



References on the Administration of NMDA Agonists
Using ALZET® Osmotic Pumps

Aspartic Acid

P7453: M. Domercq, *et al.* Excitotoxic oligodendrocyte death and axonal damage induced by glutamate transporter inhibition. *Glia* 2005;52(1):36-46

Agents: Oligonucleotide, antisense; Oligonucleotide sense; Kainate, dihydro-; Aspartic acid, DL-threo-B-benzyloxy- **Vehicle:** Saline, sterile; **Route:** CSF/CNS (optic nerve); **Species:** Rabbit; **Pump:** 1003D; **Duration:** 3 days;

ALZET Comments: Controls received mp w/ vehicle, or contralateral nerves; antisense (glutamate transporters GLAST + GLT-1); animal info (adult, male, white New Zealand)

P6888: J. Darman, *et al.* Viral-induced spinal motor neuron death is non-cell-autonomous and involves glutamate excitotoxicity. *Journal of Neuroscience* 2004;24(34):7566-7575

Agents: Aspartic acid, dl-threo-B-hydroxy; spermine, 1-naphthyl acetyl **Vehicle:** Not Stated; **Route:** CSF/CNS (intrathecal, subarachnoid space); **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Controls received mp w/ saline; enzyme inhibitors (GLT-1, GluR2)

Q9373: M. M. Moore, *et al.* Role of tensile stress and strain in the induction of cell death in experimental vein grafts. *Journal of Biomechanics* 2000;

Agents: (aspartic acid-glutamic acid-valine-aspartic acid)-CHO **Vehicle:** Not Stated; **Route:** IP; **Species:** Rat; **Pump:** 2001; **Duration:** 1 hour; 24 hours; 240 hours;

ALZET Comments: Dose (5nM DEVD-CHO); animal info (Male, 3month-old Sprague±Dawley rats); (aspartic acid-glutamic acid-valine-aspartic acid)-CHO aka DEVD-CHO; enzyme inhibitor (caspase 3); DEVD-CHO is a tetrapeptide aldehyde;

P3908: A. Hirata, *et al.* AMPA receptor-mediated slow neuronal death in the rat spinal cord induced by long-term blockade of glutamate transporters with THA. *Brain Research* 1997;771(37-44)

Agents: Aspartic acid, dl-threo-B-hydroxy; Glutamate, l- **Vehicle:** CSF, artificial;; **Route:** CSF/CNS (subarachnoid space, intrathecal); **Species:** Rat; **Pump:** 2ML1; **Duration:** Not Stated;

ALZET Comments: Dose-response; cannula position verified

P0289: R. M. Mangano, *et al.* Chronic infusion of endogenous excitatory amino acids into rat striatum and hippocampus. *Brain Research Bulletin* 1983;10(47-51)

Agents: Aminobutyric acid, Y-; Aspartic acid, dl-threo-B-hydroxy; Aspartic acid, l-; Cysteine sulfinic acid; Glutamic acid, l-; Radio-isotopes **Vehicle:** 3H tracer; Acetate; Saline; **Route:** CSF/CNS (corpus striatum); CSF/CNS (hippocampus); **Species:** Rat; **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: comparison of injec. vs. mp infusion; amino acids infused separately & simultaneously

Cycloserine

Q2862: H. Geekiyanage, *et al.* Inhibition of serine palmitoyltransferase reduces Abeta and tau hyperphosphorylation in a murine model: a safe therapeutic strategy for Alzheimer's disease. *NEUROBIOLOGY OF AGING* 2013;34(8):2037-2051

Agents: Cycloserine, L- **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice (transgenic); **Pump:** 2004; **Duration:** 28 days;

ALZET Comments: Animal info (TgCRND8, male, female, 3 mo old)

Cysteinesulfinic Acid

P0289: R. M. Mangano, *et al.* Chronic infusion of endogenous excitatory amino acids into rat striatum and hippocampus. *Brain Research Bulletin* 1983;10(47-51)

Agents: Aminobutyric acid, Y-; Aspartic acid, dl-threo-B-hydroxy; Aspartic acid, l-; Cysteine sulfinic acid; Glutamic acid, l-; Radio-isotopes **Vehicle:** 3H tracer; Acetate; Saline; **Route:** CSF/CNS (corpus striatum); CSF/CNS (hippocampus); **Species:** Rat; **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: comparison of injec. vs. mp infusion; amino acids infused separately & simultaneously



Dehydroepiandrosterone

Q5064: I. D. Kim, *et al.* Effect of ovariectomy, 17-beta estradiol, and progesterone on histology and estrogen receptors of bladder in female partial bladder outlet obstruction rat model. *J Obstet Gynaecol Res* 2013;39(7):1259-67

Agents: estrogen; progesterone; dehydroepiandrosterone **Vehicle:** DMSO; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: animal info: Sprague-Dawley, bladder outlet obstruction model, ovariectomized model; functionality of mp verified by plasma measurement; mp used to infuse estrogen, progesterone, and DHEA to examine their effect on angiogenesis of the bladder detrusor; dose: E2 (0.1 mg/kg/day); P4 (1mg/kg/day); P4 and DHEA (300 ug/kg/day);

P9826: R. Genu, *et al.* DHEA Lessens Depressive-Like Behavior via GABA-ergic Modulation of the Mesolimbic System. *Neuropsychopharmacology* 2009;34(3):577-584

Agents: Dehydroepiandrosterone sulfate **Vehicle:** PBS; **Route:** CSF/CNS (ventral tegmental area); CSF/CNS (nucleus accumbens); **Species:** Rat; **Pump:** Not Stated; **Duration:** 14 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (male, Sprague Dawley, FSL, 230-260 g.); cannula placement verified by microscopy; brain tissue distribution

P7200: M. Robichaud, *et al.* Oestrogen and testosterone modulate the firing activity of dorsal raphe nucleus serotonergic neurones in both male and female rats. *Journal of Neuroendocrinology* 2005;17(3):179-185

Agents: Estradiol, 17B-; Testosterone; Progesterone; Pregnane-3, 20 dione, 5B-; Pregnane-3a-ol, 20-one, 5a-; Dehydroepiandrosterone; Testosterone, 5a-dihydroxy **Vehicle:** Ethanol; Water, distilled; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2ML1; **Duration:** 3, 7 days;

ALZET Comments: Controls received mp w/ vehicle; ALZET brain infusion kit used; 3% ethanol; animal info (Sprague-Dawley, 250-325 g)

P7159: T. Iwasaki, *et al.* Marked attenuation of production of collagen type I from cardiac fibroblasts by dehydroepiandrosterone. *American Journal of Physiology Endocrinology and Metabolism* 2005;288(6):E1222-E1228

Agents: Angiotensin II; Dehydroepiandrosterone **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Cardiovascular; peptides

P7097: M. Robichaud, *et al.* Modulation of the firing activity of female dorsal raphe nucleus serotonergic neurons by neuroactive steroids. *Journal of Endocrinology* 2004;182(1):11-21

Agents: NE-100; Progesterone; Pregnenolone; Dehydroepiandrosterone; Pregnane -3,20-dione, 5B; pregnane -3-ol,20-one, 5a; Pregnane -3,20-dione, 5a; Pregnane -5B-ol,20-one, 3a; Pregnane -3B-ol,20-one, 5B; Pregnane -3B-ol,20-one, 5a **Vehicle:** Water, distilled; Ethanol; **Route:** SC; CSF/CNS; **Species:** Rat; **Pump:** Not Stated; **Duration:** 7,14,21 days;

ALZET Comments: Controls received mp w/ vehicle, or saline; replacement therapy (ovariectomy); NE-100 is N,N-dipropyl-2-(4-methoxy-3-(2-phenylethoxy) phenyl)-ethylamine; allopregnanolone; DHP and THP metabolite stereoisomers

P6517: N. N. Kim, *et al.* Effects of ovariectomy and steroid hormones on vaginal smooth muscle contractility. *International Journal of Impotence Research* 2004;16(1):43-50

Agents: Testosterone; estradiol; dihydrotestosterone; dehydroepiandrosterone **Vehicle:** PEG 300; **Route:** SC; **Species:** Rabbit; **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Controls received mp w/ vehicle; replacement therapy (ovariectomy); animal info (female, New Zealand, white, 4.5-5.0 kg, OVX (for some))

P6016: S. Veiga, *et al.* Neuroprotection by the steroids pregnenolone and dehydroepiandrosterone is mediated by the enzyme aromatase. *Journal of Neurobiology* 2003;56(4):398-406

Agents: Pregnenolone; dehydroepiandrosterone **Vehicle:** Saline; fadrozole; **Route:** SC; **Species:** Rat; **Pump:** 2002; **Duration:** Not Stated;

ALZET Comments: Controls received mp w/ vehicle; replacement therapy (gonadectomy); comparison of IP injections vs. chronic mp; dehydroepiandrosterone (DHEA) and pregnenolone are sex hormone precursors



P6480: A. M. Traish, *et al.* Sex steroid hormones differentially regulate nitric oxide synthase and arginase activities in the proximal and distal rabbit vagina. *International Journal of Impotence Research* 2003;15(6):397-404

Agents: Testosterone; dehydroepiandrosterone; dihydrotestosterone, 5-alpha-; androstenediol, delta 5-3B, 17B; estradiol; progesterone **Vehicle:** PEG; **Route:** SC; **Species:** Rabbit; **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Controls received mp w/ vehicle; replacement therapy (ovariectomy); multiple pumps per animal (2)

P5073: E. Corsini, *et al.* In vivo dehydroepiandrosterone restores age-associated defects in the protein kinase C signal transduction pathway and related functional responses. *Journal of Immunology* 2002;168(4):1753-1758

Agents: Dehydroepiandrosterone **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Rat; **Pump:** 2ML2; **Duration:** 2 weeks;

ALZET Comments: controls received mp w/ vehicle; functionality of mp verified by plasma levels; replacement therapy (castration p. 1754); immunology; dehydroepiandrosterone is also known as DHEA.

P3238: M. J. Lobo, *et al.* Effect of chronic intravenous injection of steroid hormones on body weight and composition of female rats. *Biochem. Molec. Biol. Intl* 1993;29(2):349-358

Agents: Progesterone; Cortisol; Cortisone; Corticosterone; Dehydroepiandrosterone; Androstenedione, 4-; Androstendiol, 5-; Testosterone; Nortestosterone, 19-; Estradiol, B-; Estrone; Estriol; Deoxycorticosterone **Vehicle:** PEG 400; **Route:** IV (lower cava); **Species:** Rat; **Pump:** 2002; **Duration:** 15 days;

ALZET Comments: controls received mp with PEG; no stress (see pg. 351); pumps placed into peritoneal cavity and sutured to musculature; surgical wound sprinkled with sulphathiazol

P2044: W. Kowalski, *et al.* Effects of subchronic infusion of dehydroepiandrosterone sulfate on serum gonadotropin levels and ovarian function in the cynomolgus monkey. *Fertil. Steril* 1992;57(4):912-920

Agents: Dehydroepiandrosterone sulfate **Vehicle:** Ethanol; **Route:** SC; **Species:** Monkey; **Pump:** 2ML2; **Duration:** 6 weeks;

ALZET Comments: Functionality of mp verified by urine and serum DHEA levels; pumps replaced every 14 days; 70% ethanol used although not recommended by manufacturer; DHEA infused only 2 wks. but preceded and followed by 2 wks. of saline only

P1922: M. Gaillard-Mogulewsky. Pharmacology of antiandrogens and value of combining androgen suppression with antiandrogen therapy. *Suppl. Urol* 1991;37(2):5-12

Agents: Androstenedione; Dehydroepiandrosterone; Dehydroepiandrosterone sulfate **Vehicle:** Not Stated; **Route:** Not Stated;

Species: Rat; **Pump:** Not Stated; **Duration:** 15 days;

ALZET Comments: no comment posted

P0393: M. Haug, *et al.* La dehydroepiandrosterone inhibe le comportement agressif de Souris males castrées. *C. R. Acad. Sc. Paris* 1983;296(20):975-977

Agents: Pregnenolone; Dehydroepiandrosterone **Vehicle:** Olive oil; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 15 days;

ALZET Comments: comparison of sc injections vs. mp infusion; comparison of agents effects; 1/2 of male mice used were castrated

Ibotenic Acid

Q6857: P. Pompei, *et al.* Regulation of Preprotachykinin-A Gene Expression in an Animal Model of Alzheimer's Disease. *The Journal of Histochemistry & Cytochemistry* 2001;49(11):1469-1470

Agents: Amyloid protein, Beta (1-40); ibotenic acid **Vehicle:** Saline; **Route:** CSF/CNS (hippocampus); **Species:** Rat; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: Dose (B-amyloid (0.075, 0.15, or 0.224 µg/µl); ibotenic acid (0.01875, 0.15, or 0.0562 µg/µl)); Controls received mp w/ vehicle; animal info (Twenty male Albino Wistar rats weighing ~340 g); B-amyloid and ibotenic acid are neurotoxins; neurodegenerative (Alzheimer's);



P2571: H. Kaneda, *et al.* Alteration in regional brain neuropeptides following intracerebroventricular infusion of excitotoxins in rats. *Biological Psychiatry* 1994;36(103-109)

Agents: Ibotenic acid; Kainic acid; Quinolinic acid **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 14 days; **ALZET Comments:** controls received mp w/ vehicle

P1682: M. R. Dursteler, *et al.* Directional pursuit deficits following lesions of the foveal representation within the superior temporal sulcus of the macaque monkey. *J. Neurophysiol* 1987;57(5):1262-1286

Agents: Ibotenic acid **Vehicle:** Not Stated; **Route:** CSF/CNS (middle temporal area); **Species:** Monkey; **Pump:** 2001; **Duration:** 3 days; 23 hours; **ALZET Comments:** no comment posted

NMDA

Q8648: F. Mannara, *et al.* Allosteric modulation of NMDA receptors prevents the antibody effects of patients with anti-NMDAR encephalitis. *Journal of Neurology* 2020;143(9):2709-2720

Agents: NMDAR-CSF **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** Not stated; **Duration:** 14 days; **ALZET Comments:** Animal info (male C57BL/6J mice, 8-10 weeks old, 25-30 g); behavioral testing (Novel object location; locomotor activity); Brain coordinates (0.2 mm posterior and \pm 1.00 mm lateral from bregma, depth 2.2 mm); dependence;

Q8402: M. Carceles-Cordon, *et al.* NMDAR Antibodies Alter Dopamine Receptors and Cause Psychotic Behavior in Mice. *Ann Neurol* 2020;88(3):603-613

Agents: NMDAR-CSF **Vehicle:** CSF; **Route:** CNS/CSF (lateral ventricle); **Species:** Mice; **Pump:** Not stated; **Duration:** 14 days; **ALZET Comments:** Controls received mp w/ vehicle; animal info (male C57BL/6J mice, 8 to 10 weeks old (25-30g)); behavioral testing (prepulse inhibition of the acoustic startle reflex; novel object location; general locomotor activity); Multiple pumps per animal (2 pumps); NMDAR aka anti-N-methyl-D-aspartate receptor; dependence;

Q5224: Yongzhi Li, *et al.* Induction of Memory Deficit in Mice with Chronic Exposure to Cerebrospinal Fluid from Patients with Anti-N-Methyl-DAspartate Receptor Encephalitis. *Journal of Experimental Medicine* 2015;237(329-338)

Agents: NMDAR-CSF **Vehicle:** Saline; **Route:** CSF/CNS (left lateral ventricle); **Species:** Mice; **Pump:** 1004; **Duration:** 18 days; **ALZET Comments:** Controls received mp w/ vehicle; animal info: C57BL/6 male mice (age: 8 weeks; weight: 22-24 g); functionality of mp verified by behavioral tests; neurodegenerative (anti-NMDAR encephalitis); behavioral testing (spontaneous locomotor activity, open field test, NOR test, Morris Water maze); Immunology, immunotherapy; brain tissue distribution; cyanoacrylate adhesive; "The diffusion of methylene blue in all ventricles was confirmed in all mice examined" pg 331; Cannula placement verified via methylene blue or thionine solution injection into brain; NMDAR-CSF aka Anti-N-methyl-D-aspartate receptor-CSF; CSF collected from patients with anti-NMDAR encephalitis; Brain coordinates; 0.4 mm posterior to bregma, 1.0 mm lateral to the lambda point, and 2.0 mm deep from the dural surface

P3074: D. W. Zochodne, *et al.* A segmental chronic pain syndrome in rats associated with intrathecal infusion of NMDA: evidence for selective action in the dorsal horn. *Canadian Journal of Neurological Sciences* 1994;21(24-28)

Agents: NMDA; Magnesium sulfate **Vehicle:** PBS; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2002; **Duration:** 4-8 weeks;

ALZET Comments: controls received mp with PBS; long-term study, pumps replaced every 2 weeks; NMDA given with MgSO4

P3663: S. Nag, *et al.* Spinal neuronal pathology associated with continuous intrathecal infusion of N-methyl-D-aspartate in the rat. *Acta Neuropathologica* 1990;81(7-13)

Agents: NMDA; Glycine; Magnesium sulfate; APV **Vehicle:** PBS; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** Not Stated; **Duration:** 1, 2, or 4 weeks;

ALZET Comments: controls received no agent or mp w/ .1MPBS alone or w/ .15M glycine in .1MPS; 0.2 and 0.5M NMDA for 1-2 weeks poorly tolerated; .15M for 2 & 4 weeks better; NMDA and other agents infused in pairs



Pregnenolone

Q3194: A. Gonzalez-Usano, *et al.* Pregnenolone Sulfate Restores the Glutamate-Nitric-Oxide-cGMP Pathway and Extracellular GABA in Cerebellum and Learning and Motor Coordination in Hyperammonemic Rats. ACS CHEMICAL NEUROSCIENCE 2014;5(2):100-105

Agents: Pregnenolone sulfate **Vehicle:** DMSO; saline, sterile; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2004; **Duration:** 28 days; **ALZET Comments:** Control animals received mp w/vehicle; animal info (male, Wistar, 140-160 g); ALZET brain infusion kit 2 used; 10% DMSO used; "PregS is administered intracerebrally because it does not cross the blood-brain barrier." pg 104; behavioral testing (Y-Maze)

P8283: J. L. W. Yau, *et al.* Central administration of a cytochrome P450-7 alpha product 7 alpha-hydroxypregnenolone improves spatial memory retention in cognitively impaired aged rats. Journal of Neuroscience 2006;26(43):11034-11040

Agents: Pregnenolone; Dehydroepiandrosterone **Vehicle:** CSF, artificial; Cyclodextrin, hydroxypropyl, beta; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 2 weeks;

ALZET Comments: Controls received mp w/ vehicle; ALZET brain infusion kit used; animal info (male, Lister hooded, 29 months, 500-600 grams); dental cement used to secure cannula; behavioral study; 10% cyclodextrin used; aging

P7097: M. Robichaud, *et al.* Modulation of the firing activity of female dorsal raphe nucleus serotonergic neurons by neuroactive steroids. Journal of Endocrinology 2004;182(1):11-21

Agents: NE-100; Progesterone; Pregnenolone; Dehydroepiandrosterone; Pregnane -3,20-dione, 5B; pregnane -3-ol,20-one, 5a; Pregnane -3,20-dione, 5a; Pregnane -5B-ol,20-one, 3a; Pregnane -3B-ol,20-one, 5B; Pregnane -3B-ol,20-one, 5a **Vehicle:** Water, distilled; Ethanol; **Route:** SC; CSF/CNS; **Species:** Rat; **Pump:** Not Stated; **Duration:** 7,14,21 days;

ALZET Comments: Controls received mp w/ vehicle, or saline; replacement therapy (ovariectomy); NE-100 is N,N-dipropyl-2-(4-methoxy-3-(2-phenylethoxy) phenyl)-ethylamine; allopregnanolone; DHP and THP metabolite stereoisomers

P6016: S. Veiga, *et al.* Neuroprotection by the steroids pregnenolone and dehydroepiandrosterone is mediated by the enzyme aromatase. Journal of Neurobiology 2003;56(4):398-406

Agents: Pregnenolone; dehydroepiandrosterone **Vehicle:** Saline; fadrozole; **Route:** SC; **Species:** Rat; **Pump:** 2002; **Duration:** Not Stated;

ALZET Comments: Controls received mp w/ vehicle; replacement therapy (gonadectomy); comparison of IP injections vs. chronic mp; dehydroepiandrosterone (DHEA) and pregnenolone are sex hormone precursors

Quinolinic Acid

Q7001: A. Rahman, *et al.* Intraventricular infusion of quinolinic acid impairs spatial learning and memory in young rats: a novel mechanism of lead-induced neurotoxicity. J Neuroinflammation 2018;15(1):263

Agents: Quinolinic acid **Vehicle:** Saline; **Route:** CSF/CNS (right lateral ventricle); **Species:** Rat (neonate); **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Dose (9 mM); Controls received mp w/ vehicle; animal info (21-day old Wistar rat pups); behavioral testing (Spatial learning and memory test); ALZET brain infusion kit used; Brain coordinates (anteroposterior—3 mm behind bregma; lateral—3.6 mm from midline; and depth—3.8 mm from skull surface);

Q5843: B. Kalaska, *et al.* Serum metabolic fingerprinting after exposure of rats to quinolinic acid. J Pharm Biomed Anal 2016;131(175-182)

Agents: Quinolinic acid **Vehicle:** DMSO; **Route:** IP; **Species:** Rat; **Pump:** 2006; **Duration:** 28 days;

ALZET Comments: Controls received mp w/ vehicle; animal info (weight: 151.5g); 10% DMSO; Therapeutic indication (Metabolic fingerprinting); Dose (0.3 mg/day, 1 mg/day);

P8905: J. R. Yates, *et al.* 4-Chloro-3-hydroxyanthranilate reduces local quinolinic acid synthesis, improves functional recovery, and preserves white matter after spinal cord injury. Journal of Neurotrauma 2006;23(6):866-881

Agents: Quinolinic acid, ¹³C₇- **Vehicle:** Saline, physiological; **Route:** IP; **Species:** Guinea pig; **Pump:** 1007D; **Duration:** 5 days; **ALZET Comments:** Brain tissue distribution; animal info (female, Hartley, adult, 300-480 g.); lateral compression of the spinal cord (spinal cord injury; SCI); nephrology; behavioral testing (motor testing, CTM reflex/sensory testing)



R0207: T. W. Stone. Kynurenines in the CNS: from endogenous obscurity to therapeutic importance. *Progress in Neurobiology* 2001;64(185-218)

Agents: Quinolinic acid **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Rat; **Pump:** Not Stated; **Duration:** 14 days;
ALZET Comments:

P3815: K. E. Beagles, *et al.* Quinolinic acid in vivo synthesis rates, extracellular concentrations, and intercompartmental distributions in normal and immune-activated brain as determined by multiple-isotope microdialysis. *J. Neurochem* 1998;70(281-291)

Agents: Quinolinic acid **Vehicle:** Saline; 3H tracer; Radio-isotopes; **Route:** SC; **Species:** Gerbil; **Pump:** 1007D;
ALZET Comments: no comment posted

P3973: K. Maeda, *et al.* Neurochemical and metabolic consequences of elevated cerebrospinal fluid quinolinic acid concentrations in rat brain. *Neurosci. Res* 1997;29(303-309)

Agents: Quinolinic acid **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;
ALZET Comments: controls received mp w/saline; comparison of ICV injections vs. mp; no stress (see pg. 305); stress/adverse reaction only in animals receiving ICV injections (pg.305)

P3489: M. P. Heyes, *et al.* Quantification of local de novo synthesis versus blood contributions to quinolinic acid concentrations in brain and systemic tissues. *J. Neurochem* 1997;68(280-288)

Agents: Quinolinic acid **Vehicle:** Saline; 13C tracer; Radio-isotopes; **Route:** SC; **Species:** Gerbil; **Pump:** 1007D; **Duration:** 7 days;

ALZET Comments: Controls received saline; functionality of mp verified by in vitro assay, in vivo assays on blood and tissue samples; 13C-QUIN (labeled) used; analyzed fluid & tissue distribution of labeled quinolinic acid

P3492: T. Bazzett, *et al.* The neuronal NOS inhibitor L-MIN, but not 7-NINA, reduces neurotoxic effects of chronic intrastriatal administration of quinolinic acid. *Brain Research* 1997;775(229-232)

Agents: Quinolinic acid; Nitroindazole, 7-, sodium salt; thiocitrulline dihydrochloride, methyl- **Vehicle:** PBS; **Route:** CSF/CNS (striatum); **Species:** Rat; **Pump:** 2002; **Duration:** Not Stated;

ALZET Comments: Dose-response; microdialysis; quinolinic acid administered alone or w/1 other agent in same pump; enzyme inhibitor; nitric oxide synthase inhibitor;

P3423: M. Misztal, *et al.* Subchronic intraventricular infusion of quinolinic acid produces working memory impairment - a model of progressive excitotoxicity. *Neuropharmacology* 1996;35(4):449-458

Agents: Quinolinic acid **Vehicle:** Not Stated; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 3, 14 days;

ALZET Comments: ALZET BIK; pumps removed after 3 or 14 days, infusion tubing sealed and left in place, behavioral testing

P3479: M. Misztal, *et al.* Learning deficits induced by chronic intraventricular infusion of quinolinic acid - protection by MK-801 and memantine. *European Journal of Pharmacology* 1996;296(1-8)

Agents: Quinolinic acid; Memantine; MK-801 **Vehicle:** Saline; **Route:** SC; CSF/CNS; **Species:** Rat; **Pump:** 2002; 2ML2; **Duration:** 2 weeks;

ALZET Comments: ALZET brain infusion kit used; animals were given ICV quinolinic acid concurrently w/ subcutaneous NMDA antagonists

P2571: H. Kaneda, *et al.* Alteration in regional brain neuropeptides following intracerebroventricular infusion of excitotoxins in rats. *Biological Psychiatry* 1994;36(103-109)

Agents: Ibotenic acid; Kainic acid; Quinolinic acid **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;

ALZET Comments: controls received mp w/ vehicle

P2787: B. E. Kalisch, *et al.* Picolinic acid protects against quinolinic acid-induced depletion of NADPH diaphorase containing neurons in the rat striatum. *Brain Research* 1994;668(1-8)

Agents: Quinolinic acid; Picolinic acid **Vehicle:** Saline; **Route:** CSF/CNS (striatum); **Species:** Rat; **Pump:** 2002; **Duration:** 1,7 days, 7 days;

ALZET Comments: Controls received mp w/ saline; agents infused alone or concomitantly



P2180: T. J. Bazzett, *et al.* Chronic intrastriatal dialytic administration of quinolinic acid produces selective neural degeneration. *Experimental Neurology* 1993;120(177-185)

Agents: Quinolinic acid **Vehicle:** PBS; **Route:** CSF/CNS (striatum); **Species:** Rat; **Pump:** 2002; **Duration:** 18 days;
ALZET Comments: controls received mp w/phosphate buffered saline; microdialysis; pump attached to dialysis probe anchored via guide cannula; stylet maintained patency of 8 mm cannula

P1997: T. J. Bazzett, *et al.* A novel device for chronic intracranial drug delivery via microdialysis. *J. Neurosci. Methods* 1991;40(1-8)

Agents: Quinolinic acid **Vehicle:** Not Stated; **Route:** CSF/CNS (striatum); **Species:** Rat; **Pump:** 2002; **Duration:** 14-17 days;
ALZET Comments: functionality of mp verified in vitro for 22 days; detailed methods; excitotoxin; pumps used in a microdialysis infusion apparatus; detailed schematic on p. 2

P3084: K. Yamada, *et al.* Neurotoxicity induced by continuous infusion of quinolinic acid into the lateral ventricle in rats. *Neurosci. Lett* 1990;118(128-131)

Agents: Quinolinic acid **Vehicle:** PBS; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 7,14,21 days;
ALZET Comments: controls received mp with vehicle; comparison of striatal injections vs. mp

P3025: A. Vezzani, *et al.* Neurodegenerative effects induced by chronic infusion of quinolinic acid in rat striatum and hippocampus. *European Journal of Neuroscience* 1990;3(40-46)

Agents: Quinolinic acid; Nicotinic acid; AP7; Kynurenic acid **Vehicle:** Radio-isotopes; 3H tracer; NaOH; PBS; HCl; **Route:** CSF/CNS (striatum); CSF/CNS (hippocampus); **Species:** Rat; **Pump:** 2002; **Duration:** 15 hours; 2 weeks;
ALZET Comments: Controls received mp with nicotinic acid; functionality of mp verified by measurement of radioactivity; dose response;