



Recent References (2013-2019) on the Administration of Leptin Using ALZET® Osmotic Pumps

Q6983: C. Caballero-Eraso, *et al.* Leptin acts in the carotid bodies to increase minute ventilation during wakefulness and sleep and augment the hypoxic ventilatory response. *J Physiol* 2019;597(1):151-172

ALZET Comments: Leptin; Saline; SC; Mice; 2 days; Dose (120 µg/day); Controls received mp w/ vehicle;.

Q6878: D. M. Arble, *et al.* Vertical sleeve gastrectomy improves ventilatory drive through a leptin-dependent mechanism. *JCI Insight* 2019;4(1):

ALZET Comments: Leptin; Water; SC; Mice; 6 weeks; Dose (10µg/day); Controls received mp w/ vehicle; animal info (C57BL6/J WT and ob/ob male mice, 6-8 weeks of age);.

Q7236: T. Murata, *et al.* Leptin Aggravates Reflux Esophagitis by Increasing Tissue Levels of Macrophage Migration Inhibitory Factor in Rats. *Tohoku J Exp Med* 2018;245(1):45-53

ALZET Comments: Leptin; PBS; SC; Rat; 2001; 1 week; Dose (0.6 mg/Kg-weight); 200 µL of 10 mM used; Controls received mp w/ vehicle; Controls received mp w/ vehicle;.

R0365: L. Maletinska, *et al.* The impact of anorexigenic peptides in experimental models of Alzheimer's disease pathology. *J Endocrinol* 2018;

ALZET Comments: PrRP palmitoylated analogs, Leptin, Amylin, Cyclic AC253, Exendin 4; SC, CSF/CNS (lateral ventricle); Mice; 2 months; 28 days; 5 weeks, 5 months, 16 weeks; Dose: Palm11-PrRP (5 mg/kg/day), Leptin (2.4 nmol/day), Amylin (0.24 mg/kg/day), Exendin-4 (3.5 pmol/kg/min); animal info (7 month old THY-Tau22 mice; 5 month old APP/PS1 mice; 6 month old AMP8 mice); behavioral testing (Y-maze); neurodegenerative (Alzheimer's); This review summarizes current information on the potential neuroprotective properties of food intake-lowering (anorexigenic) peptides that have been tested in experimental models of AD-like pathology.

Q4806: M. Labyb, *et al.* Oxytocin Administration Alleviates Acute but Not Chronic Leptin Resistance of Diet-Induced Obese Mice. *Int J Mol Sci* 2018;20(1):

ALZET Comments: Oxytocin; leptin; Saline; SC; Mice; 2 weeks; Dose (oxytocin (50 µg/day); leptin (20 or 40 µg/day)); Controls received mp w/ vehicle; animal info (Eight-week-old C57BL/6JRj male mice); "Osmotic pump content was verified postmortem in order to ensure complete drug delivery."

Q5956: J. Tam, *et al.* Peripheral cannabinoid-1 receptor blockade restores hypothalamic leptin signaling. *Mol Metab* 2017;6(10):1113-1125

ALZET Comments: Leptin; SHU-9119; PBS; SC; CSF/CNS; Mice; 2004; 12 weeks, 7 days; Controls received mp w/ vehicle; animal info (leptin-deficient ob/ob mice); long-term study; pumps replaced every 28 days; SHU-9119 is a MC4R antagonist; Leptin dissolved in PBS and delivered SC for 12 weeks; SHU-9119 dissolved in saline and delivered ICV for 7 days; Pumps model incorrectly listed as Model 2001D. It should be Model 2004 based on description.

Q6797: Y. Shimizu, *et al.* Role of leptin in conditioned place preference to high-fat diet in leptin-deficient ob/ob mice. *Neurosci Lett* 2017;640(60-63)

ALZET Comments: Leptin, recomb. mouse; Saline; SC; Mice; 1 week; 4 weeks; Dose (4.8 µg/day); Controls received mp w/ vehicle; animal info (AnimalsMale C57BL/6J mice and ob/ob mice (5-week and 8-week old));.

Q5797: M. Sakaguchi, *et al.* Adipocyte Dynamics and Reversible Metabolic Syndrome in Mice with an Inducible Adipocyte-Specific Deletion of the Insulin Receptor. *Cell Metab* 2017;25(2):448-462

ALZET Comments: Leptin; Saline; SC; Mice; 1002; 12 days; Controls received mp w/ vehicle; animal info (8 weeks old); Therapeutic indication (Metabolic syndrome, Syndrome X); Dose (10 ug/day);.



Q6713: K. A. Philbrick, *et al.* Leptin stimulates bone formation in ob/ob mice at doses having minimal impact on energy metabolism. *J Endocrinol* 2017;232(3):461-474

ALZET Comments: Leptin; SC; Mice; 1002; 12 days; Dose (0, 4, 12, 40, 140, or 400 ng/h); dose-response (Fig 2; Page 16); animal info (6-week-old female ob/ob mice); Therapeutic indication (obesity);.

Q5820: R. J. Perry, *et al.* Mechanism for leptin's acute insulin-independent effect to reverse diabetic ketoacidosis. *J Clin Invest* 2017;127(2):657-669

ALZET Comments: Leptin; Saline; SC; Mice; 1004; 2 weeks, 14 days; Controls received mp w/ vehicle; animal info (8 weeks old); diabetes; Therapeutic indication (diabetic ketoacidosis); Dose (0.624 ug/hr);.

Q6701: P. Mota, *et al.* Mp17-14 Depletion of Peripheral Serotonin Synthesis Induces Benign Prostatic Growth in Mice: More Evidence for the New "Neuroendocrine Theory" in Bph Etiology. *The Journal of Urology* 2017;197(4):e216-e217

ALZET Comments: Leptin; SC; Mice; 24 weeks; Dose (5 mg/day; 10 mg/day); Controls received mp w/ vehicle; animal info (10-week-old male ObOb and strain-matched control mice); pumps replaced every 12 weeks; Multiple pumps per animal (2); long-term study;.

Q5828: K. Matoba, *et al.* Leptin sustains spontaneous remyelination in the adult central nervous system. *Sci Rep* 2017;7(40397)

ALZET Comments: Antibody, leptin neutralizing; leptin, recombinant mouse; PBS; CSF/CNS (intrathecal); Mice; 1007D, 1002; Controls received mp w/ vehicle; animal info (7-8 weeks old) ; ALZET brain infusion kit used; neurodegenerative (Demyelination); Therapeutic indication (Demyelination); Dose ((12 μ g/kg body weight per day, 10 ug/kg of body weight per day);.

Q6248: R. B. S. Harris. Low-dose leptin infusion in the fourth ventricle of rats enhances the response to third-ventricle leptin injection. *Am J Physiol Endocrinol Metab* 2017;313(2):E134-E147

ALZET Comments: Leptin; CSF/CNS (fourth ventricle); Rat; 2004; 11 days; 13 days; Dose (0.01, 0.1, 0.3, or 0.6 ug/24 h); Controls received mp w/ vehicle; animal info (rats weighing ~280 g);.

Q6091: A. Gupta, *et al.* Chronic hyper-leptinemia induces insulin signaling disruption in adipocytes: Implications of NOS2. *Free Radic Biol Med* 2017;112(93-108)

ALZET Comments: Leptin, recomb. murine; HCl; SC; Mice; 2004; 4 weeks; Dose (2.5 mg/ml); animal info (6-8 week old C57BL/6 and NOS2-/- mice);.

Q6257: N. Gomez-Hurtado, *et al.* Beneficial effects of leptin treatment in a setting of cardiac dysfunction induced by transverse aortic constriction in mouse. *J Physiol* 2017;595(13):4227-4243

ALZET Comments: Leptin; Tris; Saline; SC; Mice; 3 weeks; Dose (0.36 mg/kg/day); 20 mmol L-1 Tris, 150 nmol L-1 NaCl used; Controls received mp w/ vehicle; animal info (Ten-week-old C57Bl/6 male mice); cardiovascular;.

Q6157: E. A. Flatow, *et al.* Elucidating the role of leptin in systemic inflammation: a study targeting physiological leptin levels in rats and their macrophages. *Am J Physiol Regul Integr Comp Physiol* 2017;313(5):R572-R582

ALZET Comments: Leptin; Saline; CSF/CNS (lateral ventricle); Rat; 1003D; 3 days; Controls received mp w/ vehicle; animal info (Male Wistar rats weighing 180–250 g); post op. care (5 mg/kg ketoprofen); Brain coordinates (0.5 mm caudal to the bregma and 1.5 mm to the right of the midline);.

Q6386: Dorfman MD, *et al.* Deletion of Protein Kinase C I in POMC Neurons Predisposes to Diet-Induced Obesity. *Diabetes* 2017;66(4):920-934

ALZET Comments: Leptin; PBS; CSF/CNS; Rat; Mice; 14 days; animal info (male Wistar rats; Eight-week-old male and female POMC-IKO and WT mice); Brain coordinates (0.8 mm posterior to bregma; 1.5 mm lateral to the sagittal suture, and 3.6 mm below the skull surface); diabetes;.



Q6387: J. M. do Carmo, *et al.* Changes in ambient temperature elicit divergent control of metabolic and cardiovascular actions by leptin. *FASEB J* 2017;31(6):2418-2428

ALZET Comments: Leptin; Saline; SC; Mice; 1007D; 7 days; Dose (4 mg/kg/min); Controls received mp w/ vehicle; animal info (22 week old Male wild-type (WT) C57BL/6J mice); cardiovascular;

Q6021: A. A. da Silva, *et al.* Role of autonomic nervous system in chronic CNS-mediated antidiabetic action of leptin. *Am J Physiol Endocrinol Metab* 2017;312(5):E420-E428

ALZET Comments: Leptin, Hexamethonium; Saline; CSF/CNS (lateral ventricle); Rat; 2002; 12 days; Controls received mp w/ vehicle; animal info (360-420g); diabetes; Therapeutic indication (Diabetes); Dose (Hexamethonium: 15 mg/kg);

Q6006: K. T. Chang, *et al.* Leptin is essential for microglial activation and neuropathic pain after preganglionic cervical root avulsion. *Life Sci* 2017;187(31-41)

ALZET Comments: Leptin; PBS; CSF/CNS (Cervical); Mice; 2004; 28 days; Controls received mp w/ vehicle; animal info (male and female, C57B/6 J (B6) and Ob); Therapeutic indication (Obesity, Neuropathic pain); Dose (1 ug/day);

Q6115: L. R. Beutler, *et al.* Dynamics of Gut-Brain Communication Underlying Hunger. *Neuron* 2017;96(2):461-475 e5

ALZET Comments: Leptin; SC; Mice; 2002; 10 days; Dose (450 ng/hr); Controls received mp w/ vehicle; animal info (ob/ob mice); Therapeutic indication (Obesity);

Q5101: S. Xu, *et al.* The 14th Ile residue is essential for Leptin function in regulating energy homeostasis in rat. *Sci Rep* 2016;6(28508)

ALZET Comments: Leptin, rat recombinant; Saline, sterile; SC; Rat; 2001; 7 days; Controls received mp w/ vehicle; animal info (female, Lep114/114 or Wt); animal info (female, Lep114/114 or Wt); obesity.

Q5211: O. O. Talton, *et al.* Maternal Hyperleptinemia Improves Offspring Insulin Sensitivity in Mice. *Endocrinology* 2016;157(7):2636-48

ALZET Comments: Leptin; Saline; SC; Mice (pregnant); 2004; Controls received mp w/ vehicle; animal info (female, WT); stress/adverse reaction: (see pg. 2645); teratology; diabetes; Dose (350 ng/h);

Q6596: R. Maurya, *et al.* Differential Role of Leptin as an Immunomodulator in Controlling Visceral Leishmaniasis in Normal and Leptin-Deficient Mice. *Am J Trop Med Hyg* 2016;95(1):109-19

ALZET Comments: Leptin, recomb.; PBS; IP; Mice; 2002; 2 weeks; Dose (10 ug/day); Controls received mp w/ vehicle; animal info (9- to 10-week old female C57Bl/6 wild-type mice and congenic C57Bl/6-Ob/Ob mice);

Q6615: P. Martin-Mateos, *et al.* In-vivo, non-invasive detection of hyperglycemic states in animal models using mm-wave spectroscopy. *Sci Rep* 2016;6(34035)

ALZET Comments: Leptin; SC; Mice; 28 days; Controls received mp w/ vehicle; animal info (C57Bl6/J, albino BalbC and ob/ob mice); diabetes;

Q5392: J. Li, *et al.* Human C-reactive protein impedes entry of leptin into the CNS and attenuates its physiological actions in the CNS. *Biochem J* 2016;473(9):1215-24

ALZET Comments: C-reactive protein, human; Leptin, human; PBS; SC; Mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info (Male C57BL/6J ob/ob mice (8 week olds)); functionality of mp verified by serum and CSF levels; Measurement of leptin content in CSF of mice; Dose (1 mg/kg/day CRP; 0.2 or 0.6 mg/kg/day Leptin);

Q6566: K. J. Kaiyala, *et al.* Physiological role for leptin in the control of thermal conductance. *Mol Metab* 2016;5(10):892-902

ALZET Comments: Leptin; PBS; SC; Mice (knockout); 1007D; Dose (100 ng/h); Controls received mp w/ vehicle; animal info (Adult male leptin-deficient ob/ob mice);



Q4626: Jussara M. do Carmo, *et al.* Regulation of Blood Pressure, Appetite, and Glucose by Leptin After Inactivation of Insulin Receptor Substrate 2 Signaling in the Entire Brain or in Proopiomelanocortin Neurons. *Hypertension* 2016;67):378-386

ALZET Comments: Leptin; Saline; IP; Mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info (RIS2 flox/flox or Nestin-cre, 22 weeks old); functionality of mp verified by leptin plasma levels; behavioral testing (air jet stress test; motor activity); cardiovascular; Dose (4 ug/kg/min);.

Q5316: Jeremie Boucher, *et al.* Differential Roles of Insulin and IGF-1 Receptors in Adipose Tissue Development and Function. *Diabetes* 2016;66(2201-2213

ALZET Comments: Leptin; Saline; SC; Mice; 1002; 14 days; Controls received mp w/ vehicle; animal info (Fat-specific IR, IGF1R, and IR/IGF1R knockout mice; 3 month old); functionality of mp verified by blood glucose levels; dose-response (pg 2204-2206); behavioral testing (cold-resistance testing); replacement therapy (leptin); Lipoatrophic diabetes; Dose (10 ug/mouse/d);.

Q6090: R. B. Harris, *et al.* Fourth-ventricle leptin infusions dose-dependently activate hypothalamic signal transducer and activator of transcription 3. *Am J Physiol Endocrinol Metab* 2016;311(6):E939-E948

ALZET Comments: Leptin, recomb. rat; CSF/CNS (fourth ventricle); Rat; 1002; 7 days; Dose (0, 0.1, 0.3, 0.6, 0.9, 1.2, or 2.0 ug/day); dose-response (Fig. 1 &2); animal info (male Sprague-Dawley rats weighing 330–350 g);.

Q4872: H. Pho, *et al.* The effect of leptin replacement on sleep-disordered breathing in the leptin-deficient ob/ob mouse. *J Appl. Physiol* 2016;120(78-86

ALZET Comments: Leptin, recombinant; Saline; SC; Mice; 1003D; 3 days; Controls received mp w/ vehicle; animal info (male, ob/ob, 23 weeks old); functionality of mp verified by leptin plasma levels; stress/adverse reaction: (see pg. 81); pumps explanted after 3 days; Dose (30 ug/day);.

Q5783: H. C. Denroche, *et al.* The role of autonomic efferents and uncoupling protein 1 in the glucose-lowering effect of leptin therapy. *Mol Metab* 2016;5(8):716-24

ALZET Comments: Leptin, recombinant mouse; PBS; SC; Mice; 9 days; Controls received mp w/ vehicle; animal info (6 weeks old); functionality of mp verified by leptin and glucose levels: (After leptin release from the osmotic pumps had ceased (~9.2 days after pump implantation), hyperglycemia rapidly returned to pre-treatment levels in 6OHDA-leptin and sham-leptin groups, concomitant with the reduction of plasma leptin levels (Figure 3A,C)); diabetes; Temperature transponders (Implantable Programmable Temperature Transponder IPTT-300; Bio Medic Data Systems Inc, Seaford, USA) were implanted interscapularly at the same time as osmotic pumps. After leptin release from the osmotic pumps had ceased (w9.2 days after pump implantation), hyperglycemia rapidly returned to pre-treatment levels in 6OHDA-leptin and sham-leptin groups, concomitant with the reduction of plasma leptin levels (Figure 3A,C) Therapeutic indication (Diabetes Type 1, Brown adipose tissue); Dose (10, 20 ug/day);.

Q5304: H. C. Denroche, *et al.* Disrupted Leptin Signaling in the Lateral Hypothalamus and Ventral Premammillary Nucleus Alters Insulin and Glucagon Secretion and Protects Against Diet-Induced Obesity. *Endocrinology* 2016;157(7):2671-85

ALZET Comments: Leptin, recombinant mouse; SC; mice; 1007D, 1002; 15 days; Controls received mp w/ vehicle; animal info (Male Lep^rflox/flox and Lep^rflox/flox Syn-cre mice, 12-14 wks); functionality of mp verified by plasma levels; pumps replaced after day 10; dose-response (pg. 2679); diabetes; Dose (10 ug/d or 20 ug/d);.

Q5640: J. A. Davidson, *et al.* Glucagon therapeutics: Dawn of a new era for diabetes care. *Diabetes Metab Res Rev* 2016;32(7):660-665

ALZET Comments: Metroleptin; SC; mice; 17 days; diabetes; “While we applaud the efforts of the insulin/glucagon pump infusion studies, the delivery space cannot simulate normal physiology (Figure 1B). p.663 ; Therapeutic indication (Diabetes, Glucagon, Glucagon receptor, insulin); Dose (400 mg/day);.

Q5779: N. M. Dalesio, *et al.* Effects of Obesity and Leptin Deficiency on Morphine Pharmacokinetics in a Mouse Model. *Anesth Analg* 2016;123(6):1611-1617



ALZET Comments: Leptin, recombinant mouse; Mice; 1003D; 3 days; animal info (9 week old ob/ob mice; weight: chart p. 1613) ; post op. care (morphine); Therapeutic indication (Obesity);.

Q5766: K. H. Chhabra, *et al.* Reprogramming the body weight set point by a reciprocal interaction of hypothalamic leptin sensitivity and Pomc gene expression reverts extreme obesity. *Mol Metab* 2016;5(10):869-81

ALZET Comments: Leptin; PBS; CSF/CNS (Left lateral ventricle); Mice; 14 days, 2 weeks; Controls received mp w/ vehicle; Leptin transport across the blood-brain barrier is required for its effects to decrease food intake and body weight [39e41] ; Therapeutic indication (Leptin resistance, obesity); Dose (10 ug/day);.

Q4675: W. W. Zeng, *et al.* Reanalysis of parabiosis of obesity mutants in the age of leptin. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA* 2015;112(E3874-E3882

ALZET Comments: Leptin; acyl-ghrelin; growth hormone; SC; Mice; 5 weeks; Controls received mp w/ saline; animal info (C57BL6J or db or clusterin KO, 6-8 weeks old); functionality of mp verified by leptin plasma levels; obesity;.

Q4654: C. L. Yan, *et al.* Meta-chlorophenylpiperazine enhances leptin sensitivity in diet-induced obese mice. *BRITISH JOURNAL OF PHARMACOLOGY* 2015;172(3510-3521

ALZET Comments: Leptin; meta-chlorophenylpiperazine; Saline; SC; Mice; 2002; 2 weeks; Controls received mp w/ vehicle; animal info (male, C57BL6, 8 weeks old); obesity; meta-chlorophenylpiperazine aka mCPP;.

Q4634: M. Y. Wang, *et al.* Glucagon receptor antibody completely suppresses type 1 diabetes phenotype without insulin by disrupting a novel diabetogenic pathway. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA* 2015;112(2503-2508

ALZET Comments: Leptin, recombinant; pramlintide acetate; liraglutide; exenatide; SC; Mice (NOD); 2001; 12 weeks; Controls received mp w/ PBS; animal info (female, NOD/ShiLtJ, 8 weeks old); pumps replaced every 7 days; long-term study; diabetes;.

Q4612: K. Thieme, *et al.* Renal Hemodynamic and Morphological Changes after 7 and 28 Days of Leptin Treatment: The Participation of Angiotensin II via the AT(1) Receptor. *PLoS One* 2015;10(U2677-U2695

ALZET Comments: Leptin, recombinant rat; SC; Rat; 2ML1; 2ML4; 7 days; 28 days; Controls received mp w/ saline; animal info (male, Wistar, 150-250g); cardiovascular; peptides; bp measured using tail cuff;.

Q4694: A. C. Palei, *et al.* Chronic hyperleptinemia results in the development of hypertension in pregnant rats. *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY* 2015;308(R855-R861

ALZET Comments: Leptin; IP; Rat (pregnant); 2ML1; 5 days; Animal info (female, Sprague Dawley, GD14); cardiovascular; bp measured using indwelling catheter;.

Q4692: N. Ottaway, *et al.* Diet-Induced Obese Mice Retain Endogenous Leptin Action. *Cell Metabolism* 2015;21(877-882

ALZET Comments: Leptin receptor antagonist, non-pegylated; PBS; CSF/CNS; Mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info (C57BL6J, Mc4r -/-, Lep ob/ob); Leptin receptor antagonist, non-pegylated aka LA;.

Q3779: G. T. Dodd, *et al.* Leptin and Insulin Act on POMC Neurons to Promote the Browning of White Fat. *Cell* 2015;160(88-104

ALZET Comments: Leptin; insulin, human; CSF/CNS; CSF/CNS (intra-arcuate nucleus of the hypothalamus); Mice; 1002; 6 days; Control animals received mp w/ vehicle; animal info (8 wks old, C57BL/6); ALZET brain infusion kit (3) used; Plastics One bilateral cannula used with PEG tubing and a Y connector.

Q3853: B. N. Desai, *et al.* Leptin in the hindbrain facilitates phosphorylation of STAT3 in the hypothalamus. *AMERICAN JOURNAL OF PHYSIOLOGY-ENDOCRINOLOGY AND METABOLISM* 2015;308(E351-E361

ALZET Comments: Leptin; CSF/CNS (third ventricle; fourth ventricle); Rat; 2002; 6 days; Controls received mp w/ saline; animal info (male, Sprague Dawley, 275-300g); Multiple pumps per animal (2); tissue perfusion (third ventricle; fourth ventricle); bilateral infusion; one cannula to third ventricle second cannula to fourth ventricle; used plastics one cannula;.



Q4401: H. C. Denroche, *et al.* Leptin induces fasting hypoglycaemia in a mouse model of diabetes through the depletion of glycerol. *DIABETOLOGIA* 2015;58(1100-1108

ALZET Comments: Leptin, recombinant murine; Water; SC; Mice; 14 days; Controls received mp w/ vehicle; animal info (male, C57BL6J, 8-10 weeks old, STZ); functionality of mp verified by plasma levels; diabetes;

Q4391: A. A. da Silva, *et al.* Brain-mediated antidiabetic, anorexic, and cardiovascular actions of leptin require melanocortin-4 receptor signaling. *JOURNAL OF NEUROPHYSIOLOGY* 2015;113(2786-2791

ALZET Comments: Leptin; CSF/CNS; Rat; 2001; 7 days; Animal info (male, Wistar, 14-16 weeks old, STZ); diabetes; after 7 days of infusion, ICV cannula was severed;

R0323: W. R. Crowley, *et al.* Neuroendocrine Regulation of Lactation and Milk Production. *COMPREHENSIVE PHYSIOLOGY* 2015;5(255-291

ALZET Comments: Leptin; insulin; SC; Rat; Animal info (female);

Q4338: E. Burgos-Ramos, *et al.* Chronic central leptin infusion modulates the glycemia response to insulin administration in male rats through regulation of hepatic glucose metabolism. *MOLECULAR AND CELLULAR ENDOCRINOLOGY* 2015;415(157-172

ALZET Comments: Leptin; BSA; CSF/CNS; SC; Rat; 14 days; Controls received mp w/ saline; animal info (male, Wistar, adult, 250 +/-10g); 1% BSA used; diabetes;

Q5128: T. Bruder-Nascimento, *et al.* Deletion of protein tyrosine phosphatase 1b in proopiomelanocortin neurons reduces neurogenic control of blood pressure and protects mice from leptin- and sympatho-mediated hypertension. *Pharmacol Res* 2015;102(235-44

ALZET Comments: Leptin; Phenylephrine; SC; mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info: POMC Ptp1b^{-/-} and Ptp1b^{+/+} mice; functionality of mp verified by blood pressure; cardiovascular; antihypertensive; Dose: leptin (10 µg/d); phenylephrine (7.2 and 20 mg/kg/day).

Q4231: Z. J. Zhao, *et al.* The role of leptin in striped hamsters subjected to food restriction and refeeding. *ZOOLOGICAL RESEARCH* 2014;35(262-271

ALZET Comments: Leptin, recombinant murine; PBS; SC; Hamster; 1007D; 7 days; Controls received mp w/ vehicle; animal info (male, Striped, 4-6 months old); functionality of mp verified by leptin serum levels; obesity;

Q3637: Z. J. Zhao, *et al.* Seasonal Changes of Body Mass and Energy Budget in Striped Hamsters: The Role of Leptin. *PHYSIOLOGICAL AND BIOCHEMICAL ZOOLOGY* 2014;87(245-256

ALZET Comments: Leptin, recombinant murine; PBS; SC; Hamster; 1007D; 7 days; Controls received mp w/ vehicle; animal info (striped hamster); functionality of mp verified by serum leptin levels;

Q4177: J. T. White, *et al.* Insulins, leptin and feeding in a population of *Peromyscus leucopus* (white-footed mouse) with variable fertility. *Hormones and Behavior* 2014;66(169-179

ALZET Comments: Leptin, mouse recombinant; Saline; BSA; SC; Mice; 2004; 28 days; Controls received mp w/ vehicle; animal info (P leucopus); functionality of mp verified by serum levels; diabetes;

Q3689: S. L. Watson, *et al.* ADENOSINE A(1) RECEPTORS IN MOUSE PONTINE RETICULAR FORMATION MODULATE NOCICEPTION ONLY IN THE PRESENCE OF SYSTEMIC LEPTIN. *Neuroscience* 2014;275(531-539

ALZET Comments: Leptin, mouse recombinant; adenosine, N6-p-sulfophenyl; SC; Mice; 1002; 14 days; Controls received mp w/ saline; animal info (male, B6 and B6.Cg-lep ob/J, 8-10 weeks old); functionality of mp verified by plasma levels; N6-p-sulfophenyladenosine aka SPA; SPA is an adenosine A1 receptor agonist;pumps removed after 14 days; obesity;

Q4745: M. I. Vaill, *et al.* Blockade of the cerebral aqueduct in rats provides evidence of antagonistic leptin responses in the forebrain and hindbrain. *AMERICAN JOURNAL OF PHYSIOLOGY-ENDOCRINOLOGY AND METABOLISM* 2014;306(4):E414-E423



ALZET Comments: Leptin, rat recombinant; PBS; CSF/CNS (third ventricle); Rat; 1002; 7 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley); brain coordinates;.

Q5431: E. Tuduri, *et al.* Partial ablation of leptin signaling in mouse pancreatic alpha-cells does not alter either glucose or lipid homeostasis. *Am J Physiol Endocrinol Metab* 2014;306(7):E748-55

ALZET Comments: Leptin, mouse recombinant; Water; SC; Mice; Controls received mp w/ vehicle; animal info (male and female, *Lepr* flox/flox; *Gcg-cre*;mT/mG mice); functionality of mp verified by plasma levels; diabetes; Type 1 diabetes model; Dose (20 ug/day);.

Q3771: T. Sakai, *et al.* Leptin restores the insulinotropic effect of exenatide in a mouse model of type 2 diabetes with increased adiposity induced by streptozotocin and high-fat diet. *AMERICAN JOURNAL OF PHYSIOLOGY-ENDOCRINOLOGY AND METABOLISM* 2014;307(E712-E719

ALZET Comments: Leptin, recomb.; exenatide; SC; Mice; 2002; 14 days; Control animals received mp w/ saline; animal info (STZ induced diabetes, HFD 8 wks old); multiple pumps (2) implanted.

Q3614: H. M. Rodgers, *et al.* Attenuated pain response of obese mice (B6.Cg-*lep*(ob)) is affected by aging and leptin but not sex. *PHYSIOLOGY & BEHAVIOR* 2014;123(;):80-85

ALZET Comments: Leptin; Saline; SC; Mice; 1002; 14 days; Controls received mp w/ vehicle; animal info (ob/ob, B6.Cg-*lep*ob, 41-42 weeks old); behavioral testing (tail-flick, water intake); diabetes; used wound clips;.

Q3597: E. Petervari, *et al.* Age versus nutritional state in the development of central leptin resistance. *Peptides* 2014;56(59-67

ALZET Comments: Leptin, recombinant; Saline, pyrogen-free; CSF/CNS; Rat; 7 days; Controls received mp w/ vehicle; animal info (male, Wistar, 3, 6, 12, 18, 24 months old); ALZET brain infusion kit used; cardiovascular;.

Q3363: U. H. Neumann, *et al.* IGFBP2 Is Neither Sufficient nor Necessary for the Physiological Actions of Leptin on Glucose Homeostasis in Male ob/ob Mice. *Endocrinology* 2014;155(3):716-725

ALZET Comments: Leptin, recombinant mouse; Water; SC; Mice; 1004; 15 days; Controls received mp w/ vehicle; animal info (male, ob/ob, 9 weeks old); functionality of mp verified by leptin plasma levels; diabetes; pumps primed in 37C saline for 48 hours;.

Q3698: A. J. Mercer, *et al.* Temporal changes in nutritional state affect hypothalamic POMC peptide levels independently of leptin in adult male mice. *AMERICAN JOURNAL OF PHYSIOLOGY-ENDOCRINOLOGY AND METABOLISM* 2014;306(E904-E915

ALZET Comments: Leptin; PBS; SC; Mice (transgenic); 1002; 2 weeks; Controls received mp w/ vehicle; animal info (male, C57BL6 POMC-Discosoma red, 8-10 weeks old); functionality of mp verified by plasma leptin levels;.

Q3999: T. H. Meek, *et al.* Role of Melanocortin Signaling in Neuroendocrine and Metabolic Actions of Leptin in Male Rats With Uncontrolled Diabetes. *Endocrinology* 2014;155(4157-4167

ALZET Comments: SHU9119; leptin; melanotan-II;; Saline; PBS; water, sterile; CSF/CNS; SC; Rat; mice; 11 days; Controls received mp w/ vehicle; animal info (rat - male, Wistar, adult; mice - STZ-DM, AgRP-deficient or WT); functionality of mp verified by decreased insulin plasma levels; Multiple pumps per animal (2); diabetes; melanotan-II aka MTII; delayed delivery - catheters filled with saline; received drug on day 5; bilateral infusion for rat;.

Q3536: C. E. Koch, *et al.* High-Fat Diet Induces Leptin Resistance in Leptin-Deficient Mice. *Journal of Neuroendocrinology* 2014;26(2):58-67

ALZET Comments: Leptin; CSF, artificial; CSF/CNS; Mice; 1002; 10 days; Controls received mp w/ vehicle; animal info (male, *Lep* ob/ob, 7 weeks old); behavioral testing (food intake); diabetes;.

Q3514: T. Iwasa, *et al.* Pre-pubertal serum leptin levels and sensitivity to central leptin injection of prenatally undernourished female rats. *International Journal of Developmental Neuroscience* 2014;35(52-54



ALZET Comments: Leptin; Saline; CSF/CNS; Rat; 2002; 14 days; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, PD28); functionality of mp verified by serum level; ALZET brain infusion kit 2 used; post op. care (ibuprofen, antibiotic ointment); diabetes;.

R0353: R. B. Harris. Direct and indirect effects of leptin on adipocyte metabolism. *Biochim Biophys Acta* 2014;1842(3):414-23

ALZET Comments: Leptin; SC; Rat; diabetes;.

Q3497: Y. M. Han, *et al.* Leptin-promoted cilia assembly is critical for normal energy balance. *Journal of Clinical Investigation* 2014;124(2193-2197)

ALZET Comments: Leptin; CSF/CNS; Mice; 7 days; Controls received mp w/ saline; animal info (male, C57BL6, ob/ob, db/db, 12 weeks old); diabetes;.

Q3485: G. H. M. Goncalves, *et al.* Hypothalamic Agouti-Related Peptide Neurons and the Central Melanocortin System Are Crucial Mediators of Leptin's Antidiabetic Actions. *CELL REPORT* 2014;7(1093-1103)

ALZET Comments: Leptin; SC; Mice; 2002; 12 days; Controls received mp w/ PBS; animal info (diabetic, Let ob/ob, 8 weeks old); functionality of mp verified by serum levels; diabetes;.

Q3855: A. M. D'souza, *et al.* Leptin Deficiency in Rats Results in Hyperinsulinemia and Impaired Glucose Homeostasis. *Endocrinology* 2014;155(1268-1279)

ALZET Comments: Leptin, rat recombinant; Water; SC; Rat; 2ML4; 28 days; Controls received mp w/ vehicle; animal info (male, Leptin KO, 16 weeks old); functionality of mp verified by plasma serum; diabetes;.

Q3857: J. M. do Carmo, *et al.* Shp2 signaling in POMC neurons is important for leptin's actions on blood pressure, energy balance, and glucose regulation. *American Journal of Physiology-Regulatory Integrative and Comparative Physiology* 2014;307(R1438-R1447)

ALZET Comments: Leptin; Saline; IP; Mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info (Shp2 flox/flox or Shp2/Pomc-cre, 22 weeks old); behavioral testing (motor activity); cardiovascular; diabetes; bp measured using radiotelemetry; obesity study;.

Q3848: R. P. da Silva, *et al.* Leptin Resistance Is Not the Primary Cause of Weight Gain Associated With Reduced Sex Hormone Levels in Female Mice. *Endocrinology* 2014;155(4226-4236)

ALZET Comments: Leptin, mouse recombinant; SC; Mice; 1002; 11 days; Controls received sham surgery; animal info (female, C57Bl6J); behavioral testing (locomotor activity; energy expenditure); obesity;.

Q3449: V. A. Cortes, *et al.* Leptin ameliorates insulin resistance and hepatic steatosis in Agpat2(-/-) lipodystrophic mice independent of hepatocyte leptin receptors. *Journal of Lipid Research* 2014;55(2):276-288

ALZET Comments: Leptin, mouse recombinant; PBS; SC; Mice; 1002; 4 weeks; Controls received mp w/ vehicle; animal info (Agpat2 -/-); functionality of mp verified by plasma levels; pumps replaced every 2 weeks; post op. care (animals recovered on heating pad); behavioral testing (locomotor activity); Used wound clips;.

Q3824: E. D. Canton, *et al.* Leptin mediates seasonal variation in some but not all symptoms of sickness in Siberian hamsters. *Hormones and Behavior* 2014;66(802-811)

ALZET Comments: Leptin, recombinant murine; Tris buffer; SC; Hamster; 1002; 12 days; Controls received mp w/ vehicle; animal info (male, Siberian, adult >60 days old); functionality of mp verified by blood levels; behavioral testing (nest building behavior, anhedonic behavior,);.

Q2785: W. L. Zhu, *et al.* Effects of Exogenous Leptin on Body Mass, Thermogenesis Capacity and Hormone Concentrations of Yuman Chinese Vole, *Eothenomys miletus*, Under Varied Photoperiod. *PAKISTAN JOURNAL OF ZOOLOGY* 2013;45(4):997-1006

ALZET Comments: Leptin, recomb, murine; SC; Vole; 2001; 3 weeks; Control animals received mp w/ PBS; animal info (E. miletus).



Q2670: Z. J. Zhao, *et al.* Energy Budget, Behavior and Leptin in Striped Hamsters Subjected to Food Restriction and Refeeding. *PLoS One* 2013;8(1):U493-U502

ALZET Comments: Leptin, murine, recomb.; PBS; SC; Hamster; 1007D; Control animals received mp w/ vehicle; animal info (striped).

Q2812: S. Supale, *et al.* Loss of Prohibitin Induces Mitochondrial Damages Altering beta-Cell Function and Survival and Is Responsible for Gradual Diabetes Development. *Diabetes* 2013;62(10):3488-3499

ALZET Comments: Leptin, human; SC; Mice; 1002; Control animals received mp w/ saline; animal info (8 wks old, Phb2 KO); diabetes;

Q2767: M. R. Schroeter, *et al.* Leptin promotes neointima formation and smooth muscle cell proliferation via NADPH oxidase activation and signalling in caveolin-rich microdomains. *Cardiovascular Research* 2013;99(3):555-565

ALZET Comments: Leptin, recomb. murine; SC; Mice; 8 week; Control animals received mp w/ saline; animal info (male, apoE -/-, LDL-R -/-; cav-1 -/-, 10 wks old); pumps replaced after 4 weeks.

Q2693: E. rteaga-Solis, *et al.* Inhibition of Leptin Regulation of Parasympathetic Signaling as a Cause of Extreme Body Weight-Associated Asthma. *Cell Metabolism* 2013;17(1):35-48

ALZET Comments: Leptin; CSF/CNS (third ventricle); Mice; 5 days; Control animals received mp w/ PBS; animal info (DIO-WT, 5 wks old); ALZET brain infusion kit 2 used; infusion rate of 0.5 ul/hr.

Q3581: W. Pichaiwong, *et al.* Reversibility of Structural and Functional Damage in a Model of Advanced Diabetic Nephropathy. *Journal of the American Society of Nephrology* 2013;24(7):1088-1102

ALZET Comments: Leptin; Saline; SC; Mice; 2004; 2006; 4 weeks; 6 weeks; Controls received mp w/ vehicle; animal info (BTBR ob/ob, 18 weeks old); functionality of mp verified by leptin serum levels; replacement therapy (leptin replacement); diabetes; bp measured using tail cuff;

Q3355: N. R. Pandey, *et al.* The LIM Domain Only 4 Protein Is a Metabolic Responsive Inhibitor of Protein Tyrosine Phosphatase 1B That Controls Hypothalamic Leptin Signaling. *Journal of Neuroscience* 2013;33(31):12647-12655

ALZET Comments: Leptin; Saline; CSF/CNS (third ventricle); Mice; 1 week; Animal info (male, LMO4KO); behavioral testing (paired vs single feeding); diabetes; used guide cannula from Plastics One. used dental cement/screws.

Q3015: F. Oury, *et al.* Maternal and Offspring Pools of Osteocalcin Influence Brain Development and Functions. *Cell* 2013;155(1):228-241

ALZET Comments: Osteocalcin; Leptin; SC; Mice; 1002; Animal info (female, 3 month old).

Q4975: M. Nakazawa, *et al.* Involvement of leptin in the progression of experimentally induced peritoneal fibrosis in mice. *Acta Histochem Cytochem* 2013;46(2):75-84

ALZET Comments: Leptin; HCL, NaOH (1.25 mg/ml); SC; mice; 1002; 2 weeks; controls received mp w/ vehicle PBS; animal info: male, C57BL/6, 22.6g; C57BL/6J-Lepob/Lepob, 37.3g; functionality of mp verified by Leptin serum concentrations, and peritoneal fluid-ELISA kit; dose: 0.45 g/kg/day.

Q2814: T. H. Meek, *et al.* Leptin Action in the Ventromedial Hypothalamic Nucleus Is Sufficient, But Not Necessary, to Normalize Diabetic Hyperglycemia. *Endocrinology* 2013;154(9):3067-3076

ALZET Comments: Leptin; PBS; CSF/CNS; Mice; 13 days; Control animals received mp w/ vehicle; animal info (STZ induced diabetes, Lepr wt, Lepr KO VMN); diabetes;

Q2870: V. Mansuy-Aubert, *et al.* Imbalance between Neutrophil Elastase and its Inhibitor alpha(1)-Antitrypsin in Obesity Alters Insulin Sensitivity, Inflammation, and Energy Expenditure. *Cell Metabolism* 2013;17(4):534-548

ALZET Comments: Leptin, recomb. murine; SC; Mice; 1007D; 7 days; Animal info (db/db, male, 10 wks old).



Q3304: Z. Y. Li, *et al.* Developmental Role for Endocannabinoid Signaling in Regulating Glucose Metabolism and Growth. *Diabetes* 2013;62(7):2359-2367

ALZET Comments: Leptin; SC; Mice; 2004; 17 days; Animal info (Cnrl double KO ob/ob, 12 weeks old); behavioral testing (food intake); diabetes; Pumps primed overnight in 37C saline;.

Q2963: B. King, *et al.* Weight control, endocrine hormones and cancer prevention. *EXPERIMENTAL BIOLOGY AND MEDICINE* 2013;238(5):502-508

ALZET Comments: Insulin-like growth factor-1; leptin; SC; Mice; 20 weeks; Animal Info (SENCAR mice); cancer (colon); cancer.

Q2950: E. Kacar, *et al.* Leptin regulation of pubertal maturation in intact and pinealectomized female rats. *Turkish Journal Of Medical Sciences* 2013;43(4):557-561

ALZET Comments: Leptin; SC; Rat; 1004; 28 days; Animal info (Wistar, female).

Q2604: F. K. Huynh, *et al.* A Role for Hepatic Leptin Signaling in Lipid Metabolism via Altered Very Low Density Lipoprotein Composition and Liver Lipase Activity in Mice. *Hepatology* 2013;57(2):543-554

ALZET Comments: Leptin, recomb.; Mice; 28 days; Animal info (Lepr flox/flox, Alb Cre ob/ob).

Q2947: R. B. S. Harris. Leptin-induced increase in body fat content of rats. *AMERICAN JOURNAL OF PHYSIOLOGY-ENDOCRINOLOGY AND METABOLISM* 2013;304(3):E267-E281

ALZET Comments: Leptin; mutein; PBS; CSF/CNS (fourth ventricle); IP; Rat; 1002; 2002; 12 days; Controls received mp w/ PBS, or saline; animal info (male, sprague dawley, 320-350 g); central administration of leptin through 4th ventricle, and effect on body fat mass; 0.15 ug leptin/24 hr, or 0.6 ug leptin/24 hr; 4th ventricle; multiple pumps (2).

Q5644: R. B. Harris. Evidence that leptin-induced weight loss requires activation of both forebrain and hindbrain receptors. *Physiol Behav* 2013;120(83-92)

ALZET Comments: Leptin, Mutein; Saline; CSF/CNS (3rd ventricle, 4th ventricle); Rat; 1002; 12 days; Controls received mp w/ vehicle; animal info (320g); stress/adverse reaction: "Attaching Alzet pumps to ventricular cannulae caused a transient inhibition of food intake in all rats for at least 1 day following surgery (Fig. 1A), but then daily food intake stabilized for most of the groups." (see pg. 85); Plastics One ventricular cannulae used ; Therapeutic indication (Energy, weight loss, calorimetry); Dose (Leptin: .1 ug/24 hours, Mutein: 2.0 ug/24 hours);.

Q2998: T. Fujikawa, *et al.* Leptin Engages a Hypothalamic Neurocircuitry to Permit Survival in the Absence of Insulin. *Cell Metabolism* 2013;18(3):431-444

ALZET Comments: Leptin; PBS; CSF/CNS; Mice; 10 days; Controls received mp w/ PBS; Interesting paper; leptin administration permits survival and improves hyperglycemia of mice totally lacking insulin via CNS-dependent mechanisms. Leptin also lowers circulating and effect of glucagon. Effect is not through alpha pancreatic cells, but indirectly through hypothalamic GABA neurons; diabetes;.

Q2853: J. H. Dubinion, *et al.* Role of Proopiomelanocortin Neuron Stat3 in Regulating Arterial Pressure and Mediating the Chronic Effects of Leptin. *Hypertension* 2013;61(5):1066-1074

ALZET Comments: Leptin; IP; Mice; 1007D; 7 days; Animal info (18 wks old, Stat3 flox/flox).

Q2857: B. N. Desai, *et al.* Integrated Effects of Leptin in the Forebrain and Hindbrain of Male Rats. *Endocrinology* 2013;154(8):2663-2675

ALZET Comments: Leptin; Saline; CSF/CNS (third ventricle); CSF/CNS (fourth ventricle); Rat; 2002; 12 days; Control animals received mp w/ saline; animal info (Sprague Dawley, male); Plastics One cannula used.

Q2869: H. C. Denroche, *et al.* Leptin Administration Enhances Islet Transplant Performance in Diabetic Mice. *Diabetes* 2013;62(8):2738-2746

ALZET Comments: Leptin, recomb. murine; Water; SC; Mice; 2006; 4, 6 weeks; Control animals received mp w/ vehicle; animal info (C57BL/6, male); dose-response; 4 week pumps used; diabetes;.



Q5953: Y. J. Choi, *et al.* Combined treatment of betulinic acid, a PTP1B inhibitor, with Orthosiphon stamineus extract decreases body weight in high-fat-fed mice. *J Med Food* 2013;16(1):2-8

ALZET Comments: Betulinic Acid; leptin; CSF/CNS (lateral ventricle); Rat; 2001; 7 days; animal info (Sprague-Dawley rats (body weights, 280–300 g)); Brain coordinates (1.3mm posterior to bregma, 1.9mm lateral to the midsagittal suture, and to a depth of 4.0 mm).

R0363: K. D. Carr, *et al.* Animal Models of Eating Disorders. *Neuromethods*, 2013;74(261-317

ALZET Comments: Leptin, recomb. mouse; CSF/CNS (lateral ventricle); Rat; 2002; 14 days; Dose (0.5 ug/0.5 uL/hr); Controls received mp w/ vehicle; Brain coordinates (1.0 mm posterior, 1.5 mm lateral, and 4.5 mm ventral); good methods (pg. 267); Wound clips used;

Q3695: K. Bitton-Worms, *et al.* The Effect of Leptin Administration on Mammary Tumor Growth in Diabetic Mice. *Hormone and Metabolic Research* 2013;45(9):655-659

ALZET Comments: Leptin, recombinant mouse; SC; Mice; 2002; 14 days; Controls received mp w/ saline; animal info (female, MKR, 8-10 weeks old); cancer (breast; mammary tumors); diabetes;

Q2693: E. Arteaga-Solis, *et al.* Inhibition of Leptin Regulation of Parasympathetic Signaling as a Cause of Extreme Body Weight-Associated Asthma. *Cell Metabolism* 2013;17(1):35-48

ALZET Comments: Leptin; CSF/CNS (third ventricle); Mice; 5 days; Control animals received mp w/ PBS; animal info (DIO-WT, 5 wks old); ALZET brain infusion kit 2 used; infusion rate of 0.5 ul/hr.

R0311: J. W. Apolzan, *et al.* Rapid onset and reversal of peripheral and central leptin resistance in rats offered chow, sucrose solution, and lard. *Appetite* 2013;60(1):65-73

ALZET Comments: Leptin; CSF/CNS; Rat; 4 days; Animal info (male, Sprague Dawley rats); Paper interesting to weight management in the sense that it shows initial drop in weight harder due to re-gaining peripheral leptin sensitivity where you first start to lose body fat (burning brown fat), before noticing weight loss, and less food intake;