



**Recent References (2011-2019) on the Intravenous Administration of Agents  
Using ALZET® Osmotic Pumps**

**Q6890:** X. Wang, *et al.* Liver-Selective MMP-9 Inhibition in the Rat Eliminates Ischemia-Reperfusion Injury and Accelerates Liver Regeneration. *Hepatology* 2019;69(1):314-328

**ALZET Comments:** 2-[(4-biphenylsulfonyl)amino]-3-phenyl-propionic acid; IV (inferior mesenteric vein); IP; Rat (transgenic); 2ML1; 2001; 7 days; Dose (100 µg/h); animal info (Male Lew-Tg(CAG-EGFP)ys rats); enzyme inhibitor (Matrix metalloproteinases 2/9);

**Q6881:** W. Deng, *et al.* Insulin ameliorates pulmonary edema through the upregulation of epithelial sodium channel via the PI3K/SGK1 pathway in mice with lipopolysaccharide-induced lung injury. *Mol Med Rep* 2019;

**ALZET Comments:** Insulin, human; PBS; IV (jugular); Mice; 24 hours; 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;

**R0377:** X. S. Zeng, *et al.* Neurotoxin-Induced Animal Models of Parkinson Disease: Pathogenic Mechanism and Assessment. *ASN Neuro* 2018;10(1759091418777438)

**ALZET Comments:** Rotenone, MPTP; IV, IP; Rat; 14 days, 33 days; Dose (Rotenone (3 mg/kg/day); MPTP (46 mg/kg/day)); neurodegenerative (Parkinson's);

**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

**ALZET Comments:** Zinc metallochaperone 1; DMSO; IV (jugular); Mice (nude); 2001; 7, 17 days; 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);

**Q5616:** 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

**ALZET Comments:** Zinc metallochaperone 1; IV (jugular); Mice (nude); 2001; 7 days; Dose (1 mg/kg/d); comparison of IV daily bolus injections vs continuous IV with mp; cancer (Pancreatic);

**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

**ALZET Comments:** MKEY; MKEY, scrambled; Formic acid; IV (jugular); Mice; 1007D; 7 days; Dose (1.3 mg/kg/day); animal info (C57BL/6 mice); cardiovascular;

**Q6226:** A. J. Turner, *et al.* Tubuloglomerular feedback responses in offspring of dexamethasone-treated ewes. *Am J Physiol Renal Physiol* 2017;313(4):F864-F873

**ALZET Comments:** Dexamethasone 21-phosphate disodium salt; IV (lateral saphenous vein); Sheep (pregnant); 2ML1; 48 hours; Dose (0.48 mg/h);

**Q5980:** W. Shangguan, *et al.* Angiotensin-(1-7) attenuates atrial tachycardia-induced sympathetic nerve remodeling. *J Renin Angiotensin Aldosterone Syst* 2017;18(3):1470320317729281

**ALZET Comments:** Ang (1-7); IV (jugular); Dog; 14 days; Controls received mp w/ vehicle; animal info (12-14 kg); cardiovascular; Pacemaker also implanted; Therapeutic indication (Atrial tachycardia); Dose (6 µg/kg/h);

**Q6142:** D. Lana, *et al.* The neuron-astrocyte-microglia triad in CA3 after chronic cerebral hypoperfusion in the rat: Protective effect of dipyrindamole. *Exp Gerontol* 2017;96(46-62)

**ALZET Comments:** Dipyrindamole; IV (jugular); Rat; 2001; 7 days; Dose (4 mg/kg/day); animal info (3 month old male Wistar rats); Resultant plasma level (2–2.5 µM over the entire week);

**Q6301:** J. K. Karimy, *et al.* Inflammation-dependent cerebrospinal fluid hypersecretion by the choroid plexus epithelium in posthemorrhagic hydrocephalus. *Nat Med* 2017;23(8):997-1003



**ALZET Comments:** TAK-242; DMSO; saline; cyclodextrin, 2-hydroxypropyl-b-; IV (jugular); Rat; 2ML1; 7 days; Dose (1 mg/kg); 0.5% DMSO, 10% b-cyclodextrin used; TAK-242 aka ethyl (6R)-6-[N-(2-chloro-4-fluorophenyl)sulfamoyl]cyclohex-1-ene-1-carboxylate;

**Q6312:** M. Jelinic, *et al.* Short-term (48 hours) intravenous serelaxin infusion has no effect on myogenic tone or vascular remodeling in rat mesenteric arteries. *Microcirculation* 2017;24(6):

**ALZET Comments:** Serelaxin; Sodium acetate; IV (jugular); Rat; 1003D; 72 hours; Dose (13.33 µg/kg/h); 20 mmol/L sodium acetate used; Controls received mp w/ vehicle; animal info (8-10 week old male Wistar rats weighing 300-400g); post op. care (bupivacaine); cardiovascular;

**Q6259:** J. Gatfield, *et al.* Selexipag Active Metabolite ACT-333679 Displays Strong Anticontractile and Antiremodeling Effects but Low beta-Arrestin Recruitment and Desensitization Potential. *J Pharmacol Exp Ther* 2017;362(1):186-199

**ALZET Comments:** Selexipag; Treprostinil; IV (jugular); Rat; 2ML1; 2ML2; 48 hours; Controls received mp w/ vehicle; animal info (Male Wistar and spontaneously hypertensive rats); cardiovascular;

**Q6271:** Chaoyun Wang, *et al.* Safflor yellow B reduces hypoxia-mediated vasoconstriction by regulating endothelial micro ribonucleic acid/nitric oxide

synthase signaling. *ONCOTARGET* 2017;8(55):93551–93566

**ALZET Comments:** Safflor yellow B; Saline; IV; Rat; 2ML4; 4 weeks; Controls received mp w/ vehicle; animal info (Male Sprague-Dawley rats); Safflor yellow B is a natural plant compound;

**Q5690:** B. Carusillo Theriault, *et al.* Cerebral microbleeds in a neonatal rat model. *PLoS One* 2017;12(2):e0171163

**ALZET Comments:** Endotoxin, LPS; IV (jugular); Rat (pregnant); 2001D; 24 hours; animal info (female, Wistar E19); ischemia (intrauterine); no stress (see pg. 4 “No mortality was experienced for dams undergoing the above protocol”); behavioral testing (Righting Reflex, negative geotaxis, open field, elevated plus maze, Morris water maze, balance beam); teratology; Dose (600 ng/hr); Resultant plasma level (4.5 EU/mL after 16 hours of infusion);

**Q5112:** J. Zhao, *et al.* The potential role of atrial natriuretic peptide in the effects of Angiotensin-(1-7) in a chronic atrial tachycardia canine model. *J Renin Angiotensin Aldosterone Syst* 2016;17(1):1470320315627409

**ALZET Comments:** Angiotensin (1-7); A-71915; IV (jugular); Dog; 14 days; animal info (mongrel, 13-17 kg); cardiovascular; peptides; A-71915 is an ANP receptor antagonist; Dose (Ang (1-7) 6 µg/kg/hr; A-71915 0.3 µg/kg/hr); “Ang-(1– 7) dose was selected because 6 µg/kg/h is verified as the highest dose that wouldn’t affect blood pressure in our preliminary study” pg 2;

**Q4901:** M. Zenggen Wang, *et al.* Infusion of esmolol attenuates lipopolysaccharide-induced myocardial dysfunction. *Journal of Surgical Research* 2016;200(283-289)

**ALZET Comments:** Esmolol; Saline; IV (jugular); Mice; 6 hours; Controls received mp w/ vehicle; animal info (male, C57BL6J, 8-12 weeks old); cardiovascular; immunology; Dose (6.7 µg/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

**ALZET Comments:** IV; Mice; Jugular vein catheter; animal info (Adult Sprague-Dawley rats weighing 200-250 g); ALZET jugular catheter used with another product.

**P5241:** T. Nakamachi, *et al.* PACAP suppresses dry eye signs by stimulating tear secretion. *Nat Commun* 2016;7(12034)

**ALZET Comments:** Pituitary adenylate cyclase-activating polypeptide; PACAP38; BSA; saline; IV (jugular); Mice; 1007D; 4 days; 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);

**Q4908:** MingWu, *et al.* Placental growth factor 2 — A potential therapeutic strategy for chronic myocardial ischemia. *International Journal of Cardiology* 2016;203(534-542)



**ALZET Comments:** Placental growth factor-2, recombinant human; PBS; IV; Pig; 2ML2; 14 days; Controls received mp w/ vehicle; animal info (Sus Scrofa, 20-25kg); functionality of mp verified by plasma levels; ischemia (myocardial); cardiovascular; Dose (15 ug/kg/day);.

**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

**ALZET Comments:** HIV Viral Protein R; Water; IV (jugular); Mice; 2001; 1 week; Dose (60 mg/kg/week); Therapeutic indication (HIV);.

**Q5358:** A. Garcia-Alvarez, *et al.* Beta-3 adrenergic agonists reduce pulmonary vascular resistance and improve right ventricular performance in a porcine model of chronic pulmonary hypertension. *Basic Res Cardiol* 2016;111(4):49

**ALZET Comments:** BRL37344; Saline; IV (right jugular vein); pigs; 2ML2; 14 days; Controls received mp w/ vehicle; animal info (pig, 4 months old, 45 kg); functionality of mp verified by plasma levels; cardiovascular; antihypertensive; PE-60 catheter used for IV application; BRL37344 is a B3AR agonist; Dose (10 ug/kg/day BRL37344);.

**Q5760:** V. Caolo, *et al.* CXCL1 microspheres: a novel tool to stimulate arteriogenesis. *Drug Deliv* 2016;23(8):2919-2926

**ALZET Comments:** CXCL1; Saline; IP, Perivascular (femoral artery); Mice; 1004; 28 days; Controls received mp w/ vehicle; comparison of IM injection vs mp; ischemia (induced hind leg ischemia); Therapeutic indication (Drug delivery, arteriogenesis, peripheral artery disease);.

**Q5320:** M. Benlloch, *et al.* Pterostilbene Decreases the Antioxidant Defenses of Aggressive Cancer Cells In Vivo: A Physiological Glucocorticoids- and Nrf2-Dependent Mechanism. *Antioxid Redox Signal* 2016;24(17):974-90

**ALZET Comments:** Pterostilbene, Corticosterone; DMSO, Ethanol; PEG400; IV (jugular); mice; 35 days; 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);.

**Q4954:** T. Wanger, *et al.* Spatial patterns of neuronal activity in rat cerebral cortex during non-rapid eye movement sleep. *Brain Struct Funct* 2015;220(6):3469-84

**ALZET Comments:** IV (jugular); Rat; animal info (male, Wistar, 250-400g); rat jugular catheters only;.

**Q4604:** K. Takemori, *et al.* Prophylactic effects of elastin peptide derived from the bulbus arteriosus of fish on vascular dysfunction in spontaneously hypertensive rats. *LIFE SCIENCES* 2015;120(48-53

**ALZET Comments:** Prolyglycine; IV (femoral); Rat; 2ML4; 4 weeks; Controls received mp w/ saline; animal info (male, SHR/lzm, 15 weeks old); cardiovascular; peptides;.

**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

**ALZET Comments:** Atrial natriuretic peptide; Saline; IV (jugular); Mice (nude); 1002; 2004; 4 days; 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;.

**Q5227:** D. Luo, *et al.* Continuous angiotensin-(1-7) infusion improves myocardial calcium transient and calcium transient alternans in ischemia-induced cardiac dysfunction rats. *Biochem Biophys Res Commun* 2015;467(4):645-50

**ALZET Comments:** Angiotensin (1-7); saline; IV (jugular); Rat; 2ML4; 28 days; Controls received mp w/ vehicle and sham operation; animal info: Sprague Dawley adult male rats, 180-220 g; functionality of mp verified by measurements of hemodynamic parameters, the calcium transient, and the heart rate threshold of calcium transient alternans; ischemia (cardiac); post op. care (IP injection of buprenorphine); cardiovascular; peptides; “evaluate impact of Ang-(1e7) on calcium transient (CaT) in cardiomyocytes during the pathogenesis of heart failure” (pg 645); Dose: 24 mg/kg per hour.



**Q4493:** B. Li, *et al.* Ghrelin Protects Alveolar Macrophages Against Lipopolysaccharide-Induced Apoptosis Through Growth Hormone Secretagogue Receptor 1a-Dependent c-Jun N-Terminal Kinase and Wnt/beta-Catenin Signaling and Suppresses Lung Inflammation. *ENDOCRINOLOGY* 2015;156(182-192

**ALZET Comments:** Ghrelin; Saline; IV (jugular); Rat; 2001D; 24 hours; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 6-7 weeks old, 300 +/- 20g); immunology; pumps primed for 3 hours in 37C saline;.

**Q4447:** M. Hecker, *et al.* Immunomodulation by lipid emulsions in pulmonary inflammation: a randomized controlled trial. *CRITICAL CARE* 2015;19(U1-U13

**ALZET Comments:** Fish oil-based lipid emulsion; Soybean oil-based lipid emulsion; IV (jugular); Mice; 24 hours; Controls received mp w/ saline; animal info (ChemR23 -/- or WT Sv129/S1); 10% emulsion used; immunology;.

**Q5123:** R. F. Barth, *et al.* Evaluation of TK1 targeting carboranyl thymidine analogs as potential delivery agents for neutron capture therapy of brain tumors. *Appl Radiat Isot* 2015;106(251-5

**ALZET Comments:** N5-2OH; DMSO; CSF/CNS (intracerebral); IV; Rat; 2001D; 24 hr; Controls received mp w/ vehicle, untreated controls; 35% of DMSO; cancer (brain tumor; F98 glioma model); tissue perfusion (brain tissue); brain tissue distribution; Animals were irradiated for 5 min at the MITR-II reactor;

"intracerebral. administration of BPA did not increase the tumor boron uptake compared to that obtained following i.v. administration" (pg. 252); Dose: 500 ug.

**Q4227:** J. L. Zhang, *et al.* Endothelin-1 Activation of the Endothelin B Receptor Modulates Pulmonary Endothelial CX3CL1 and Contributes to Pulmonary Angiogenesis in Experimental Hepatopulmonary Syndrome. *American Journal of Pathology* 2014;184(1706-1714

**ALZET Comments:** BQ788; Saline; IV (femoral); Rat; 2002; 2 weeks; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 250-300g); cardiovascular; BQ788 is a selective ETb receptor antagonist; common bile duct ligation;.

**Q3282:** Y. Yang, *et al.* Spinal Changes of a Newly Isolated Neuropeptide Endomorphin-2 Concomitant with Vincristine-Induced Allodynia. *PLoS One* 2014;9(2):U627-U638

**ALZET Comments:** Vincristine; IV (jugular); Rat; 2002; 2 weeks; Control animals received mp w/ saline; animal info (adult, male, Sprague Dawley, 200 g).

**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

**ALZET Comments:** Visfatin; IV (jugular); Mice; 2002; 14 days; Controls received mp w/ vehicle; animal info (male, C57BL6J or Asc -/-, 8 weeks old); cardiovascular; immunology; visfatin is an adipokine;.

**Q3720:** J. Wedel, *et al.* Simultaneous subcutaneous implantation of two osmotic minipumps connected to a jugular vein catheter in the rat. *Laboratory Animals* 2014;48(338-341

**ALZET Comments:** Dopamine, N-octanoyl; Tween 80; saline; IV (jugular); Rat; 2ML4; 14 days; animal info (male, Brown Norway, 230-270 g, female, Wistar, 280-310 g); good methods; "Our data show that double pump implantation is a feasible alternative to changing pumps or the use of extracorporeal pump systems connected via a long wire to partly restrained animals." pg 338; N-octanoyl-dopamine also known as NOD; multiple pumps (2) used; two pumps connected to Y connector, in-house made Y-tube; "we showed that the simultaneous implantation of two slow-flow rate osmotic pumps connected to a jugular vein catheter is feasible and is not linked to additional signs of discomfort compared with single pump-implanted rats." pg 341.

**Q5460:** S. Watada, *et al.* Evaluation of intragastric vs intraperitoneal glucose tolerance tests in the evaluation of insulin resistance in a rodent model of burn injury and glucagon-like polypeptide-1 treatment. *J Burn Care Res* 2014;35(1):e66-72

**ALZET Comments:** Glucagon-like peptide-1 peptide; saline; IA (carotid); iv (jugular); Rat; 2001; 7 days; Controls received mp w/ vehicle; animal info (male CD rats, ~400 g); Braintree Polyethylene Catheters used; Dose (40 ng/kg/min);.

**Q3753:** X. W. Wang, *et al.* Angiotensin-(1-7) Prevent Atrial Tachycardia Induced Sodium Channel Remodeling. *PACE-PACING AND CLINICAL ELECTROPHYSIOLOGY* 2014;37(1349-1356



**ALZET Comments:** Angiotensin (1-7); IV (jugular); Dog (mongrel); Animal info (male, female, 11-15 kg); peptides.

**Q3759:** J. C. Q. Velez, *et al.* Lack of Renoprotective Effect of Chronic Intravenous Angiotensin-(1-7) or Angiotensin-(2-10) in a Rat Model of Focal Segmental Glomerulosclerosis. *PLoS One* 2014;9(U305-U318)

**ALZET Comments:** Angiotensin II; angiotensin (2-10); angiotensin (1-7); Saline, isotonic; IV (jugular); Rat; 2004; 2006; 8 weeks; Control animals received mp w/ vehicle; animal info (male, FHH, 95-205 g); peptides; blood pressure measured via tail cuff.

**Q3319:** T. F. Rau, *et al.* Administration of low dose methamphetamine 12 h after a severe traumatic brain injury prevents neurological dysfunction and cognitive impairment in rats. *Experimental Neurology* 2014;253(:):31-40

**ALZET Comments:** Methamphetamine; IV (femoral); Rat; 2001D; 24 hours; Controls received mp w/ vehicle; animal info (male, Wistar, 350-500g); functionality of mp verified by plasma serum levels; dose-response (pg.33); behavioral testing (foot fault assessment, morris water maze); pumps implanted in inguinal crease; catheter preloaded with 50% dextrose/50% heparin; pumps removed after 61-65hours;.

**Q3586:** M. P. Ocaranza, *et al.* Angiotensin-(1-9) reverses experimental hypertension and cardiovascular damage by inhibition of the angiotensin converting enzyme/Ang II axis. *Journal of Hypertension* 2014;32(4):771-783

**ALZET Comments:** Angiotensin II; angiotensin (1-9); PD123319; A779; IV (jugular); Rat; 2002; 28 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley); functionality of mp verified by plasma levels; pumps replaced every 14 days; cardiovascular; antihypertensive; peptides; bp measured using CODA 2;.

**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)

**ALZET Comments:** IV (jugular); Mice; 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)

**ALZET Comments:** PACAP38; Saline; BSA; IV (femoral); Mice; 24 hours; 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;.

**Q3553:** P. Lyden, *et al.* Direct Thrombin Inhibitor Argatroban Reduces Stroke Damage in 2 Different Models. *Stroke* 2014;45(3):896-899

**ALZET Comments:** Argatroban; Saline; IV; Rat; 2001D; 1 day; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 290-310g); ischemia (cerebral); behavioral testing (morris water maze, barnes maze task, spatial probe task);.

**Q3551:** K. P. Loh, *et al.* TRPM4 inhibition promotes angiogenesis after ischemic stroke. *PFLUGERS ARCHIV-EUROPEAN JOURNAL OF PHYSIOLOGY* 2014;466(3):563-576

**ALZET Comments:** RNA, small interfering TRPM inhibiting; IV (jugular); Rat; 24 hours; Controls received mp w/ vehicle; animal info (male, Wistar, 300g); ischemia (cerebral); behavioral testing (rotarod apparatus); gene therapy; cardiovascular; TRPM4 aka transient receptor potential melastatin 4;.

**Q3952:** D. Lana, *et al.* The neuron-astrocyte-microglia triad in a rat model of chronic cerebral hypoperfusion: protective effect of dipyridamole. *FRONTIERS IN AGING NEUROSCIENCE* 2014;6(U7-U23)

**ALZET Comments:** Dipyridamole; IV (jugular); Rat; 2001; 7 days; Controls received mp w/ vehicle; animal info (male, Wistar, 3 months old, 300g); pumps removed after 7 days; used ALZET jugular catheter; pumps incubated in 37C for 12 hours;.

**Q3517:** M. F. Jarvis, *et al.* A peripherally acting, selective T-type calcium channel blocker, ABT-639, effectively reduces nociceptive and neuropathic pain in rats. *Biochemical Pharmacology* 2014;89(536-544)

**ALZET Comments:** Vincristine sulfate; IV (jugular); Rat; 2002; 14 days; Animal info (male, Sprague Dawley, 200-420g); behavioral testing (paw withdrawal); pumps primes overnight; used PE-60 catheter tubing; chemotherapy-induced neuropathic pain model;.



**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

**ALZET Comments:** Esmolol; saline; IV (jugular); mice; 1 week; 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 transthoracic 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-U658)Triglycerides, long-chain; triglycerides, medium chain; fish oil

**ALZET Comments:** Triglycerides, long-chain; triglycerides, medium chain; fish oil; IV (jugular); Mice; 3 days; 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.

**Q2522:** K. Yo, *et al.* Brown adipose tissue and its modulation by a mitochondria-targeted peptide in rat burn injury-induced hypermetabolism. *AMERICAN JOURNAL OF PHYSIOLOGY-ENDOCRINOLOGY AND METABOLISM* 2013;304(4):E331-E341

**ALZET Comments:** SS31; Saline; IV (jugular); Rat; 7 days; Control animals received mp w/ vehicle; animal info (Sprague Dawley, male, 16-19 wks old, 400-500 g); peptides; stability verified via stable isotope dilution method ("more than 7 days").

**Q2546:** J. Uden, *et al.* Post-ischemic continuous infusion of erythropoietin enhances recovery of lost memory function after global cerebral ischemia in the rat. *BMC NEUROSCIENCE* 2013;14(1):U1-U8

**ALZET Comments:** Erythropoietin; Saline; IV (jugular); Rat; 2001D; 1003D; 72 hours; Control animals received mp w/ vehicle; animal info (Wistar, male, 300-350 g); silastic tubing used.

**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.

**Q2928:** Y. F. Tian, *et al.* Lipoic acid suppresses portal endotoxemia-induced steatohepatitis and pancreatic inflammation in rats. *WORLD JOURNAL OF GASTROENTEROLOGY* 2013;19(18):2761-2771

**ALZET Comments:** LPS; Saline; IV; Rat; 2004; Controls received mp w/ saline; toxicology; immunology; animal info (male, sprague-dawley, 5-6 weeks old); portal vein; mp were used to infuse LPS to study the effect of lipoic acid on suppressing steatohepatitis in portal endotoxemia.

**Q3140:** K. Takemori, *et al.* Effects of Oxidative Stress on Vascular Reactivity in the Offspring of Protein-Restricted Stroke-Prone Spontaneously Hypertensive Rats. *BIOSCIENCE BIOTECHNOLOGY AND BIOCHEMISTRY* 2013;77(8):1689-1693 Phorbol 12-myristate 13-acetate

**ALZET Comments:** Phorbol 12-myristate 13-acetate; IV (femoral); Rat; 2ML4; 4 weeks; Animal info (SHRSP(spontaneously hypertensive)/Kpo, 12 weeks old); no stress "There were no significant differences in either the body weight or blood pressure after starting PMA infusion" (see pg. 1691); phorbol 12-myristate 13-acetate aka PMA; PMA is an activator of NADPH oxidase; induces superoxide anion production.

**Q3007:** T. D. Nguyen, *et al.* Glucagon-like peptide-1 reduces contractile function and fails to boost glucose utilization in normal hearts in the presence of fatty acids. *International Journal of Cardiology* 2013;168(4):4085-4092

**ALZET Comments:** Glucagon-like peptide-1; Saline; IV (jugular vein); Rat; 2ML4; 28 Days; Cardiovascular; peptides; animal info (male, Sprague Dawley rats, 250-350g, 110-130g); functionality verified by residual volume; diabetes.

**Q3251:** J. M. Muradov, *et al.* Intravenous Infusion of Magnesium Chloride Improves Epicenter Blood Flow during the Acute Stage of Contusive Spinal Cord Injury in Rats. *Journal of Neurotrauma* 2013;30(10):840-852



**ALZET Comments:** Magnesium chloride; PEG; IV (jugular); Rat; 2001D; 1003D; 2001; 24 hours; 48 hours; 7 days; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, young adult, 180-220g); functionality of mp verified by residual volume; spinal cord injury; post op. care (Bacitracin ointment, saline injection SC, heating pad, twice daily bladder expression); behavioral testing (open field test, grid walk); Primed overnight in saline 37C.

**Q3530:** D. Kim, *et al.* Inosine Enhances Axon Sprouting and Motor Recovery after Spinal Cord Injury. PLoS One 2013;8(12):U1143-U1156

**ALZET Comments:** Inosine; Saline; CSF/CNS; IV; Rat; 2002; 2ML1; 4 weeks; Animal info (male, Sprague Dawley, adult, 250-300g); pumps replaced biweekly or weekly; ALZET brain infusion kit 2 used; dose-response (pg.8); spinal cord injury; post op. care (buprenex 0.05 mg/kg; enrofloxacin 2.5 mg/kg, bladders expressed manually BID, SC bolus of lactated Ringer's solution BID); behavioral testing (ladder rung waking; hindlimb function; open field behavior); pumps primed; IV catheters flushed weekly during pump change;

**Q2494:** M. S. Katz, *et al.* Gene alterations and intestinal mucosal changes following growth factor and omega-3 exposure in a rat model of inflammatory bowel disease. Journal of Pediatric Surgery 2013;48(2):345-352

**ALZET Comments:** Hepatocyte growth factor; HCl, Tris-; PBS; IV (jugular); Rat; 14 days; Control animals received mp w/ saline; animal info (adult, female, HLA-B27).

**Q3089:** X. T. Ji, *et al.* Spinal Astrocytic Activation Contributes to Mechanical Allodynia in a Rat Chemotherapy-Induced Neuropathic Pain Model. PLoS One 2013;8(4):U440-U451

**ALZET Comments:** Vincristine; Saline; IV (jugular); Rat; 2002; 14 days; Controls received mp w/ vehicle; animal info (male, adult, sprague dawley, 200g); behavioral testing (Rotarod test, Von Frey monofilaments, Hargreaves' method); "Implantation of the mini-osmotic pump is a simple procedure with the advantages of performing only once, providing reliable intravenous drug delivery, taking little time to perform, and good tolerance" pg 9; Used to induce chemotherapy-induced neuropathic pain in rat model.

**Q3039:** N. Farhat, *et al.* Angiopoietin-Like 2 Promotes Atherogenesis in Mice. JOURNAL OF THE AMERICAN HEART ASSOCIATION 2013;2(3):U137-U149

**ALZET Comments:** Angiopoietin like -2; TBSE; IV; Mice (transgenic); 1004; 1 month; Control animals received mp w/ vehicle; animal info (3 mo old, ATX).

**Q2909:** G. L. Ding, *et al.* MRI of Neuronal Recovery after Low-Dose Methamphetamine Treatment of Traumatic Brain Injury in Rats. PLoS One 2013;8(4):U175-U183

**ALZET Comments:** Methamphetamine; IV; Rat; 24 hours; Controls received mp w/ saline; animal info. (male, wistar rats, 200-300 g); functionality of mp verified by MRI measurement of fractional anisotropy.

**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

**ALZET Comments:** Bovine testicular Hyaluronidase; Saline; IV; Mice; 4 Days; Controls received mp w/ heat inactivated hyaluronidase; peptides; animal info. (C57B1/6, 14 weeks).

**Q2871:** E. Baquedano, *et al.* Differential effects of GH and GH-releasing peptide-6 on astrocytes. Journal of Endocrinology 2013;218(3):263-274

**ALZET Comments:** Growth hormone; Saline; IV (jugular); Rat; 2001; 7 days; Control animals received mp w/ vehicle; animal info (Wistar, male, 200-250 g).

**Q4759:** A. Q. Antoniazzi. Endocrine Delivery of Interferon Tau Protects the Corpus Luteum from Prostaglandin F2 Alpha-Induced Luteolysis in Ewes. Biology of Reproduction 2013;88(6):1-12

**ALZET Comments:** interferon-tau, recombinant ovine; BSA; IV (jugular, intrauterine); ewe; 2001D, 1003D; 1 day, 3 day; controls received mp w/ vehicle; functionality of mp verified by serum antiviral activity; pumps were anchored in the s.c. space with cyanoacrylate glue; 200 ug/day (uterine vein); 200 ug/day (jugular vein).



**Q2067:** W. T. Zeng, *et al.* Impairment of Cardiac Function and Remodeling Induced by Myocardial Infarction in Rats are Attenuated by the Nonpeptide Angiotensin-(1-7) Analog AVE 0991. *Cardiovascular Therapeutics* 2012;30(3):152-161

**ALZET Comments:** A-779; IV (jugular); Rat; 2004; Animal info (Sprague Dawley, male, 8 wks old, 220-260 g).

**R0315:** N. Xiong, *et al.* Mitochondrial complex I inhibitor rotenone-induced toxicity and its potential mechanisms in Parkinson's disease models. *Critical Reviews In Toxicology* 2012;42(7):613-632

**ALZET Comments:** Rotenone; DMSO; polyethylenimine; PEG; IV (jugular); SC; Rat; Animal info (Sprague Dawley, Lewis); 50% DMSO used; summarized results from various studies that used ALZET pumps for rotenone infusion.

**Q2390:** R. Q. Wu, *et al.* Ghrelin maintains the cardiovascular stability in severe sepsis. *Journal of Surgical Research* 2012;178(1):370-377

**ALZET Comments:** Ghrelin, rat; Saline, normal; IV (jugular); Rat; 2001D; 15 hours; Control animals received mp w/ vehicle; animal info (adult, male).

**Q1911:** W. Tao, *et al.* Attenuation of Hyperoxia-induced Lung Injury in Rats by Adrenomedullin. *Inflammation* 2012;35(1):150-157

**ALZET Comments:** Adrenomedullin; Saline; IV (jugular); Rat; Controls received mp w/ vehicle; animal info (Sprague Dawley, male, 170-200 g); hyperoxia chamber.

**Q2175:** J. M. Simard, *et al.* Heparin Reduces Neuroinflammation and Transsynaptic Neuronal Apoptosis in a Model of Subarachnoid Hemorrhage. *TRANSLATIONAL STROKE RESEARCH* 2012;3(;):S155-S165

**ALZET Comments:** Heparin sodium, unfractionated; IV (jugular); Rat; 2001; Controls received mp w/ vehicle; animal info (Wistar, male, 300-350 g, adult); "The catheter was filled sequentially with 11 µL of NS, 1 µL of air, and the remainder with the solution to be administered; the first 12 µL in the catheter provided a 12-h delay in the start of drug administration" pg S157.

**Q2683:** T. F. Rau, *et al.* Treatment with low-dose methamphetamine improves behavioral and cognitive function after severe traumatic brain injury. *JOURNAL OF TRAUMA AND ACUTE CARE SURGERY* 2012;73(;):S165-S172

**ALZET Comments:** Methamphetamine; IV (femoral); Rat; 2001D; 24 hours; Control animals received mp w/ saline; animal info (Wistar, male, adult, 400 g); PE50 tubing used.

**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

**ALZET Comments:** IV (jugular); Mice; Animal info (Adora1 -/-, wt, 12 wks old); ALZET mouse jugular catheter used, inserted into the right corpus cavernosum.

**Q2716:** M. G. Neerhof, *et al.* The Significance of Endothelin in Platelet-Activating Factor-Induced Fetal Growth Restriction. *REPRODUCTIVE SCIENCES* 2012;19(11):1175-1180

**ALZET Comments:** Platelet-activating factor, carbamyl; ABT-546; Ethyl alcohol; propylene glycol; sodium hydroxide; IV (jugular); SC; Rat (pregnant); 2ML1; Control animals received mp w/ vehicle; animal info (Sprague Dawley, female); multiple pumps used (2).

**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

**ALZET Comments:** Tempol; Saline; folate; IV (jugular); Mice; 48 hours; 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).

**Q1885:** M. S. Katz, *et al.* Hepatocyte growth factor and omega-3-enriched feeds have a synergistic effect on mucosal mass in an animal model of inflammatory bowel disease. *Journal of Pediatric Surgery* 2012;47(1):194-198

**ALZET Comments:** Hepatocyte growth factor, human recomb.; PBS; HCL, tris; IV (jugular); Rat; 2002; 14 days; Controls received mp w/ saline; animal info (female, adult, HLA-B27, 200-250 g).





**Q2331:** M. Harada, *et al.* Transient Receptor Potential Canonical-3 Channel-Dependent Fibroblast Regulation in Atrial Fibrillation. *Circulation* 2012;126(17):2051-U112

**ALZET Comments:** Pyrazole-3; DMSO; polyethylene glycol; IV; Dog; 2ML1; 7 days; Control animals received mp w/ vehicle; animal info (mongrel, 20-36 kg, atrial fibrillation).

**Q1906:** S. J. Guild, *et al.* High Dietary Salt and Angiotensin II Chronically Increase Renal Sympathetic Nerve Activity A Direct Telemetric Study. *Hypertension* 2012;59(3):614-U217

**ALZET Comments:** Angiotensin II; IV (jugular); Rabbit; 2ML4; 21 days; Controls received sham operation; animal info (New Zealand, male, female); peptides.

**Q1652:** J. G. Wu, *et al.* Angiotensin-(1-7) Inhibits Vascular Remodelling in Rat jugular Vein Grafts via Reduced ERK1/2 and p38 MAPK Activity. *Journal of International Medical Research* 2011;39(6):2158-2168

**ALZET Comments:** Angiotensin (1-7); IV (carotid); Rat; 2ML4; 4 weeks; Controls received mp w/ normal saline; animal info (Sprague Dawley, male, 11-12 mo old, 250-260 g); blood pressure measured via pressure transducer.

**Q1487:** C. E. Wood. Fetal Hypothalamus-Pituitary-Adrenal Responses to Estradiol Sulfate. *Endocrinology* 2011;152(12):4966-4973

**ALZET Comments:** Estradiol-3-sulfate; CSF/CNS; IV (femoral, saphenous); Sheep (ewe); 2ML4; Animal info (120-125 d gestation); post op. care (ampicillin); "metabolic clearance rates (MCR) were calculated for each hormone using infusion rates and changes in plasma concentration from this (for E2SO4) and one previous (for E2) study from this laboratory using the following formula:  $MCR = \frac{\text{infusion rate}}{\text{change in plasma concentration at steady state}}$ ." pg 4968.

**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

**ALZET Comments:** Tempol; ebselen; DMSO; saline; SC; IV (jugular); Mice; 2ML1; 1007D; 4 days; 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

**ALZET Comments:** Digibind; IV (jugular); Mice; 2002; 2 weeks; Animal info (alpha1s/s alpha2s/s, alpha1r/r alpha2r/r).

**Q1969:** G. B. Wang, *et al.* Ghrelin prevents neuronal apoptosis and cognitive impairments in sepsis-associated encephalopathy. *NeuroReport* 2011;22(18):959-964

**ALZET Comments:** Ghrelin; Saline, normal; IV (jugular); Rat; 2001D; 24 hours; Controls received mp w/ vehicle; animal info (Sprague Dawley, male, 250 g); "a continuous infusion of ghrelin is required to maintain an effective in-vivo concentration. Therefore, we used a mini-pump, which was connected to a jugular venous catheter and implanted subcutaneously." pg 961.

**Q1358:** X. Tian, *et al.* Phosphodiesterase 10A Upregulation Contributes to Pulmonary Vascular Remodeling. *PLoS One* 2011;6(4):U32-U43

**ALZET Comments:** Papaverine; IV (jugular); Rat; 2ML2; 14 days; Controls received mp w/ saline; animal info (male, Sprague Dawley, adult, 250-300 g); enzyme inhibitor (Phosphodiesterase 10A); PE50 catheter used; antihypertensive.

**Q0932:** L. G. Thaete, *et al.* ENDOTHELIN AND BLOOD PRESSURE REGULATION IN THE FEMALE RAT: STUDIES IN NORMAL PREGNANCY AND WITH NITRIC OXIDE SYNTHASE INHIBITION-INDUCED HYPERTENSION. *HYPERTENSION IN PREGNANCY* 2011;19(2):233-247

**ALZET Comments:** A-127722; A-182086; A-192621; FR-139317; L-NAME; Ethyl alcohol; propylene glycol; NaOH; water; SC; IV (jugular); Rat (pregnant); Rat; 7 days; Controls received mp w/ vehicle; animal info (female, Sprague-Dawley); multiple pumps per animal (2); wound clips used; 20% ethyl alcohol used; "It is likely that administration with the pumps resulted in more consistent drug levels..." pg 242.



- Q1954:** Z. Tan, *et al.* Regulation of angiotensin-converting enzyme 2 and Mas receptor by Ang-(1-7) in heart and kidney of spontaneously hypertensive rats. *JOURNAL OF THE RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM* 2011;12(4):413-419  
**ALZET Comments:** Angiotensin (1-7); Saline; IV (jugular); Rat; 2ML2; 14 days; Controls received mp w/ vehicle; animal info (SHR, normotensive, Wistar, male, 14 wks old, 276 g, 287 g); peptides; systolic blood pressure measured via tail cuff (NIBP); PE50 tubing used.
- Q1463:** K. Takemori, *et al.* Possible role of nitric oxide generated by leukocytes in the pathogenesis of hypertensive cerebral edema in stroke-prone spontaneously hypertensive rats. *Brain Research* 2011;1417(:):137-145  
**ALZET Comments:** Angiotensin II; IV (femoral); Rat; 2ML2; 1 week; Control animals were normotensive; animal info (male, SHRSP, WKY, 10 wks old); peptides.
- Q1517:** N. S. Sunderland, *et al.* Tumor necrosis factor alpha induces a model of preeclampsia in pregnant baboons (*Papio hamadryas*). *Cytokine* 2011;56(2):192-199  
**ALZET Comments:** Tumor necrosis factor-alpha; PBS; IV (femoral); Monkey (pregnant, baboon); 2ML4; Controls received mp w/ vehicle; animal info (female, baboon, *Papio hamadryas*).
- Q1313:** J. M. Sasser, *et al.* Relaxin Ameliorates Hypertension and Increases Nitric Oxide Metabolite Excretion in Angiotensin II But Not N (omega)-Nitro-L-Arginine Methyl Ester Hypertensive Rats. *Hypertension* 2011;58(2):197-204  
**ALZET Comments:** Angiotensin II; relaxin,; SC; IV; Rat; 2001; 2ML1; 3 weeks; Controls received mp w/ vehicle; animal info (male, Sprague Dawley); pumps replaced after 7 days; blood pressure measured via indwelling arterial catheter.
- 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  
**ALZET Comments:** Galectin-3C; PBS; IP; IV; Mice (NOD/SCID); 2002; 16 days; 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.
- Q1214:** F. Ljuca, *et al.* Contribution of Ras farnesyl transferase, MAP kinase and cytochrome P-450 metabolites to endothelin-1 induced hypertension. *Bosnian Journal of Basic Medical Sciences* 2011;11(2):84-86  
**ALZET Comments:** Endothelin 1; FPT III; PD-98059; baicalein; ODA, 17-; IV (jugular); Rat; 9 days; Controls received no pump; animal info (male, Sprague Dawley); peptides; enzyme inhibitor (Ras farnesyl transferase, MAP kinase, COX); 17-ODA is a CYP450 inhibitor; PE-60 tubing used.
- 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  
**ALZET Comments:** TMD23; IV; Mice (nude); 2ML4; 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  
**ALZET Comments:** Angiotensin II; IV; Mice; 14 days; 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  
**ALZET Comments:** Leptin; Saline; IV (jugular); Mice; 1007D; 7 days; 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.



**Q0997:** G. Chen, *et al.* Different effects of clazosentan on consequences of subarachnoid hemorrhage in rats. *Brain Research* 2011;1392(:):132-139

**ALZET Comments:** Clazosentan; IV (jugular); Rat; 2ML1; 7 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 350-450 g); post op. care (20 ml saline subcutaneously to prevent dehydration).

**Q1717:** G. L. Barrett, *et al.* Leptin-derived peptides that stimulate food intake and increase body weight following peripheral administration. *REGULATORY PEPTIDES* 2011;170(1-3):24-30

**ALZET Comments:** Leptin, 1-33; leptin, 61-90; leptin, 15-32; leptin, 83-108; PBS; IV; Rat; 2004; 4 weeks; Controls received mp w/ vehicle; peptides; animal info (Sprague Dawley, male, female).