



**Recent References (2015-2019) on the Administration of Nicotine
Using ALZET® Osmotic Pumps**

Q6791: R. Saravia, *et al.* Anti-inflammatory agents for smoking cessation? Focus on cognitive deficits associated with nicotine withdrawal in male mice. *Brain Behav Immun* 2019;75(228-239

ALZET Comments: Nicotine hydrogen tartate salt; Saline; SC; Mice; 2002; 14 days; Dose (25 mg/kg/day); animal info (8-weeks old male C57BL/6J mice (Charles River).); dependence;.

Q6064: R. F. Keller, *et al.* Comparison between dopaminergic and non-dopaminergic neurons in the VTA following chronic nicotine exposure during pregnancy. *Sci Rep* 2019;9(1):445

ALZET Comments: Nicotine hydrogen tartrate salt; Saline; SC; Rat (pregnant); 28 days; Dose (6 mg/kg/d); Controls received mp w/ vehicle; animal info (Pregnant female Sprague–Dawley (SD) rats); dependence;.

Q6079: D. DiPalma, *et al.* Persistent attenuation of nicotine self-administration in rats by co-administration of chronic nicotine infusion with the dopamine D1 receptor antagonist SCH-23390 or the serotonin 5-HT_{2C} agonist lorcaserin. *Pharmacol Biochem Behav* 2019;176(16-22

ALZET Comments: Nicotine; Saline; SC; Rat; 2ML4; 4 weeks; Dose (2.5 mg/kg/day); Controls received mp w/ vehicle; animal info (young adult female Sprague-Dawley rats, aged 66–72 days with an average weight of 210 g); post op. care (ketoprofen (5 mg/kg, s.c.); topical bupivacaine); behavioral testing (lever press);.

Q6978: R. D. Cole, *et al.* Adolescent and adult nicotine exposure differentially impacts oral nicotine and oral saccharin self-administration in mice. *Behav Brain Res* 2019;359(836-844

ALZET Comments: nicotine hydrogen tartrate; Saline; SC; Mice; 1002; 2 weeks; Dose (3.0 mg/kg/d - adolescent, 6.3 mg/kg/d-adult); Controls received mp w/ vehicle; animal info (adolescent, adult); stability verified by (measuring the residual volume following surgical removal at the end of the exposure period for each time point); half-life 10 min (p.841); dependence;.

Q6986: R. B. Bassey, *et al.* Combined early life stressors: Prenatal nicotine and maternal deprivation interact to influence affective and drug seeking behavioral phenotypes in rats. *Behav Brain Res* 2019;359(814-822

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Rat (pregnant); 2004; 14 days; Dose (4 mg/kg/day); 0.9% saline used; Controls received mp w/ vehicle; animal info (Timed-pregnant Sprague-Dawley rats 250 g- 300 g); pumps implanted during gestation); behavioral testing (open field test, forced swim test); dependence;.

Q6905: L. B. Wollman, *et al.* Developmental plasticity of GABAergic neurotransmission to brainstem motoneurons. *J Physiol* 2018;596(23):5993-6008

ALZET Comments: Nicotine bitartrate; Saline; SC; Rat (pregnant); 1007D; (6 mg/kg/day); Controls received mp w/ vehicle; animal info (pregnant dams on gestational day 5); post op. care (buprenorphine sc 0.5 mg/kg); dependence;.

Q7154: S. R. Subramaniam, *et al.* Chronic nicotine improves cognitive and social impairment in mice overexpressing wild type alpha-synuclein. *Neurobiol Dis* 2018;117(170-180

ALZET Comments: Nicotine; Saline; SC; Mice; 2004; 1 or 6 months; Dose (0.4 mg/kg/h and 2.0 mg/kg/h); dose-response (); dose-response (); pumps replaced every 4 weeks; long-term study; stress/adverse reaction: Mice treated with the higher nicotine dose (2.0 mg/kg/h) lost weight after surgery and 50% died after one week. This was as a result of combined toxic effects of isoflurane and a higher dose of nicotine. Therefore, pentobarbital was used instead of isoflurane for induction of anesthesia, which reduced the mortality rate and improved weight gain in the higher dose group. (see pg. 172);.

Q7051: S. Semenova, *et al.* Differential effects of withdrawal from intermittent and continuous nicotine exposure on reward deficit and somatic aspects of nicotine withdrawal and expression of alpha4beta2* nAChRs in Wistar male rats. *Pharmacol Biochem Behav* 2018;171(54-65

ALZET Comments: Nicotine; Saline; SC; Rat; 2ML4; 20 days; Dose (1.2, 3.16, or 6.32 mg/kg/dau); animal info (male Wistar rats weighing 320-360g); dependence;.



Q6963: D. H. Malin, *et al.* A subtype-specific neuropeptide FF receptor antagonist attenuates morphine and nicotine withdrawal syndrome in the rat. *Neurosci Lett* 2018;684(98-103

ALZET Comments: Morphine sulfate, Nicotine bitartrate; Saline, isotonic; SC; Rat; 2ML1; 7 days; Dose (morphine at 0.3 and 0.6 mg/kg/hr, nicotine at 9 mg/kg/day); Controls received mp w/ vehicle; animal info (male Sprague-Dawley rats averaging 234 g); dependence;.

Q7073: C. Li, *et al.* Mito-Tempo prevents nicotine-induced exacerbation of ischemic brain damage. *J Appl Physiol* (1985) 2018;125(1):49-57

ALZET Comments: Nicotine; Saline; SC; Rat; 7 days; Dose (2 mg/kg/day); Controls received mp w/ vehicle; animal info (Male Sprague-Dawley rats);.

Q6922: S. Y. Lee, *et al.* Pre- and early postnatal nicotine exposure exacerbates autoresuscitation failure in serotonin-deficient rat neonates. *J Physiol* 2018;596(23):5977-5991

ALZET Comments: Nicotine; Saline; SC; Rat (pregnant); 2ML4; Dose (6 mg/kg/day); Controls received mp w/ vehicle; animal info (female Sprague-Dawley dams);.

Q7199: C. Lee, *et al.* Differential regulation of neuronal excitability by nicotine and substance P in subdivisions of the medial habenula. *Anim Cells Syst (Seoul)* 2018;22(3):165-171

ALZET Comments: Nicotine; Sodium Chloride; SC; Mice; 1004; 14 days; Dose (1 mg/kg/hr); animal info (5 weeks old, Male, C57BL/6); dependence;.

Q7152: C. Lee, *et al.* Differential regulation of neuronal excitability by nicotine and substance P in subdivisions of the medial habenula. *Anim Cells Syst (Seoul)* 2018;22(3):165-171

ALZET Comments: Nicotine; Saline; SC; Mice; 1004; 14 days; Dose (1 mg/kg/hr); 9% NaCl used; animal info (male C57BL/6 mice, 6–8 weeks of age);.

Q7013: R. F. Keller, *et al.* Investigating the genetic profile of dopaminergic neurons in the VTA in response to perinatal nicotine exposure using mRNA-miRNA analyses. *Sci Rep* 2018;8(1):13769

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Rat (pregnant); 4 weeks; Dose (6 mg/kg/day); Controls received mp w/ vehicle; animal info (pregnant female Sprague-Dawley rats); minipumps released nicotine for 4 weeks from gestational day 6 to postnatal day 14;.

Q7020: A. Jackson, *et al.* Pharmacological modulation of the alpha7 nicotinic acetylcholine receptor in a mouse model of mecamylamine-precipitated nicotine withdrawal. *Psychopharmacology (Berl)* 2018;235(7):1897-1905

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Mice; 2002; 14 days; Dose (24 mg/kg/day); Controls receive Jacksod mp w/ vehicle; animal info (8 week old ICR male mice);.

Q7028: V. G. Garcia, *et al.* aPDT for periodontitis treatment in ovariectomized rats under systemic nicotine. *Photodiagnosis Photodyn Ther* 2018;22(70-78

ALZET Comments: Nicotine; Saline; SC; Rat; 2006; Controls received mp w/ vehicle; animal info (3-month old Wistar rats);.

Q7030: C. C. J. Frye, *et al.* Continuous nicotine exposure does not affect resurgence of alcohol seeking in rats. *PLoS One* 2018;13(8):e0202230

ALZET Comments: Nicotine; Saline; SC; Rat; 2ML4; 28 days; Dose (3 mg/kg/day); 0.9% sterile saline solution used; Controls received mp w/ vehicle; animal info (male Long Evans rats); post op. care (NSAID analgesic, an antibiotic);.

Q7125: N. D. d'Adesky, *et al.* Nicotine Alters Estrogen Receptor-Beta-Regulated Inflammasome Activity and Exacerbates Ischemic Brain Damage in Female Rats. *Int J Mol Sci* 2018;19(5):

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Rat; 2ML2; 16 days; Dose (4.5 mg/kg/day); animal info (Adult female, Sprague-Dawley, 290 g, 6-7 months old); ischemia (Nicotine-induced);.



Q5615: N. D. d'Adesky, *et al.* Nicotine Alters Estrogen Receptor-Beta-Regulated Inflammasome Activity and Exacerbates Ischemic Brain Damage in Female Rats. *Int J Mol Sci* 2018;19(5):

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Rat; 2ML2; 16-21 days; Dose (4.5 mg/kg/day); Controls received mp w/ vehicle; animal info (adult female Sprague-Dawley rats); ischemia (brain);.

Q7111: Y. H. Chen, *et al.* Nicotine-Induced Conditional Place Preference Is Affected by Head Injury: Correlation with Dopamine Release in the Nucleus Accumbens Shell. *Int J Neuropsychopharmacol* 2018;21(10):949-961

ALZET Comments: Nicotine; Saline; SC; Rats; 2ML1; 1 week; Dose (9 mg/kg/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (Male, Sprague-Dawley, 6 weeks old, 200-250 g); behavioral testing (Open Field Test); Brain coordinates (3.8 mm posterior to bregma, 2.5 mm lateral to midline); neurodegenerative (Concussion);.

Q7106: L. M. Carcoba, *et al.* Amino acid modulation of dopamine in the nucleus accumbens mediates sex differences in nicotine withdrawal. *Addict Biol* 2018;23(5):1046-1054

ALZET Comments: Nicotine hydrogen tartrate salt; Saline; Saline; 2ML2; 1004; 14 days; 0.9% saline used; animal info (Adult, male and female, Wistar rats); post op. care (analgesic flunixin- 2.5 mg/kg); dependence; .

Q7100: J. K. Brynildsen, *et al.* Activation of AMPK by metformin improves withdrawal signs precipitated by nicotine withdrawal. *Proc Natl Acad Sci U S A* 2018;115(16):4282-4287

ALZET Comments: Nicotine, Metformin; Saline; CSF/CNS (lateral ventricle); Mice; 1002; 2 weeks; Dose (18 mg/kg/day-nicotine, 50 ug/day-metformin); 0.85% saline used; Controls received mp w/ vehicle; behavioral testing (Marble Burying Test, Novelty-Induced Hypophagia Test); Brain coordinates (anteroposterior, -0.8 mm; mediolateral, +1.5 mm); dependence;.

Q5935: M. Yuan, *et al.* The alpha3beta4 nAChR partial agonist AT-1001 attenuates stress-induced reinstatement of nicotine seeking in a rat model of relapse and induces minimal withdrawal in dependent rats. *Behav Brain Res* 2017;333(251-257

ALZET Comments: Nicotine; SC; Rat; 2ML1; 7 days; animal info (male, Sprague Dawley, 300-350g, adult); behavioral testing (open field chambers); dependence; Dose (3.15 mg/kg/day);.

Q5336: J. Yang, *et al.* Chronic nicotine differentially affects murine transcriptome profiling in isolated cortical interneurons and pyramidal neurons. *BMC Genomics* 2017;18(1):194

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Mice; 2002; 14 days; Controls received mp w/ vehicle; animal info (male mice 20 g, 5-7 weeks old); Dose (48 mg/kg/d);.

Q5715: Y. Xu, *et al.* Long-term nicotine exposure dampens LPS-induced nerve-mediated airway hyperreactivity in murine airways. *Am J Physiol Lung Cell Mol Physiol* 2017;313(3):L516-L523

ALZET Comments: Nicotine tartrate; PBS; SC; Mice; 2004; 28 days; Controls received mp w/ vehicle; animal info (female, BALB/c, 10 weeks old); post op. care (clips were removed 7-10 days post operation); immunology; "Subcutaneous osmotic pumps containing nicotine tartrate salt produces a stable plasma nicotine concentration that has long been utilized in the field of neuroscience for the study of chronic nicotine effects" pg L517; Used Reflex wound clips (2-3 per mouse); Dose (24 mg/kg/day); Used Reflex clips; wound clips removed 7-10 days postop;.

Q6539: F. Wichern, *et al.* Perinatal nicotine treatment induces transient increases in NACHO protein levels in the rat frontal cortex. *Neuroscience* 2017;346(278-283

ALZET Comments: Nicotine Hydrogen Tartate; SC; Rat (pregnant); 2006; 6 weeks; Dose (4 mg/kg/day); animal info (timed-pregnant Sprague Dawley (SD) rats); comparison of injections vs mp;.

Q5905: M. von Chamier, *et al.* Impact of gestational nicotine exposure on intrauterine and fetal infection in a rodent model. *Biol Reprod* 2017;96(5):1071-1084

ALZET Comments: Nicotine tartrate; Saline; SC; Rat (pregnant); 2ML4; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, GD6); post op. care (single housed; heating pads); teratology; "To test our hypothesis, we combined a maternal nicotine infusion model that achieves high levels of plasma nicotine and cotinine without causing fetal loss or changes in birth weight." pg 1072; Used wound clips; Dose (6 mg/kg/day);.



- Q6526:** A. Vivekanandarajah, *et al.* Intermittent hypercapnic hypoxia effects on the nicotinic acetylcholine receptors in the developing piglet hippocampus and brainstem. *Neurotoxicology* 2017;60(23-33)
ALZET Comments: Nicotine Hydrogen Tartate Salt; Water (sterile); IP; Pig (neonate); 2ML2; 14 days; Dose (2.0 mg/kg/day); animal info (mixed-breed miniature piglets); comparison of patch vs mp; Resultant plasma level (serum cotinine: 23.1 +17.3 ng/mL); “The use of an osmotic minipump as opposed to a skin patch was chosen as the method of nicotine delivery given it provides a steady state, same dose, infusion over our 14 day study whereas patches result in sudden spikes in plasma levels and require replacement of patches every 1–2 days dependent on chosen patch ” pg. 2 ;.
- Q6517:** S. Tolu, *et al.* Nicotine enhances alcohol intake and dopaminergic responses through beta2* and beta4* nicotinic acetylcholine receptors. *Sci Rep* 2017;7(45116)
ALZET Comments: Nicotine; Saline; SC; Mice (knockout); 2004; 26 days; Dose (10 mg/kg/d); 0.9% saline used; Controls received mp w/ vehicle; animal info (8–16 week old male C57BL/6J wild-type, $\beta 2^{-/-}$ 18 and $\beta 4^{-/-}$ mice); pumps replaced every 4 weeks; Resultant plasma level (10 to 50 ng/ml); dependence;.
- Q5985:** M. V. Singh, *et al.* Abnormal CD161(+) immune cells and retinoic acid receptor-related orphan receptor gammat-mediate enhanced IL-17F expression in the setting of genetic hypertension. *J Allergy Clin Immunol* 2017;140(3):809-821 e3
ALZET Comments: Nicotine; Saline; SC; Rat; 2001D; 24 hours; Controls received mp w/ vehicle; animal info (1-38 weeks) ; dependence; Dose (15 mg/kg);.
- Q6768:** R. Saravia, *et al.* CB1 Cannabinoid Receptors Mediate Cognitive Deficits and Structural Plasticity Changes During Nicotine Withdrawal. *Biol Psychiatry* 2017;81(7):625-634
ALZET Comments: Nicotine hydrogen tartrate salt; Saline; SC; Mice (knockout); 2002; 14 days; Dose (25 mg/kg/day); animal info (CB1R constitutive knockout (KO) mice; conditional KO mice and their wild-type (WT) littermates (8–12 weeks old)); dependence;.
- Q6365:** Q. Liu, *et al.* Distinctive Roles for alpha7*- and alpha9*-Nicotinic Acetylcholine Receptors in Inflammatory and Autoimmune Responses in the Murine Experimental Autoimmune Encephalomyelitis Model of Multiple Sclerosis. *Front Cell Neurosci* 2017;11(287)
ALZET Comments: Nicotine salt; PBS; SC; Mice; 1004; Dose (13 mg of nicotine free base/kg/day); Controls received mp w/ vehicle; animal info (C57BL/6J mice); Resultant plasma level (~49 ng/ml or ~300 nM,);.
- Q6439:** J. Lee, *et al.* Nicotine drives neutrophil extracellular traps formation and accelerates collagen-induced arthritis. *Rheumatology (Oxford)* 2017;56(4):644-653
ALZET Comments: Nicotine; PBS; SC; Mice; 2006; 42 days; Dose (15 mg/kg/day); Controls received mp w/ vehicle; animal info (male DBA/1J mice);.
- Q2873:** Ke J, *et al.* Role of DNA methylation in perinatal nicotine-induced development of heart ischemia-sensitive phenotype in rat offspring. *Oncotarget* 2017;8(44):76865-76880
ALZET Comments: Nicotine; Saline; SC; Rat (pregnant); 2ML4; 6 days; Dose (4 ug/kg/min); Controls received mp w/ vehicle; animal info (pregnant Sprague-Dawley rats); cardiovascular;.
- Q6433:** P. Kanlikilicer, *et al.* Gene expression profiling of midbrain dopamine neurons upon gestational nicotine exposure. *Med Biol Eng Comput* 2017;55(3):467-482
ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Rat (pregnant); 4 weeks; Dose (0.6 mg/kg/day); Controls received mp w/ vehicle; animal info (E2 Sprague–Dawley rats);.
- Q6305:** H. Kanamori, *et al.* Influence of nicotine on choline-deficient, L-amino acid-defined diet-induced non-alcoholic steatohepatitis in rats. *PLoS One* 2017;12(6):e0180475
ALZET Comments: Nicotine; Saline; SC; Rat; 2006; 6 weeks; Dose (12 mg/kg/day); Controls received mp w/ vehicle; animal info (Six-week-old male Wistar rats);.



Q6451: O. O. Kalejaiye, *et al.* Enhanced susceptibility of CA3 hippocampus to prenatal nicotine exposure. *J Dev Orig Health Dis* 2017;8(2):155-160

ALZET Comments: Nicotine; Saline; SC; Rat (pregnant); 2004; Dose (4 mg/kg/d.); Controls received mp w/ vehicle; animal info (Timed-pregnant Sprague–Dawley rats weighing 250–300 g); dependence;.

Q6313: A. Jackson, *et al.* Varenicline, the clinically effective smoking cessation agent, restores probabilistic response reversal performance during withdrawal from nicotine. *Addict Biol* 2017;22(5):1316-1328

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Rat; 2ML2; 7 days; Dose (3.16 mg/kg/day); 0.9% saline used; animal info (Male hooded Lister rats weighing 280-300g); post op. care (carprofen 5 mg/kg IP); dependence;.

Q6455: A. Jackson, *et al.* In vivo interactions between alpha7 nicotinic acetylcholine receptor and nuclear peroxisome proliferator-activated receptor-alpha: Implication for nicotine dependence. *Neuropharmacology* 2017;118(38-45

ALZET Comments: Nicotine; Saline; Mice; Dose (24 mg/kg/day); Controls received mp w/ vehicle; animal info (ICR male mice); dependence;.

Q6137: J. Huang, *et al.* Hypoxia and nicotine effects on Pituitary adenylate cyclase activating polypeptide (PACAP) and its receptor 1 (PAC1) in the developing piglet brainstem. *Neurotoxicology* 2017;62(30-38

ALZET Comments: Nicotine; Water; IP; Pig; 2ML2; 14 days; Dose (2 mg/kg/day); Controls received mp w/ vehicle; “The delivery of nicotine via the minipump provides a steady state infusion over our 14 day study whereas other methods result in sudden spikes in plasma levels (reviewed by Shiffman et al., 2005) and require more animal handling and stress.” pg. 31;.

Q6256: T. E. Grieder, *et al.* Deletion of alpha5 nicotine receptor subunits abolishes nicotinic aversive motivational effects in a manner that phenocopies dopamine receptor antagonism. *Eur J Neurosci* 2017;46(1):1673-1681

ALZET Comments: Nicotine; SC; Mice; 1002; 12 days; Dose (7 mg/kg/day); animal info (Adult male C57BL/6 mice); dependence;.

Q6150: X. Gao, *et al.* Prenatal nicotinic exposure prolongs superior laryngeal C-fiber-mediated apnea and bradycardia through enhancing neuronal TRPV1 expression and excitation. *FASEB J* 2017;31(10):4325-4334

ALZET Comments: Nicotine; Saline; SC; Rat; 2004; 28 days; Dose (6 mg/kg/d); Controls received mp w/ vehicle; animal info (adult female Sprague–Dawley rats weighing 250–350 g); Resultant plasma level (free nicotine 24 ng/ml in neonates and 18 ng/ml in pregnant dams);.

Q6375: M. L. Fisher, *et al.* Distinct Roles of CREB Within the Ventral and Dorsal Hippocampus in Mediating Nicotine Withdrawal Phenotypes. *Neuropsychopharmacology* 2017;42(8):1599-1609

ALZET Comments: Nicotine; Saline; SC; Mice; 2002; 12 days; Dose (18 mg/kg/day); 0.9% saline used; Controls received mp w/ vehicle; animal info (8-10 week old Male and female CREBloxP/loxP mice); Resultant plasma level (~0.3 μM);.

Q6269: S. Elhassan, *et al.* Effects of Nicotine Metabolites on Nicotine Withdrawal Behaviors in Mice. *Nicotine Tob Res* 2017;19(6):763-766

ALZET Comments: Nicotine; Saline; SC; Mice; 2002; 14 days; Dose (24 mg/kg/day); Controls received mp w/ vehicle; animal info (Male adult ICR mice weighing 20–25 g); dependence;.

Q6100: D. A. Connor, *et al.* Chronic fluoxetine ameliorates adolescent chronic nicotine exposure-induced long-term adult deficits in trace conditioning. *Neuropharmacology* 2017;125(272-283

ALZET Comments: Nicotine; Saline; SC; Mice; 12 days; Dose (12.6 mg/kg/day and 6.3 mg/kg/day); animal info (Male C57BL/6J mice); behavioral testing (mice were trained in trace fear conditioning after 24 h abstinence and tested 24 h after training);.

Q6397: M. Cholanian, *et al.* Developmental nicotine exposure alters potassium currents in hypoglossal motoneurons of neonatal rat. *J Neurophysiol* 2017;117(4):1544-1552



ALZET Comments: Nicotine bitartrate; Saline; SC; Rat (pregnant); 1007D; Dose (6 mg/kg/day); Controls received mp w/ vehicle; animal info (Sprague-Dawley dams); Resultant plasma level (60 to 92 ng/ml); dependence;

Q5769: M. Cholanian, *et al.* Influence of developmental nicotine exposure on glutamatergic neurotransmission in rhythmically active hypoglossal motoneurons. *Exp Neurol* 2017;287(Pt 2):254-260

ALZET Comments: Nicotine; Saline; SC; Rat; 1007D; 28 days; Controls received mp w/ vehicle; animal info (Implanted at gestational day 5); half-life 20-24 hrs (p.255); Therapeutic indication (AMPA, Hypoglossal nucleus, Nicotine, Desensitization, developmental nicotine exposure); Dose (6 mg/kg/day);

Q6422: Bade AN, *et al.* MEMRI is a biomarker defining nicotine-specific neuronal responses in subregions of the rodent brain. *Am J Transl Res* 2017;9(2):601-610

ALZET Comments: Nicotine; Saline; SC; Rat; 2ML1; 1 week; Dose (3.0 mg/kg/day); Controls received mp w/ vehicle; animal info (250-300g male Wistar rats); dependence;

Q3891: Y. Alkhlaif, *et al.* Assessment of nicotine withdrawal-induced changes in sucrose preference in mice. *Pharmacol Biochem Behav* 2017;161(47-52

ALZET Comments: Nicotine hydrogen tartrate; Saline, physiological; SC; Mice; 2002; 14 days; Dose (12 and 24 mg/kg/day); animal info (8-week-old male C57BL/6J and beta2 KO mice);

Q4920: L. Zhao, *et al.* Prenatal nicotinic exposure upregulates pulmonary C-fiber NK1R expression to prolong pulmonary C-fiber-mediated apneic response. *Toxicol Appl Pharmacol* 2016;290(107-15

ALZET Comments: Nicotine; mecamylamine; methyllycaconitine; SC; Rat (pregnant); 2004; 28 days; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 250-300g); pumps replaced on GD7; Multiple pumps per animal (2); no stress (see pg. 110-111); teratology; Dose (Nicotine 6 mg/kg/day; mecamylamine 0.03 mg/kg/day; methyllycaconitine 3 mg/kg/day);

Q5113: L. Zhao, *et al.* Bronchopulmonary C-fibers' IL1RI contributes to the prolonged apneic response to intra-atrial injection of capsaicin by prenatal nicotinic exposure in rat pups. *Toxicol Appl Pharmacol* 2016;303(58-64

ALZET Comments: Nicotine; methyllycaconitine; Saline; SC; Rat; 2004; 28 days; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 250-350g); pumps replaced every 28 days; Multiple pumps per animal (2); long-term study; teratology; MLA is an $\alpha 7$ nAChR antagonist; methyllycaconitine aka MLA; Dose (nicotine 6 mg/kg/day; MLA 3 mg/kg/day);

Q5513: L. Zhao, *et al.* From the Cover: Prenatal Nicotinic Exposure Attenuates Respiratory Chemoreflexes Associated With Downregulation of Tyrosine Hydroxylase and Neurokinin 1 Receptor in Rat Pup Carotid Body. *Toxicol Sci* 2016;153(1):103-11

ALZET Comments: Nicotine; SC; Rat; 2004; 28 days; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 250-350g); pumps replaced every 21 days; teratology; Dose (6 mg/kg/day);

Q5491: L. B. Wollman, *et al.* Developmental nicotine exposure alters cholinergic control of respiratory frequency in neonatal rats. *Dev Neurobiol* 2016;76(10):1138-49

ALZET Comments: Nicotine bitartrate; saline; sc; Rat (PREGNANT); Controls received mp w/ vehicle or sham surgery; animal info (female, Sprague Dawley, GD5); no stress (see pg. 1141); teratology; Dose (6 mg/kg/day);

Q5204: S. J. Simmons, *et al.* Nicotinic receptor blockade decreases fos immunoreactivity within orexin/hypocretin-expressing neurons of nicotine-exposed rats. *Behav Brain Res* 2016;314(226-33

ALZET Comments: Nicotine; Saline; SC; Rat; 2001; 7 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, adult); behavioral testing (open field); dependence; used staples (9mm); Dose (3.16 mg/kg/day free base);

Q6644: G. L. Powell, *et al.* Developmental nicotine exposure disrupts dendritic arborization patterns of hypoglossal motoneurons in the neonatal rat. *Dev Neurobiol* 2016;76(10):1125-37

ALZET Comments: Nicotine, bitartate; Saline; SC; Rat (pregnant); 28 days; Dose (6 mg/kg/day); Controls received mp w/ vehicle; animal info (Pregnant Sprague-Dawley rats); dependence;



Q4870: V. Parikh, *et al.* Cognitive control deficits during mecamylamine-precipitated withdrawal in mice: Possible links to frontostriatal BDNF imbalance. *NEUROBIOLOGY OF LEARNING AND MEMORY* 2016;128(110-116)

ALZET Comments: Nicotine hydrogen tartrate; Saline, sterile; SC; Mice; 1004; 28 days; Controls received mp w/ vehicle; animal info (male, C57BL6J, 8-10 weeks old, 20-25g); functionality of mp verified by plasma cotinine levels; behavioral testing (visual discriminations, operant training); dependence; Dose (18 mg/kg/day free base resulted in 100-150 ng/ml plasma cotinine levels);.

Q4869: C. C. P. a. S. M. Miraglia. Prenatal and lactation nicotine exposure affects Sertoli cell and gonadotropin levels in rats. *REPRODUCTION* 2016;151(117-133)

ALZET Comments: Nicotine hydrogen tartrate salt; Water, bacteriostatic; SC; Rat (pregnant; lactating); 2ML4; 4 weeks; Controls received mp w/ vehicle; animal info (GD1); pumps replaced after birth; no stress (see pg. 123); cyanoacrylate adhesive; "There were no cases of stillbirth, birth defects, or other signs of toxicity that could be attributed to nicotine. Behavioral changes in the rat dams that could be attributed to the stress caused by the osmotic minipump implant were also not evidenced. Body weights were obtained at every chosen age of killing and no differences were found when nicotine and control groups were compared, at any age equivalent subgroup. The" pg 123; Dose (2 mg/kg/day);.

Q4852: C. Li, *et al.* Chronic nicotine exposure exacerbates transient focal cerebral ischemia-induced brain injury. *J Appl. Physiol* 2016;120(328-333)

ALZET Comments: Nicotine; Saline; SC; Rat; 4 weeks; Controls received mp w/ saline; animal info (male, Sprague Dawley, 250-300g); ischemia (cerebral); "The subcutaneous osmotic minipump releases nicotine at a constant rate, which resulted in stable plasma nicotine and cotinine levels that match the chronic smokers. The doses of nicotine used in the present study have been reported to result in stable plasma nicotine levels corresponding reasonably well with plasma levels in habitual light (0.5-1 pack/day) and moderate (2 packs/day) smokers" pg 331; traumatic brain injury; Dose (2 or 4 mg/kg/day);.

Q5551: E. D. Levin, *et al.* Reduction of nicotine self-administration by chronic nicotine infusion with H1 histamine blockade in female rats. *Psychopharmacology (Berl)* 2016;233(15-16):3009-15

ALZET Comments: Nicotine ditartrate, pyrilamine; Saline; SC; Rat; 2ML2, 2ML4; 2 weeks; Controls received mp w/ vehicle; Multiple pumps per animal (2); animal info (Young adult female Sprague-Dawley rats, 8 weeks old); Nicotine dependence; Chronic nicotine infusion via sc implanted osmotic minipumps is functionally similar to the zero order kinetic of steady nicotine infusion achieved by nicotine skin patches; Therapeutic indication (Nicotine dependency); Dose (Nicotine administered for 4 weeks with 2ML4 at 2.5, 5 mg/kg/day, Pylrilamine administered for 2 weeks with 2ML2 at 25 mg/kg/day);.

Q5383: M. G. Kutlu, *et al.* Impairment of contextual fear extinction by chronic nicotine and withdrawal from chronic nicotine is associated with hippocampal nAChR upregulation. *Neuropharmacology* 2016;109(341-8)

ALZET Comments: Nicotine Hydrogen Tartrate Salt; Saline; SC; Mice; 1002; 11 days, 13 days; Controls received mp w/ vehicle; animal info (adult (8-10 weeks old) male C57BL6/J mice); functionality of mp verified by measurement of withdrawal, plasma levels; dose-response (pg. 342); behavioral testing (contextual fear conditioning training, retention tests, and extinction sessions); dependence; chronic nicotine and withdrawal; Dose (3.1, 6.3, or 12.6 mg/kg/day);.

Q6083: E. Kleeman, *et al.* Impaired function of alpha2-containing nicotinic acetylcholine receptors on oriens-lacunosum moleculare cells causes hippocampus-dependent memory impairments. *Neurobiol Learn Mem* 2016;136(13-20)

ALZET Comments: Nicotine; Saline; SC; Mice (lactating); Rat; 1002; 2ML2; 14 days; Dose (21 mg/kg/day for mice and 6 mg/kg/day for rats); Controls received mp w/ vehicle; behavioral testing (Elevated plus maze test; object location and recognition memory tasks); Plasma half-life of nicotine in mice is 6-9 min; in rats it is about 54 min (p.14);.

Q4810: Kang Chen, *et al.* Early postnatal nicotine exposure disrupts the $\alpha 2^*$ nicotinic acetylcholine receptor-mediated control of oriens-lacunosum moleculare cells during adolescence in rats. *Neuropharmacology* 2016;101(57-67)



ALZET Comments: Nicotine; Saline; SC; Rat (lactating); 2ML2; 14 days; animal info (female, Sprague Dawley,); teratology; Dose (6 mg/kg/day);.

Q4831: E. C. G. Jr., *et al.* Antimicrobial photodynamic therapy minimizes the deleterious effect of nicotine in female rats with induced periodontitis. *Lasers med sci* 2016;31(83-94

ALZET Comments: Nicotine; Saline; SC; Rat; 2006; 40 days; Controls received mp w/ vehicle; animal info (female, Wistar, 3 months old, 266+/-6.5g); pumps replaced after 40 days; Dose (6 mg/kg/day);.

Q5376: N. J. Hunt, *et al.* Changes in orexinergic immunoreactivity of the piglet hypothalamus and pons after exposure to chronic postnatal nicotine and intermittent hypercapnic hypoxia. *Eur J Neurosci* 2016;43(12):1612-22

ALZET Comments: Nicotine hydrogen tartrate salt; Water; SC; Pig (mini); 2ML2; 14 days; Controls received mp w/ vehicle; animal info (male mixed breed miniature piglets, postnatal day 2, 1.27 kg); functionality of mp verified by brain analysis; toxicology; Chronic postnatal nicotine and intermittent hypercapnic hypoxia (IHH); Dose (2 mg/kg/day);.

Q5850: E. D. Holliday, *et al.* Long-term effects of chronic nicotine on emotional and cognitive behaviors and hippocampus cell morphology in mice: comparisons of adult and adolescent nicotine exposure. *Eur J Neurosci* 2016;44(10):2818-2828

ALZET Comments: Nicotine; Saline; SC; Mice; 1002; 12 days; Controls received mp w/ vehicle; animal info ; behavioral testing (Fear conditioning, forced swim test, elevated plus maze); dependence; Therapeutic indication (Anxiety, depression, learning, memory); Dose (12.6 mg/kg/day);.

Q5865: S. C. Harwani, *et al.* Nicotine Mediates CD161a+ Renal Macrophage Infiltration and Premature Hypertension in the Spontaneously Hypertensive Rat. *Circ Res* 2016;119(10):1101-1115

ALZET Comments: Nicotine bitartrate salt; Saline; SC; Rat; 2001D, 2002; 1 day, 14 days; Controls received mp w/ vehicle; animal info (3-5 weeks old); immunology; Therapeutic indication (Hypertension); Dose (15 mg/kg/day);.

Q5860: Z. Z. Guo, *et al.* SP600125 Attenuates Nicotine-Related Aortic Aneurysm Formation by Inhibiting Matrix Metalloproteinase Production and CC Chemokine-Mediated Macrophage Migration. *Mediators Inflamm* 2016;2016(9142425

ALZET Comments: Nicotine, Angiotensin II; Saline; SC; Mice; 2004; 28 days; Controls received mp w/ vehicle; animal info (1 month old) ; stress/adverse reaction: Nicotine plus AngII cotreatment induced the formation of aortic aneurysms in 6 out of 12 mice (Figure 2(a)), two of which died on the 7th and 11th day after implantation of the pump. Autopsy indicated that the two mice had died of aneurysm rupture. (see pg. 4);Therapeutic indication (AAA, Abdominal aortic aneurysm); Dose (4 mg/kg/day);.

Q5786: G. Dezfuli, *et al.* Evidence for the role of beta2* nAChR desensitization in regulating body weight in obese mice. *Neuropharmacology* 2016;110(Pt A):165-174

ALZET Comments: Nicotine; Saline; SC; Mice; 2002; Controls received mp w/ vehicle; animal info (15 weeks old) ; pumps replaced every 2 weeks (at the end of the initial 14-day treatment period, the pump was removed and a new pump was implanted with a higher dose. This was repeated for the third and highest dose of nicotine);pumps replaced every 2 weeks (at the end of the initial 14-day treatment period, the pump was removed and a new pump was implanted with a higher dose. This was repeated for the third and highest dose of nicotine);comparison of twice daily SC injections vs mp;dose-response (18, 36, 72 mg/kg);good methods (2.3. Osmotic pump placement pg. 166); dependence;Therapeutic indication (Nicotine, body weight, food intake); Dose (18, 36, 72 mg/kg);.

Q5623: J. Avraam, *et al.* alpha4-Containing nicotinic receptors contribute to the effects of perinatal nicotine on ventilatory and metabolic responses of neonatal mice to ambient cooling. *Am J Physiol Regul Integr Comp Physiol* 2016;311(4):R727-R734

ALZET Comments: Nicotine; SC; Mice (knockout); 1002; 2 weeks; Controls received mp w/ vehicle; animal info (14 days); Therapeutic indication (Thermogenesis); Dose (6 mg/kg/day);.



Q6479: M. Arvaniti, *et al.* Functional interaction between Lypd6 and nicotinic acetylcholine receptors. *J Neurochem* 2016;138(6):806-20

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Rat (pregnant); 2006; 6 weeks; Dose (4 mg/kg/day); animal info (Sprague Dawley pregnant dams weighing 200-250g); comparison of injections vs mp;.

Q4263: J. G. Zhuang, *et al.* Prenatal nicotinic exposure augments cardiorespiratory responses to activation of bronchopulmonary C-fibers. *AMERICAN JOURNAL OF PHYSIOLOGY-LUNG CELLULAR AND MOLECULAR PHYSIOLOGY* 2015;308(L922-L930

ALZET Comments: Nicotine; SC; Rat; 2ML4; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 250-350g); pumps replaced on 7th day of gestation; teratology;.

Q4674: P. Zanos, *et al.* Region-specific up-regulation of oxytocin receptor binding in the brain of mice following chronic nicotine administration. *NEUROSCIENCE LETTERS* 2015;600(33-37

ALZET Comments: Nicotine; SC; Mice; 2002; 14 days; Controls received mp w/ saline; animal info (male, C57BL/6J); dependence;.

Q5298: V. Younes-Rapozo, *et al.* Neonatal Nicotine Exposure Leads to Hypothalamic Gliosis in Adult Overweight Rats. *J Neuroendocrinol* 2015;27(12):887-98

ALZET Comments: Nicotine; Saline; SC; Rat (pregnant); 2ML2; 14 days; Controls received mp w/ vehicle; animal info (Wistar rats, pregnant); functionality of mp verified by plasma levels; Pumps primed for 24 hrs; Resultant plasma level (cotinine 25 ng/ml); Dose (6 mg/kg/d);.

Q4206: E. Yildirim, *et al.* ABT-089, but not ABT-107, ameliorates nicotine withdrawal-induced cognitive deficits in C57BL/6/J mice. *Behavioural Pharmacology* 2015;26(241-248

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Mice; 1002; 12 days; Controls received mp w/ vehicle; animal info (male, C57BL6J, 8-12 weeks old); behavioral testing (fear conditioning, contextual and cued fear conditioning, five-choice serial reaction time task); dependence; pumps removed after 12 days.

Q4249: D. L. Xiao, *et al.* Antenatal Antioxidant Prevents Nicotine-Mediated Hypertensive Response in Rat Adult Offspring. *BIOLOGY OF REPRODUCTION* 2015;93(U97-U104

ALZET Comments: Nicotine; Saline; SC; Rat (pregnant); 7 days; Control animals received mp w/vehicle; animal info (Sprague Dawley, female).

Q4188: C. Xiao, *et al.* Nicotinic Receptor Subtype-Selective Circuit Patterns in the Subthalamic Nucleus. *Journal of Neuroscience* 2015;35(3734-3746

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Mice (transgenic); 1002; 2002; 7 days; 14 days; Controls received mp w/ vehicle; animal info (male, a4-GFP, 5-6 weeks old); dependence; "Nicotine or vehicle (saline) was administered to mice (5- to 6-week-old) by subcutaneously implanted osmotic minipumps (model 1002 or 2002, Alzet) for 7 or 14 d to avoid repetitive handling, which causes stress" pg 3735;.

Q4649: Y. Wu, *et al.* Activation of AMPKalpha2 in adipocytes is essential for nicotine-induced insulin resistance in vivo. *NATURE MEDICINE* 2015;21(373-+

ALZET Comments: Nicotine; Saline; SC; Mice; Rat; 4 weeks; 6 weeks; Controls received mp w/ vehicle; animal info (mice male, C57BL6J, 8 weeks old; rat male, Sprague Dawley, 10 weeks old); diabetes;.

Q5289: A. Vivekanandarajah, *et al.* Postnatal nicotine effects on the expression of nicotinic acetylcholine receptors in the developing piglet hippocampus and brainstem. *Int J Dev Neurosci* 2015;47(Pt B):183-91

ALZET Comments: Nicotine Hydrogen Tartrate; water; IP; Pig (mini); 2ML2; 14 days; Controls received mp w/ vehicle; animal info (piglets); functionality of mp verified by blood and urine samples; toxicology; Dose (2 mg/kg/d); Resultant plasma level (20.3 ± 2.5 ng/mL);.



Q4625: A. P. Varani, *et al.* Lack of GABA(B) receptors modifies behavioural and biochemical alterations induced by precipitated nicotine withdrawal. *NEUROPHARMACOLOGY* 2015;90(90-101

ALZET Comments: Nicotine hydrogen tartrate salt; SC; Mice; 2001; 6 days; Controls received mp w/ saline; animal info (male, BALB/C, 20-30g); behavioral testing (nicotine withdrawal; locomotor activity); dependence;

Q4619: O. V. Torres, *et al.* Nicotine Withdrawal Increases Stress-Associated Genes in the Nucleus Accumbens of Female Rats in a Hormone-Dependent Manner. *NICOTINE & TOBACCO RESEARCH* 2015;17(422-430

ALZET Comments: Nicotine; SC; Rat; 2ML2; 14 days; Controls received sham surgery; animal info (female, Wistar, PD60-62); behavioral testing (elevated plus maze, light-dark transfer procedures); dependence;

Q4117: A. K. Stoker, *et al.* Null mutation of the beta2 nicotinic acetylcholine receptor subunit attenuates nicotine withdrawal-induced anhedonia in mice. *European Journal of Pharmacology* 2015;753(146-150

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Mice; 2004; 28 days; Controls received mp w/ vehicle; animal info (male, 12-18 weeks old); cardiovascular; pumps removed after 28 days; used wound clips;

Q5271: T. A. Slotkin, *et al.* Prenatal drug exposures sensitize noradrenergic circuits to subsequent disruption by chlorpyrifos. *Toxicology* 2015;338(8-16

ALZET Comments: Nicotine Bitartrate; Water, bacteriostatic; SC; Rat (pregnant dams); 2ML2; 17 days; Controls received mp w/ vehicle; animal info (pregnant Sprague-Dawley rats, 211-217g); animal info (pregnant Sprague-Dawley rats, 211-217g); dependence; Wound clips used; Dose (3 mg/kg/day);

Q4105: T. A. Slotkin, *et al.* Prenatal nicotine changes the response to postnatal chlorpyrifos: Interactions targeting serotonergic synaptic function and cognition. *Brain Research Bulletin* 2015;111(84-96

ALZET Comments: Nicotine; Water, bacteriostatic; SC; Rat (pregnant); 2ML2; Controls received mp w/ vehicle; animal info (female, pregnant, Sprague Dawley); teratology; used wound clips.

Q4937: T. A. Slotkin, *et al.* Developmental Neurotoxicity of Tobacco Smoke Directed Toward Cholinergic and Serotonergic Systems: More Than Just Nicotine. *Toxicol Sci* 2015;147(1):178-89

ALZET Comments: Nicotine; tobacco smoke extract; DMSO; Rat; 2ML4; 28 days; Controls received mp w/ vehicle; animal info (female, non-pregnant, adult, Sprague Dawley); functionality of mp verified by plasma nicotine levels; dose-response (pg 181); teratology; Dose (Nicotine free base 0.2 or 2 mg/kg/day; TSE 0.18 mg/kg/day);

Q4104: T. A. Slotkin, *et al.* Prenatal nicotine alters the developmental neurotoxicity of postnatal chlorpyrifos directed toward cholinergic systems: Better, worse, or just "different?". *Brain Research Bulletin* 2015;110(54-67

ALZET Comments: Nicotine; Water, bacteriostatic; SC; Rat; 2ML2; Controls received mp w/ vehicle; animal info (female, pregnant, Sprague Dawley); teratology; "dosage determined by the initial body weights of the dams (215 ± 2 g); control pumps contained bacteriostatic water and equivalent concentrations of sodium bitartrate. Because weights increased with gestation, the dose rate fell accordingly to 2 mg/kg/day, but the dose rates remained well within the range that produces nicotine plasma levels " pg 55; used wound clips.

Q5268: P. Y. Shih, *et al.* Nicotine Dependence Reveals Distinct Responses from Neurons and Their Resident Nicotinic Receptors in Medial Habenula. *Mol Pharmacol* 2015;88(6):1035-44

ALZET Comments: Nicotine hydrogen-tartrate salt; Saline; SC; mice; 2004; 14 days; Controls received mp w/ vehicle; animal info (Adult (2–3 months old) mice; C57BL/6 wild-type); functionality of mp verified by plasma levels; functionality of mp verified by plasma levels; dependence; Dose (1 mg/kg/hr); Resultant plasma level (0.3 uM; 40 ng/ml);

Q5256: S. M. Renaud, *et al.* Paradoxical effects of injection stress and nicotine exposure experienced during adolescence on learning in a serial multiple choice (SMC) task in adult female rats. *Neurotoxicol Teratol* 2015;48(40-8

ALZET Comments: Nicotine bitartrate; Water, bacteriostatic; SC; Rat; 2004; 28 days; Controls received mp w/ vehicle; animal info: female Long Evans rats; functionality of mp verified by behavioral test; dose-response (pg 43-44); neurodegenerative (learning impairments); behavioral testing (serial multiple choice); effects of adolescent nicotine exposure on learning in adulthood; anesthetized under isoflurane; Dose: 0.033 mg/h.



Q4276: E. V. Radchenko, *et al.* Agonist and antagonist effects of cytisine in vivo. NEUROPHARMACOLOGY 2015;95(206-214)
ALZET Comments: Nicotine hydrogen tartrate; PBS; SC; Rat; 2ML2; 14 days; Controls received mp w/ saline; animal info (male, Wistar, adult); behavioral testing (locomotor activity, nicotine self administration); dependence;

Q3955: X. L. Qi, *et al.* A critical role for the melanocortin 4 receptor in stress-induced relapse to nicotine seeking in rats. Addiction Biology 2015;20(324-335)
ALZET Comments: Nicotine; Saline; SC; Rat; 2ML4; 28 days; Controls received mp w/ vehicle; animal info (male, Wistar, 250-300g); dependence;

Q4568: G. L. Powell, *et al.* Influence of developmental nicotine exposure on spike-timing precision and reliability in hypoglossal motoneurons. JOURNAL OF NEUROPHYSIOLOGY 2015;113(1862-1872)
ALZET Comments: Nicotine bitartrate; SC; Rat (pregnant); Controls received mp w/ saline; animal info (Sprague Dawley, GD5); functionality of mp verified by plasma cotinine levels; teratology;

Q4981: C. R. Pinheiro, *et al.* Exposure to nicotine increases dopamine receptor content in the mesocorticolimbic pathway of rat dams and offspring during lactation. Pharmacol Biochem Behav 2015;136(87-101)
ALZET Comments: Nicotine; Saline; SC; Rat (lactating); 2ML2; 14 days; Controls received mp w/ vehicle; animal info (female, Wistar, PN2); Dose (6 mg/kg/day); Resultant plasma level (cotinine dams serum 239 ng/ml and in milk 226 ng/ml; cotinine levels in 15 days old pumps 20 ng/ml);

Q4874: C. R. Pinheiro, *et al.* Maternal nicotine exposure during lactation alters food preference, anxiety-like behavior and the brain dopaminergic reward system in the adult rat offspring. Physiol Behav 2015;149(131-141)
ALZET Comments: Nicotine; Saline; SC; Rat (lactating); 2ML2; 14 days; animal info (female, Wistar, PN2); behavioral testing (food preference); "Exposure to nicotine through subcutaneous osmotic minipump infusion was used to avoid the adverse effects of nicotine peaks" pg 132; Dose (6 mg/kg/day); Resultant plasma level (25 ng/ml, "similar to those found in typical smokers");

Q4544: S. Nakauchi, *et al.* Early postnatal nicotine exposure causes hippocampus-dependent memory impairments in adolescent mice: Association with altered nicotinic cholinergic modulation of LTP, but not impaired LTP. NEUROBIOLOGY OF LEARNING AND MEMORY 2015;118(178-188)
ALZET Comments: Nicotine; SC; Mice (pregnant); 15 days; Controls received mp w/ saline; animal info (C57BL6, pregnant); behavioral testing (object location, object recognition memory task, elevated-plus maze; teratology);

Q4539: P. P. Muldoon, *et al.* Inhibition of monoacylglycerol lipase reduces nicotine withdrawal. BRITISH JOURNAL OF PHARMACOLOGY 2015;172(869-882)
ALZET Comments: Nicotine; SC; Mice; 2002; 14 days; Controls received mp w/ saline; animal info (male, ICR, 8-10 weeks old); dependence; pumps removed after 14 days;

Q5238: P. Muelken, *et al.* A Two-Day Continuous Nicotine Infusion Is Sufficient to Demonstrate Nicotine Withdrawal in Rats as Measured Using Intracranial Self-Stimulation. PLoS One 2015;10(12):e0144553
ALZET Comments: Nicotine bitartrate; Saline, physiological; SC; Rat; 2ML2; 14 days; Controls received mp w/ vehicle; animal info (Male Wistar rats, 275–300 g); functionality of mp verified by elevations in intracranial self-stimulation; dose-response (pg 8, 9); post op. care (buprenorphine, ceftriaxone); behavioral testing (intracranial self-stimulation pg 4); Dependence, nicotine; "elevations in ICSS thresholds beginning on the second day of infusion" (Pg. 1); primed in saline for 1 hour prior to implantation; Dose (3.2 mg/kg/day);

Q3984: J. O. Lo, *et al.* Vitamin C supplementation ameliorates the adverse effects of nicotine on placental hemodynamics and histology in nonhuman primates. American Journal of Obstetrics and Gynecology 2015;212(U271-U278)



ALZET Comments: Nicotine bitartrate; Water, bacteriostatic; SC; Monkey (macaque, pregnant); 2ML4; 134 days; Controls received mp w/ vehicle; animal info (female, Rhesus, pregnant, GD26); functionality of mp verified by blood levels; pumps replaced every 3 weeks; post op. care (cefazolin 150 mg BID); long-term study; teratology; dependence;.

Q4495: J. Y. Li, *et al.* Exposure to Nicotine During Pregnancy and Altered Learning and Memory in the Rat Offspring. NICOTINE & TOBACCO RESEARCH 2015;17(661-666

ALZET Comments: Nicotine; SC; Rat (pregnant); 2ML4; Controls received mp w/ saline; animal info (female, Sprague Dawley, GD4, 300-350g); behavioral testing (morris water maze, escape latency, cross-platform); teratology;.

Q5219: B. G. Lee, *et al.* Effects of the BDNF Val66Met Polymorphism on Anxiety-Like Behavior Following Nicotine Withdrawal in Mice. Nicotine Tob Res 2015;17(12):1428-35

ALZET Comments: Nicotine hydrogen tartrate salt; Saline; SC; mice; 2002; 2 weeks; Controls received mp w/ vehicle; animal info: Mice (23–38 g; 2–4 months old); functionality of mp verified by behavior; behavioral testing (withdrawal measurements); Dependence nicotine; Dose: 18 mg /kg/day.

Q4490: P. T. Leach, *et al.* Withdrawal From Chronic Nicotine Reduces Thyroid Hormone Levels and Levothyroxine Treatment Ameliorates Nicotine Withdrawal-Induced Deficits in Hippocampus-Dependent Learning in C57BL/6J Mice. NICOTINE & TOBACCO RESEARCH 2015;17(690-696

ALZET Comments: Nicotine; SC; Mice; 1002; 12 days; 13 days;; Controls received mp w/ vehicle; no stress "Mice were observed to identify any adverse reactions to surgeries (none were observed)" (see pg. 692); behavioral testing (fear conditioning); dependence; pumps removed at 12 days;.

Q5018: K. J. Jackson, *et al.* Effects of orally-bioavailable short-acting kappa opioid receptor-selective antagonist LY2456302 on nicotine withdrawal in mice. Neuropharmacology 2015;97(270-4

ALZET Comments: Nicotine hydrogen tartrate salt; Saline; SC; Mice; 2002; 14 days; 28 days; Controls received mp w/ vehicle; animal info (male, ICR, 8-10 weeks old); behavioral testing (elevated plus maze; hyperalgesia); dependence; Dose (24 mg/kg/day);.

Q5164: B. G. Hoegberg, *et al.* Regulation of alpha4beta2alpha5 nicotinic acetylcholinergic receptors in rat cerebral cortex in early and late adolescence: Sex differences in response to chronic nicotine. Neuropharmacology 2015;99(347-55

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; 2002; 14 days; Controls received mp w/ vehicle; animal info: Sprague Dawley rats; dose-response (pg 350); post op. care (buprenorphine); dependence; Dose: 17 mg/kg/day.

Q4445: J. L. Hawkins, *et al.* NICOTINE STIMULATES EXPRESSION OF PROTEINS IMPLICATED IN PERIPHERAL AND CENTRAL SENSITIZATION. NEUROSCIENCE 2015;290(115-125

ALZET Comments: Nicotine; PBS; SC; Rat; 2ML2; 14 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, adult, 400-500g); functionality of mp verified by cotinine levels; behavioral testing (von Frey filaments); dependence;.

Q4422: Z. Gao, *et al.* NICOTINE MODULATES NEUROGENESIS IN THE CENTRAL CANAL DURING EXPERIMENTAL AUTOIMMUNE ENCEPHALOMYELITIS. NEUROSCIENCE 2015;297(11-21

ALZET Comments: Nicotine ditartrate; Saline; SC; Mice; 2004; 28 days; Controls received mp w/ vehicle; animal info (C57BL6); functionality of mp verified by serum cotinine levels; immunology;.

Q5140: J. B. de la Pena, *et al.* Cigarette smoke exposure during adolescence enhances sensitivity to the rewarding effects of nicotine in adulthood, even after a long period of abstinence. Neuropharmacology 2015;99(9-14

ALZET Comments: Nicotine; SC; Rat; 2ML2; 14 days; Controls received sham pumps; animal info: Male Sprague Dawley; dose-response (pg 12); behavioral testing (conditioned place preferences (CPP) and self-administration tests); dependence, nicotine; Dose: 3.2 mg/kg/day.

Q4382: E. P. Conceicao, *et al.* Maternal nicotine exposure leads to higher liver oxidative stress and steatosis in adult rat offspring. FOOD AND CHEMICAL TOXICOLOGY 2015;78(52-59



ALZET Comments: Nicotine; Saline; SC; Rat (lactating); 2ML2; 14 days; Controls received mp w/ vehicle; animal info (female, Wistar, PN2); teratology; toxicology; dependence;.

Q4381: R. D. Cole, *et al.* Contributions of beta2 subunit-containing nAChRs to chronic nicotine-induced alterations in cognitive flexibility in mice. *PSYCHOPHARMACOLOGY* 2015;232(1207-1217

ALZET Comments: Nicotine hydrogen tartrate; Saline; SC; Mice; 1004; 28 days; Controls received mp w/ vehicle; animal info (B2 +/-); functionality of mp verified by cotinine ELISA; behavioral testing (visual discrimination, strategy set-shifting, reversal learning);.

Q4364: C. M. Chen, *et al.* Maternal nicotine exposure during gestation and lactation induces kidney injury and fibrosis in rat offspring. *PEDIATRIC RESEARCH* 2015;77(56-63

ALZET Comments: Nicotine tartrate; Saline, sterile; SC; Rat (pregnant); 2ML2; 2ML4; 14 days; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, pregnant, GD7); teratology; used sutures;.

Q4363: C. M. Chen, *et al.* Maternal Nicotine Exposure Induces Epithelial-Mesenchymal Transition in Rat Offspring Lungs. *Neonatology* 2015;108(179-187

ALZET Comments: Nicotine; SC; Rat; 2ML2; 2ML4; 14 days; Controls received mp w/ saline; animal info (female, Sprague Dawley); teratology; dependence;.

Q5133: V. J. Cerpa, *et al.* The Alteration of Neonatal Raphe Neurons by Prenatal-Perinatal Nicotine. Meaning for Sudden Infant Death Syndrome. *Am J Respir Cell Mol Biol* 2015;53(4):489-99

ALZET Comments: Nicotine bitartrate; saline; SC; Mice (pregnant); 2004; 28 days; Controls received mp w/ vehicle; animal info 5-7 days pregnant adult mice; dependence, nicotine; Pump delivery mimics the tendency of smokers to maintain a constant blood level of nicotine throughout the day; Dose: (60 mg kg⁻¹ day⁻¹).

Q3383: T. Bordia, *et al.* The alpha7 nicotinic receptor agonist ABT-107 protects against nigrostriatal damage in rats with unilateral 6-hydroxydopamine lesions. *Experimental Neurology* 2015;263(277-284

ALZET Comments: Nicotine; ABT-107; DMXB; Rat; 2006; Control animals received mp w/ vehicle; animal info (male, Sprague Dawley, 120-140 g); neurodegenerative (Parkinson's disease).

Q4322: S. Barreda, *et al.* Developmental nicotine exposure adversely effects respiratory patterning in the barbiturate anesthetized neonatal rat. *RESPIRATORY PHYSIOLOGY & NEUROBIOLOGY* 2015;208(45-50

ALZET Comments: Nicotine bitartrate; Saline; SC; Rat; 2ML4; 28 days; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, embryonic day 5); post op. care (antibiotics Pen-48, Buprenex 0.5 mg/kg BID); teratology;.

Q4311: J. Ayraam, *et al.* Prenatal nicotine exposure increases hyperventilation in alpha4-knock-out mice during mild asphyxia. *RESPIRATORY PHYSIOLOGY & NEUROBIOLOGY* 2015;208(29-36

ALZET Comments: Nicotine bitartrate; Water; SC; Mice; 1002; 14 days; Animal info (female, a4 nAChR KO or WT, embryonic day14); teratology;.

Q4306: S. D. Alsharari, *et al.* Effects of Menthol on Nicotine Pharmacokinetic, Pharmacology and Dependence in Mice. *PLoS One* 2015;10(U459-U474

ALZET Comments: Nicotine tartrate salt; Saline; Mice; 7 days; Controls received mp w/ vehicle; animal info (male, ICR, 20-25g, adult); functionality of mp verified by plasma levels; behavioral testing (tail-flick test; somatic signs; elevated plus-maze); dependence; pumps removed after 7 days;.