.5'-monophosphate stimulation of renal 1,25-dihydroxyvitamin D production in Hyp mice: evidence that 25-hydroxyvitamin d-1a-hydroxylase dysfunction results from aberrant intracellular function. Endocrinology 1989;124(1184-1189
Agents: Cyclic AMP, N-6-monobutyryl **Vehicle:** Water; **Route:** IV (jugular); **Species:** Mice; **Pump:** 2001; **Duration:** 24 hours;
ALZET Comments: no comment posted

P1160: K. Naito, *et al.* Effect of continuous administration of interleukin 2 on active specific chemoimmunotherapy with extracted tumor-specific transplantation antigen and cyclophosphamide. Cancer Research 1988;48(101-108
Agents: Interleukin-2 **Vehicle:** Not Stated; **Route:** IP; IV; **Species:** Mice; **Pump:** 1702; 2001; 2002; 2ML2; **Duration:** 10 days;
ALZET Comments: mp connected to catheter; half-life; 2 doses infused; IL-2 infused to potentiate effects of TSTA/CY inject.; comparison of bolus inject. vs. inject. vs. mp infusion; tissue perfusion (spleen); cancer/immunology; peptides; human IL-2 used

P0963: K. Ishida, *et al.* Eosinophil responses of permissive and nonpermissive hosts to the young adult worms of Angiostrongylus cantonensis. Z. Parasitenkd 1986;72(661-671
Agents: Worm extract -A.cantonensis; Worm secretions -A.cantonensis **Vehicle:** Not Stated; **Route:** IP; IV (jugular); **Species:** Guinea pig; mice; Rat; **Pump:** 2001; **Duration:** 7 days;
ALZET Comments: mice implanted w/mp ip other animals infused iv; host-parasite response; eosinophilia determination; comparison of iv injections vs. mp infusion