



**Recent References (2010-Present) on the Administration of Prolactin
Using ALZET® Osmotic Pumps**

Q10625: K. C. Radecki, *et al.* Multiple Cell Types in the Oviduct Express the Prolactin Receptor. *FASEB BioAdvances* 2022;4(7):485-504

Agents: Prolactin, recombinant murine **Vehicle:** PBS, Dulbecco's; **Route:** SC; **Species:** Mice; **Pump:** 2001; **Duration:** 7 days; **ALZET Comments:** Dose (3 µg/h/mouse); animal info (Female C57BL6/J; 6 weeks old);

Q10603: S. Mellado, *et al.* Prolactin Reduces Hippocampal Parvalbumin and GABAA Receptor Expression in Female Mice. *Neuroendocrinology* 2022;112(8):796-806

Agents: Prolactin **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Dose (150 µg/day); 0.9% NaCl used; Controls received mp w/ vehicle; animal info (Adult; Female RjHan/NMRI mice; 2-3 months old); behavioral testing: Barnes maze; hyperprolactinemia

Q10476: V. S. Farrar, *et al.* Prolactin promotes parental responses and alters reproductive axis gene expression, but not courtship behaviors, in both sexes of a biparental bird. *Hormones and Behavior* 2022;144(105217)

Agents: Prolactin, ovine **Vehicle:** Saline; **Route:** SC; **Species:** Bird; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Dose: (3.33 µg/h, 80 µg/day); 0.87 % physiological saline used; Controls received mp w/ vehicle; animal info: Male & female ring-doves; Ovine prolactin aka (oPRL)

Q10494: S. Barbee, *et al.* A cautionary tale: Alien prolactins may induce lesser, no, or opposite effects to homologous hormone! *Journal of Neuroendocrinology* 2022;e13225

Agents: Prolactin, mouse recombinant **Vehicle:** PBS, Dulbecco's; **Route:** SC; **Species:** Mice; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Dose: 3 µg/h, 4 µg/h, 2.5 µg/h; Controls received mp w/ vehicle; animal info (Female; 6 weeks old);

Q9874: A. Zamora-Moratalla, *et al.* Prolactin enhances hippocampal synaptic plasticity in female mice of reproductive age. *Hippocampus* 2021;31(3):281-293

Agents: Prolactin **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Dose (150 µg/day); Controls received mp w/ vehicle; animal info (nulliparous female mice, 2-3 months old);

Q10136: L. I. Cere, *et al.* Induction of P-glycoprotein expression and activity by prolactin in female rat liver. *Life Sciences* 2021;287(119936)

Agents: Prolactin **Vehicle:** NaCl; Tris-HCl; **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Dose: Prolactin (300 µg/day); 0.9% NaCl vehicle used; Controls received mp w/ vehicle; animal info: Adult female Wistar (weighing 280–310 g); Prolactin aka (PRL); Actinomycin D aka (ActD) Bromocriptine is a dopamine receptor agonists

Q9492: T. Takeda, *et al.* Gestational dioxin exposure suppresses prolactin-stimulated nursing in lactating dam rats to impair development of postnatal offspring. *Biochemical Pharmacology* 2020;178(114106)

Agents: Prolactin **Vehicle:** Saline, sterile; **Route:** CSF/CNS (lateral ventricle); **Species:** Rat; **Pump:** 2002; **Duration:** 28 days;

ALZET Comments: Dose (400 ng/day); Controls received mp w/ vehicle; animal info (Male (10 wk, 280 ~ 320 g) and female (6–7 week, 160 ~ 220 g) Wistar rats); behavioral testing (Maternal Capacity Tests, Y-maze Test); ALZET brain infusion kit 2 used; Brain coordinates (antero-posterior, –1.0 mm and lateral, 1.0 mm from the bregma, and depth of 4 mm.); replacement therapy

Q8896: K. S. Lynch, *et al.* Examining the disconnect between prolactin and parental care in avian brood parasites. *Genes, Brain and Behaviour* 2020;19(7):e12653

Agents: Prolactin ovine **Vehicle:** Saline; **Route:** SC; **Species:** Bird; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (80 µg/day); 0.87% NaCl used; Controls received mp w/ vehicle; animal info (Female brown-headed and bronzed cowbirds); Ovine Prolactin aka Prolactin; replacement therapy (Prolactin);



Q9053: S. H. Yip, *et al.* Elevated Prolactin during Pregnancy Drives a Phenotypic Switch in Mouse Hypothalamic Dopaminergic Neurons. *Cell Reports* 2019;26(7):1787-1799 e5

Agents: Prolactin **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1003D; **Duration:** Not Stated;

ALZET Comments: Dose (1500 ug/day); Controls received mp w/ vehicle; animal info (20-25 g, 8-12 weeks old); dependence;

Q7373: K. S. Lynch, *et al.* Understanding the Loss of Maternal Care in Avian Brood Parasites Using Preoptic Area Transcriptome Comparisons in Brood Parasitic and Non-parasitic Blackbirds. *G3 (Bethesda)* 2019;9(4):1075-1084

Agents: Prolactin, ovine **Vehicle:** Sodium bicarbonate; **Route:** SC; **Species:** Bird (brown-headed cowbirds), bird (bronzed cowbirds), bird (red-winged); **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (80 ug/day); Controls received mp w/ vehicle;

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

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

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

Q7367: R. A. Augustine, *et al.* Impaired hypothalamic leptin sensitivity in pseudopregnant rats treated with chronic prolactin to mimic pregnancy. *J Neuroendocrinol* 2019;e12702

Agents: Ovine prolactin **Vehicle:** CSF, artificial; **Route:** IV; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Dose (2.5 ug/uL/hr); Controls received mp w/ vehicle; animal info (10 week old, female, SD);

Q8103: K. S. Lynch, *et al.* Losing maternal care: Neotenic gene expression in the preoptic area of avian brood parasites. *bioRxiv* 2018;

Agents: Prolactin **Vehicle:** Saline; **Route:** SC; **Species:** Cowbird; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (80 ug/day); 0.87% Saline used; Controls received mp w/ vehicle; dependence;

Q7798: E. A. de Los Rios, *et al.* Impaired prolactin actions mediate altered offspring metabolism induced by maternal high-fat feeding during lactation. *FASEB J* 2018;32(6):3457-3470

Agents: prolactin, ovine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat (lactating); **Pump:** Not Stated; **Duration:** 17 days;

ALZET Comments: Dose (0.16 mg/kg/d); Controls received sham surgery; animal info (female, Sprague-Dawley, 300-350g); comparison of oral administration of PRL in pups vs mp; replacement therapy (prolactin); pump model not stated although listed as a 28-day rate. pumps implanted from d4 to d21 of lactation.;

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

Agents: Prolactin, ovine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 28 days;

ALZET Comments: 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 2minutes." (P.57)

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

Agents: Progesterone; Prolactin **Vehicle:** Cyclodextrin, 2-hydroxypropyl-b; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: Dose (progesterone 250 µg/day; prolactin 7 µg/day); 20% (w/v) 2-hydroxypropyl-beta-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. *ASAIO Journal* 2017;19(1):93

Agents: Prolactin **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 28 days;

ALZET Comments: 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):

Agents: Prolactin **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 1003D; **Duration:** 3 days;

ALZET Comments: Dose (1500 µg/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

Agents: Prolactin **Vehicle:** PBS, Dulbecco's; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 28 days;

ALZET Comments: Dose (2.4 µg/day); Controls received mp w/ vehicle; animal info (Eight week-old C57BL6/J female mice);

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

Agents: Prolactin, recombinant mouse **Vehicle:** Albumin, mouse; **Route:** Not Stated; **Species:** Mice (NOD); **Pump:** 1004;

Duration: 3 weeks;

ALZET Comments: Controls received mp w/ vehicle; Controls received mp w/ vehicle; diabetes; Therapeutic indication (diabetes); Dose (2.7 ug/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

Agents: Prolactin, recombinant human; oligomer, splice-modulating **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice (NOD/SCID); **Pump:** Not Stated; **Duration:** 5 days; 25 days; 40 days;

ALZET Comments: 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

Agents: Prolactin, ovine **Vehicle:** PBS; BSA; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

ALZET Comments: 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. *Animal Science Journal* 2015;5(803-820

Agents: Prolactin **Vehicle:** Saline; **Route:** SC; **Species:** Cattle (pregnant); **Pump:** Not Stated; **Duration:** 28 days;

ALZET Comments: 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

Agents: Prolactin **Vehicle:** Saline; **Route:** Not Stated; **Species:** Mice (pregnant); **Pump:** Not Stated; **Duration:** 14 days;

ALZET Comments: 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

Agents: Prolactin, ovine **Vehicle:** Saline; sodium bicarbonate; **Route:** SC; **Species:** Bird (ring dove); **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: 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

Agents: Prolactin **Vehicle:** Saline; **Route:** SC; **Species:** Gerbil; **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: 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

Agents: Prolactin, mouse, recomb. **Vehicle:** Albumin, mouse serum; saline; **Route:** SC; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: 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

Agents: Prolactin, ovine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 6 days; 21 days;

ALZET Comments: 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

Agents: Prolactin, mouse, recomb **Vehicle:** BSA; saline, sterile; **Route:** CSF/CNS (hippocampus); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days; 28 days;

ALZET Comments: 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

Agents: Prolactin **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

ALZET Comments: 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

Agents: Prolactin, rat **Vehicle:** NaHCO₃; NaCl; **Route:** CSF/CNS; **Species:** Rat; **Pump:** Not Stated; **Duration:** 4 weeks;

ALZET Comments: Controls received mp w/ vehicle; animal info (Sprague Dawley, male, 224 g)