References on the Administration of Estrogens
Using ALZET® Osmotic Pumps


ALZET Comments: Estradiol, 17b; Cyclodextrin, B-; SC; Rat; Pump model not stated; 14 days; Dose (0.0167 mg); 20% β-cyclodextrin used; animal info (3 month old, female, Sprague Dawley); ischemia (Cerebral);


ALZET Comments: Angiotensin II, estradiol, 17beta-; PBS, Ethanol; SC; Mice; Ang-II (1000 ng/kg/min), Estradiol (0.25 ug/hr); Beta-estradiol reconstituted in a PBS-ethanol solution [9:1]; animal info (8- to 12-week-old female C57BL/6 mice);


ALZET Comments: Estradiol; SC; Rat; 2006; 14 days; Dose (0.05 ug/h); “exogenous E2 replacement produced E2 levels of 25-33pg/ml” (pg 2);


ALZET Comments: Estradiol; Mice; 2006; 6 weeks; Dose (6 μg/d); animal info (5-month-old C57BL/6 male mice);


ALZET Comments: Estradiol, 17b-; Cyclodextrin, 2-hydroxypropyl-b- ; water; SC; Rat; 2002; 14 days; Dose (0.25 mg/kg body weight); 27% hydroxypropyl-β-cyclodextrin used; animal info (ovariectomized (OVX) female Sprague Dawley rats, weighing between 200–225 g); replacement therapy (estradiol);


ALZET Comments: Estradiol; Progesterone sulfate; SC; Mice; 2002; 14 days; Dose (17b-estradiol : 0.1 mg/kg/d, progesterone sulfate: 0.25 mg/kg/d, 0.1 mg/kg/d estradiol + 0.25 mg/kg/d progesterone); Controls received mp w/ vehicle; animal info (7-12 week old female C57BL/6J mice); replacement therapy (estradiol, ovariectomy); Therapeutic indication.

Q6603: S. Menazza, et al. Non-nuclear estrogen receptor alpha activation in endothelium reduces cardiac ischemia-reperfusion injury in mice. J Mol Cell Cardiol 2017;107(41-51

ALZET Comments: Estradiol; Dendrimer; Estrogen-dendrimer conjugate; ICI182,780; SC; Mice; 2 weeks; Dose (Estradiol (6μg/day); (Dendrimer 6μg/day), Estrogen-dendrimer conjugate (6μg/day); ICI182,780 (2mh/kg/day0); Controls received mp w/ vehicle; animal info (11 week old C57BL/6J female mice); Estrogen-dendrimer conjugate aka EDC; ischemia (Cardiac);


ALZET Comments: Estradiol; SC; Rat; 2ML4; 28 days; Dose (0.5 mg/kg/d); Controls received mp w/ vehicle; animal info (Sprague-Dawley female rats weighing 230–250 g); post op. care (3.5 mg/kg bupivicaine and 7 mg/kg lidocaine SC injections for 48 hours after); functionality of mp verified by measuring residual volume at the end of the study; replacement therapy (estradiol).

**ALZET Comments:** Bazedoxifene; Estradiol, 17b-; DMSO; IP; Rat; 2ML1; Dose (Bazedoxifene: 3 mg/kg/day; Estradiol: 100 μg/kg/day); 100% DMSO used; Controls received mp w/ vehicle; animal info (male Wistar rats weighing 300–350g); Resultant plasma level (at 4 hours Bazedoxifene: 20.7 ± 2.1 ng/mL and Estradiol: 45.6 ± 7.8 pg/mL); Therapeutic indication (stroke).


**ALZET Comments:** Estradiol, 17 beta-; Glycerol, DMSO; SC; Rat; 2006; 8 weeks; Dose (10 mg); 50% (v/v) glycerol/50% (v/v) DMSO solution used; animal info (Female Fisher 344 rats).


**ALZET Comments:** Estradiol, 17b-; SC; Rat; 3 weeks; Dose (75 mg/kg/day); animal info (male Sprague-Dawley rats weighing 250–300g); cardiovascular; Therapeutic indication (Pulmonary arterial hypertension).


**ALZET Comments:** Estradiol; DMSO, PBS, Ethanol; IP; mice; 1004; 3.5 weeks; Controls received mp w/ vehicle; animal info (5 months old) (15% EtOH, 43% DMSO, 42% PBS) replacement therapy (Estradiol); Therapeutic indication (Estrogen); Dose (6 ug/day).


**ALZET Comments:** Estradiol, 2-methoxy; entanercept; CSF, artificial; CSF/CNS; Rat; 1003D; 3 days; Controls received mp w/ vehicle; animal info (male, Wistar, 200-250g); ALZET brain infusion kit used; Cannula placement verified via histologic analysis.


**ALZET Comments:** Estradiol, 17B-; SC; Rat; 2004; 28 days; Controls received mp w/ saline; animal info (female, Wistar, 5-6 months old); functionality of mp verified by estrogen-mediated phenomena (cutaneous infusion of 17β-estradiol (5 μg/day) for 4 weeks demonstrated the well-known estrogen-mediated phenomena of acyclic conditions and uterine hypertrophy... This indicates that estradiol was definitely administered to our study rats) pg 23; Dose (5 ug/day).


**ALZET Comments:** DHED; estradiol, 17B-; Propylene glycol; SC; Mice (transgenic); 2004; 8 weeks; Controls received mp w/ vehicle; animal info (female, APPswe/PS1dE9, 6 months old); functionality of mp verified by plasma levels (see figure S1 - E2 only; no assay for DHED); pumps replaced every 4 weeks; neurodegenerative (Alzheimer’s); replacement therapy (estradiol infusion); DHED aka 10β,17β-dihydroxyostra-1,4-dien-3-one; Dose (2 ug/day); Industry authored (AgyPharma LLC).


**ALZET Comments:** Estradiol, 17B-; Cyclodextrin, B-; SC; Rat; Mice; 2002; 14 days; animal info (Rats female, Sprague Dawley, 3 months old, OVX; Mice C27BL/6 PELP1, young adult, OVX); 20% Cyclodextrin used; ischemia (cerebral); replacement therapy (estradiol infusion); immunology; Resultant plasma level (10-15 pg/mL).

Q4865: Osamu Nakagawasaia, et al. BE360, a new selective estrogen receptor modulator, produces antidepressant and antidementia effects through the enhancement of hippocampal cell proliferation in olfactory bulbectomized mice. Behavioural Brain Research 2016;297(315-322
**ALZET Comments**: BE360; estradiol, 17b-; tamoxifen; raloxifen hydrochloride; PEG 300; SC; Mice; 2002; 2 weeks; Controls received mp w/ vehicle; animal info (female, ddY, 10 weeks old, bulbectomized); dose-response (pg 317-318); neurodegenerative (dementia); behavioral testing (sucrose preference; y-maze); BE360 is a novel selective estrogen receptor modulator; Dose (100 ug/day).

**Q4860**: E. Maggioli, *et al.* Estrogen protects the blood–brain barrier from inflammation-induced disruption and increased lymphocyte trafficking. Brain Behav. Immun 2016;51(212-222)

**ALZET Comments**: Estradiol; Cyclodextrin, B-; SC; Mice; 2002; 14 days; Controls received mp w/ vehicle; animal info (C57BL6 or AnxA1 -/-, 2 months old, OVX); replacement therapy (estradiol infusion); immunology; dose: 100nM.

**Q4788**: Jeffrey A. Blair, *et al.* Luteinizing hormone downregulation but not estrogen replacement improves ovariectomy-associated cognition and spine density loss independently of treatment onset timing. Horm. Behav 2016;78(60-66)

**ALZET Comments**: Estradiol, 17b-; leuprolide acetate; Saline; SC; Mice; 1004; 2 months; Controls received mp w/ vehicle; animal info (C57BL6J, 9 months old, OVX); pumps replaced every month; behavioral testing (morris water maze); replacement therapy (estradiol infusion); Dose (E2 1.1 ng/day; leuprolide 3.6 ug/day).

**Q5377**: A. Ichikawa, *et al.* Ketoconazole-induced estrogen deficiency causes transient decrease in placental blood flow associated with hypoxia and later placental weight gain in rats. Reprod Toxicol 2016;63(62-9)

**ALZET Comments**: Estradiol, 17-beta-; Ethanol, Propylene Glycol; SC; Rat; 2003; 3 days; animal info (Female Crl:CD (SD) rats, 11-12 weeks old); functionality of mp verified by plasma levels; 0.5% ethanol, 99.5% Propylene glycol used; dose-response (pg 63); E2 aka estradiol-17beta; hypoxia and later placental weight gain in rats; Dose (0, 0.1, or 1 ug/rat/day); Plasma Level: Lower limit of sensitivity (measured by double-antibody radioimmunoassay (RIA); 5 pg/mL).


**ALZET Comments**: Methoxyestradiol, 2-; DMSO, PEG; SC; Mice; 2001; 7 days; Controls received mp w/ vehicle; animal info (C57BL6/J; 50% DMSO; 50% PEG400; cancer (Leukemia); 2-methoxyestradiol (2-ME2) is an estrogen derivative; Therapeutic indication (Cancer, chemotherapy); Dose (40 mg/kg/day).


**ALZET Comments**: Estradiol, estrogen dendrimer conjugate; IP; Mice; 2006; 12 weeks, 84 days; Controls received mp w/ vehicle; animal info (5 weeks old, ovariectomy); pumps replaced every 6 weeks; long-term study; Therapeutic indication (atherosclerosis); Dose (6 ug/day).


**ALZET Comments**: Estradiol; estrogen receptor selective agonist, alpha; estrogen receptor selective agonist, beta; DMSO; water; Rat; Animal info (juvenile, female, ZDF fa/fa, 6 wks old, 180-240 g).

**P6007**: M. Sarvari, *et al.* Hippocampal Gene Expression Is Highly Responsive to Estradiol Replacement in Middle-Aged Female Rats. Endocrinology 2015;156(7):2632-45

**ALZET Comments**: Estradiol, 17b-; Propylene glycol; SC; Rat; 2004; 29 days; Dose (0.33 mg/mL); animal info (Female Harlan-Wistar rats; 9 months old); replacement therapy (Estradiol).


**ALZET Comments**: Estradiol, 2-methoxy; DMSO; IA (carotid artery); Rat; 8 days, 14 days; Controls received mp w/ vehicle; animal info (male Wistar Kyoto rats, 350 to 400 g); dose-response (E999); 0.1% DMSO; cardiovascular; cardiovascular; Balloon injury-induced neointima formation; Dose (350 ug/kg/day).
Q4669: Z. pelletYu, et al. Role for HIF-1alpha and Downstream Pathways in Regulating Neuronal Injury after Intracerebral Hemorrhage in Diabetes. CELLULAR PHYSIOLOGY AND BIOCHEMISTRY 2015;37(67-76

ALZET Comments: Estradiol, 2-methoxy; ML228; CSF, artificial; Rat; 1003D; 3 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 200-300g, STZ); ALZET brain infusion kit used; diabetes; "This intervention allowed animals to receive continuous intracerebroventricular (ICV) infusion via the minipumps before brain tissues were removed." pg 69;

Q4536: T. I. Montoya, et al. Effect of Vaginal or Systemic Estrogen on Dynamics of Collagen Assembly in the Rat Vaginal Wall. BIOLOGY OF REPRODUCTION 2015;92(U115-U123

ALZET Comments: Estradiol; SC; Rat; 4 weeks; Animal info (female, Sprague Dawley, 12 weeks old); replacement therapy (estradiol infusion);

Q4530: S. E. Mennenga, et al. Understanding the cognitive impact of the contraceptive estrogen Ethinyl Estradiol: Tonic and cyclic administration impairs memory, and performance correlates with basal forebrain cholinergic system integrity. PSYCHONEUROENDOCRINOLOGY 2015;54(1-13

ALZET Comments: Estradiol, ethinyl; Propylene glycol; SC; Rat; 2006; 6 weeks; Controls received mp w/ vehicle; animal info (female, Fischer-344, OVX, 3 months old); functionality of mp verified by serum levels; dose-response (pg8); behavioral testing (water radial-arm maze, morris water maze, visible platform task); replacement therapy (estradiol infusion); long-term study;


ALZET Comments: DHED; estradiol, 17b-; PEG; SC; Rat; 2ML4; 48 days; Controls received mp w/ vehicle; animal info (female, Fischer 344, middle aged, OVX); pumps replaced every 14 days; behavioral testing (plus maze); Dose (4 ug/day);

Q4460: T. Ikeda, et al. 17alpha-Estradiol is generated locally in the male rat brain and can regulate GAD65 expression and anxiety. NEUROPHARMACOLOGY 2015;90(9-14

ALZET Comments: Letrizole; estradiol, 17b-; DMSO; saline; CSF/CNS; Rat; 3 days; Controls received mp w/ vehicle; animal info (male, Wistar/ST, 4 weeks old); 20% DMSO used; replacement therapy (estradiol); This dose of E2 (0.017 mg) was used to mimic low, physiological E2 levels produced during Diestrus I (10–15 pg/mL serum E2);

Q4406: G. J. Dong, et al. 17beta-Estradiol enhances the activation of IFN-alpha signaling in B cells by down-regulating the expression of let-7e-5p, miR-98-5p and miR-145a-5p that target IKKepsilon. BIOCHIMICA ET BIOPHYSICA ACTA-MOLECULAR BASIS OF DISEASE 2015;1852(1585-1598

ALZET Comments: Estradiol, 17b-; Ethanol; propylene glycol; SC; Mice; 1004; 4 weeks; Controls received mp w/ vehicle; animal info (female, C57BL6, 4 weeks old, OVX); 0.5% ethanol used; 99.5% polypropylene glycol used; replacement therapy (estradiol infusion);


ALZET Comments: Estradiol, b-; PEG 400; SC; Rat (pregnant); 2004; 14 days; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, GD4); replacement therapy (ovarectomized);

ALZET Comments: Angiotensin II; estradiol, 17b-; angiotensin (1-7); A-779; saline; DMSO; SC; CSF/CNS; Rat; 2001; 2002; 1 week; 2 weeks; Animal info (Sprague Dawley, 10-12 weeks old); ALZET brain infusion kit used; Multiple pumps per animal (2); replacement therapy (ovariectomized, estradiol infusion); cardiovascular; antihypertensive; peptides; bp measured using radiotelemetry (DSI).


ALZET Comments: Estradiol; ethanol; propylene glycol; Mice; 1002; 1 week; Animal info (male, CB1 KO, 8-12 weeks old, OVX); 0.5% ethanol used; behavioral testing (social interaction test; three-chamber social investigation test); replacement therapy (ovariectomized, estradiol infusion).

Q4091: E. L. Scott, et al. Surgical menopause enhances hippocampal amyloidogenesis following global cerebral ischemia. JOURNAL OF SPORT AND HEALTH SCIENCE 2014;3(206-216

ALZET Comments: Estradiol, 17B-; Cyclodextrin, B-; SC; Rat; 2002; 1 week; Controls received mp w/ vehicle; animal info (female, ovariectomized); 20% cyclodextrin used; ischemia (cerebral); replacement therapy (estradiol infusion); cardiovascular;


ALZET Comments: Estradiol; Rat; 2004; Animal info (female, Harlan-Wistar 2 months old, ovariectomized); replacement therapy (estradiol infusion); mentions use of "silicone capsules", but only mentions pumps once;


ALZET Comments: Leuprolide Acetate; Estradiol, 17b-; Saline; SC; mice; 1004; 3 months; Controls received sham OVX surgery, mp w/ vehicle; animal info (female, 18 month old, triple-transgenic mice, OVX); functionality of mp verified by plasma levels; long-term study; pumps replaced every 4 weeks; neurodegenerative (Alzheimer’s Disease); behavioral testing (morris water maze); LA aka Leuprolide Acetate; Cognition improvement study; learning and memory; Therapeutic indication (Alzheimer’s Disease); Dose (3.6 ug/day LA, 1.1 ng/day Estradiol);

Q3744: P. R. Kramer, et al. INFUSION OF GABRalpha6 siRNA INTO THE TRIGEMINAL GANGLIA INCREASED THE MYOGENIC OROFACIAL NONCEPTIVE RESPONSE OF OVARIECTOMIZED RATS TREATED WITH 17beta-ESTRADIOL. Neuroscience 2014;278(144-153

ALZET Comments: Estradiol benzoate, 17 beta-; SC; Rat; Animal info (Sprague Dawley, 250-300 g, female, ovariectomized); 28 day pump used; hormone replacement (ovariectomy).

Q3498: S. I. Han, et al. Estrogen Receptor Ligands Ameliorate Fatty Liver Through a Nonclassical Estrogen Receptor/Liver X Receptor Pathway in Mice. Hepatology 2014;59(1791-1802

ALZET Comments: Estradiol, 17b-; phloretin; Mice (transgenic); 2004; 4 weeks; Animal info (female, C57BL6 or ERα flox/flox, 5 weeks old); replacement therapy (ovariectomized); phloretin is a phytoestrogen;

ALZET Comments: Estradiol, 17β-; bazedoxifene; DMSO; IP; Rat; 2ML1; Controls received mp w/ vehicle; animal info (male, Wistar, 300-350g); functionality of mp verified by plasma levels; 100% DMSO used; ischemia (cerebral, MCAO); cardiovascular;

ALZET Comments: Estradiol, 17β-; Glycerol; DMSO; SC; Rat; 2006; 6 weeks; Controls received mp w/ vehicle; animal info (female, Fischer, 4 weeks old, 60-70g); functionality of mp verified by prolactinoma growth with PRL immunoreactive lactotrophs; 50% DMSO; 50% glycerol used; cancer (prolactinomas); long-term study;

ALZET Comments: Estradiol, 17β-; SC; Rat; 21 days; Controls received mp w/ placebo; animal info (female, 3 months old, Sprague Dawley, ovariectomized); neurodegenerative (Alzheimer's disease); behavioral testing (Morris Water Maze); replacement therapy (17beta estradiol after ovariectomy);

ALZET Comments: Estradiol; agonist, estradiol receptor alpha-selective 16-alpha-VE2; agonist, estradiol receptor beta-selective 8-beta-VE2; DMSO; water; SC; Rat; 10 weeks; Controls received sham surgery; animal info (Female, Wistar, 120-150g, 6 weeks old); replacement therapy (ovariectomy, estradiol infusion); long-term study; immunology;

ALZET Comments: Estradiol; PEG; SC; Rat; 2002; 14 days; Dose (10 µg/kg/day estradiol); animal info (Time-impregnated Sprague-Dawley rats);

ALZET Comments: Estradiol; PEG; SC; Rat; 2002; 12 days; Controls received mp w/ vehicle; animal info (Sprague Dawley, 21 days old); functionality of mp verified by serum measurement; dose-response (table 1 & 2); toxicology;

ALZET Comments: Estradiol, 17B-; Cyclodextrin, B-; SC; Rat; 2002; 12 days; Controls received mp w/ vehicle; animal info (Sprague Dawley, 21 days old); functionality of mp verified by serum measurement; dose-response (table 1 & 2); toxicology;

ALZET Comments: Estradiol, 17β-; Cyclodextrin; SC; Rat; 2002; 2 weeks; Control animals received mp w/ saline; animal info (Sprague Dawley, female, 3-4 mo old, 250-300 g); replacement therapy (ovariectomy).

ALZET Comments: Estradiol; dendrimer, empty estradiol; IP; Mice; 2006; 6 weeks; Control animals received mp w/ vehicle; animal info (C57BL/6, female, 15 wks old); replacement therapy (ovariectomy);

ALZET Comments: Estradiol; Polyethylene glycol; SC; Guinea pig; 2006; 21 days; Control animals received mp w/ vehicle; animal info (virginal, female, adult, Hartley, 12 wks old); replacement therapy (bilateral oophrectomy).
ALZET Comments: Estradiol, hydroxy 2-; PEG 400; SC; Rat; 2ML4; 4 weeks; Control animals received mp w/ vehicle; animal info (Sprague Dawley, female); replacement therapy (ovariectomy); wound clips used; half-life (pg.89).

ALZET Comments: Estradiol, 17-beta; Rat; Animal info (Wistar, female, ovariectomized, obese, 400 g); replacement therapy (ovariectomy).

ALZET Comments: Estradiol, 17-beta; SC; Rat; 2004; 14 days; Animal info (Sprague Dawley, female, pre-pubertal).

ALZET Comments: Estradiol, 17-beta; estrogen receptor alpha specific agonist, 16-alpha-LE2; estrogen receptor beta specific agonist, 8-beta-VE2; DMSO; water; Rat; 10 weeks; Controls received mp w/ vehicle; animal info (Wistar, juvenile, 6 wks old, 120-150 g, female, ovariectomized); replacement therapy (ovariectomy).

ALZET Comments: Estradiol, 17b-; Rat; 2004; Control animals received sham operation; animal info (female, Wistar, young, middle-aged); replacement therapy (ovariectomy).

ALZET Comments: Estradiol; Polyethylene glycol; SC; Rat; 2002; 14 days; Control animals received mp w/ vehicle; animal info (Sprague Dawley, female); replacement therapy (ovariectomy).

ALZET Comments: Estradiol-3-sulfate; Water; CSF/CNS; Sheep (fetus); 2ML2; 7-12 days; Animal info (twin fetuses, 120-127 days of gestation); good methods, pg 669; functionality of mp verified via visual inspection at the time of death and tissue collection.

ALZET Comments: Estradiol; Polyethylene glycol; DMSO; SC; Mice; 1002; 12 days; Controls received mp w/ vehicle; animal info (female, adult, C57BL/6J, ovariectomized); 20% DMSO used; 80% polyethylene glycol used; replacement therapy (ovariectomy); teratology.

ALZET Comments: Estradiol benzoate; PEG; CSF/CNS (left lateral ventricle); Rat; 1002; 4 days; Dose (1.0, 5.0, or 10.0 µg/6.0 µl/day); Controls received mp w/ vehicle; animal info (Adult female Sprague Dawley rats (220–300 g)); Brain coordinates (4.5 mm ventral to skull surface, 1.8 mm lateral to midline, and 1.1 mm posterior to bregma); diabetes.

ALZET Comments: Estradiol; G protein-coupled receptor 30 agonist; SC; Rat; 2006; 2 weeks; Animal info (Sprague Dawley, female, 180-220 g); G protein-coupled receptor 30 agonist also known as G15.

ALZET Comments: Estradiol; testosterone; Ethanol; propylene glycol; PBS; SC; Mice; 1002; 1004; 2, 4 weeks; Control animals received mp w/ vehicle; animal info (LEPR-B Tyr985Leu, male, female, OVX, castrated); 10% ethanol used; replacement therapy (ovariectomy); post op. care (analgesic, carprofen).

Q2684: W. F. Chen, et al. Estrogenic effects of ginsenoside Rg1 in endometrial cells in vitro were not observed in immature CD-1 mice or ovariectomized mice model. MENOPAUSE-THE JOURNAL OF THE NORTH AMERICAN MENOPAUSE SOCIETY 2012;19(9):1052-1061
ALZET Comments: Estradiol; Rg1; SC; Mice; 3 months; Control animals received mp w/ vehicle; animal info (C57BL/6J, female, OVX, 5 mo old); long-term study; replacement therapy (ovariectomy).

ALZET Comments: Oestradiol, 17b-; Ethanol; polypropylene glycol; SC; Rat; 1007D; 5, 8 days; Control animals received mp w/ vehicle; animal info (Wistar, male, adult, 200-400 g); 0.5% ethanol used; functionality of mp verified via serum drug levels.

ALZET Comments: Estradiol; SC; Rat; Animal info (male, Wistar, adult, 3 mo old, Sprague-Dawley, female, Harlan, adult, young, 3 mo old, middle-aged, 10 mo old, 24 mo old, Fischer 344); replacement therapy (ovariectomy).

ALZET Comments: Estradiol; SC; Rat; 2ML4; 2 weeks; Controls received mp w/ vehicle; animal info (8 wks old, male, CRL, Sprague Dawley).

ALZET Comments: Estradiol, beta-17; Ethanol; PBS; SC; Mice (transgenic); 1007D; Animal info (GnRH-Cr transgenic, Jak2 flox); replacement therapy (ovariectomized).

Q1487: C. E. Wood. Fetal Hypothalamus-Pituitary-Adrenal Responses to Estradiol Sulfate. Endocrinology 2011;152(12):4966-4973
ALZET Comments: Estradiol-3-sulfate; CSF/CNS; IV (femoral, saphenous); Sheep (ewe); 2ML2; 7, 12 days; Controls received mp w/ vehicle; animal info (ewe); post op. care (ampicillin). "metabolic clearance rates (MCR) were calculated for each hormone using infusion rates and changes in plasma concentration from this (for E2SO4) and one previous (for E2) study from this laboratory using the following formula: MCR = (infusion rate)/(change in plasma concentration at steady state)." pg 4968.

ALZET Comments: Estradiol-3-sulfate; Water; CSF/CNS; Sheep (pregnant); 2ML2; 7, 12 days; Controls received mp w/ vehicle; animal info (ewe); post op. care (ampicillin).


**ALZET Comments:** Estradiol; DMSO; SC; Rat; 14 Days; Animal info (Wistar, female); replacement therapy (ovariectomy).


**ALZET Comments:** Diarylpropionitrile; estradiol, 16-alpha-lactone; estradiol; Propylene glycol; SC; Rat; 2004; 29 days; Controls received mp w/ vehicle; animal info (Harlan Wistar, middle-aged, retired breeder, ovariectomized); replacement therapy (ovariectomy).


**ALZET Comments:** Estradiol, beta; Propylene glycol; IP; Mice; 1002; 2 weeks; Controls received mp w/ vehicle; animal info (CS7BL/6, 10 wks old, KKAy, male, female, OVX); replacement therapy (ovariectomized).


**ALZET Comments:** Estradiol, 17-beta; Rat; Animal info (Sprague Dawley, female, adult, 3 mo old); replacement therapy (ovariectomy); wound clips used.


**ALZET Comments:** Estradiol; Polyethylene glycol; Rat; Controls received mp w/ vehicle; animal info (Sprague Dawley, female, 250 g); replacement therapy (ovariectomy); 28-day pump used.


**ALZET Comments:** Estradiol; SC; Rat; Controls received placebo; animal info (Sprague Dawley, female, 6 mo old); replacement therapy (ovariectomy); infusion rate of 0.25 ul/hr.


**ALZET Comments:** Estradiol; G-1; DMSO; Cyclodextrin, 2-hydroxypropyl-b-; SC; Rat; 2006; Controls received mp w/ vehicle; animal info (Sprague Dawley, female, young adult, ovariectomized); replacement therapy (ovariectomy); G-1 is a selective GPR30 agonist; 13.9% or 33.7% DMSO used.

Q5053: R. Hammond, *et al.* GPR30 is positioned to mediate estrogen effects on basal forebrain cholinergic neurons and cognitive performance. *Brain Res* 2011;1379(53-60

**ALZET Comments:** estradiol, 17B; G-1; G Protein-couple receptor 30 antagonist; Rat; animal info (Ovx Rat); administration of estradiol to perimenopausal women, or women who have gone an ovariectomy, right after, will help with cognitive functions. There is a "window of opportunity to help with cognition." administration of estradiol to women older than 69 might not be as useful, and even harmful; dose (5ug/day).