



References on the Administration of Prolactin Using ALZET® Osmotic Pumps

Q6762: X. Ruiz-Herrera, *et al.* Prolactin Promotes Adipose Tissue Fitness and Insulin Sensitivity in Obese Males. *Endocrinology* 2017;158(1):56-68

ALZET Comments: Prolactin, ovine; SC; Rat; 28 days; Dose (0.16 mg/kg /d); Controls received mp w/ vehicle; animal info (Male Wistar rats); diabetes; "...the pumps were implanted sc in less than 2 minutes." (P.57).

Q6204: S. McIlvride, *et al.* A progesterone-brown fat axis is involved in regulating fetal growth. *Sci Rep* 2017;7(1):10671

ALZET Comments: Progesterone; Prolactin; Cyclodextrin, 2-hydroxypropyl- β ; SC; Mice; 2002; 14 days; Dose (progesterone 250 μ g/day; prolactin 7 μ g/day); 20% (w/v) 2-hydroxypropyl- β -cyclodextrin used; Controls received mp w/ vehicle; animal info (7–8 week old female mice with bilateral oophorectomy); replacement therapy (oophorectomy);

Q6440: M. G. Ledesma-Colunga, *et al.* Prolactin blocks the expression of receptor activator of nuclear factor kappaB ligand and reduces osteoclastogenesis and bone loss in murine inflammatory arthritis. *Arthritis Res Ther* 2017;19(1):93

ALZET Comments: Prolactin; SC; Rat; 28 days; animal info (Male Sprague-Dawley rats weighing 200–250 g);

Q6249: P. Gustafson, *et al.* The role of prolactin in the suppression of Crh mRNA expression during pregnancy and lactation in the mouse. *J Neuroendocrinol* 2017;29(9):

ALZET Comments: Prolactin; SC; Mice; 1003D; 3 days; Dose (1500 μ g/day-); Controls received mp w/ vehicle; animal info (Adult female C57BL/6J mice aged 8-12 weeks);

Q6388: R. Dill, *et al.* Role of Prolactin in Promotion of Immune Cell Migration into the Mammary Gland. *J Mammary Gland Biol Neoplasia* 2017;22(1):13-26

ALZET Comments: Prolactin; PBS, Dulbecco's; SC; Mice; 28 days; Dose (2.4 μ g/day); Controls received mp w/ vehicle; animal info (Eight week-old C57BL6/J female mice); immunology;

Q4837: Colin M. Hyslop, *et al.* Prolactin as an Adjunct for Type 1 Diabetes Immunotherapy. *Endocrinology* 2016;157(1):150-165

ALZET Comments: Prolactin, recombinant mouse; Albumin, mouse; Mice (NOD); 1004; 3 weeks; Controls received mp w/ vehicle; Controls received mp w/ vehicle; diabetes; Therapeutic indication (diabetes); Dose (2.7 μ g/d); resulted in serum PRL level 300-500 ng/mL;

Q4662: T. Yonezawa, *et al.* Anti-metastatic outcome of isoform-specific prolactin receptor targeting in breast cancer. *CANCER LETTERS* 2015;366(84-92)

ALZET Comments: Prolactin, recombinant human; oligomer, splice-modulating; SC; Mice (NOD/SCID); 5 days; 25 days; 40 days; Controls received mp w/ vehicle; animal info (female, BALB/cJ or NOD SCID, 8-9 weeks old); functionality of mp verified by plasma levels; pumps replaced every 28 days; cancer (breast); dose-response (pg 87);

Q4484: N. G. Kondegowda, *et al.* Osteoprotegerin and Denosumab Stimulate Human Beta Cell Proliferation through Inhibition of the Receptor Activator of NF-kappaB Ligand Pathway. *Cell Metabolism* 2015;22(77-85)

ALZET Comments: Prolactin, ovine; PBS; BSA; SC; Mice; 7 days; Controls received mp w/ saline; animal info (male, OPG-KO, 12-14 weeks old); diabetes;

Q4384: H. M. Crawford, *et al.* Evidence for a Role of Prolactin in Mediating Effects of Photoperiod during the Dry Period. *ANIMALS* 2015;5(803-820)

ALZET Comments: Prolactin; Saline; SC; Cattle (pregnant); 28 days; Controls received no mp; animal info (female, Holstein, multiparous); functionality of mp verified by blood samples; pumps removed after 28 days;

Q4064: M. Ricke-Hoch, *et al.* Opposing roles of Akt and STAT3 in the protection of the maternal heart from peripartum stress. *Cardiovascular Research* 2014;101(587-596)



ALZET Comments: Prolactin; Saline; Mice (pregnant); 14 days; Controls received mp w/ vehicle; animal info (female, CKO, pregnant); cardiovascular; peptides;

Q3424: J. D. Buntin, *et al.* Increased STAT5 signaling in the ring dove brain in response to prolactin administration and spontaneous elevations in prolactin during the breeding cycle. *General and Comparative Endocrinology* 2014;200(1-9)

ALZET Comments: Prolactin, ovine; Saline; sodium bicarbonate; SC; Bird (ring dove); 2001; 7 days; Controls received mp w/ vehicle; animal info (female, ring doves, adult, non-breeding);

Q3124: D. B. Yang, *et al.* Limits to sustained energy intake. XIX. A test of the heat dissipation limitation hypothesis in Mongolian gerbils (*Meriones unguiculatus*). *Journal of Experimental Biology* 2013;216(17):3358-3368

ALZET Comments: Prolactin; Saline; SC; Gerbil; 2002; 2 weeks; Controls received mp w/ vehicle; animal info (female, Mongolian, 6-7 months old, 59-88g); functionality of mp verified by serum levels; behavioral testing (physical activity);

Q2469: W. B. Wang, *et al.* Extracellular Signal-regulated Kinase 5 (ERK5) Mediates Prolactin-stimulated Adult Neurogenesis in the Subventricular Zone and Olfactory Bulb. *Journal of Biological Chemistry* 2013;288(4):2623-2631

ALZET Comments: Prolactin, mouse, recomb.; Albumin, mouse serum; saline; SC; Mice; 1007D; 7 days; Control animals received mp w/ vehicle; animal info (male, female, Nestin CreER TM/ERK5 loxP/loxP, 8-10 wks old).

Q3045: N. Adan, *et al.* Prolactin promotes cartilage survival and attenuates inflammation in inflammatory arthritis. *Journal of Clinical Investigation* 2013;123(9):3902-3913

ALZET Comments: Prolactin, ovine; SC; Rat; 6 days; 21 days; Animal info (male, Sprague Dawley, 200-250g); functionality of mp verified by serum levels at 21 days; behavioral testing (hind paw pain); immunology;

Q2449: T. L. Walker, *et al.* Prolactin Stimulates Precursor Cells in the Adult Mouse Hippocampus. *PLoS One* 2012;7(9):U456-U466

ALZET Comments: Prolactin, mouse, recomb.; BSA; saline, sterile; CSF/CNS (hippocampus); Mice; 1007D; 7 days; 28 days; Control animals received mp w/ vehicle; animal info (C57BL/6, adult); behavioral testing (Morris water maze test, Porsolt forced swim test, open field test, Y maze test).

Q2369: C. Sonigo, *et al.* Hyperprolactinemia-induced ovarian acyclicity is reversed by kisspeptin administration. *Journal of Clinical Investigation* 2012;122(10):3791-3795

ALZET Comments: Prolactin; SC; Mice; 2004; 28 days; Control animals received mp w/ PBS; animal info (6 wks old, adult, female).

Q2190: S. Park, *et al.* Central Prolactin Modulates Insulin Sensitivity and Insulin Secretion in Diabetic Rats. *Neuroendocrinology* 2012;95(4):332-343

ALZET Comments: Prolactin, rat; NaHCO₃; NaCl; CSF/CNS; Rat; 4 weeks; Controls received mp w/ vehicle; animal info (Sprague Dawley, male, 224 g).

Q0948: G. K. Mak, *et al.* Paternal recognition of adult offspring mediated by newly generated CNS neurons. *Nature Neuroscience* 2010;13(6):753-U134

ALZET Comments: Prolactin, mouse, recomb.; luteinizing hormone, mouse, recomb.; antibody, prolactin neutralizing; Albumin, mouse serum; PBS;; SC; CSF/CNS; Mice; 1003D; 1007D; 2 days; Controls received mp w/ vehicle or normal goat antibody; animal info (8 wks old, Prlr +/+, Prlr -/-, male).

Q0515: T. E. Ziegler, *et al.* Prolactin's mediative role in male parenting in parentally experienced marmosets (*Callithrix jacchus*). *Hormones and Behavior* 2009;56(4):436-443

ALZET Comments: Prolactin, human, recomb.; Glycerol; NaHCO₃; NaCl; SC; Monkey (marmoset); 2004; Controls received mp w/ saline; animal info (2.5-9 yrs old, male, parentally experienced); "... these pellets (from Innovative Research of America) did not raise the level of prolactin in the blood over the level of our control parentally experienced fathers... Therefore, we chose to use the osmotic minipump (Alzet, CA) for our test males." pg 439; "The position of the pumps on



the lower area of a male's back precluded any interference with infant carrying since infant carrying occurs nearer the neck" pg 439; comparison of pellets vs mp.

R0263: J. E. Merrill. In Vitro and In Vivo Pharmacological Models to Assess Demyelination and Remyelination. *Neuropsychopharmacology* 2009;34(1):55-73

ALZET Comments: LINGO-1, antibody; Prolactin; CSF/CNS; Mice; Rat; 2, 3 weeks; Animal info (MOG-induced Experimental Autoimmune Encephalomyelitis).

P8839: R. A. Augustine, *et al.* Induction of central leptin resistance in hyperphagic pseudopregnant rats by chronic prolactin infusion. *Endocrinology* 2008;149(3):1049-1055

ALZET Comments: Prolactin, ovine; CSF, artificial; CSF/CNS; Rat; 2001; 7 days; Controls received mp w/ vehicle; peptides; animal info (female, Sprague Dawley, 10 wks old, 200-300g., pseudopregnant); endocrinology.

P8503: V. L. Williams, *et al.* Common and specific effects of the two major forms of prolactin in the rat testis. *AMERICAN JOURNAL OF PHYSIOLOGY-ENDOCRINOLOGY AND METABOLISM* 2007;293(6):E1795-E1803

ALZET Comments: Prolactin; Saline; SC; Rat; 4 weeks; Controls received mp w/ vehicle; plasma levels taken; peptides; animal info (male).

P8809: L. Naef, *et al.* Prolactin/Leptin interactions in the control of food intake in rats. *Endocrinology* 2007;148(12):5977-5983

ALZET Comments: Prolactin, ovine; NaHCO₃; HCl; CSF/CNS; Rat; 2001; 2002; 7, 10 days; Controls received mp w/ vehicle; dose-response (Fig. 1); peptides; animal info (female, Wistar, 220-240g.).

P8083: D. Hilfiker-Kleiner, *et al.* A cathepsin D-cleaved 16 kDa form of prolactin mediates postpartum cardiomyopathy. *Cell* 2007;128(3):589-600

ALZET Comments: Prolactin, recomb; Mice; 3 weeks; Controls received mp w/ saline; cardiovascular; peptides; animal info (female).

P8425: C. Gregg, *et al.* White matter plasticity and enhanced remyelination in the maternal CNS. *Journal of Neuroscience* 2007;27(8):1812-1823

ALZET Comments: Prolactin, recomb. mouse; Saline; albumin mouse serum; SC; Mice; 1007D; 2.5 days; Controls received mp w/ vehicle; peptides; animal info (female, CD-1, 6-8 wks old).

P8681: D. R. Grattan, *et al.* Prolactin regulation of gonadotropin-releasing hormone neurons to suppress luteinizing hormone secretion in mice. *Endocrinology* 2007;148(9):4344-4351

ALZET Comments: Prolactin, ovine; CSF/CNS; Mice; 1002; 7 days; Serum levels taken, peptides, animal info (adult, female, C57BL6/J, 6-8 weeks, 24-28g, OVX).

P8230: A. J. Craven, *et al.* Prolactin delays hair regrowth in mice. *Journal of Endocrinology* 2006;191(2):415-425

ALZET Comments: Prolactin, ovine; domperidone; Sodium bicarbonate buffer; PEG 400; SC; Mice; 1003D; 1007D; 1002; 3, 12, 14, days; Controls received no treatment; functionality of mp verified by plasma prolactin levels; animal info (Balb/c, 18-30 days old).

P7620: F. J. Obal, *et al.* Rapid eye movement sleep is reduced in prolactin-deficient mice. *Journal of Neuroscience* 2005;25(44):10282-10289

ALZET Comments: Prolactin, murine; Saline, physiological; SC; Mice; 1002; 11-12 days; Controls received mp w/ vehicle; animal info (C57BL/6J, pRL, KO, male, 25-30 g, 8-16 wk old).

P7199: I. Nasir, *et al.* The role of pregnancy hormones in the regulation of Pdx-1 expression. *MOLECULAR AND CELLULAR ENDOCRINOLOGY* 2005;233(1-2):1-13

ALZET Comments: Prolactin, bovine; NaHCO₃; SC; Mice; 2001; 4.5 days; Controls received mp w/ vehicle; functionality of mp verified by serum bPRL levels; peptides; multiple pumps per animal (2).



- P7450:** S. T. Leonard, *et al.* The role of prolactin and testosterone in mediating seasonal differences in the self-grooming behavior of male meadow voles, *Microtus pennsylvanicus*. *PHYSIOLOGY & BEHAVIOR* 2005;85(4):461-468
ALZET Comments: Bromocriptine; prolactin, ovine; Saline, sterile; SC; Prairie vole; 2004; Controls received mp w/ vehicle; replacement therapy (gonadectomy); animal info (male, meadow); animals also received testosterone via silastic implant at same time.
- P7665:** E. A. Guzman, *et al.* Abrogation of delayed type hypersensitivity response to *Candida albicans* produced by a molecular mimic of phosphorylated prolactin. *Journal of Neuroimmunology* 2005;170(1-2):31-40
ALZET Comments: Prolactin, recomb.; prolactin, S179D; Saline; SC; Mice; 2004; 21 days; Controls received mp w/ vehicle; immunology; animal info (male, C3H/HeJ or C3H/HeJ-TnFsF6gld, 10-12 wk. old).
- P7044:** T. L. Auchtung, *et al.* Prolactin mediates photoperiodic immune enhancement: Effects of administration of exogenous prolactin on circulating concentrations, receptor expression, and immune function in steers. *Biology of Reproduction* 2004;71(6):1913-1918
ALZET Comments: Prolactin, recomb. bovine; Saline; SC; Cattle; 2ML2; 10 days; Comparison of IV injections vs mp; no stress (see pg. 1914); immunology; peptides; post op. care (prodine, excenel); each animal received 4 rounds of 10 day prolactin treatment (2 w/ mp, 2 IV injection) with 11 days of non treatment between each round; wound clips used.
- P6603:** X. L. Xu, *et al.* Opposite effects of unmodified prolactin and a molecular mimic of phosphorylated prolactin on morphology and the expression of prostate specific genes in the normal rat prostate. *PROSTATE* 2003;54(1):25-33
ALZET Comments: Prolactin, human recomb.; prolactin, S179D; Saline; SC; Rat; 2004; 3 weeks; Comparison of SC injections vs. mp; peptides.
- P5677:** F. Nahi, *et al.* Prolactin modulates hypothalamic preproenkephalin, but not proopiomelanocortin, gene expression during lactation. *Endocrine* 2003;20(1-2):115-122
ALZET Comments: Prolactin, ovine; Sodium bicarbonate; heparin; NaCl; IV (jugular); Rat; Controls received mp w/ vehicle; half-life = 6 hours (p.119); peptides; heparin dose 50 U/ml.
- P5678:** T. E. Johnson, *et al.* Unmodified prolactin (PRL) promotes PRL secretion and acidophil hypertrophy and is associated with pituitary hyperplasia in female rats. *Endocrine* 2003;20(1-2):101-109
ALZET Comments: Prolactin; Saline; SC; Rat (pregnant); 2001; 2004; 7, 21 days; peptides; unmodified (u-PRL) & phosphorylated (p-PRL) prolactin used.
- P5810:** G. P. Hedlund, *et al.* Fetal antigen 1 (FA1) in the adult rat adrenal gland, ovary and pituitary gland. *In Vivo* 2003;17(1):1-4
ALZET Comments: Growth hormone, human; prolactin, ovine; growth hormone, bovine; Saline; SC; Rat; 2ML1; 7 days; Controls received mp w/ PBS vehicle; peptides; agents infused separately or concomitantly.
- P7705:** T. P. Combs, *et al.* Sexual differentiation, pregnancy, calorie restriction, and aging affect the adipocyte-specific secretory protein adiponectin. *Diabetes* 2003;52(2):268-276
ALZET Comments: Prolactin; bromocriptine; SC; Mice; 1007D; 3 days; Animal info (female, C57BL/6J).
- P5410:** L. Yang, *et al.* Maternal prolactin composition can permanently affect epidermal gamma delta T cell function in the offspring. *Developmental and Comparative Immunology* 2002;26(9):849-860
ALZET Comments: Prolactin, recomb; prolactin, phosphorylated; Saline; Rat (pregnant); 2002; Controls received mp w/ vehicle; teratology; peptides; apoptosis.
- P5143:** L. Torner, *et al.* Increased hypothalamic expression of prolactin in lactation: involvement in behavioural and neuroendocrine stress responses. *European Journal of Neuroscience* 2002;15(1381-1389)
ALZET Comments: Oligodeoxynucleotide, antisense; Prolactin, ovine; Ringer's solution; CSF/CNS; Rat (lactating); 1007D; 5 days; controls received mp w/ vehicle; antisense; oligonucleotides against the long form of the brain Prolactin receptor.



P5460: C. B. Kuo, *et al.* Pseudophosphorylated prolactin (S179D PRL) inhibits growth and promotes beta-casein gene expression in the rat mammary gland. *Cell and Tissue Research* 2002;309(3):429-437

ALZET Comments: Prolactin, S179D; Saline; SC; Rat; 2001; 2004; 28 days;

Q6873: L. Yang, *et al.* Administration of unmodified prolactin (U-PRL) and a molecular mimic of phosphorylated prolactin (PP-PRL) during rat pregnancy provides evidence that the U-PRL:PP-PRL ratio is crucial to the normal development of pup tissues. *Journal of Endocrinology* 2001;168(2):227-238

ALZET Comments: Prolactin, phosphorylated; prolactin, unphosphorylated; Saline; SC; Rat (pregnant); 2004; Dose (6 µg/d); Controls received mp w/ vehicle; animal info (female Sprague–Dawley rats);

P4870: X. L. Xu, *et al.* A molecular mimic of phosphorylated prolactin markedly reduced tumor incidence and size when DU145 human prostate cancer cells were grown in nude mice. *Cancer Research* 2001;61(6):6098-6104

ALZET Comments: Prolactin; S179D; SC; Mice (nude); 2004; 22-24 days; controls received mp w/ vehicle; functionality of mp verified by plasma prolactin levels; peptides; cancer (prostate); S179D is a prolactin receptor antagonist; wild-type prolactin used.

P4954: L. Torner, *et al.* Anxiolytic and anti-stress effects of brain prolactin: Improved efficacy of antisense targeting of the prolactin receptor by molecular modeling. *Journal of Neuroscience* 2001;21(9):3207-3214

ALZET Comments: Oligonucleotide, antisense; Prolactin, ovine; Ringer's solution; CSF/CNS; Rat; 1007D; 5 days; controls received mp w/ vehicle; comparison of ICV injections vs. mp; peptides; antisense; antisense ODN was anti-prolactin.

P5239: K. W. Sockman, *et al.* The role of prolactin in the regulation of clutch size and onset of incubation behavior in the American kestrel. *Horm. Behav* 2000;38(3):168-176

ALZET Comments: Prolactin, ovine; NaCO₃; NaCl; SC; Bird (kestrel); 1002; 15 days; Controls received mp w/ vehicle; prolactin plasma levels checked; dose-response (p.173); 17 min. half-life (p.171).

P3694: S. L. Wardlaw, *et al.* Effect of chronic prolactin infusion on pituitary prolactin and hypothalamic proopiomelanocortin. *J. Neuroendocrinology* 1997;9(8):81-85

ALZET Comments: Prolactin, ovine; Phosphate buffer; SC; CSF/CNS (third ventricle); Rat; 2001; 1 or 2 weeks; controls received mp w/ vehicle; ICV & SC pumps replaced after 7 days; peptides; solutions were millipore filtered; 1 sc mp replaced with 2 pumps after 7 days.

P6301: A. P. Payne, *et al.* Hormones and the Control of Porphyrin Biosynthesis and Structure in the Hamster Harderian Gland. *Microscopy Res. and Tech* 1996;34(1):123-132

ALZET Comments: Bromocriptine; prolactin; Hamster; Replacement therapy (castration, ovariectomy); multiple pumps per animal (2).

P3807: E. Hedner, *et al.* Systemically and locally administered growth hormone stimulates bone healing in combination with osteopromotive membranes: an experimental study in rats. *J. Bone and Min. Res* 1996;11(12):1952-1960

ALZET Comments: Growth hormone, bovine; Growth hormone, human; Prolactin, ovine; SC; bone (mandible); Rat; 2, 3, 4 weeks; controls received mp w/saline; pumps replaced after 2 weeks; recomb. human and bovine GH used.

P2858: G. R. Pitts, *et al.* Role of vasoactive intestinal peptide in the control of prolactin-induced turkey incubation behavior. II. Chronic infusion of vasoactive intestinal peptide. *Biol. Reprod* 1994;50(13):1350-1356

ALZET Comments: Vasoactive intestinal peptide, porcine; Prolactin, ovine; Saline; Sodium bicarbonate; SC; CSF/CNS; CSF/CNS (median eminence); bird (turkey); 2001; 2002; 7, 10, 12 days; controls received mp with saline; functionality of mp verified by residual volume; stability of pVIP -- still potent after 17 days in sc pump; peptides; pumps implanted after recovery from CNS surgery.

P3037: Y. Myal, *et al.* Tissue-specific androgen-inhibited gene expression of a submaxillary gland protein, a rodent homolog of the human prolactin-inducible protein/GCDFP-15 gene. *Endocrinology* 1994;135(4):1605-1610



ALZET Comments: Prolactin, ovine; Rat; 14 days; peptides.

P3008: B. Freyschuss, *et al.* The hormonal regulation of the oestrogen receptor in rat liver: an interplay involving growth hormone, thyroid hormones and glucocorticoids. *J. Endocrinol* 1994;142(285-298)

ALZET Comments: Growth hormone, human; Triiodothyronine, L-; Prolactin, ovine; Dexamethasone; SC; Rat; 7 days; controls received hypophysectomy only w/ no mp; functionality of mp verified by checking pumps after usage; replacement therapy (hypophysectomy); comparison of single sc injections of GH & T3 vs. mp; agents given alone or in combination; growth hormone via mp partly restores liver estrogen receptor concentration while same dose in 2 single injections daily has no effect.

P2998: G. B. DiGregorio, *et al.* Roles of melatonin and prolactin in testicular crudesence in mink (*Mustela vison*). *J. Reprod. Fertil* 1994;102(1-5)

ALZET Comments: Prolactin, ovine; SC; mink; 110 days; controls received no treatment; long-term study, pumps replaced every 4 weeks; peptides.

P2591: L. A. Arbogast, *et al.* Pituitary adenylate cyclase-activating polypeptide (PACAP) increases prolactin release and tuberoinfundibular dopaminergic neuronal activity. *Brain Research* 1994;655(17-24)

ALZET Comments: Prolactin, ovine; Sodium bicarbonate; Sodium chloride; Heparin; IV (jugular); Rat; 2 days; functionality of mp verified by RIA of plasma levels; peptides; PACAP 38 or saline injections iv, concomitantly; 50 U/ml of heparin.

P2422: N. F. Ruby, *et al.* Prolactin and testosterone inhibit torpor in siberian hamsters. *Am. J. Physiol* 1993;264(133):R123-R128

ALZET Comments: Prolactin, ovine; Glycerol; Sodium azide; Sodium heparin; PBS; SC; hamster; 2002; 10 days; controls received mp w/ vehicle solution; telemetry tracked temperature and activity.

P2456: L. S. Katz, *et al.* Evidence for a role of the liver in the luteotropic action of prolactin in rats. *Biol. Reprod* 1993;48(512-514)

ALZET Comments: Prolactin, ovine; Sodium azide; Sodium phosphate; Saline; Glycerol; IV (jugular); IV (hepatic portal); Rat; 2002; no duration posted; pulsed delivery; peptides; air used in lynch coil.

P2312: N. J. Hebert, *et al.* Restoration of lactation in bromocriptine-treated rats by prolactin replacement: comparison of constant versus pulsatile infusion and intrahepatic versus intrajugular routes of delivery. *J. Endocrinol. Invest* 1993;16(29-35)

ALZET Comments: Prolactin, ovine; IV (jugular); IV (hepatic portal); Rat; 2001; 5 days; controls received mp w/ solvent; functionality of mp verified by in vitro dye testing of pulsatile release; comparison of pulsed delivery w/ mp vs. continuous infusion w/ mp; pulsed delivery; "Constant infusion of oPRL. . . was, overall, more effective at restoring lactation. . . than was giving pulses, regardless of the site of delivery." (pg. 29).

P2359: A. Meseguer, *et al.* Effects of pituitary hormones on the cell-specific expression of the KAP gene. *Mol. and Cellular Endocrin* 1992;89(153-162)

ALZET Comments: Luteinizing hormone; ACTH, human; Thyroid-stimulating hormone, rat; Follicle stimulating hormone, rat; Growth hormone, rat; Prolactin, ovine; SC; mice; 2001; 7 days; controls received mp w/ vehicles; replacement therapy (hypophysectomy); peptides.

P2003: Y. Liu, *et al.* Prolactin regulates maternal bile secretory function post partum. *J. Pharmacol. Exp. Ther* 1992;261(2):560-566

ALZET Comments: Prolactin; Glycerol; Sodium azide; Sodium carbonate; IV (jugular); Rat; 2001; 6 days; dose-response (table p564).

P1844: O. M. Youngren, *et al.* Intracranial prolactin perfusion induces incubation behavior in turkey hens. *Biol. Reprod* 1991;44(3):425-431

ALZET Comments: Prolactin, ovine; Ammonium bicarbonate; Saline; CSF/CNS; bird (turkey); 2ML4; 14 days; peptides.



P3106: H. Tsukamura, *et al.* The suppressing effect of the suckling stimulus on the pulsatile luteinizing hormone release is not mediated by prolactin in the rat at mid-lactation. *Jpn. J. Animal Reprod* 1991;37(1):59-63

ALZET Comments: Prolactin, ovine; Sodium bicarbonate; Saline; SC; Rat; 2001; no duration posted; peptides.

P1758: N. J. Hebert, *et al.* On the possible role of the liver in the galactopoietic action of prolactin in the rat. *Endocrinology* 1991;128(3):1505-1510

ALZET Comments: Prolactin, ovine; Glycerol; heparin, porcine sodium; sodium azide; IV (external jugular); IV (hepatic portal); Rat; 2001; no duration posted; Functionality of mp verified by serum RIA; stability verified by incubation in pumps in vitro at 37 degrees celsius for 2 days, data given out to 6 days; 5 doses of prolactin infused; 250 U/ml porcine, sodium heparin used; animal info (Long-Evans, F).

P1889: L. A. Arbogast, *et al.* Hyperprolactinemia increases and hypoprolactinemia decreases tyrosine hydroxylase messenger ribonucleic acid levels in the arcuate nuclei, but not the substantia nigra or zona incerta. *Endocrinology* 1991;128(2):997-1005

ALZET Comments: Prolactin; Heparin; Sodium bicarbonate; Sodium chloride; IV (jugular); Rat; 2001; 7 days; Animal info (SD, F, 175-225 g); 50 U/ml of heparin.

P1589: R. J. Madon, *et al.* Hypoinsulinaemia in the lactating rat is caused by a decreased glycaemic stimulus to the pancreas. *J. Endocrinol* 1990;125(81-88)

ALZET Comments: Growth hormone, ovine; Prolactin, ovine; Rat; 2001; 5 days; functionality of mp verified by serum levels; replacement therapy (ovariectomy) in some of the prolactin-treated animals.

P3271: M. K.-I., *et al.* Prolactin does not mediate the suppressive effect of the suckling stimulus on luteinizing hormone secretion in ovariectomized lactating rats. *Endocrinol. Japan* 1990;37(3):405-411

ALZET Comments: Prolactin, ovine; SC; Rat; 2001; no duration posted; pumps replaced after 8 days; peptides.

P1832: D. E. English, *et al.* Evidence for a role of the liver in the mammatrophic action of prolactin. *Endocrinology* 1990;126(5):2252-2256

ALZET Comments: Prolactin, ovine; Glycerol; Sodium azide; IV (jugular); IV (hepatic portal); Rat; 2 weeks; pulse delivery; peptides.

R0089: A. Amkraut, *et al.* Osmotic delivery of peptides and macromolecules. *Adv. Drug Delivery Review* 1990;4(255-276)

ALZET Comments: Atrial natriuretic factor; cholecystokinin; Granulocyte-colony stimulating factor.; glucagon; insulin; interleukin-2; interleukin-3; melatonin; nerve growth factor; neurotensin; prolactin; theophylline; CSF/CNS; IA (femoral); intrasplenic; IP; SC; no duration posted; peptides; ALZA-authored, review of peptide delivery issues and applications; tissue perfusion (spleen).

P1834: H. C. Pedersen. Effects of exogenous prolactin on parental behaviour in free-living female willow ptarmigan lagopus l. lagopus. *Anim. Behav* 1989;38(926-934)

ALZET Comments: Prolactin; Sodium bicarbonate; SC; bird (ptarmigan); 2001; 6 days; pumps replaced after 6 days; flow calculated for birds' higher body temp. to be 1.15 ul/hr; peptides.

P1375: J. Oscarsson, *et al.* Plasma pattern of growth hormone regulates sexual differentiation of phosphatidylcholine in rat plasma. *Acta Physiol. Scand* 1988;133(257-265)

ALZET Comments: Growth hormone, human; Prolactin, ovine; Saline; SC; Rat; 2001; 7 days; controls received sham surgery; comparison of sc injections vs. mp infusion; replacement therapy (hypophysectomy); peptides.

P1336: J. Oscarsson, *et al.* Sex differences in fatty acid composition of rat liver phosphatidylcholine are regulated by the plasma pattern of growth hormone. *Biochim. Biophys. Acta* 1988;959(280-287)

ALZET Comments: Growth hormone, bovine; Growth hormone, human; Prolactin, ovine; Glycerol; PBS; Saline; Sodium azide; Water; SC; Rat; 2001; 6 days; comparison of sc injections 2x daily vs. mp infusion; replacement therapy (gonadectomy and hypophysectomy); peptides.



P1264: K. Kishi, *et al.* Pituitary factors regulating mouse placental lactogen-II secretion during the last half of pregnancy in mice. *Endocrinology* 1988;122(5):2309-2317

ALZET Comments: Growth hormone, murine; Prolactin, murine; Prolactin, bovine; Saline; SC; mice (pregnant); 2001; no duration posted; controls received mp w/saline; dose-response; comparison of sc injections vs. mp infusion; replacement therapy (hypophysectomy); peptides.

P1361: T. C. Brelje, *et al.* Nutrient and hormonal regulation of the threshold of glucose-stimulated insulin secretion in isolated rat pancreases. *Endocrinology* 1988;123(3):1582-1590

ALZET Comments: Growth hormone, bovine; Prolactin, ovine; Glycerol; Sodium bicarbonate; Water; SC; Rat; 2ML1; 4 days; functionality of mp verified by serum levels; peptides.

P1422: Y. Yamazoe, *et al.* Suppression of levels of phenobarbital-inducible rat liver cytochrome P-450 by pituitary hormone. *J. Biol. Chem* 1987;262(15):7423-7428

ALZET Comments: Growth hormone, human; Prolactin, ovine; SC; Rat; 2001; 7 days; comparison of sc injections vs. mp infusion; replacement therapy (hypophysectomy); peptides.

P1146: R. L. Sorenson, *et al.* Decreased glucose stimulation threshold, enhanced insulin secretion, and increased beta cell coupling in islets of prolactin-treated rats. *Pancreas* 1987;2(3):283-288

ALZET Comments: Prolactin, ovine; Glycerol; Sodium bicarbonate; SC; Rat; 2ML1; 4 days; controls received mp w/ vehicle; dose-response (text); functionality of mp verified; peptides.

P1005: G. Norstedt, *et al.* Induction of prolactin receptors in the liver is more closely related to the growth-promoting than to the lactogenic potency of peptides. *Acta Endocrinol* 1987;114(350-356)

ALZET Comments: Prolactin, human; Growth hormone, bovine; Growth hormone, human; Growth hormone, rat; Lactogen, human placental; Prolactin, ovine; Prolactin, rat; 125I tracer; Saline; Sodium bicarbonate; Sodium carbonate; Tris buffer; SC; Rat; 2001; 2ML1; 1 week; mp w/vehicle; peptides; replacement therapy (hypophysectomy).

P0981: A. Nilsson, *et al.* Effects of unilateral arterial infusion of GH and IGF-I on tibial longitudinal bone growth in hypophysectomized rats. *Calcif. Tissue Int* 1987;40(2):91-96

ALZET Comments: Growth hormone, human; Insulin-like growth factor I; Prolactin, ovine; Saline, heparinized; IA (femoral); Rat; 2002; 14 days; controls were untreated; mp connected to catheter in femoral artery; replacement therapy (hypophysectomy); local IA infusion; peptides.

P1151: A. Blanck, *et al.* Growth hormone modifies the growth rate of enzyme-altered hepatic foci in male rats treated according to the resistant hepatocyte model. *Carcinogenesis* 1987;8(11):1585-1588

ALZET Comments: Growth hormone, bovine; Prolactin, ovine; SC; Rat; 2001; 2002; 7, 20 days; controls received mp sized tubing; concomitant infusion of agents; 2001 replaced w/ 2002 after 7 days; 2-AAF suppl.; peptides; cancer.

P0885: S. W. Shyr, *et al.* Effect of neonatal prolactin deficiency on prepubertal tuberinfundibular and tuberohypophyseal dopaminergic neuronal activity. *Endocrinology* 1986;119(3):1217-1221

ALZET Comments: Prolactin, ovine; Saline; SC; Rat; 2001; 2-5 days; controls received mp w/saline; teratology; pumps implanted on postpartum day 2; half of mp group received bromocriptine treatment also; peptides.

P0771: N. L. Schlechter, *et al.* A direct growth effect of growth hormone in rat hindlimb shown by arterial infusion. *Am. J. Physiol* 1986;250(E231-E235)

ALZET Comments: Growth hormone, rat; Prolactin, ovine; Glycerol; Sodium azide; IA (superior vesicle); Rat; 2001; 7 days; replacement therapy (hypophysectomy); mp connected to catheter in superior vesicle artery; detailed description and diagram of catheter apparatus; constant and pulsed delivery of GH; peptides.

P0767: D. E. Mills, *et al.* Effect of prolactin on blood pressure and cardiovascular responsiveness in the rat. *Proc. Soc. Exp. Biol. Med* 1986;181(3-8)



ALZET Comments: Prolactin, ovine; Saline; IP; Rat; 2001; 7 days; dose-response (plasma levels); various doses of agent infused; oPRL half-life; peptides.

P0807: J. A. Joseph, *et al.* Reduction of motor behavioral deficits in senescent animals via chronic prolactin administration I. rotational behavior. *Neurobiol. Aging* 1986;7(1):31-35

ALZET Comments: Prolactin, rat; Saline; SC; Rat; 2001; 7 days; 6-OHDA lesions in left substantia nigra; peptides.

P0808: J. A. Joseph, *et al.* Reduction of motor behavioral deficits in senescent animals via chronic prolactin administration II. non-stereotypic behaviors. *Neurobiol. Aging* 1986;7(1):37-40

ALZET Comments: Prolactin, rat; Saline; SC; Rat; 2001; 7 days; peptides.

P0949: C. E. Grosvenor, *et al.* Effect of neonatal prolactin deficiency on prepubertal tuberoinfundibular and tuberohypophyseal dopaminergic neuronal activity. *Endocrinol. Exp* 1986;20(2/3):223-228

ALZET Comments: Prolactin, ovine; Saline; SC; Rat; 2001; 6 days; controls received mp w/saline; dose-response; peptides.

P0710: D. E. Mills, *et al.* Interaction of prolactin with adrenal hormones in blood pressure regulation in rats. *Am. J. Physiol* 1985;249(E614-E618)

ALZET Comments: Corticosterone; Epinephrine; Norepinephrine; Prolactin, ovine; Ethanol; Sodium chloride; Water; IP; Rat; 2001; 7 days; replacement therapy (adrenalectomy); separate and simultaneous infusion of agents; multiple pumps per animal (2) for CORT; hypertension; controls received mp w/NaCl; peptides.

P0639: C. C. W. Mick, *et al.* Prolactin directly stimulates the liver in vivo to secrete a factor (synlactin) which acts synergistically with the hormone. *Endocrinology* 1985;116(5):2049-2053

ALZET Comments: Growth hormone, ovine; Prolactin, ovine; Citric acid; Glycerol; IV (hepatic portal); IV (jugular); bird (pigeon); 2001; 1 week; comparison of agents effects; citric acid added to solvent for bacteriostatic effects; pulsed delivery of hormone or solvent (intermittent w/ air); peptides; tissue perfusion.

P0688: C. MacGeoch, *et al.* Hypothalamo-pituitary regulation of cytochrome P-450(15B) apoprotein levels in rat liver. *Endocrinology* 1985;117(5):2085-2092

ALZET Comments: Growth hormone, human; Growth hormone, rat; Prolactin, ovine; SC; Rat; 2001; 2ML1; 1 week; comparison of twice daily sc injec of rat GH vs. mp infusion; replacement therapy (hypophysysectomy); controls received sham mp made of silicone; tubing; peptides.

P0725: P. H. Jellinck, *et al.* Normal and recombinant human growth hormone administered by constant infusion feminize catechol estrogen formation by rat liver microsomes. *Endocrinology* 1985;117(2274-2278)

ALZET Comments: Growth hormone, human; Prolactin; Saline; SC; Rat; 2001; 5-7 days; peptides.

P0667: T. C. Dembinski, *et al.* Evidence for a novel pituitary factor that potentiates the mitogenic effect of estrogen in human breast cancer cells. *Cancer Res* 1985;45(7):3083-3089

ALZET Comments: Growth hormone, human; Growth hormone, ovine; Prolactin, ovine; mice; 49-56 days; comparison of daily sc injec. vs. mp infusion; comparison of agents effects; cancer; peptides.

P0573: D. G. Morgan, *et al.* Hyperprolactinemia fails to increase striatal dopamine receptors in male and female C57BL/6J mice. *Eur. J. Pharmacol* 1984;107(1):101-104

ALZET Comments: Prolactin, ovine; Saline; SC; mice; 2001; 1 week; comparison of homotypic anterior pituitary grafts vs. mp prolactin infusion; dose-response data; peptides.

P0460: T. Haaparanta, *et al.* Characterization and endocrine regulation of the cytochrome P-450 dependent microsomal hydroxylation of 5 α -androstane-3 β ,17 β -diol in the rat ventral prostate. *Endocrinology* 1984;114(6):2293-2300

ALZET Comments: Growth hormone, human; Prolactin, ovine; Sodium hydroxide; Saline; SC; Rat; 2001; 1 week; vehicle used w/PRL was saline & NaOH; saline used alone as vehicle w/hGH; peptides.



P0450: R. C. Baxter, *et al.* Rat growth hormone (GH) but not prolactin (PRL) induces both GH and PRL receptors in female rat liver. *Endocrinology* 1984;114(5):1893-1901

ALZET Comments: Growth hormone, ovine; Growth hormone, rat; Prolactin, ovine; Prolactin, rat; Sodium hydroxide; Saline; SC; Rat; 1 week; comparison of agents effects; peptides.

P0535: R. C. Baxter, *et al.* Induction of hepatic receptors for growth hormone (GH) and prolactin by GH infusion is sex independent. *Endocrinology* 1984;115(5):2009-2014

ALZET Comments: Growth hormone, rat; Prolactin, rat; SC; Rat; 1 week; comparison of agents effects; replacement therapy (hypophysectomy); peptides.

P0329: P. Levin, *et al.* Effect of aging on prolactin regulation of rat striatal dopamine receptor concentrations. *Life Sci* 1983;32(1743-1749

ALZET Comments: Prolactin, rat; Saline; SC; Rat; 2001; 1 week; peptides.

P0318: J. Herbert, *et al.* The effects of intraventricular prolactin infusions on pituitary responsiveness to thyrotropin-releasing hormone, 5-hydroxytryptophan or morphine in rhesus monkeys. *Brain Research* 1983;258(251-262

ALZET Comments: Prolactin, ovine; Albumin, bovine serum; CSF/CNS; monkey; 2ML1; 6 days; comparison of injec. vs mp infusion; peptides.

P0322: L. L. Ewing, *et al.* Effect of luteinizing hormone on Leydig cell structure and testosterone secretion. *Endocrinology* 1983;112(5):1763-1769

ALZET Comments: Follicle stimulating hormone; Growth hormone, ovine; Luteinizing hormone; Prolactin, ovine; Thyroid-stimulating hormone; Borate; Peanut oil; SC; Rat; 5 days; replacement therapy (hypophysectomy); simultaneous infusion of testosterone & estradiol implants w/ mp infusion of polypeptides; pulsed delivery of agents (intermittent w/ vehicle); peptides; ovine LH used.

P0230: P. Skett, *et al.* The effects of pituitary hormones on hepatic drug metabolism in the rat. *Acta Endocrinol* 1982;100(421-426

ALZET Comments: Follitropin, rat; Thyrotropin, rat; Growth hormone, human; Growth hormone, rat; Pituitary extract; Prolactin, rat; Saline; Water; SC; Rat; 1701; 6 days; organ replacement therapy (hypophysectomy); agents also injected - comparison of injec vs. mp infusion; peptides.

P0212: A. Pousette, *et al.* Influence of pituitary and adrenocortical hormones on prostatic secretion protein, a major protein in rat prostate. *The Prostate* 1982;3(109-114

ALZET Comments: Growth hormone, human; Growth hormone, rat; Prolactin, rat; Sodium hydroxide; Saline; SC; Rat; 2 weeks; replacement therapy (hypophysectomy); peptides.

P0215: G. Norstedt. A comparison between the effects of growth hormone on prolactin receptors and estrogen receptors in rat liver. *Endocrinology* 1982;110(6):2107-2112

ALZET Comments: Growth hormone, human; Growth hormone, rat; Prolactin, rat; Sodium hydroxide; Saline; SC; Rat; 1 week; organ replacement therapy (hypophysectomy); intermittent injections vs. infusion; peptides.

P0330: R. E. Hruska, *et al.* Prolactin increases the density of striatal dopamine receptors in normal and hypophysectomized male rats. *Life Sci* 1982;30(547-553

ALZET Comments: Prolactin, ovine; Saline; SC; Rat; 7-8 days; comparison of injec vs. mp infusion; peptides.

P0155: S. M. Shafie, *et al.* Role of hormones in the growth and regression of human breast cancer cells (MCF-7) transplanted into athymic nude mice. *J. Natl. Cancer Inst* 1981;67(1):51-56

ALZET Comments: Prolactin, ovine; Saline; IP; Mice (nude); no duration posted; replacement therapy (hypophysectomy); cancer; peptides.



P0118: G. Norstedt, *et al.* Multihormonal regulation of the estrogen receptor in rat liver. *Endocrinology* 1981;108(4):1190-1196

ALZET Comments: Growth hormone, bovine; Prolactin, bovine; Prolactin, ovine; Sodium hydroxide; Saline; SC; Rat; 7 days; comparison of agents; organ replacement therapy (hypophysectomy); separate infusion of all hormones & simultaneous infusion of oPRL & bGH (2 pumps/animal); peptides.

P0126: G. Norstedt, *et al.* Induction of prolactin receptors in rat liver after the administration of growth hormone. *Endocrinology* 1981;108(5):1855-1861

ALZET Comments: Growth hormone, human; Growth hormone, rat; Prolactin, ovine; Prolactin, rat; Sodium hydroxide; Saline; SC; Rat; 7 days; replacement therapy (hypophysectomy, adrenalectomy); peptides.

P0133: A. Mode, *et al.* Continuous infusion of growth hormone feminizes hepatic steroid metabolism in the rat. *Endocrinology* 1981;108(6):2103-2108

ALZET Comments: Growth hormone, human; Growth hormone, rat; Prolactin, rat; Sodium hydroxide; Saline; SC; Rat; 7 days; replacement therapy (hypophysectomy, adrenalectomy); peptides.

P0168: D. E. Mills, *et al.* Effects of prolactin administration and suppression on blood pressure and body fluid compartments in the rat. *Endocrinology* 1981;109(5):1590-1596

ALZET Comments: Lergotril mesylate; Prolactin, ovine; Vasopressin, 1-desamino-8-D arginine; Saline; IP; Rat; no duration posted; Exp. 1-3, 1701, 7 days: 1) saline, oPRL, & LM & oPRL simultaneously; 2 & 3) saline, oPRL, Vasopressin, 1-desamino-8-D arginine; 4) 2001, 7 days, saline, oPRL; peptides.

P0148: J.-A. Gustafsson, *et al.* Role of the hypothalamo-pituitary-liver axis in sex differences in susceptibility of the liver to toxic agents. *Environ. Health Perspect* 1981;38(129-141)

ALZET Comments: Growth hormone, human; Growth hormone, rat; Prolactin, rat; SC; Rat; 7 days; replacement therapy (hypophysectomy); toxicology; peptides.

R0046: P. Skett, *et al.* The effect of pituitary hormones on hepatic drug metabolism. In 'Biochemistry, Biophysics and Regulation of Cytochrome P-450,' J. -A. Gustafsson, J. Carlstedt-Duke, A. Mode, and J. Rafter (eds.), Elsevier/North-Holland, Amsterdam 1980;195-198

ALZET Comments: Enkephalin analog DADLE; Follicle stimulating hormone; Growth hormone, bovine; Growth hormone, rat; Pituitary extract; Prolactin, bovine; Prolactin, rat; Thyroid-stimulating hormone; Water; SC; Rat; 1701; 1 week; peptides.

P0071: B. D. Murphy, *et al.* Luteal function in mink: the effects of hypophysectomy after the preimplantation rise in progesterone. *Anim. Reprod. Sci* 1980;3(225-232)

ALZET Comments: Luteinizing hormone; Prolactin, bovine; Saline; IP; mink; 7 days; organ replacement therapy (hypophysectomy); peptides; ovine LH used.