References on the Administration of Dopaminergic Agents Using ALZET® Osmotic Pumps

1. Apomorphine

Q4660: T. T. Yan*, et al.* Daily Injection But Not Continuous Infusion of Apomorphine Inhibits Form-Deprivation Myopia in Mice. INVESTIGATIVE OPHTHALMOLOGY & VISUAL SCIENCE 2015;56(2475-2485
ALZET Comments: Apomorphine; SC; Mice; 1002; 4 weeks; Controls received mp w/ vehicle; animal info (male, C57Bl6, 4 weeks old); functionality of mp verified by residual volume; pumps replaced every 2 weeks; comparison of injection vs mp;.

Q0779: R. Sarkis*, et al.* Chronic dizocilpine or apomorphine and development of neuropathy in two rat models I: Behavioral effects and role of nucleus accumbens. Experimental Neurology 2011;228(1):19-29
ALZET Comments: MK-801; apomorphine HCL hemihydrate; Saline; Ascorbic acid; CSF/CNS (nucleus accumbens); Rat; 2002; Controls received mp w/ vehicle; animal info (adult, female, Sprague Dawley, 200-300 g); post op. care (dexamethasone injections to prevent brain edema); behavioral testing (mechanical allodynia, Paw withdrawal latency, cold allodynia, hotplate test, spontaneous motor activity); cannula placement verified by picomicrograph of brain section; CCI, chronic constriction injury; SNI, spared nerve injury.

P6896: F. Fornai*, et al.* Parkinson-like syndrome induced by continuous MPTP infusion: Convergent roles of the ubiquitin-proteasome system and alpha-synuclein. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 2005;102(9):3413-3418
ALZET Comments: MPTP; L-dopa; apomorphine; IP; SC; Mice; 2004; 1-28 days; Controls received mp w/ saline; comparison of IP injections vs. mp; neurodegenerative (Parkinson's disease); L-dopa and apomorphine group had SC implanted pumps; route is unclear for the MPTP group; "Continuous MPTP infusions thus recreate a disease state that mimics human PD better than acute MPTP bolus injections." (p. 3417); MPTP group received IP pumps (2004 model), verified by e-mailing author.

P5291: G. Battaglia*, et al.* Continuous subcutaneous infusion of apomorphine rescues nigro-striatal dopaminergic terminals following MPTP injection in mice. Neuropharmacology 2002;42(3):367-373
ALZET Comments: Apomorphine; Saline; SC; Mice; 28 days; Controls received mp w/ vehicle; comparison of sc bolus injections vs. mp; 20-day stability verified by HPLC (p.368); neurodegenerative (Parkinson's disease); "The neurorescue effect of continuous subcutaneous infusion of apomorphine is particularly promising from a clinical standpoint." (p.372).

P3178: T. Vander Borght*, et al.* The vesicular monoamine transporter is not regulated by dopaminergic drug treatments. Eur. J. Pharmacol 1995;294(577-583
ALZET Comments: Apomorphine; L-DOPA methyl ester; Benserazide; Tetrabenazine; Ascorbic acid; Propylene glycol; SC; Rat; 2ML2; 2 weeks; controls received mp with propylene glycol; 2 mps used to deliver apomorphine.

P1345: M. Tanaka*, et al.* Dopaminergic activity and met-enkephaline levels in the rat striatum after continuous treatment with various dopaminergic agents. Neuroscience 1988;14(114-116
ALZET Comments: Apomorphine; Haloperidol; Methamphetamine; SC; Rat; 2 weeks; japanese with english abstract.

P1339: M. A. Lyerly*, et al.* The deafferentation syndrome in the rat: effects of intraventricular apomorphine. Exp. Neurol 1988;100(188-202
ALZET Comments: Apomorphine; Ascorbic acid; water; CSF/CNS; Rat; 2002; 2 weeks; mp connected to cannula; stress/adverse reaction (pg 198).

P1291: C. A. Altar*, et al.* Dopamine release and metabolism after chronic delivery of selective or nonselective dopamine autoreceptor agonists. Mol. Pharmacol 1988;33(690-695
ALZET Comments: CGS-15855A; Apomorphine; Dopamine, antagonists; Ascorbic acid; Saline; SC; Rat; 2ML2; 2, 14 days; comparison of ip injections vs. mp infusion; functionality of mp verified by serum, brain levels; stability verified at 14 days by HPLC.

P0595: S. George*, et al.* Met-enkephalin concentrations in straitum respond reciprocally to alterations in dopamine neurotransmission. Peptides 1987;8(3):487-492
ALZET Comments: Apomorphine; FK-33824; Haloperidol; Naloxone; Ethanol; Tartaric acid; Water; SC; Rat; 5, 9 days; mp model not stated; controls received mp w/unspecified vehicle or were sham-operated; agents infused separately w/appropriate vehicle; comparison of sc inject. vs. mp infusion.

P0860: J. D. Winkler*, et al.* Reversal of supersensitive apomorphine-induced rotational behavior in mice by continuous exposure to apomorphine. J. Pharmacol. Exp. Ther 1986;238(1):242-247
ALZET Comments: Apomorphine; Ascorbic acid; DMSO; SC; mice; 2002; 8-10 days; controls rec'd mp w/ vehicle; 6-OHDA unilateral lesions of the nigrostriatal dopaminergic neurons; no stress (see p. 243).

P0704: M. Robin*, et al.* Effect of chronic apomorphine on the development of denervation supersensitivity. Pharmacol. Biochem. Behav 1985;22(547-551
ALZET Comments: Apomorphine HCl; Ascorbic acid; Water; SC; Rat; 2ML1; 5 and 15 days; pump replaced on 8th day; pumps replaced w/ pumps previously incubated in saline.

P0197: F. Porreca*, et al.* Differentiation of apomorphine from bromocriptine, piribidel and TRH by chronic administration in rats. Psychopharmacology 1982;76(70-74
ALZET Comments: Apomorphine HCl; Saline; SC; Rat; 2001; no duration posted; comparison of agents effects.

2. Bromocriptine

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.

P7133: P. L. Brooks*, et al.* Dopamine agonist treatment before and after the birth reduces prolactin concentration but does not impair paternal responsiveness in Djungarian hamsters *Phodopus campbelli*. Hormones and Behavior 2005;47(3):358-366
ALZET Comments: Bromocriptine; Saline, isotonic; ethanol; tartaric acid; SC; Hamster; 1003D; 3 days; Controls received mp w/ vehicle; comparison of SC injections vs. mp; 10% ethanol; mp primed in 37 degrees celsius saline for >4 hours; wound clips used.

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).

P5563: D. A. Douglas*, et al.* Luteotropic hormone receptors in the ovary of the mink (Mustela vison) during delayed implantation and early-postimplantation gestation. Biol. Reprod 1998;59(3):571-578
ALZET Comments: Bromocriptine; Saline; Mink; 13 days; Controls received mp w/ vehicle.

P4191: A. V. Azaryan*, et al.* Transient upregulation of m opioid receptor mRNA levels in nucleus accumbens during chronic cocaine administration. Can. J. Physiol. Pharmacol 1998;76(278-283
ALZET Comments: Cocaine HCl; SKF-82958; Bromocriptine; Hydrobromide, R(+)-6-bromo-APB; PD 128907; Saline; SC; Rat; 2ML1; 24,48,66,72,90,96,168,336 hours; controls received mp w/vehicle; dopamine agonists.

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(123-132

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

P3596: G. P. Martinelli*, et al.* Prolactin suppression enhances the effects of perioperative donor-specific blood transfusions on graft survival. J. Surg. Res 1996;64(190-197
ALZET Comments: Bromocriptine; Domperidone; PEG 400; SC; Rat; 2ML2; no duration posted; controls received mp w/ PEG; immunology.

P3446: A. V. Azaryan*, et al.* Mu opioid receptor mRNA in nucleus accumbens is elevated following dopamine receptor activation. Neurochem. Res 1996;21(11):1411-1415
ALZET Comments: Hydrobromide, R(+)-6-bromo-APB-SKF-38393; Nafadotride, (5)-bromocriptine; Cocaine HCl; Saline; Rat; 2ML1; 3 days; controls received mp w/ saline.

P2999: G. K. De Krey*, et al.* Suppression of prolactin and cytotoxic T-lymphocyte activity in PCB-treated mice. Int. J. Immunopharmac 1994;16(3):251-257
ALZET Comments: Bromocriptine; Ethanol; Water, distilled; Tartaric acid; SC; mice; 2002; no duration posted; controls received mp w/ vehicle or no treatment; 70% ethanol used but diluted 10-fold by adding water.

P2027: B. K. H. Tan. Effects of bromocriptine on systolic blood pressure, prolactin, saline and water intakes in second-generation offspring of a cross between New Zealand genetically hypertensive and normotensive rats. Asia Pac. J. Pharmacol 1992;7(111-114
ALZET Comments: Bromocriptine; Tartaric acid; IP; Rat; 2ML2; 13 days; functionality of mp verified (p. 111); SC pump connected to IP catheter.

P3134: B. K. H. Tan*, et al.* Effects of bromocriptine on pituitary arginine vasopressin content in the segregating generation of the hybrid of spontaneously hypertensive and Wistar Kyoto rats. Asia Pac. J. Pharmacol 1991;6(63-66
ALZET Comments: Bromocriptine; Tartaric acid; IP; Rat; 13 days; pumps implanted sub-q, interscapularly, SC pump connected to IP catheter.

P3700: B. K. H. Tan*, et al.* Plasma and pituitary thyroid-stimulating hormone levels in bromocriptine-treated new zealand genetically hypertensive and normotensive rats. Clin. Exp. Pharmacol. Physiol 1990;17(439-443
ALZET Comments: Bromocriptine; Tartaric acid; IP; Rat; 13 days; controls received mp w/ vehicle; pumps implanted sc but PE-50 cannula directed IP.

P1754: B. K. H. Tan*, et al.* Saline and water intake in the bromocriptine-treated hybrid of spontaneously hypertensive and normotensive rats. Asia Pac. J. Pharmacol 1990;5(91-94
ALZET Comments: Bromocriptine; Tartaric acid; IP; Rat; 2ML2; 13 days; no comment posted.

P1766: B. K. H. Tan*, et al.* Changes in saline and water intakes in bromocriptine-treated genetically hypertensive and normotensive rats. Clin. Exp. Pharmacol. Physiol 1990;17(2):129-133
ALZET Comments: Bromocriptine; IP; Rat; 2ML2; 13 days; no comment posted.

P1634: B. K. H. Tan*, et al.* Changes in saline and water intakes in bromocriptine-treated spontaneously hypertensive and Wistar-Kyoto rats. Asia Pac. J. Pharmacol 1989;4(121-124
ALZET Comments: Bromocriptine; IP; Rat; 2ML2; 13 days; no comment posted.

P1506: B. K. H. Tan*, et al.* Blood pressure, plasma and pituitary prolactin responses to bromocriptine in new zealand genetically hypertensive and normotensive rats. Clin. Exp. Pharmacol. Physiol 1988;15(13-18
ALZET Comments: Bromocriptine; Ethanol; Saline; Tartaric acid; Water; IP; Rat; 2ML2; 13 days; no comment posted.

P1285: B. K. H. Tan*, et al.* Plasma and pituitary prolactin and blood pressure in bromocriptine-treated spontaneously hypertensive and Wistar-Kyoto rats. Clin. Exp. Pharmacol. Physiol 1987;14(797-803

ALZET Comments: Bromocriptine; Ethanol; Saline; Tartaric acid; IP; Rat; 2ML2; 13 days; SC pump connected to IP catheter.

3. Dinapsoline

P4791: A. G. Gulwadi*, et al.* Dinapsoline: Characterization of a D_1 dopamine receptor agonist in a rat model of Parkinson's disease. Journal of Pharmacology and Experimental Therapeutics 2001;296(2):338-344
ALZET Comments: Dinapsoline; DMSO; Ascorbic acid; CSF/CNS; Rat; 2ML2; 14 days; Controls received mp w/ vehicle; neurodegenerative (Parkinson's disease); vehicle used was 50% DMSO, 12.5% ascorbic acid; dinapsoline is a potent D_1 dopamine receptor agonist.

4. Domeperidone

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).

P7254: T. E. Kippin*, et al.* Dopamine specifically inhibits forebrain neural stem cell proliferation, suggesting a novel effect of antipsychotic drugs. Journal of Neuroscience 2005;25(24):5815-5823
ALZET Comments: Haloperidol; domperidone; water, distilled; saline; SC; Rat; mice; 1002; 2ML2; 2ML4; 14, 30 days; Controls received mp w/ vehicle; functionality of mp verified by plasma drug levels; dose-response (fig. 1); comparison of ip injections vs. mp; dopamine D2 receptor antagonist.

P3596: G. P. Martinelli*, et al.* Prolactin suppression enhances the effects of perioperative donor-specific blood transfusions on graft survival. J. Surg. Res 1996;64(190-197
ALZET Comments: Bromocriptine; Domperidone; PEG 400; SC; Rat; 2ML2; no duration posted; controls received mp w/ PEG; immunology.

5. Dopamine

Q6442: C. Laloux*, et al.* Continuous cerebroventricular administration of dopamine: A new treatment for severe dyskinesia in Parkinson's disease? Neurobiol Dis 2017;103(24-31
ALZET Comments: Dopamine, anaerobia; Saline; CSF/CNS; Mice; 2001; 7 days; Controls received mp w/ vehicle; animal info (5 month old C57Bl/6 J mice); neurodegenerative (Parkinson’s disease);.

Q6038: P. Dubovy*, et al.* Local chemical sympathectomy of rat bone marrow and its effect on marrow cell composition. Auton Neurosci 2017;206(19-27
ALZET Comments: Guanethidine, 6-hydroxydopamine hydrochloride; Saline, Ascorbic acid; SC; Rat; 2002; 2 weeks; Controls received mp w/ vehicle; animal info (240-250g); Good alzet diagram ;.

Q3720: J. Wedel*, et al.* Simultaneous subcutaneous implantation of two osmotic minipumps connected to a jugular vein catheter in the rat. Laboratory Animals 2014;48(338-341
ALZET Comments: Dopamine, N-octanoyl; Tween 80; saline; IV (jugular); Rat; 2ML4; 14 days; animal info (male, Brown Norway, 230-270 g, female, Wistar, 280-310 g); good methods; "Our data show that double pump implantation is a feasible alternative to changing pumps or the use of extracorporeal pump systems connected via a long wire to partly restrained animals." pg 338; N-octanoyl-dopamine also known as NOD; multiple pumps (2) used; two pumps connected to Y connector, in-house made Y-tube; "we showed that the simultaneous implantation of two slow-flow rate osmotic pumps connected to a jugular vein catheter is feasible and is not linked to additional signs of discomfort compared with single pump-implanted rats." pg 341.

Q0098: A. Leblois*, et al.* Striatal Dopamine Modulates Basal Ganglia Output and Regulates Social Context-Dependent Behavioral Variability through D_1 Receptors. Journal of Neuroscience 2010;30(16):5730-5743
ALZET Comments: Dopamine; SCH23390; Saline; CSF/CNS (area X); Bird (zebra finch); 1002; 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.

R0352: A. A. Boulton. Animal Models of Dementia. Springer Protocols 2010;48(1-721
ALZET Comments: Amphetamine sulfate; Dopamine; Propylene Glycol; SC; CSF/CNS (nucleus accumbens); Rat; 2ML2; 14 days; comparison of injections and sylastic pellet vs mp; pulsed delivery; PE tubing contained drug and a dye in short sections interspersed with a substance immiscible with drug, to allow 12 hour infusions of drug and l2-hour infusions of the inert substance (perfluorodecalin) throughout a 14 day infusion period.; pumps primed in a physiological saline solution at 37°C for 4 hours.

P8735: K. Nishikawa*, et al.* Effect of dopamine on the healing of acetic acid-induced gastric ulcers in rats. INFLAMMOPHARMACOLOGY 2007;15(5):209-213
ALZET Comments: Dopamine; Saline; SC; Rat; 7 days; Controls received mp w/ vehicle; comparison of SC injections vs. mp; animal info (male, Sprague-Dawley, 230-260g, gastic ulceration).

P8719: S. Hoeger*, et al.* Dopamine treatment in brain-dead rats mediates anti-inflammatory effects: the role of hemodynamic stabilization and D-receptor stimulation. TRANSPLANT INTERNATIONAL 2007;20(9):790-799
ALZET Comments: Dopamine; IV (femoral); Rat; 2ML1; 24 hours; Functionality of mp verified by blood pressure; animal info (male, Fisher, 200-250g).

P7802: R. Oberbeck*, et al.* Dopamine affects cellular immune functions during polymicrobial sepsis. Intensive Care Medicine 2006;32(5):731-739
ALZET Comments: Dopamine; IP; Mice; 48 hours; Controls received mp w/ saline; functionality of mp verified by dopamine plasma concentration; animal info (male, NMRI, 8-9 wk old, 30-34-g.); laparotomy or polymicrobial sepsis induced by cecal ligation and puncture.

P8290: P. T. Brinkkoetter*, et al.* Hypothermia-induced loss of endothelial barrier function is restored after dopamine pretreatment: Role of p42/p44 activation. Transplantation 2006;82(4):534-542
ALZET Comments: Dopamine; IV (femoral); Rat; 2ML1; 24 hours; Controls received mp w/ isotonic saline; ischemia; reperfusion injury; animal info (male, Lewis, 220-250 g).

P7469: U. Gottmann*, et al.* Influence of donor pretreatment with dopamine on allogeneic kidney transplantation after prolonged cold storage in rats. Transplantation 2005;79(10):1344-1350
ALZET Comments: Dopamine; Saline; IV (femoral); Rat; 2ML1; 24 hours; Controls received mp w/ vehicle; animal info (male, Lewis Fisher).

P6552: R. Oberbeck*, et al.* Dopexamine and cellular immune functions during systemic inflammation. Immunobiology 2004;208(5):429-438
ALZET Comments: Dopexamine; dopamine; IP; Mice; 48 hours; Controls received saline & sham operation; immunology; polymicrobial sepsis induced cecal ligation & puncture (CLP).

P6447: R. Ozono*, et al.* Dopamine D_2 receptor modulates sodium handling via local production of dopamine in the kidney. Journal of Cardiovascular Pharmacology 2003;42(S75-S79
ALZET Comments: Dopamine; Saline; SC; Mice (knockout); 2002; 3 days; cardiovascular.

P5642: L. Carr*, et al.* In vivo administration of L-dopa or dopamine decreases the number of splenic IFN-gamma-producing cells. Journal of Neuroimmunology 2003;137(1-2):87-93

ALZET Comments: Dopamine; HCL; saline; Ascorbic acid; SC; Mice; 1007D; 5 days; Controls received mp w/ vehicle (without HCL); Incorrectly states the pump's release rate was 0.25 ul/hr, (correct rate is 0.5 ul/hr).

P6218: P. J. Blanchet. The fluctuating parkinsonian patient - Clinical and pathophysiological aspects. Canadian Journal of Neurological Sciences 2003;30(S19-S26
ALZET Comments: Dopamine, agonists; SC; Monkey; Pump model and duration not listed; neurodegenerative (Parkinson's disease).

P4754: H. Maeda*, et al.* Roles of renal dopamine and Kallikrein-Kinin systems in antihypertensive mechanisms of exercise in rats. Hypertens Res 2000;23(511-519
ALZET Comments: Dopamine;; Water, distilled; Sodium metabisulfate;; SC;; Rat;; 2ML4;; 2 weeks;; Antihypertensive; vehicle was water w/ 0.1% sodium metabisulfate;.

6. Dopexamine

P6552: R. Oberbeck*, et al.* Dopexamine and cellular immune functions during systemic inflammation. Immunobiology 2004;208(5):429-438
ALZET Comments: Dopexamine; dopamine; IP; Mice; 48 hours; Controls received saline & sham operation; immunology; polymicrobial sepsis induced cecal ligation & puncture (CLP).

P2831: S. W. Martin*, et al.* Effects of chronic intraveneous infusions of dopexamine and isoprenaline to rats on D1-, B1- and B2-receptor-mediated responses. Br. J. Pharmacol 1994;112(595-603
ALZET Comments: Dopexamine; Isoprenaline; Saline; EDTA; HCl; IV (jugular); Rat; 2ML1; 7 days; controls received mp with saline.

7. Fenoldpam

Q5317: D. C. Borcherding*, et al.* Expression and therapeutic targeting of dopamine receptor-1 (D1R) in breast cancer. Oncogene 2016;35(24):3103-13
ALZET Comments: Fenoldopam; PBS; SC; mice; 1004; 1 week, 3 weeks; Controls received mp w/ vehicle; animal info (Eight-week-old female athymic nu/nu mice; inoculated with MDA-MB-231 cells or SUM159 cells); functionality of mp verified by measurement of tumor volumes; cancer (breast cancer); dose-response (pg. 3109); Xenograft models; Dose (400 ng/kg/min or 133 ng/kg/min);.

P9731: M. Z. Zhang*, et al.* Intrarenal Dopaminergic System Regulates Renin Expression. Hypertension 2009;53(3):564-570
ALZET Comments: Fenoldopam; SC; Rat; 2001; 1 week; Animal info (male, Sprague Dawley, 4-6 wks old).

P3071: A. J. Nichols*, et al.* Effect of fenoldopam on the acute and subacute nephrotoxicity produced by amphotericin B in the dog. J. Pharmacol. Exp. Ther 1992;260(1):269-274
ALZET Comments: Fenoldopam mesylate; Water, distilled; Citric acid; Propylene glycol; Sodium metabisulfate; IV (jugular); dog; 2ML2; no duration posted; controls received mp with vehicle; multiple pumps per animal (2).

P1466: J. Winkler*, et al.* Effect of continuous exposure to selective D1 and D2 dopaminergic agonists on rotational behavior in supersensitive mice. J. Pharmacol. Exp. Ther 1989;249(2):507-516
ALZET Comments: CY-208-243; Fenoldopam; N-0437; SKF-75670; Quinpirole; SKF-38393; Ascorbic acid; DMSO; Water; SC; mice; 2001; 7 days; Dopamine agonists; comparison of sc injections vs. mp infusion; stability verified in vitro at 37 degrees for 7 days.

8. Haloperidol

Q7103: A. Calevro*, et al.* Effects of chronic antipsychotic drug exposure on the expression of Translocator Protein and inflammatory markers in rat adipose tissue. Psychoneuroendocrinology 2018;95(28-33
ALZET Comments: Haloperidol, olanzapine; Cyclodextrin, 2-Hydroxypropyl-B-; SC; Rat; 2ML4; 8 weeks; Dose (Haloperidol-2mg/ kg/ day, Olanzapine-10 mg/kg/ day); Controls received mp w/ vehicle; animal info (10-week old, male, Sprague-Dawley, 240–250 g); pumps replaced every 4 weeks; long-term study; dependence;.

Q5973: A. Servonnet*, et al.* Neurotensin in the nucleus accumbens reverses dopamine supersensitivity evoked by antipsychotic treatment. Neuropharmacology 2017;123(10-21
ALZET Comments: Haloperidol; Acetic acid, water; SC; Rat; 2ML2; Controls received mp w/ vehicle; animal info (200-225 g); Mp vs. intermittent administration by injection; Therapeutic indication (Anti-psychosis); Dose (0.5 mg/kg);.

Q5738: L. E. Sebel*, et al.* Haloperidol Selectively Remodels Striatal Indirect Pathway Circuits. Neuropsychopharmacology 2017;42(4):963-973
ALZET Comments: Haloperidol-Hcl; Saline; SC; Mice; 2004; 14 days; Controls received mp w/ vehicle; animal info (hemizygous bacterial artificial chromosome (BAC) transgenic mice (p28-p38) expressing eGFP under either Drd1a or Drd2 control); Therapeutic indication (Schizophrenia); Dose (0.25 mg/kg/day);.

Q6192: Y. Oda*, et al.* Alterations in glutamatergic signaling in the brain of dopamine supersensitivity psychosis and non-supersensitivity psychosis model rats. Psychopharmacology (Berl) 2017;234(20):3027-3036
ALZET Comments: Haloperidol; Acetic acid, glacial; Water; SC; Rat; 2ML2; 14 days; Dose (0.75 mg/kg/day); 2% glacial acetic acid/H2O solution (pH adjusted to 3.8 with NaOH); Controls received mp w/ vehicle; animal info (Eleven-week-old male Wistar rats weighing 240–270 g); Therapeutic indication (dopamine supersensitivity psychosis);.

Q6104: K. Chikama*, et al.* Chronic atypical antipsychotics, but not haloperidol, increase neurogenesis in the hippocampus of adult mouse. Brain Res 2017;1676(77-82
ALZET Comments: Haloperidol; quetiapine; aripiprazole; clozapine; olanzapine; risperidone; IP; Mice; 1004; 21 days; Dose (haloperidol 1 mg/kg/d, quetiapine 20 mg/kg/d, aripiprazole 3 mg/kg/d, clozapine 20 mg/kg/d, olanzapine 2 mg/kg/d, risperidone 0.5 mg/kg/d); Controls received mp w/ vehicle; “It is known that osmotic pumps serve some preferable aspect such as to reduce stress to the animals, minimize unwanted experimental variables, and hold the drug concentration constant” pg. 80;.

Q6316: A. Almey*, et al.* Interactions between estradiol and haloperidol on perseveration and reversal learning in amphetamine-sensitized female rats. Horm Behav 2017;89(113-120
ALZET Comments: Haloperidol; Saline; SC; Rat; 2002; 14 days; Dose (0.25 mg/day, 0.13 mg/day); Controls received mp w/ vehicle; animal info (female Sprague-Dawley rats); behavioral testing (Locomotor activity boxes); Haloperidol aka HAL;.

Q5414: D. Madularu*, et al.* High estrogen and chronic haloperidol lead to greater amphetamine-induced BOLD activation in awake, amphetamine-sensitized female rats. Horm Behav 2016;82(56-63
ALZET Comments: Haloperidol; Saline; SC; Rat; 2002; 14 days; Controls received mp w/ vehicle; Animal info (OVX Sprague Dawley rats, 200-250 g, 2 months old); post op. care (Anafen analgesic 0.1 mL/rat, and local antibiotic ointment); replacement therapy (estrogen replacement); MRI compatible PEEK tubing used; Dose (0.25 mg/kg/day); Therapeutic indication (Schizophrenia);.

Q6020: W. R. Crum*, et al.* Chronic exposure to haloperidol and olanzapine leads to common and divergent shape changes in the rat hippocampus in the absence of grey-matter volume loss. Psychol Med 2016;46(15):3081-3093
ALZET Comments: Haloperidol, Olanzapine; Cyclodextrin, hydroxypropyl-β-, Ascorbic acid; SC; Rat; 2ML4; 28 days; Controls received mp w/vehicle; animal info (10 weeks old) pumps replaced every 4 weeks; Therapeutic indication (Learning and memory, hippocampus, antipsychotic); Dose (HAL (2 mg/kg perday), or OLZ (10 mg/kg perday);.

Q5240: Y. Oda*, et al.* G protein-coupled receptor kinase 6/beta-arrestin 2 system in a rat model of dopamine supersensitivity psychosis. J Psychopharmacol 2015;29(12):1308-13
ALZET Comments: Haloperidol; Acetic acid, glacial; water; SC; Rat; 2ML2; 14 days; Controls received mp w/ vehicle; animal info (Eleven-week-old male Wistar rats, 240–260 g); functionality of mp verified by ELIZA testing; 2% acetic acid used; good methods (pg 1309); stress/adverse reaction: “One animal did not recover from pump-implanting surgery and was excluded from analysis” (see pg. 1310); behavioral testing (MAP-induced locomotion test); Vehicle pH adjusted to 3.6-3.8 with NaOH; 9mm wound clips used; Dose (0.75 mg/kg/d;);.

Q5037: D. Madularu*, et al.* Changes in brain volume in response to estradiol levels, amphetamine sensitization and haloperidol treatment in awake female rats. Brain Res 2015;1618(100-10
ALZET Comments: Haloperidol; SC; Rat; 2002; 14 days; Controls received sham surgery; animal info (female, Sprague Dawley, 200-250g 2-3 months old, OVX); post op. care (Anafen 0.1 mL/rat; antibiotic ointment); MRI; PEEK; Dose (0.25 mg/kg/day);.

Q5144: C. El Hage*, et al.* Antipsychotic treatment leading to dopamine supersensitivity persistently alters nucleus accumbens function. Neuropharmacology 2015;99(715-25
ALZET Comments: Haloperidol; Olanzapine; Acetic acid; water; SC; Rat; 2ML2; 15 days; 17 days; Controls received sham surgery; animal info: Male Sprague-Dawley rats; %0.5 or %2 of acetic acid; behavioral testing (trained to associate the delivery of 100 ml water (the unconditioned stimulus; UCS) into a receptacle with a light/tone conditioned stimulus (CS)); Dose: 0.5 mg/kg/day (haloperidol); 10 mg/kg/day (olanzapine).

Q5134: A. Charron*, et al.* 5-HT2 receptors modulate the expression of antipsychotic-induced dopamine supersensitivity. Eur Neuropsychopharmacol 2015;25(12):2381-93
ALZET Comments: Haloperidol; Acetic acid, glacial; water; SC; Rat; 2ML2; 15, 17 days; Controls received sham surgery consisting of an incision and sutures; animal info: Male Sprague-Dawley rats 200–225g; water (pH 5) used; half-life (p. 2383), 1.5 hours; models the kinetics of standard antipsychotic treatment in patients; Dose: 0.5 mg/ kg/day.

Q3580: S. Natesan*, et al.* Effect of chronic antipsychotic treatment on striatal phosphodiesterase 10A levels: a [(11C)]MP-10 PET rodent imaging study with ex vivo confirmation. TRANSLATIONAL PSYCHIATRY 2014;4(U4-U10
ALZET Comments: Haloperidol; Cyclodextrin, 2-hydroxypropyl-b-; Ascorbic acid; SC; Rat; 2ML4; 3 weeks; Controls received mp w/ vehicle; animal info (male, Sprague Dalwy, 308-456g); functionality of mp verified by plasma; 20% B-hydroxypropylcyclodextrin used; behavioral testing (chewing movements); "Daily intraperitoneal injections in rodents lead to plasma levels that dip to a negligible level during a 24-h period as most antipsychotics have a half-life of 2-4 h in rodents, whereas the half-life of most antipsychotics in humans is usually 12-24 h.14 Hence, the present study was designed taking into consideration a delivery method (subcutaneous mini-osmotic pumps) that maintained constant plasma levels to evaluate the effect of chronic antipsychotic treatment on striatal PDE10A levels in rodents" pg 1;.

Q3306: D. Madularu*, et al.* Estrogen potentiates the behavioral and nucleus accumbens dopamine response to continuous haloperidol treatment in female rats. European Journal of Neuroscience 2014;39(2):257-265
ALZET Comments: Haloperidol; Saline; SC; Rat; 2002; 12 days; Animal info (female, Sprague Dawley, ovariectomized); behavioral testing (motor activity); replacement therapy (ovariectomized); pump removed after 12 days;.

Q3884: J. Gao*, et al.* Differential effects of intermittent versus continuous haloperidol treatment throughout adolescence on haloperidol sensitization and social behavior in adulthood. PROGRESS IN NEURO-PSYCHOPHARMACOLOGY & BIOLOGICAL PSYCHIATRY 2014;54(67-75
ALZET Comments: Haloperidol; Water, sterile; SC; Rat; 2ML4; 28 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, PND44-71); comparison of injection vs mp; post op. care (incision cleaned with 75% ethanol); behavioral testing (two-way avoidance conditioning apparatus; locomotor activity monitoring apparatus; avoidance training); dependence; used 9mm wound clips; pumps wiped with 75% ethanol; pumps removed after 28 days;.

Q3290: M. Cazorla*, et al.* Dopamine D2 Receptors Regulate the Anatomical and Functional Balance of Basal Ganglia Circuitry. Neuron 2014;81(1):153-164

ALZET Comments: Haloperidol; Lactic acid; sodium hydroxide; SC; Mice (transgenic); 2002; 14 days; Controls received mp w/ vehicle; animal info (male, D2R-OE, adult); behavioral testing (open field, locomotor activity);.

Q3806: P. M. Anderson*, et al.* Chronic administration of antipsychotics attenuates ongoing and ketamine-induced increases in cortical gamma oscillations. INTERNATIONAL JOURNAL OF NEUROPSYCHOPHARMACOLOGY 2014;17(1895-1904
ALZET Comments: Haloperidol; clozapine; LY379268; Saline; acetic acid; water, sterile; SC; Rat; 2ML4; 28 days; Controls received mp w/ vehicle; animal info (male, Wistar, 10-12 weeks old, 250-350g); functionality of mp verified by residual volume; behavioral testing (locomotor activity); LY379268 is a metabotropic glutamate 2/3 receptor agonist (mGluR 2/3);.

9. L- dopa

Q6625: G. Mulas*, et al.* Differential induction of dyskinesia and neuroinflammation by pulsatile versus continuous l-DOPA delivery in the 6-OHDA model of Parkinson's disease. Exp Neurol 2016;286(83-92
ALZET Comments: L-DOPA; Benserazide; SC; Rat; 2ML2; 2 weeks; Dose (12mg/kg/day); animal info (6-OHDA-lesioned male Sprague-Dawley rats weighing 275-300g); comparison of pulsatile injections vs mp; neurodegenerative (Parkinson's disease);.

Q0502: M. Lebel*, et al.* Striatal inhibition of PKA prevents levodopa-induced behavioural and molecular changes in the hemiparkinsonian rat. NEUROBIOLOGY OF DISEASE 2010;38(1):59-67
ALZET Comments: L-DOPA; CSF/CNS (striatum); Rat; 2004; 2ML1; 2ML4; 21 days; Controls received mp w/ vehicle; pumps replaced every week; cyanoacrylate adhesive; ALZET brain infusion kit 2 used; animal info (male, Sprague Dawley).

P9062: T. M. Kaeaeriaeinen*, et al.* Serotonergic activation after 2-week intrastriatal infusion of L-dopa and slow recovery of circling in rats with unilateral Nigral lesions. BASIC & CLINICAL PHARMACOLOGY & TOXICOLOGY 2008;102(3):300-307
ALZET Comments: L-DOPA; NaCl, isotonic; Ascorbic acid; CSF/CNS (striatum); Rat; 2002; 14 days; Controls received mp w/ vehicle; dose-response (fig.2, pg. 302); animal info (male, Wistar, 190-230 g.); pumps incubated at 37 degree Celsius overnight in isotonic saline; behavioral (rotational behavioral); neurodegenerative (Parkinson's Disease).

P7751: G. Bilbao*, et al.* Electrophysiological characterization of substantia nigra dopaminergic neurons in partially lesioned rats: Effects of subthalamotomy and levodopa treatment. Brain Research 2006;1084(175-184
ALZET Comments: L-DOPA; benserazide; Water, distilled; SC; Rat; 2ML2; 14 days; Enzyme inhibitor (dopadecarboxylase); neurodegenerative (Parkinson's disease); animal info (male, albino Sprague-Dawley, 150-175g); nigrostriatal pathway lesions.

P6896: F. Fornai*, et al.* Parkinson-like syndrome induced by continuous MPTP infusion: Convergent roles of the ubiquitin-proteasome system and alpha-synuclein. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 2005;102(9):3413-3418
ALZET Comments: MPTP; L-dopa; apomorphine; IP; SC; Mice; 2004; 1-28 days; Controls received mp w/ saline; comparison of IP injections vs. mp; neurodegenerative (Parkinson's disease); L-dopa and apomorphine group had SC implanted pumps; route is unclear for the MPTP group; "Continuous MPTP infusions thus recreate a disease state that mimics human PD better than acute MPTP bolus injections." (p. 3417); MPTP group received IP pumps (2004 model), verified by e-mailing author.

P6820: G. U. Hoglinger*, et al.* Dopamine depletion impairs precursor cell proliferation in Parkinson disease. Nature Neuroscience 2004;7(7):726-735
ALZET Comments: L-DOPA, methyl ester; Benserazide; Ascorbic acid; SC; Rat; 2ML4; 3 weeks; Neurodegenerative (Parkinson's disease).

P5969: E. S. Kemmerer*, et al.* Treatment effects on nigrostriatal projection integrity in partial 6-OHDA lesions: comparison of L-DOPA and pramipexole. Experimental Neurology 2003;183(1):81-86
ALZET Comments: L-DOPA; benserazide; prazosin; IP; Rat; 2ML4; 4 weeks; Neurodegenerative (Parkinson's disease).

P5834: T. Caprile*, et al.* Reissner fiber binds and transports away monoamines present in the cerebrospinal fluid. MOLECULAR BRAIN RESEARCH 2003;110(2):177-192
ALZET Comments: Serotonin, binoxaiate; Norepinephrine; serotonin trifluoroacetate; Serotonin creatinin sulfate; L-DOPA; CSF, artificial; radio-isotopes; 3H tracer; CSF/CNS; Rat; 2001; 7 days;

P3515: J. M. Trugman*, et al.* Dose-related effects of continuous levodopa infusion in rats with unilateral lesions of the substantia nigra. Brain Research 1996;725(177-183
ALZET Comments: L-DOPA methyl ester; Benserazide; Water; SC; Rat; 2001D; 22 hours; dose response; comparison of injections vs. mp made based upon published studies administering L-dopa by injection.

P3178: T. Vander Borght*, et al.* The vesicular monoamine transporter is not regulated by dopaminergic drug treatments. Eur. J. Pharmacol 1995;294(577-583
ALZET Comments: Apomorphine; L-DOPA methyl ester; Benserazide; Tetrabenazine; Ascorbic acid; Propylene glycol; SC; Rat; 2ML2; 2 weeks; controls received mp with propylene glycol; 2 mps used to deliver apomorphine.

P2582: G. C. Inglis*, et al.* Effects of long-term infusions of dopa and carbidopa on renin and steroid secretion in the rat. Endocrinology 1992;131(6):2941-2945
ALZET Comments: L-DOPA; Carbidopa; HCl; SC; Rat; 2002; 2 weeks; controls received mp w/ vehicle; agents given separately and together.

P2252: T. M. Engber*, et al.* Levodopa replacement therapy alters enzyme activities in striatum and neuropeptide content in striatal output regions of 6-hydroxydopamine lesioned rats. Brain Research 1991;552(1):113-118
ALZET Comments: L-DOPA; Benserazide; Saline; IP; Rat; 2ML2; 21 days; controls received mp w/saline; functionality of mp verified upon removal; comparison of intermittent IP injections vs mp.

P1800: T. M. Engber*, et al.* Chronic levodopa treatment alters basal and dopamine agonist-stimulated cerebral glucose utilization. J. Neurosci 1990;10(2):3889-3895
ALZET Comments: L-DOPA; IP; Rat; 2ML2; 19 days; dose-response (table, p. 3892); comparison of bid injections vs. mp; 'levodopa replacement by continuous infusion may be more physiological than oral intermittent therapy.' (p. 3895).

P1648: T. M. Engber*, et al.* Continuous and intermittent levodopa differentially affect rotation induced by D-1 and D-2 dopamine agonists. Eur. J. Pharmacol 1989;168(291-298
ALZET Comments: L-DOPA; IP; Rat; 19 days; functionality of mp verified by blood levels; comparison of IP injections b.i.d. vs. mp.

P0740: I. Stromberg*, et al.* Chronic implants of chromaffin tissue into the dopamine-denervated striatum. Effects of NGF on graft survival, fiber growth and rotational behavior. Exp. Brain Research 1985;60(2):335-349
ALZET Comments: Dopamine; L-DOPA; Nerve growth factor; Saline; CSF/CNS (corpus striatum); Rat; 2002; 28 days; comparison of injections vs. mp infusion; mp replaced after 14 days; mp connected to cannula in striatum mounted w/dialysis fiber; l-dopa & dopamine used only to test fiber; 6-OHDA lesions.

10. Lisuride

Q1973: K. Zweckberger*, et al.* Effects of lisuride hydrogen maleate on pericontusional tissue metabolism, brain edema formation, and contusion volume development after experimental traumatic brain injury in rats. Neuroscience Letters 2011;499(3):189-193
ALZET Comments: Lisuride; Hydrogen maleate; SC; Rat; 2ML1; Animal info (Sprague Dawley, male, 350-380 g).

P1320: H. Wachtel*, et al.* Effect of chronic subcutaneous minipump infusion of lisuride upon locomotor activity of rats. J. Neural Transm 1988;27(177-183

ALZET Comments: Lisuride; Saline; Tartaric acid; SC; Rat; 2002; 14 days; stability.

P1446: J. Garcia de Yebenes*, et al.* Intracerebroventricular infusion of dopamine and its agonists in rodents and primates. ASAIO Transactions 1988;34(951-957
ALZET Comments: Dopamine; Lisuride; Pergolide; Hydroxynaphthoxacine, 4-propyl-9-; HCl; Water; CSF/CNS; Rat; 1, 2 weeks; PHNO is dopamine D-2 receptor agonist;.

P1313: J. G. de Yebenes*, et al.* Continuous intracerebroventricular infusion of dopamine and dopamine agonists through a totally implanted drug delivery system in animal models of Parkinson's disease. J. Neural Transm 1988;27(141-160
ALZET Comments: Deprenyl; Dopamine; Lisuride; Pargyline; Pergolide; HCl; Sodium metabisulfite; Water; CSF/CNS; Rat; 2001; 6, 7 days; mp connected to cannula; stability of DA verified in several vehicles, p 146; concomitant DA infusion with pargyline; DA infusion with deprenyl; replacement therapy (dopamine deficiency); stability verified in vitro; antihypertensive; neurodegenerative (Parkinson's disease).

P2709: J. G. de Yebenes*, et al.* Continuous intracerebroventricular infusion of dopamine and dopamine agonists through a totally implanted drug delivery system in animal models of Parkinson's disease. Movement Disorders 1987;2(3):143-158
ALZET Comments: Dopamine; Pargyline; Deprenyl; Lisuride; Pergolide; HCl; Sodium metabisulfate; CSF/CNS; Rat; 2001; 6,7 days; controls received mp with vehicles; replacement therapy (lesion in dopamine pathway); stability verified for 1 week by measuring dopamine concentrations and its metabolites at varying time intervals with HPLC; concomitant dopamine infusion w/ pargyline and w/ deprenyl; antihypertensive; neurodegenerative (Parkinson's disease).

11. Metoclopramide

P0391: G. Aguilera*, et al.* Dopaminergic modulation of aldosterone secretion in the rat. Endocrinology 1984;114(1):176-181
ALZET Comments: Angiotensin II; Dopamine; Metoclopramide; IP; IV; Rat; 2 days; simultaneous administration of MCP (iv) w/ AII (ip), and MCP (iv) w/ DOP (iv); MCP and AII also infused alone, all by mp; peptides.

P0124: V. Chan*, et al.* Hormonal regulation of testicular luteinizing hormone and prolactin receptors. Endocrinology 1981;108(5):1607-1612
ALZET Comments: Metoclopramide; IP; Rat; 7 days; no comment posted.

12. Nafadotride

P3446: A. V. Azaryan*, et al.* Mu opioid receptor mRNA in nucleus accumbens is elevated following dopamine receptor activation. Neurochem. Res 1996;21(11):1411-1415
ALZET Comments: Hydrobromide, R(+)-6-bromo-APB-SKF-38393; Nafadotride, (5)-bromocriptine; Cocaine HCl; Saline; Rat; 2ML1; 3 days; controls received mp w/ saline.

13. Other

Q0202: B. Yao*, et al.* Intrarenal Dopamine Attenuates Deoxycorticosterone Acetate/High Salt-Induced Blood Pressure Elevation in Part Through Activation of a Medullary Cyclooxygenase 2 Pathway. Hypertension 2009;54(5):1077-1083
ALZET Comments: SCH-23390; SC; Mice; 2004; Animal info (wt, COMT -/-); SCH-23390 is a D1-like receptor agonist.

P5474: E. M. Byrnes*, et al.* Dopamine antagonists during parturition disrupt maternal care and the retention of maternal behavior in rats. Pharmacology Biochemistry and Behavior 2002;73(4):869-875
ALZET Comments: SCH-23390; DMSO; water, sterile; SC; Rat; 2001; Controls received mp w/ vehicle; agent is a D1-like antagonist.

P4367: S. A. Davidoff*, et al.* Acute administration of SCH23390 increases D_1 receptors on nonpyramidal neurons in rat mPFC. Synapse 2000;35(173-181
ALZET Comments: SCH-23390; Saline, normal; SC; Rat; 1003D; 48 hours; controls received mp with vehicle.

P3313: A. V. Azaryan*, et al.* Effect of chronic cocaine treatment on m- and d-opioid receptor mRNA levels in dopaminergically innervated brain regions. J. Neurochem 1996;66(443-448
ALZET Comments: Cocaine HCl; Eticlopride; SCH-23390; Saline; SC; Rat; 2001; 3 days; controls received mp w/saline; eticlopride is a D1 & D2 receptor antagonist.

P3341: T. Suzuki*, et al.* Morphine-induced place preference in the CXBK mouse: characteristics of u opioid receptor subtypes. Brain Research 1993;602(45-52
ALZET Comments: SCH-23390; DMSO; Water; SC; mice; 2001; no duration posted; controls received mp w/vehicle; pump implanted in flank.

P2489: B. Glenthoj*, et al.* Effects of chronic discontinuous and continuous treatment of rats with a dopamine D receptor antagonist (NNC-756). Eur. J. Pharmacol 1993;242(283-291
ALZET Comments: NNC-756; Acetic acid; Water; SC; Rat; 2002; 15 weeks; comparison of Q week injections vs. mp; long-term study, pumps replaced every 2 weeks; dopamine receptor antagonist.

P2185: L. Y. Burger*, et al.* Day/night differences in D1 but not D2 DA receptor protection from EEDQ denaturation in rats treated with continuous cocaine. Synapse 1993;13(20-29
ALZET Comments: SCH-23390; Cocaine HCl; Raclopride; Water; SC; Rat; 2ML2; 14 days; no comment posted.

P2611: J. Alberch*, et al.* Control of tachykinin-evoked acetylcholine release from rat striatal slices by dopaminergic neurons. Naunyn-Schmiedeberg's Arch. Pharmacol 1993;348(445-449
ALZET Comments: Haloperidol; SCH-23390; SC; Rat; 14 days; controls received mp w/ saline.

P2318: L. L. Howell*, et al.* Enhanced sensitivity to the behavioral effects of cocaine after chronic administration of D2-selective dopamine antagonists in the squirrel monkey. J. Pharmacol. Exp. Ther 1992;262(3):907-915
ALZET Comments: Raclopride tartrate; SCH-23390; Saline; Alcohol; SC; monkey; 2002; 14 days; controls received mp w/ saline.

P2436: M. Srinivasan*, et al.* Chronic treatment with SCH-23390, a selective dopamine D1 receptor blocker decreases preprotachykinin-A mRNA levels in nucleus tractus solitarii of the rabbit: role in respiratory control. Mol. Brain Research 1991;9(3):233-238
ALZET Comments: SCH-23390; Glucose; Lactic acid; Sodium hydroxide; SC; rabbit; 2002; 14 days; peptides.

P1288: T. S. Shippenberg*, et al.* Motivational effects of opioids; influence of D-1 versus D-2 receptors antagonists. Eur. J. Pharmacol 1988;151(233-242
ALZET Comments: Spiperone; SCH-23390; DMSO; Water; SC; Rat; 2001; 2ML1; 7 days; functionality of mp verified after delivery; dopamine antagonist.

P1233: M. T. Martin-Iverson*, et al.* Long-term motor stimulant effects of (+) -4-propyl-9-hydroxynaphthoxazine (PHNO), a dopamine D-2 receptor agonist: interactions with a dopamine D-1 receptor antagonist and agonist. Eur. J. Pharmacol 1988;149(25-31
ALZET Comments: Hydroxynaphthoxacine, 4-propyl-9-; SCH-23390; Water; SC; Rat; 2002; 11 days; controls received mp w/water; multiple pumps per animal (2); separate and simultaneous infusion of agents; PHNO is a dopamine antagonist.

14. Pergolide

P1446: J. Garcia de Yebenes*, et al.* Intracerebroventricular infusion of dopamine and its agonists in rodents and primates. ASAIO Transactions 1988;34(951-957
ALZET Comments: Dopamine; Lisuride; Pergolide; Hydroxynaphthoxacine, 4-propyl-9-; HCl; Water; CSF/CNS; Rat; 1, 2 weeks; PHNO is dopamine D-2 receptor agonist;.

P1313: J. G. de Yebenes*, et al.* Continuous intracerebroventricular infusion of dopamine and dopamine agonists through a totally implanted drug delivery system in animal models of Parkinson's disease. J. Neural Transm 1988;27(141-160
ALZET Comments: Deprenyl; Dopamine; Lisuride; Pargyline; Pergolide; HCl; Sodium metabisulfite; Water; CSF/CNS; Rat; 2001; 6, 7 days; mp connected to cannula; stability of DA verified in several vehicles, p 146; concomitant DA infusion with pargyline; DA infusion with deprenyl; replacement therapy (dopamine deficiency); stability verified in vitro; antihypertensive; neurodegenerative (Parkinson's disease).

P2709: J. G. de Yebenes*, et al.* Continuous intracerebroventricular infusion of dopamine and dopamine agonists through a totally implanted drug delivery system in animal models of Parkinson's disease. Movement Disorders 1987;2(3):143-158
ALZET Comments: Dopamine; Pargyline; Deprenyl; Lisuride; Pergolide; HCl; Sodium metabisulfate; CSF/CNS; Rat; 2001; 6,7 days; controls received mp with vehicles; replacement therapy (lesion in dopamine pathway); stability verified for 1 week by measuring dopamine concentrations and its metabolites at varying time intervals with HPLC; concomitant dopamine infusion w/ pargyline and w/ deprenyl; antihypertensive; neurodegenerative (Parkinson's disease).

15. PHNO

P5258: M. Ruzich*, et al.* Pinealectomy blocks stress-induced motor stimulation but not sensitization and tolerance to a dopamine D2 receptor agonist. Psychopharmacology (Berl) 2000;152(3):275-282
ALZET Comments: Hydroxynaphthoxacine, 4-propyl-9-; Water, distilled; SC; Rat; 2002; 12 days; Controls received mp w/ vehicle; good methods (p.276-77); tolerance; PHNO is a selective dopamine D2 receptor agonist; "The advantages of using a continuous drug regimen are that sensitization and tolerance are produced independently of the confounding influences..." (p.275).

P4536: J. D. Munro*, et al.* Circadian rhythm-dependent development of melatonin effects and tolerance to PHNO in rats. Pharmacology Biochemistry and Behavior 2000;65(3):495-501
ALZET Comments: Hydroxynaphthoxacine, 4-propyl-9-;; Water, distilled;; SC;; Rat;; 2002;; 12 days;; controls received mp w/vehicle; tolerance; PHNO is a selective dopamine D_2 receptor agonist.

P1884: G. M. Alexander*, et al.* Dopamine receptor changes in untreated and (+)-PHNO-treated MPTP parkinsonian primates. Brain Research 1991;547(181-189
ALZET Comments: Hydroxynaphthoxacine, 4-propyl-9-; SC; monkey; 7, 30, 40 days; Neurodegenerative (Parkinson's disease); PHNO is dopamine D-2 receptor agonist.

P1557: M. T. Martin-Iverson*, et al.* Chronic administration of a selective dopamine D-2 agonist: factors determining behavioral tolerance and sensitization. Psychopharmacology 1988;95(534-539
ALZET Comments: Hydroxynaphthoxacine, 4-propyl-9-; SC; Rat; 2002; 11-15 days; 12 hours (intermittently); comparison of injections vs. mp infusion; functionality of mp verified in vitro; pulsed delivery using coiled tubing, intermittent inert placebo, 12h 'on' and 12h 'off'; PHNO is dopamine D-2 receptor agonist.

P1233: M. T. Martin-Iverson*, et al.* Long-term motor stimulant effects of (+) -4-propyl-9-hydroxynaphthoxazine (PHNO), a dopamine D-2 receptor agonist: interactions with a dopamine D-1 receptor antagonist and agonist. Eur. J. Pharmacol 1988;149(25-31
ALZET Comments: Hydroxynaphthoxacine, 4-propyl-9-; SCH-23390; Water; SC; Rat; 2002; 11 days; controls received mp w/water; multiple pumps per animal (2); separate and simultaneous infusion of agents; PHNO is a dopamine antagonist.

P1446: J. Garcia de Yebenes*, et al.* Intracerebroventricular infusion of dopamine and its agonists in rodents and primates. ASAIO Transactions 1988;34(951-957
ALZET Comments: Dopamine; Lisuride; Pergolide; Hydroxynaphthoxacine, 4-propyl-9-; HCl; Water; CSF/CNS; Rat; 1, 2 weeks; PHNO is dopamine D-2 receptor agonist;.

P1207: J. G. de Yebenes*, et al.* The effect of intracerebroventricular infusion of (+)-4-propyl-9-hydroxynapthoxacine (PHNO) through a totally implanted drug delivery system in rats with dopamine deficiency. Movement Disorders 1987;2(4):291-299
ALZET Comments: Hydroxynaphthoxacine, 4-propyl-9-; HCl; CSF/CNS; Rat; 2001; 2002; 2ML4; 7, 14 days; PHNO is a dopamine antagonist; mp connected to cannula; concomitant apomorphine administration in some animals, reserpine in the others.

16. Pramipexole

Q5373: N. A. Holtz*, et al.* Pharmacologically distinct pramipexole-mediated akinesia vs. risk-taking in a rat model of Parkinson's disease. Prog Neuropsychopharmacol Biol Psychiatry 2016;70(77-84
ALZET Comments: Pramipexole HCL; Mirtazapine; Pramipexole HCL; Mirtazapine; SC; Rat; 2002, 2ML4; 12 - 14 days; Controls received mp w/ vehicle; animal info (250-300 g, male Sprague-Dawley rats); For mirtazapine, saline brought to 5.5-6.0 pH with 1 N NaOH; good methods (pg. 79); neurodegenerative (Parkinson's disease); behavioral testing (forelimb step task); PPX is a dopamine D2 receptor agonist; Mirtazapine is an atypical antidepressant; akinesia and risk-taking rat model; Dose (PPX 0.3 and 1.2 mg/kg/day; Mirtazapine 5 mg/kg/day);.

R0319: M. Silindir*, et al.* The benefits of pramipexole selection in the treatment of Parkinson's disease. NEUROLOGICAL SCIENCES 2014;35(1505-1511
ALZET Comments: Pramipexole; Rat; Comparison of injections vs mp; "While higher therapeutic benefit in early morning akinesia was obtained with pramipexole CR (continuous release via ALZET pumps), motor impairment was reversed for several hours with pramipexole IR (instant release via injections)" pg 1508.

Q1781: O. Chernoloz*, et al.* Long-term administration of the dopamine D3/2 receptor agonist pramipexole increases dopamine and serotonin neurotransmission in the male rat forebrain. JOURNAL OF PSYCHIATRY & NEUROSCIENCE 2012;37(2):113-121
ALZET Comments: Pramipexole; SC; Rat; 14 days; Controls received mp w/ physiologic saline; animal info (Sprague Dawley, male, 270-320 g).

Q0092: B. Ferger*, et al.* Continuous Dopaminergic Stimulation by Pramipexole Is Effective to Treat Early Morning Akinesia in Animal Models of Parkinson's Disease: A Pharmacokinetic-Pharmacodynamic Study Using in Vivo Microdialysis in Rats. Synapse 2010;64(7):533-541
ALZET Comments: Pramipexole; Saline; SC; Rat; 1007D; 2004; 2, 14 days; Controls received mp w/ vehicle; animal info (male, Wistar, 250-300 g.); comparison of SC injections vs mp; neurodegenerative (Parkinson's Disease); "...this study highlights the potential benefit of CDS (continuous dopaminergic stimulation) using PPX-CR and the advantage over PPX-IR in two symptomatic PD models" pg 540; half-life "long" pg 534; haloperidol-induced catalepsy; pk study.

P9907: O. Chernoloz*, et al.* Sustained Administration of Pramipexole Modifies the Spontaneous Firing of Dopamine, Norepinephrine, and Serotonin Neurons in the Rat Brain. Neuropsychopharmacology 2009;34(3):651-661
ALZET Comments: Pramipexole; SC; Rat; 2, 14 days; Controls received mp w/saline, physiological; animal info (male, Sprague Dawley, 270-320 g).

P5488: E. H. Ellinwood*, et al.* Effect of daily dosing duration of direct and indirect dopamine receptor agonists: cocaine cross-tolerance following chronic regimens. European Neuropsychopharmacology 2002;12(5):407-415
ALZET Comments: Cocaine; pramipexole; Saline; SC; Rat; 2ML2; 14 days; Functionality of mp verified by measuring residual volume; pulsed delivery - drugs administered either continuously or for 16 or 20 hrs per day (p. 409); study included behavioral testing; pramipexole is a direct dopamine agonist; microdialysis fiber attached to pump via catheter to minimize

tissue necrosis caused by the cocaine (p. 408); intermittent delivery made possible by disconnecting and reconnecting an externalized catheter.

17. Quinpirole

Q3844: N. Cobacho*, et al.* Dopaminergic modulation of neuropathic pain: Analgesia in rats by a D2-type receptor agonist. Brain Research Bulletin 2014;106(62-71
ALZET Comments: Quinpirole hydrochloride; Water, sterile; SC; Rat; 2ML1; 7 days; Controls received sham mp; animal info (male, Sprague Dawley, adult, 250-300g); functionality of mp verified by incubating pumps after explantation in 37C saline and noted collected amount of fluid - post explantation in vitro testing; behavioral testing (tactile and cold allodynia); neuropathic pain; pumps primed in 37C saline for 2 hours;.

Q0720: T. D. Aumann*, et al.* Neuronal activity regulates expression of tyrosine hydroxylase in adult mouse substantia nigra pars compacta neurons. Journal of Neurochemistry 2011;116(4):646-658
ALZET Comments: Apamin; muscimol; quinpirole; riluzole; FPL64176; nimodipine; picrotoxin; benzimidazolinone; CSF/CNS (midbrain); CSF/CNS (dorsal striatum); Mice; 1002; 2 weeks; Animal info (eight-week-old, C57BL6/J, male); ALZET brain infusion kit 1 used; neurodegenerative (Parkinson's disease).

Q1584: S. Hood*, et al.* Endogenous Dopamine Regulates the Rhythm of Expression of the Clock Protein PER2 in the Rat Dorsal Striatum via Daily Activation of D(2) Dopamine Receptors. Journal of Neuroscience 2010;30(42):14046-14058
ALZET Comments: SCH23390; raclopride; quinpirole; SKF 81297; Water, distilled; SC; Rat; 2ML2; 5, 10 days; Controls received sham surgery; animal info (Wistar, male, 180-210 g); SCH23390 is a D1DA receptor antagonist; raclopride is a D2Da receptor antagonist; wound clips used.

P2254: T. M. Engber*, et al.* Differential effects of chronic dopamine D1 and D2 receptor agonists on rotational behavior and dopamine receptor binding. Eur. J. Pharmacol 1993;236(385-393
ALZET Comments: Quinpirole; SKF-38393; Ascorbate; DMSO; Water; IP; Rat; 2ML2; 19 days; Quinpirole is a dopamine agonist; controls received mp w/vehicle; functionality of mp verified upon removal; comparison of intermittent ip injections vs mp.

P2670: J. F. Chen*, et al.* Continuous treatment with the D2 dopamine receptor agonist quinpirole decreases D2 dopamine receptors, D2 dopamine receptor messenger RNA and proenkephalin messenger RNA, and increases mu opioid receptors in mouse striatum. Neuroscience 1993;54(3):669-680
ALZET Comments: Quinpirole; SKF-38393; Ascorbic acid; DMSO; mice; 6 days; Quinpirole is a dopamine agonist; controls received mp w/ vehicle.

P2115: L.-W. Zhou*, et al.* Triazolam blocks the initial rotational effects of quinpirole but permits the later developing reduction of dopamine D2-mediated rotational behavior and dopamine D2 receptors. Eur. J. Pharmacol 1992;218(219-227
ALZET Comments: Quinpirole HCl; Sulpiride; Triazolam; Ascorbic acid; DMSO; SC; mice; 2001; 6 days; Quinpirole is a dopamine agonist; antidepressant; stability verified in vitro for 7 days.

P2253: T. M. Engber*, et al.* Dopaminergic modulation of striatal neuropeptides: differential effects of D1 and D2 receptor stimulation on somatostatin, neuropeptide Y, neurotensin, dynorphin and enkephalin. Brain Research 1992;581(261-268
ALZET Comments: Quinpirole; SKF-38393; Ascorbate; DMSO; Water; IP; Rat; 2ML1; 7 days; Quinpirole is a dopamine agonist; controls received mp w/vehicle; functionality of mp verified upon removal; comparison of IP injections vs mp; prophylactic penicillin G benzathine treatment.

P1836: L.-W. Zhou*, et al.* Downregulation of stereotyped behavior and production of latent locomotor behaviors in mice treated continuously with quinpirole. Neuropsychopharm 1991;4(1):47-55
ALZET Comments: Quinpirole; Ascorbic acid; DMSO; SC; mice; 2001; 6 days; Quinpirole is a dopamine agonist; states solvent (50% DMSO with ascorbic acid) produced no unusual effects in the mice (p. 48).

P1972: C. Gerfen*, et al.* D1 and D2 dopamine receptor-regulated gene expression of striatonigral and striatopallidal neurons. Science 1990;250(1429-1432
ALZET Comments: Quinpirole; SKF-38393; IP; 21 days; comparison of injections vs. mp; dopamine agonists (D1 and D2), paper states 'continuous treatment [vs. injection] with a D2 agonist appears necessary to regulate striatopallidal neurons.'.

P1466: J. Winkler*, et al.* Effect of continuous exposure to selective D1 and D2 dopaminergic agonists on rotational behavior in supersensitive mice. J. Pharmacol. Exp. Ther 1989;249(2):507-516
ALZET Comments: CY-208-243; Fenoldopam; N-0437; SKF-75670; Quinpirole; SKF-38393; Ascorbic acid; DMSO; Water; SC; mice; 2001; 7 days; Dopamine agonists; comparison of sc injections vs. mp infusion; stability verified in vitro at 37 degrees for 7 days.

P1775: M. Jeziorski*, et al.* Dopamine agonists at repeated 'autoreceptor-selective' doses: effects upon the sensitivity of A10 dopamine autoreceptors. Synapse 1989;4(267-280
ALZET Comments: Quinpirole; SC; 7 days; Dopamine agonist; stability verified in vitro at 37 degrees celsius for 7 days.

18. Remoxipride

P2736: J. Georgieva*, et al.* Neurochemical effects of prolonged treatment with remoxipride as assessed by intracerebral microdialysis in freely moving rats. Prog. Neuro-Psychopharmacol. Biol. Psychiat 1994;18(1187-1201
ALZET Comments: Remoxipride HCl; Sodium chloride; SC; Rat; 2002; 14 days; controls received sodium chloride; functionality of mp verified by checking blood levels of drug and determining residual drug amount; comparison of sc injections vs mp; remoxipride is an antipsychotic drug.

P2204: H. Ericson*, et al.* Subchronic treatment of rats with remoxipride fails to modify sigma binding sites in the brain. Eur. J. Pharmacol. - Mol. Pharmacol. Sect 1992;226(157-161
ALZET Comments: Remoxipride HCl; Haloperidol; Water; Acetic acid; SC; Rat; 3,14 days; controls received sham operations.