



References on the Administration of Agents to Birds Using ALZET® Osmotic Pumps

Canary

P6358: B. varez-Borda, *et al.* Timing of brain-derived neurotrophic factor exposure affects life expectancy of new neurons. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 2004;101(11):3957-3961

Agents: Brain-derived neurotrophic factor **Route:** CSF/CNS (high vocal center); **Species:** Bird (canary); **Pump:** 1007D;

Duration: 6 days;

ALZET Comments: 23 g guide cannula used; pumps implanted IP with an external catheter; infusion schematic p. 3958; external pump application

P4349: S. Rasika, *et al.* BDNF mediates the effects of testosterone on the survival of new neurons in an adult brain. Neuron 1999;22(1):53-62

Agents: Brain-derived neurotrophic factor; AB1513P, BDNF antibody- **Vehicle:** Saline; BSA;; **Route:** CSF/CNS (high vocal center); **Species:** Bird (canary); **Pump:** 1007D; **Duration:** 10 days;

ALZET Comments: Controls received mp with vehicle; peptides; flow rate of mp reduced by immersion in molten paraffin; recomb. human BDNF used; schematic of experimental model (p. 55); small bird

P2647: S. D. Brown, *et al.* Neurogenesis in adult canary telencephalon is independent of gonadal hormone levels. J. Neurosci 1993;13(5):2024-2032

Agents: Thymidine **Vehicle:** 3H tracer; Radio-isotopes; **Species:** Bird (canary); **Pump:** 1003D; **Duration:** 3 days;

ALZET Comments: "Constant infusion of thymidine rather than . . 'pulse' injections was chosen for its greater sensitivity."

Chicken/Hen

Q11078: A. Gurdita, *et al.* Development of a new surgical technique to infuse kynurenic acid to optic nerves in chickens for studying loss of myelination. Heliyon 2023;9(3):e14361

Agents: Kynurenic acid **Vehicle:** PBS; NaOH; **Route:** CSF/CNS (optic nerve); **Species:** Bird (chicken); **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: animal info (Chicks; 7 days old); post op. care: meloxicam, polysporine; functionality of mp verified by India ink (non-toxic dye); receptor antagonist (Glutamate); intrathecal catheter used;

Q9069: K. Shikano, *et al.* Neurosecretory Protein GL Induces Fat Accumulation in Chicks. Frontiers in Endocrinology 2019;10(392)

Agents: Neurosecretory Protein GL **Vehicle:** PEG; **Route:** CSF/CNS; **Species:** Bird (chicken); **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Dose (15 nmol/day); 30% PEG used; Controls received mp w/ vehicle; animal info (Male, Gallus domesticus, 1 day old); Brain coordinates (2.0mm rostral to lambda, 1.0mm lateral to midline, and 5.5mm ventral to the skull surface);

R0391: T. Coutant, *et al.* Advances in Therapeutics and Delayed Drug Release. Vet Clin North Am Exot Anim Pract 2019;22(3):501-520

Agents: Florfenicol voriconazole; fentanyl; amikacin **Vehicle:** Not Stated; **Route:** SC; in vitro; **Species:** Rat; Snake (corn, rattle); Iguana; Cat; Hamster; Gelada; Pudu; Wallaby; Monkey; Quail; Hen; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: "animal info (Eastern massasauga rattlesnakes (*Sistrurus catenatus*); timber rattlesnake (*Crotalus horridus*); pudu (*Pudu pudu*); wallaby (*Macropus rufogriseus*); iguanas (*Iguana iguana*); Mojave rattlesnakes (*Crotalus scutulatus*); corn snakes (*Elaphe guttata guttata*); Japanese quails (*Coturnix japonica*); hens (*Gallus domesticus*)); " Finally, the use of intracoelemic osmotic pumps was reported in iguanas (*Iguana iguana*) in a study of reproductive behavior.²⁶ No complication due to the pump placement was reported in that study." pg. 508; Advantages: Can be extracted in case of drug overdose or toxicity, Is not altered by its biological environment, Release the drug at a constant rate, Low cost, Commercially available, Release rate and operation time can be chosen; Drawbacks: Necessitate 2 light surgical procedures under anesthesia to be implanted and explanted, Can sometimes migrate in unwanted location (especially if implanted accidentally in air sacs during intracoelemic implantation) "



Q4144: K. Ukena, *et al.* Identification of a cDNA encoding a novel small secretory protein, neurosecretory protein GL, in the chicken hypothalamic infundibulum. *Biochemical and Biophysical Research Communications* 2014;446(298-303

Agents: Neurosecretory protein GL **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 3 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (male, Gallus domesticus, 8 days old); 30% propylene glycol

Q5534: C. M. Buffinton, *et al.* Stress and strain adaptation in load-dependent remodeling of the embryonic left ventricle. *Biomechanics and Modeling in Mechanobiology* 2013;12(5):1037-51

Agents: Verapamil **Vehicle:** Saline; **Route:** In vitro (egg); **Species:** Bird (chicken embryo); **Pump:** 2001; **Duration:** Not Stated;

ALZET Comments: Controls received mp w/ (saline); Dose (1 ng/μl);

Q2364: A. R. Pandiri, *et al.* Reversion to Subgroup J Avian Leukosis Virus Viremia in Seroconverted Adult Meat-Type Chickens Exposed to Chronic Stress by Adrenocorticotropin Treatment. *Basic & Clinical Pharmacology & Toxicology* 2012;56(3):578-582

Agents: Adrenocorticotropin, porcine **Vehicle:** Saline; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2ML2; **Duration:** 14 days;

ALZET Comments: Animal info (V-A+, V-A-, DOH, 32 wks old); wound clips used; post op. care (pine tar on surgical site to avoid cannibalism)

Q1011: K. L. Carzoli, *et al.* In vivo analysis of the role of metabotropic glutamate receptors in the afferent regulation of chick cochlear nucleus neurons. *Hearing Research* 2011;272(1-2):49-57

Agents: MCPG; AIDA; LY341495 **Vehicle:** Not Stated; **Route:** CSF/CNS (fourth ventricle); **Species:** Bird (chicken); **Pump:** Not Stated; **Duration:** 5 days; 6, 24 hours;

ALZET Comments: Controls received mp w/ vehicle; animal info (12-16 day old, Ross x Ross, male, female); MCPG also known as (RS)-α-Methyl-4-carboxyphenylglycine is a general metabotropic glutamate receptor antagonist; AIDA also known as (RS)-1-Aminoindan-1,5-dicarboxylic acid is a group I mGluR antagonist

P9987: H. C. Pedersen, *et al.* Behavioural effects of cadmium (Cd) in free-living willow ptarmigan (*Lagopus lagopus*). *EUROPEAN JOURNAL OF WILDLIFE RESEARCH* 2010;56(2):141-150

Agents: Cadmium chloride **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (hen); **Pump:** 2002; **Duration:** 23 days;

ALZET Comments: Controls received mp w/ physiological saline; pumps replaced after 13 days; animal info (willow, ptarmigan, adult, juvenile)

Q1687: K. A. Borley, *et al.* Phenylhydrazine-induced anemia causes nitric-oxide-mediated upregulation of the angiogenic pathway in *Notothenia coriiceps*. *Journal of Experimental Biology* 2010;213(16):2865-2872

Agents: Hydrazine, phenyl **Vehicle:** Ringer's solution, notothenioid; **Route:** IP; **Species:** Fish (*notothenia coriiceps*); **Pump:** 2ML1; **Duration:** 10 days;

ALZET Comments: Animal info (39-43 cm, 1000-1400g); "The fish responded remarkably well to the treatment with PHZ."

P9394: M. S. Byerly, *et al.* Effects of BDNF, T₃, and corticosterone on expression of the hypothalamic obesity gene network in vivo and in vitro. *American Journal of Physiology Regulatory, Integrative, and Comparable Physiology* 2009;296(4):R1180-R1189

Agents: Corticosterone; Triiodothyronine **Vehicle:** DMSO; Propylene glycol; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 72 hours;

ALZET Comments: Controls received mp w/ vehicle; animal info (male, 29 days old); 50% DMSO used; 50% propylene glycol

P8068: J. Cafaro, *et al.* Atoh1 expression defines activated progenitors and differentiating hair cells during avian hair cell regeneration. *Developmental Dynamics* 2007;236(1):156-170

Agents: Uridine, bromodeoxy- **Vehicle:** PBS; **Route:** Ear (perilymphatic fluid); **Species:** Bird (chicken); **Pump:** 2002; **Duration:** 8 days;

ALZET Comments: No stress (see p. 167); Alzet brain infusion kit used; animal info (White Legorn, 5-10 days old)

P7970: J. O. Mumma, *et al.* Physiological stress in laying hens. *POULTRY SCIENCE* 2006;85(4):761-769

Agents: ACTH **Vehicle:** Saline; **Route:** SC; **Species:** Bird (laying hens); **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (single comb, white leghorn, 36-65 weeks old)



P6983: C. A. Ruiz-Feria, *et al.* Do incremental increases in blood pressure elicit neointimal plaques through endothelial injury? American Journal of Physiology Regulatory, Integrative, and Comparable Physiology 2004;287(6):R1486-R1493

Agents: Propranolol **Vehicle:** Water, deionized distilled; **Route:** SC; **Species:** Bird (chicken); **Duration:** 4 weeks;

ALZET Comments: Controls received mp w/ vehicle; no stress (see pg. R1488); cardiovascular; antihypertensive

P7105: D. W. Roberson, *et al.* Direct transdifferentiation gives rise to the earliest new hair cells in regenerating avian auditory epithelium. Journal of Neuroscience Research 2004;78(4):461-471

Agents: Uridine, bromodeoxy-; **Route:** Ear (cochlea); **Species:** Bird (chicken); **Pump:** 2002; **Duration:** 3-11 days;

ALZET Comments: Controls received untreated contralateral ear; functionality of mp verified by (epithelial immunohistochemistry); stability verified by epithelial immunohistochemistry; tissue perfusion (cochlea)

P5334: D. L. Park, *et al.* Avian brainstem neurogenesis is stimulated during cochlear hair cell regeneration. Brain Research 2002;949(1-2):1-10

Agents: Thymidine **Vehicle:** ³H Tracer; Radio-isotopes; **Route:** IP; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 14 days;

ALZET Comments: Pumps replaced after 7 days

P5449: K. Kita, *et al.* Response of muscle protein synthesis to the infusion of insulin-like growth factor-I and fasting in young chickens. Asian Journal of Neurosurgery 2002;15(12):1760-1764

Agents: Insulin-like growth factor I **Vehicle:** Acetic acid; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001D; **Duration:** 1 day;

ALZET Comments: Functionality of mp verified by IGF-I plasma levels; recomb. chicken IGF-I used

P4990: J. D. Tankson, *et al.* Stress and nutritional quality of broilers. POULTRY SCIENCE 2001;80(1384-1389)

Agents: ACTH **Vehicle:** Saline, avian; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Controls received mp w/ vehicle; functionality of mp verified by blood corticosterone levels; peptides; ACTH is adrenocorticotropin

P4890: J. M. Planas, *et al.* Aldosterone mediates the changes in hexose transport induced by low sodium intake in chicken distal intestine. Journal of Physiology-London 2001;535(1):197-205

Agents: Aldosterone **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: functionality of mp verified by serum aldosterone, renin levels; dose-response (fig 1 col 7 p. 535.1)

Q6833: C. Garriga, *et al.* Aldosterone mediates the changes in hexose transport

induced by low sodium intake in chicken distal intestine. Journal of Physiology 2001;535(1):197-205

Agents: Aldosterone **Vehicle:** Propylene Glycol; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2002; **Duration:** Not Stated;

ALZET Comments: Dose (15 µg/kg/d); animal info (Male White Leghorn chickens);

P5768: S. Puvadolpirod, *et al.* Model of physiological stress in chickens 3. Temporal patterns of response. Poult Sci 2000;79(3):377-382

Agents: ACTH **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Peptides; chickens were 6 weeks old; ACTH is adrenocorticotropin

P4547: C. G. Scanes, *et al.* Influence of continuous growth hormone or insulin-like growth factor I administration in adult female chickens. General and Comparative Endocrinology 1999;114(315-323)

Agents: Growth hormone, chicken; Insulin-like growth factor I **Vehicle:** Saline; Albumin, bovine serum; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2ML2; **Duration:** 10 days;

ALZET Comments: Controls received mp w/vehicle; functionality of mp verified by plasma levels; peptides; recomb. chicken growth hormone used



P4075: D. Sedmera, *et al.* A quantitative study of the ventricular myoarchitecture in the stage 21-29 chick embryo following decreased loading. *European Journal of Morphology* 1998;36(2):105-119

Agents: Verapamil **Vehicle:** Saline; **Route:** In vitro (egg); extraembryonic vascular bed; **Species:** Bird (chicken embryo); **Pump:** 2001; **Duration:** 24, 48, 72 hours;

ALZET Comments: controls received mp w/vehicle; pump immersed in saline; teratology; cardiovascular

P4149: Y. T. King, *et al.* Chemical and physical characteristics of chicken livers following adrenocorticotrophic hormone-induced stress. *J. Food Sci* 1998;63(4):589-591

Agents: ACTH, porcine **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (chicken); **Pump:** 1003D; **Duration:** 24,48 hours;

ALZET Comments: Peptides

P3229: S. M. Czerwinski, *et al.* The effect of insulin-like growth factor-1 (IGF-1) on protein turnover in the meat-type chicken (*Gallus domesticus*). *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology* 1998;119C(1):75-80

Agents: Insulin-like growth factor I **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 5 days;

ALZET Comments: Controls received mp w/saline; no stress (see pg. 75); peptides; recomb. chicken IGF-I used

P3626: G. S. G. Spencer, *et al.* Effect of recombinant human insulin-like growth factor-II on weight gain and body composition of broiler chickens. *Poult. Sci* 1996;75(388-392)

Agents: Insulin-like growth factor II; **Species:** Bird (chicken); **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: Controls received mp w/ saline; peptides; recomb. human IGF-II used

P3505: D. W. Roberson, *et al.* Light microscopic evidence that direct transdifferentiation gives rise to new hair cells in regenerating avian auditory epithelium. *Audiology & Neurotology* 1996;2(195-205)

Agents: Thymidine **Vehicle:** Radio-isotopes; ³H tracer; **Route:** Ear (cochlea); **Species:** Bird (chicken); **Pump:** 2002; **Duration:** 5,12 days; 26,30 hours;

ALZET Comments: Tissue perfusion (cochlea); ALZET brain infusion kit used

P3608: M. A. Latour, *et al.* Continuous infusion of adrenocorticotropin elevates circulating lipoprotein cholesterol and corticosterone concentrations in chickens. *Poult. Sci* 1996;75(1428-1432)

Agents: ACTH **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2002; **Duration:** Not Stated;

ALZET Comments: Controls received no treatment of mp w/ saline; peptides

P2805: H. S. Keirstead, *et al.* Axonal regeneration and physiological activity following transection and immunological disruption of myelin within the hatchling chick spinal cord. *J. Neurosci* 1995;15(10):6963-6974

Agents: Serum, complement proteins, guinea pig; Antibody, IgG GalC polyclonal; Antibody, IgM 04 polyclonal **Vehicle:** PBS; **Route:** CSF/CNS (intrathecal); **Species:** Bird (chicken); **Pump:** 2ML2; 1007D; **Duration:** 5,12,14 days;

ALZET Comments: Controls received guinea pig serum only, antibodies only, or PBS only; immunology; antibodies are myelin/oligodendrocyte-specific, complement-binding;

P3308: G. E. Hyde, *et al.* Mitochondrial role in hair cell survival after injury. *Otolaryngol Head Neck Surg* 1995;113(5):530-540

Agents: Chloramphenicol **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (chicken); **Pump:** Not Stated; **Duration:** 24 hours;

ALZET Comments: Antibiotic; immunology

P3277: F. M. McCorkle, *et al.* Continuous administration of dopamine alters cellular immunity in chickens. *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology* 1994;109C(3):289-293

Agents: Dopamine **Vehicle:** Saline, acidified; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 24,48,72 hours;

ALZET Comments: Controls received mp w/saline; immunology

P2612: F. M. McCorkle, *et al.* Biogenic amines regulate avian immunity. *Poult. Sci* 1993;72(1285-1288)

Agents: Epinephrine; Norepinephrine; **Vehicle:** Saline; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 24,48,72 hrs

ALZET Comments: Controls received mp w/ vehicle; immunology



P3217: R. S. Janzer, *et al.* Astrocytes secrete a factor inducing the expression of HT7-protein and neurothelin in endothelial cells of chorioallantoic vessels. *Advances in Experimental Medicine and Biology* 1993;331(217-221

Agents: Medium, astrocyte conditioned- **Vehicle:** Not Stated; **Route:** In vitro (egg); chorioallantoic membrane; **Species:** Bird (chicken embryo); **Pump:** 2002; **Duration:** 5 days;

ALZET Comments: Controls received mp with PBS; gelfoam placed on chorioallantoic membrane; mp connected to gelfoam with PE tubing; mp kept in saline

P3126: M. Tixier-Boichard, *et al.* Effects of insulin-like growth factor-I (IGF-I) infusion and dietary tri-iodothyronine (T3) supplementation on growth, body composition and plasma hormone levels in sex-linked dwarf mutant and normal chickens. *J. Endocrinol* 1992;133(101-110

Agents: Insulin-like growth factor I **Vehicle:** Acetic acid; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; 2002; **Duration:** 28 days;

ALZET Comments: Functionality of mp verified by plasma levels; replacement therapy; pumps replaced; peptides; normal and dwarf chicks used; recomb. human IGF-1 used

P3206: K. M. McCormick, *et al.* Mechanisms of nascent fiber formation during avian skeletal muscle hypertrophy. *Developmental Biology* 1992;150(319-334

Agents: Uridine, bromodeoxy- **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2ML1; **Duration:** Not Stated;

ALZET Comments: Pumps implanted in inguinal region

Q0611: J. A. Lobrinus, *et al.* Induction of the blood-brain barrier specific HT7 and neurothelin epitopes in endothelial cells of the chick chorioallantoic vessels by a soluble factor derived from astrocytes. *Brain Research* 1992;70(207-211

Agents: Medium, astrocyte conditioned- **Vehicle:** Not Stated; **Route:** In vitro (egg); chorioallantoic membrane; **Species:** Bird (chicken embryo); **Pump:** 2004; **Duration:** 5 days;

ALZET Comments: Schematic diagram of the experiment with ALZET pump, fig. 1; mp connected to gelfoam with PE tubing; mp kept in saline

P2320: L. M. Huybrechts, *et al.* Effect of recombinant human insulin-like growth factor-1 on weight gain, fat content, and hormonal parameters in broiler chickens. *Poult. Sci* 1992;71(181-187

Agents: Insulin-like growth factor I **Vehicle:** Sodium chloride; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: controls received mp w/ saline; good discussion of pulsatile vs. constant infusion effects with GH (pg.185); recomb. bovine IGF-1 used

P2418: J. R. Roberts. Effects of water deprivation on renal function and plasma arginine vasotocin in the feral chicken, *Gallus* (Phasianidae). *Australian Journal of Zoology* 1991;39(439-446

Agents: EDTA **Vehicle:** 51Cr tracer; Radio-isotopes; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 5 days;

ALZET Comments: No stress (see p. 440-441); pumps used to measure GFR by EDTA clearance; good discussion of advantages of pump use in this experimental method

P2032: J. N. Petite, *et al.* Daily infusion of corticosterone and reproductive function in the domestic hen (*Gallus domesticus*). *Gen. Comp. Endocrinol* 1991;83(3):397-405

Agents: Corticosterone **Vehicle:** PEG 400; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2ML2; 2ML4; **Duration:** 14 days;

ALZET Comments: Dose-response; pulsed delivery achieved by externalizing PE-60 catheter from pump. Catheter could be disconnected at will for intermittent delivery: 10 hr on/14 hr off, 4 hr on/20 hr off, 24 hr on/0 hr off (pg 398-399)

P1954: E. B. Clark, *et al.* Effect of chronic verapamil treatment on ventricular function and growth in chick embryos. *American Journal of Physiology Heart and Circulatory Physiology* 1991;261(H166-H171

Agents: Verapamil **Vehicle:** Not Stated; **Route:** In vitro (egg); **Species:** Bird (chicken embryo, extraembryonic vascular bed);

Pump: Not Stated; **Duration:** Not Stated;

ALZET Comments: En ovo, schematic p. H167



P1528: C. G. Scanes, *et al.* In vivo effects of biosynthetic chicken growth hormone in broiler-strain chickens. *Growth, Development, and Aging* 1990;54(95-101

Agents: Growth hormone, chicken **Vehicle:** Albumin, bovine serum; Saline; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2ML4; **Duration:** 3 weeks;

ALZET Comments: Pumps were siliconized (probably using Prosil) to decrease protein binding in pumps

P1684: F. M. McCorkle, *et al.* Continuous administration of 5-hydroxytryptamine alters cellular immunity in chickens. *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology* 1989;94C(2):511-514

Agents: Serotonin **Vehicle:** Saline, acidified; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2001; **Duration:** 24, 48, 72 hours;

ALZET Comments: Immunology; saline at pH 4.0, 3 doses infused

P1552: P. J. Linser, *et al.* A role for carbonic anhydrase in early eye morphogenesis. *Investigative Ophthalmology & Visual Science*, 1989;30(4):783-785

Agents: Methazolamide **Vehicle:** Tyrode's solution; **Route:** Eye; in vitro (egg, eye); **Species:** Bird (chicken embryo); **Pump:** 2001; **Duration:** 3 days;

ALZET Comments: comparison of topical dosing vs. mp infusion; tissue perfusion

P1301: G. F. Seran, *et al.* Metabolism of methadone by chicken embryos prevents induction of chronic opioid-type dependence after a single injection: use of osmotic pumps for continuous infusion. *Pharmacology Biochemistry and Behavior* 1988;30(2):357-363

Agents: Methadol, N-desmethyl-1-acetyl; Methadone; Radio-isotopes **Vehicle:** 3H tracer; Propylene glycol; Saline; Water; **Route:** In vitro (egg); **Species:** Bird (chicken embryo); **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: pump delivered to chicken egg via catheter; pump extracorporeal; comparison of a single injection vs. mp infusion

P1265: R. B. Jones, *et al.* Tonic immobility and Heterophil/lymphocyte responses of the domestic fowl to corticosterone infusion. *Physiology & Behavior* 1988;42(3):249-253

Agents: Corticosterone **Vehicle:** PEG 400; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2ML2; **Duration:** 11 days;

ALZET Comments: controls received mp w/vehicle; dose-response; functionality of mp verified by previous studies

P7962: J. T. Corwin, *et al.* Regeneration of Sensory Hair Cells after Acoustic Trauma. *Science* 1988;240(4860):1772-1774

Agents: Thymidine **Vehicle:** 3H tracer; radio-isotopes; **Route:** SC; **Species:** Bird (chicken); **Pump:** Not Stated; **Duration:** 7-10 days;

ALZET Comments: Comparison of IM injections vs. mp; multiple pumps per animal (2); animal info (white, leghorn, 9-13 days old)

P1595: A. Brenes, *et al.* Effect of continuous infusion of glucagon on abdominal fat content in chickens. *Archives of Toxicology* 1988;38(140):59-71

Agents: Glucagon **Vehicle:** Glycerol; Phenol; **Route:** SC; **Species:** Bird (chicken); **Pump:** Not Stated; **Duration:** 2 weeks;

ALZET Comments: 2 different doses; English with Spanish abstract

P1139: T. M. John, *et al.* Influence of corticosterone infusion on plasma levels of catecholamines, thyroid hormones, and certain metabolites in laying hens. *Poultry Science* 1987;66(6):1059-1063

Agents: Corticosterone **Vehicle:** PEG 400; **Route:** SC; **Species:** Bird (chicken); **Pump:** Not Stated; **Duration:** 14, 28 days;

ALZET Comments: Pump model not stated; controls received mp w/ vehicle

P1107: B. R. Grubb, *et al.* Aldosterone-induced, amiloride-inhibitable short-circuit current in the avian ileum. *American Journal of Physiology Gastrointestinal and Liver Physiology* 1987;253(G211-G216

Agents: Aldosterone **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2ML4; **Duration:** 2 weeks;

ALZET Comments: Dose-response (text); comparison of single injection vs. mp infusion; vehicle for Aldosterone not specified



P1029: F. C. Buonomo, *et al.* Effects of somatostatin immunoneutralization on growth and endocrine parameters in chickens. Domestic Animal Endocrinology 1987;4(3):191-200

Agents: Antibody, somatostatin **Vehicle:** Saline; Serum, goat; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Controls received mp w/ saline or goat serum; comparison of bolus inject. vs. IV inject. vs. mp infusion; immunology; peptides

P1202: P. C. Powell, *et al.* Induction of Marek's disease in vaccinated chickens by treatment with betamethasone or corticosterone. Isr. J. Vet. Med 1986;42(2):73-78

Agents: Corticosterone **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (chicken); **Pump:** Not Stated; **Duration:** 14 days;

ALZET Comments: Pump model not stated; controls received saline injections; concomitant cyclophosphamide injections; immunology

P0737: T. F. Davison, *et al.* Effects of continuous treatment with synthetic ACTH(1-24) or corticosterone on immature Gallus domesticus. General and Comparative Endocrinology 1985;59(4):416-423

Agents: ACTH (1-24) **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (chicken); **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: Comparison of implantable corticosterone pellets vs. mp infusion of ACTH; peptides

P0188: R. M. Weppelman, *et al.* Antifertility effects of clonidine in laying hens. Cellular and Molecular Life Sciences 1981;37(9):95-997

Agents: Clonidine **Vehicle:** HCl; Sodium phosphate; **Route:** SC; **Species:** Bird (chicken); **Pump:** 1701; **Duration:** 7 days;

ALZET Comments: Antihypertensive

P1240: P. R. Waggoner, *et al.* Method for long term delivery of soluble agents to the chick chorioallantoic membrane. Cellular and Molecular Life Sciences 1981;37(3):321-322

Agents: Thyroxine, I- **Vehicle:** Not Stated; **Route:** In vitro (egg); chorioallantoic membrane; **Species:** Bird (chicken embryo); **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: mp placed in small test tube filled w/ water and then sealed w/ parafilm; mp connected to catheter that bathed the chorioallantoic membrane

Cowbird

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 (cowbird); **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);

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 µg/day); Controls received mp w/ vehicle;

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:** Bird (cowbird); **Pump:** 1007D; **Duration:** 7 days;

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



Dove

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 (dove); **Pump:** 2001; **Duration:** 7 days;

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

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);

Pigeon

P8176: A. Radeloff, *et al.* Brain-derived neurotrophic factor treatment does not improve functional recovery after hair cell regeneration in the pigeon. *Acta Otolaryngologica* 2006;126(5):452-459

Agents: Brain-derived neurotrophic factor, recomb. human **Vehicle:** PBS; Albumin, chicken; Hank's solution; **Route:** Ear (scala tympani); **Species:** Bird (pigeon); **Pump:** 2002; **Duration:** 8 weeks;

ALZET Comments: Controls received mp w/ vehicle or no treatment to contralateral ear; long-term study; pumps replaced every 14 days; ALZET brain infusion kit used; peptides; animal info (Columba livia, 6 months old, 320-580 grams); deafening of both ears; tissue perfusion (scala tympani)

P4889: L. Fusani, *et al.* Aromatase inhibition reduces specifically one display of the ring dove courtship behavior. *General and Comparative Endocrinology* 2001;122(23-30)

Agents: Fadrozole **Vehicle:** Saline; **Route:** SC; **Species:** Bird (pigeon); **Pump:** 1007D; **Duration:** 6 days;

ALZET Comments: controls received mp w/ vehicle; functionality of mp verified by plasma androgen and estrogen levels, residual volume; enzyme inhibitor; fadrozole is a non-steroidal aromatase inhibitor; plasma androstenedione, 5 α -dihydrotestosterone, testosterone, estrone, 17 β -estradiol level. Aromatase operates on these compounds, indicates activity.

P4246: I. Giladi, *et al.* Renal function and plasma levels of arginine vasotocin during free flight in pigeons. *J. Exp. Biol* 1997;200(3203-3211)

Agents: PEG **Vehicle:** ³H tracer; Radio-isotopes; **Route:** IP; **Species:** Bird (pigeon); **Pump:** 1007D; 2001; **Duration:** 7 days;

ALZET Comments: no comment posted

P1061: F. Ramade, *et al.* Persistence of the acquisition of an endocrine response... *C. R. Soc. Biol* 1986;180(5):538-544

Agents: Muscimol **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Bird (pigeon); **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: Pump model not stated; controls received mp w/saline; paper written in French w/English summary

P1028: F. Ramade, *et al.* Effects of chronic intracerebroventricular GABAergic treatment on basal and chronic or acute stress-induced adrenocortical activities in the thalamic pigeon. *Neuroendocrinology* 1986;44(408-414)

Agents: Muscimol **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Bird (pigeon); **Pump:** 2ML4; **Duration:** 28 days;

ALZET Comments: Controls received mp w/vehicle; mp connected to cannula inserted in ventricle; comparison of iv injection vs. mp infusion

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

Agents: Growth hormone, ovine; Prolactin, ovine **Vehicle:** Citric acid; Glycerol; **Route:** IV (hepatic portal); IV (jugular); **Species:** Bird (pigeon); **Pump:** 2001; **Duration:** 1 week;

ALZET Comments: Comparison of agents effects; citric acid added to solvent for bacteriostatic effects; pulsed delivery of hormone or solvent (intermittent w/ air); peptides; tissue perfusion



Quail

R0391: T. Coutant, *et al.* Advances in Therapeutics and Delayed Drug Release. Vet Clin North Am Exot Anim Pract 2019;22(3):501-520

Agents: Florfenicol voriconazole; fentanyl; amikacin **Route:** SC; in vitro; **Species:** Rat; Snake (corn, rattle); Iguana; Cat; Hamster; Gelada; Pudu; Wallaby; Monkey; Quail; Hen;

ALZET Comments: "Finally, the use of intracoelomic osmotic pumps was reported in iguanas (Iguana iguana) in a study of reproductive behavior.²⁶ No complication due to the pump placement was reported in that study." pg. 508; Advantages: Can be extracted in case of drug overdose or toxicity, Is not altered by its biological environment, Release the drug at a constant rate, Low cost, Commercially available, Release rate and operation time can be chosen; Drawbacks: Necessitate 2 light surgical procedures under anesthesia to be implanted and explanted, Can sometimes migrate in unwanted location (especially if implanted accidentally in air sacs during intracoelomic implantation) "

Q0927: N. Nakao, *et al.* Thyrotrophin in the pars tuberalis triggers photoperiodic response. Nature 2008;452(7185):317-3U1

Agents: Thyrotrophin, bovine **Route:** CSF/CNS (third ventricle); **Species:** Bird (quail); **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Animal info (C. japonica)

P7523: T. Ubuka, *et al.* Gonadotropin-inhibitory hormone inhibits gonadal development and maintenance by decreasing gonadotropin synthesis and release in male quail. Endocrinology 2006;147(3):1187-1194

Agents: Gonadotrophin-inhibitory hormone **Vehicle:** Saline; **Route:** IP; **Species:** Bird (quail); **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Controls received mp w/ vehicle; dose-response (fig. 1); comparison of SC injections vs. mp; peptides; animal info (male, 3 month old)

P7710: M. Lohmus, *et al.* Chronic administration of leptin in Asian Blue Quail. Journal of Experimental Zoology Part A-Comparative Experimental Biology 2006;305A(1):13-22

Agents: Leptin, recomb. chicken **Vehicle:** PBS; **Route:** SC; **Species:** Bird (quail); **Pump:** 1002; **Duration:** 14 days;

ALZET Comments: Controls received mp w/ vehicle; functionality of mp verified by residual volume at 3 time points; peptides; animal info (male, asian blue quail, 50 g, young)

P7100: M. Lohmus, *et al.* Leptin increases T-cell immune response in birds. General and Comparative Endocrinology 2004;139(3):245-250

Agents: Leptin, recomb. chicken **Vehicle:** PBS; **Route:** SC; **Species:** Bird (quail); **Pump:** 1002; **Duration:** 2 weeks;

ALZET Comments: Controls received mp w/ vehicle; peptides; asian blue quail

P5986: T. Yoshimura, *et al.* Light-induced hormone conversion of T(4) to T(3) regulates photoperiodic response of gonads in birds. Nature 2003;426(6963):178-181

Agents: Thyroxine; Iopanoic Acid; Triiodothyronine **Vehicle:** NaCl; NaOH (sodium hydroxide); HCl; **Route:** CSF/CNS; **Species:** Bird (quail); **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: ALZET brain infusion kit used; placement & patency of canula verified by injecting Evans blue dye

P8154: J. E. Girling, *et al.* Administration of pregnant mare serum gonadotropin to Japanese quail (*Coturnix coturnix japonica*): dose response over seven days and comparison of delivery by daily injection or osmotic pump. NZ Vet J 2002;50(3):115-121

Agents: Gonadotropin, pregnant mare serum **Vehicle:** Saline; **Route:** SC; **Species:** Bird (quail); **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: Controls received mp w/ vehicle; dose-response (fig. 1); comparison of daily SC injections vs. mp; peptides; post op. care (Bactroban); animal info (Japanese, 6 weeks old, female); 41 C body temperature, endocrinology

P3962: S. Wakabayashi, *et al.* Hormonal induction of ovulation and oviposition in Japanese quail kept under a short-day regimen. Poult. Avian Biol. Rev 1996;7(4):183-192

Agents: Gonadotrophin, pregnant mare serum; Pituitary glycoprotein fraction **Vehicle:** Saline; **Route:** Intramuscular; **Species:** Bird (quail); **Pump:** 2001; 2002; **Duration:** 7, 14 days;

ALZET Comments: Replacement therapy (hypophysectomy); comparison of IP injections vs. mp



P2796: D. L. Goldstein. Effects of water restriction during growth and adulthood on renal function of bobwhite quail, *Colinus virginianus*. *J. Comp. Physiol. B* 1995;164(663-670

Agents: PEG **Vehicle:** Saline; Radio-isotopes; ³H tracer; **Route:** IP; **Species:** Bird (quail); **Pump:** 2002; **Duration:** Not Stated; **ALZET Comments:** no comment posted

P2165: S. Wakabayashi, *et al.* Induction of ovarian growth and ovulation by administration of a chicken gonadotrophin preparation to Japanese quail kept under a short-day regimen. *British Journal of Pharmacology* 1992;33(847-858

Agents: Pituitary glycoprotein fraction **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Bird (quail); **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Comparison of IM injections vs. mp; injections were ineffective in maintaining high plasma LH, which was achieved by continuous pump infusion

Sparrow

Q9803: K. E. Miller, *et al.* Brain-Derived Neurotrophic Factor Has a Transsynaptic Trophic Effect on Neural Activity in an Adult Forebrain Circuit. *Journal of Neuroscience* 2020;40(6):1226-1231

Agents: Recombinant Brain Derived Neurotrophic Factor **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Bird (sparrow); **Pump:** 1002D; **Duration:** 14 days;

ALZET Comments: Dose (30 ug/ml); Controls received mp w/ vehicle; animal info (Sparrow, Male); Recombinant Brain Derived Neurotrophic Factor aka Recombinant BDNF ; dental cement used; dependence;

Q5773: R. E. Cohen, *et al.* Adult Neurogenesis Leads to the Functional Reconstruction of a Telencephalic Neural Circuit. *J Neurosci* 2016;36(34):8947-56

Agents: Uridine, Bromodeoxy **Vehicle:** Saline, DMSO; **Route:** SC; **Species:** bird (sparrow); **Pump:** 1007D; **Duration:** 5 days;

ALZET Comments: Controls received mp w/ vehicle; animal info; 7.5% NaCl and 15% DMSO used; Therapeutic indication (Neurogenesis, plasticity); Dose (50 mg/kg);

Q3956: T. A. Larson, *et al.* Reactive Neurogenesis in Response to Naturally Occurring Apoptosis in an Adult Brain. *Journal of Neuroscience* 2014;34(13066-13076

Agents: Z-VAD-FMK; Z-DEVD-FMK; Z-LEHD-FMK **Vehicle:** DMSO; **Route:** CSF/CNS (HVC); **Species:** Bird (sparrow); **Pump:** 1007D; **Duration:** 5 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (male, Gambel's white-crowned sparrows, adult); 1% DMSO used; behavioral testing (song behavior); tissue perfusion (control nucleus HVC); Cannula placement verified via histologic analysis; "We placed osmotic pumps into sealed microcentrifuge tubes filled with saline and mounted the tubes into custom-made "backpacks" that allowed the birds to fly freely." pg 13067; enzyme inhibitor (caspase-3, caspase-9, pan-caspase); bilateral infusion; used dental cement;

Q2968: T. A. Larson, *et al.* Postsynaptic neural activity regulates neuronal addition in the adult avian song control system. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA* 2013;110(41):16640-16644

Agents: Muscimol **Vehicle:** NaCl; DMSO; PEG; water; **Route:** SC; **Species:** Bird (sparrow); **Pump:** 1002; **Duration:** Not Stated;

ALZET Comments: ALZET brain infusion kit used; neurodegenerative (neuroplasticity); muscimol is a GABA receptor agonist; 15%DMSO, 60%PEG used; animal info (songbird);

Q1876: S. A. Heimovics, *et al.* Rapid and Widespread Effects of 17-beta-Estradiol on Intracellular Signaling in the Male Songbird Brain: A Seasonal Comparison. *Endocrinology* 2012;153(3):1364-1376

Agents: Fadrozole **Vehicle:** Saline, avian; **Route:** SC; **Species:** Bird (song sparrow); **Pump:** 1002; **Duration:** 14 days;

ALZET Comments: animal info (Song Sparrow, male); enzyme inhibitor (aromatase)



P9516: A. M. Wissman, *et al.* The Role of Neurotrophins in the Seasonal-Like Growth of the Avian Song Control System. *Journal of Neuroscience* 2009;29(20):6461-6471

Agents: TrkB-Fc; TrkC-Fc; brain-derived neurotrophic factor; nerve growth factor **Vehicle:** PBS; **Route:** CSF/CNS (robust nucleus of the arcopallium); **Species:** Bird (Gambel's white crowned sparrow); **Pump:** 1002; **Duration:** Not Stated;
ALZET Comments: Controls received mp w/ vehicle; functionality of mp verified by residual volume; ALZET brain infusion kit 2

P9808: C. K. Thompson, *et al.* Neurogenesis in an Adult Avian Song Nucleus Is Reduced by Decreasing Caspase-Mediated Apoptosis. *Journal of Neuroscience* 2009;29(14):4586-4591

Agents: Z-VAD-FMK; Z-DEVD-FMK; Z-LEHD-FMK **Vehicle:** DMSO; **Route:** CSF/CNS (telencephalon); **Species:** Bird (sparrow); **Pump:** 1002;
ALZET Comments: Negative controls received mp w/ Z-FA-FMK; animal info (10 months old, male, Gambels white crowned); 1% DMSO used; used "custom-made backpacks"; pumps replaced after 11 days; brain tissue distribution

Q0204: B. M. Horton, *et al.* Corticosterone manipulations alter morph-specific nestling provisioning behavior in male white-throated sparrows, *Zonotrichia albicollis*. *Hormones and Behavior* 2009;56(5):510-518

Agents: RU-486 **Vehicle:** PEG; **Route:** IP; **Species:** Bird (sparrow); **Pump:** 1007D; **Duration:** Not Stated;
ALZET Comments: Controls received mp w/ vehicle; animal info (captive, white-throated, male);

P9690: C. K. Thompson, *et al.* Caspase inhibitor infusion protects an avian song control circuit from seasonal-like neurodegeneration. *Journal of Neuroscience* 2008;28(28):7130-7136

Agents: Z-VAD; Z-DEVD-FMK; Z-LEHD; Z-FA-FMK **Vehicle:** DMSO; **Route:** CSF/CNS (telencephalon); **Species:** Bird (sparrow); **Pump:** Not Stated; **Duration:** 1, 3, 7 days;
ALZET Comments: Negative controls received mp w/ Z-FA-FMK; good methods (pg 3); animal info (white-crowned, male); 1% DMSO used; pumps externalized via backpack; brain tissue distribution

P8640: J. Meitzen, *et al.* Steroid hormones act transsynaptically within the Forebrain to regulate neuronal phenotype and song stereotypy. *Journal of Neuroscience* 2007;27(44):12045-12057

Agents: Dihydrotestosterone; ICI-182,780; estradiol, 17B-; flutamide **Vehicle:** DMSO; PEG 300; propanediol, 1, 2-; **Route:** SC; CSF/CNS (HVC); CSF/CNS (robust nucleus arcopallium); **Species:** Bird (sparrow); **Pump:** 1007D; 1002; **Duration:** 14, 21 days;
ALZET Comments: Controls received mp w/ vehicle; pumps replaced after 14 days; cyanoacrylate adhesive; animal info (male, Gambel's white crowned, adult); HVC is the proper name for the telencephalic song nucleus; mp placed in custom built backpack strapped to bird's back w/harness made from surgical dressing, and a microcentrifuge tube; "pilot experiments showed that this arrangement kept the pump at its proper operating temperature (37°C), and that the pump retained saline throughout the entire release period." (p. 12047); ICI-182,780 is also known as faslodex

P7340: C. K. Thompson, *et al.* Seasonal change in neuron size and spacing but not neuronal recruitment in a basal ganglia nucleus in the avian song control system. *Journal of Comparative Neurology* 2005;481(276-283

Agents: Thymidine, [3H] **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (song sparrow); **Pump:** 1007D; **Duration:** 7 days;
ALZET Comments:

P6397: K. K. Soma, *et al.* Estrogen contributes to seasonal plasticity of the adult avian song control system. *Journal of Neurobiology* 2004;58(3):413-422

Agents: Fadrozole **Vehicle:** Saline; **Route:** SC; **Species:** Bird (song sparrow); **Pump:** 1002; **Duration:** 2 weeks;
ALZET Comments: Controls received mp w/ vehicle; enzyme inhibitor (aromatase); the pumps had a changed infusion rate of 0.31 ul/hr with the 41 degree Celsius temperature; ALZET pump was implanted using topical analgesics (4% lidocaine); skin sealed with adhesive and sutures

P2212: D. L. Goldstein, *et al.* Daily rhythms in rates of glomerular filtration and cloacal excretion in captive and wild song sparrows (*melospiza melodia*). *Physiol. Zoology* 1993;66(5):708-719

Agents: PEG **Vehicle:** Radio-isotopes; 3H tracer; **Route:** IP; **Species:** Bird (sparrow); **Pump:** 1003D; 1007D; **Duration:** 3,5,7 days;
ALZET Comments: no comment posted



Turkey

P5806: P. E. Mozdziak, *et al.* The effect of early posthatch nutrition on satellite cell mitotic activity. *POULTRY SCIENCE* 2002;81(11):1703-1708

Agents: Uridine, bromodeoxy- **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (turkey); **Pump:** 1003D; 2001; **Duration:** 3,7 days; **ALZET Comments:** Turkeys were implanted with pumps 1-2 days post hatching eggs; muscle cell labeling

P3949: P. E. Mozdziak, *et al.* Myonuclear accretion is a major determinant of avian skeletal muscle growth. *American Journal of Physiology Cell Physiology* 1997;272(C565-C571)

Agents: Uridine, bromodeoxy- **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (turkey); **Pump:** 2ML1; **Duration:** 1 week; **ALZET Comments:**

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. *Biology of Reproduction* 1994;50(1350-1356)

Agents: Vasoactive intestinal peptide, porcine; Prolactin, ovine **Vehicle:** Saline; Sodium bicarbonate; **Route:** SC; CSF/CNS; CSF/CNS (median eminence); **Species:** Bird (turkey); **Pump:** 2001; 2002; **Duration:** 7, 10, 12 days;

ALZET Comments: 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

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

Agents: Prolactin, ovine **Vehicle:** Ammonium bicarbonate; Saline; **Route:** CSF/CNS; **Species:** Bird (turkey); **Pump:** 2ML4; **Duration:** 14 days; **ALZET Comments:** Peptides

Zebra Finch

Q5412: K. Lukacova, *et al.* Dopamine D3 receptors modulate the rate of neuronal recovery, cell recruitment in Area X, and song tempo after neurotoxic damage in songbirds. *Neuroscience* 2016;331(158-68)

Agents: 7-OH-DPAT; U99194 **Vehicle:** Saline; **Route:** SC; **Species:** Bird (Zebra Finch); **Pump:** 1002; **Duration:** 2 weeks;

ALZET Comments: Controls received mp w/ vehicle, sham surgery, no BrdU injection; animal info (adult male zebra finches, 4 months to 1 year old); 7-OH-DPAT aka 2-dipropylamino-7-hydroxy-1,2,3,4-tetrahydronaphtalene; U99194 aka 5,6-dimethoxy-2-(di-n-propylamino)indan maleate; Dopamine D3 receptors; recovery, healing after neurotoxic damage; D3R agonist 7-OH-DPAT; D3R antagonist U99194; Dose (1.6 mg/100 ul DPAT, 3 mg/100 ul U99194);

Q2086: A. Leblois, *et al.* Striatal dopamine modulates song spectral but not temporal features through D1 receptors. *European Journal of Neuroscience* 2012;35(11):1771-1781

Agents: SCH23390 **Vehicle:** Not Stated; **Route:** CSF/CNS (area X); **Species:** Bird (zebra finch); **Pump:** 1002; **Duration:** 7-10 days;

ALZET Comments: Controls received mp w/ saline; animal info (adult, male, 90 days old); single pump with Y connector; bilateral infusion using multiple cannulae; pump externalized via backpack; 0.65-mL plastic microcentrifuge tube filled with 250 ul sterile saline was used as backpack

Q0098: A. Leblois, *et al.* Striatal Dopamine Modulates Basal Ganglia Output and Regulates Social Context-Dependent Behavioral Variability through D₁ Receptors. *Journal of Neuroscience* 2010;30(16):5730-5743

Agents: Dopamine; SCH23390 **Vehicle:** Saline; **Route:** CSF/CNS (area X); **Species:** Bird (zebra finch); **Pump:** 1002; **Duration:** Not Stated;

ALZET Comments: Controls received mp w/ vehicle; good methods (pg 5731); ALZET brain infusion kit used; animal info (adult, male); Y-connector used; pump externalized with a backpack; pump placed inside microcentrifuge tube; cannula placement verified by histological examination



P8981: S. Rauceo, *et al.* Dopaminergic modulation of reproductive behavior and activity in male zebra finches. *Behavioural Brain Research* 2008;187(1):133-139

Agents: Flupenthixol, cis- **Vehicle:** Not Stated; **Route:** SC; **Species:** Bird (zebra finch); **Pump:** 1002; **Duration:** Not Stated; **ALZET Comments:** Controls received mp w/ saline; animal info (adult, male, female); cis-flupenthixol is a D1/D2 DA receptor antagonist; behavioral (sexual behavioral)

P6863: C. F. Harding. Brief alteration in dopaminergic function during development causes deficits in adult reproductive behavior. *Journal of Neurobiology* 2004;61(3):301-308

Agents: Flupenthixol, cis- **Vehicle:** Saline; **Route:** SC; **Species:** Bird (zebra finch); **Pump:** 1002; **Duration:** 12 days; **ALZET Comments:** Controls received mp w/ vehicle; dose-response (fig. 1); no stress (see pg. 303)

P6514: C. F. Harding, *et al.* Vasotocin treatment inhibits courtship in male zebra finches; concomitant androgen treatment inhibits this effect. *Hormones and Behavior* 2003;44(5):413-418

Agents: Vasotocin, arginine **Vehicle:** Saline; **Route:** SC; **Species:** Bird (zebra finch); **Pump:** 1007D; **Duration:** 2 days; **ALZET Comments:** Controls received mp w/ vehicle; dose-response (fig.1); no stress (see pg.415-416); stress/adverse reaction: (see pg.415); in 1 male mp moved from animal back to side & interfered with leg movement; pump placement & integrity of overlying skin examined after behavioral observations. "They (mp) did not noticeably interfere with behavior...flying was not affected." (p. 415)