Recent References (2016-Present) on the Administration of Estrogens Using ALZET® Osmotic Pumps


**Agents:** Testosterone; Dihydrotestosterone; Estradiol; Letrozole; Bicalutamide **Vehicle:** 2-hydroxypropyl-B-cyclodextrin; PBS; DMSO; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** Not Stated;

**ALZET Comments:** Dose: Testosterone (2 mg/kg body weight/day); Estradol (2 ug/kg body weight/day); Letrozole (0.4 mg/kg body weight/day); Dutasteride (0.5 mg/kg body weight/day); 10% DMSO vehicle used Controls received mp w/ vehicle; animal info: ARdY mice and mTmG mice 3 weeks of age; replacement therapy; (Testosterone)dependence;


**Agents:** Estradiol, 17-8 **Vehicle:** Propylene glycol; DMSO; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 21 days;

**ALZET Comments:** Dose: (0.5 mg/kg/day); (50% Propylene glycol and 50% dimethyl sulfoxide) vehicle used; animal info: Sprague-Dawley female rats (57–70 days old - initial body weight 250–300 g); post op. care: All animals received systemic (buprenorphine - 0.01mg/kg – sc) and local analgesia (lidocaine + bupivacaine – total dose 7 and 3.5 mg/kg at the sites of incision) immediately before surgery and 2 consecutive days of caprofen (20 mg/kg) starting immediately after surgery; 17β- Estradiol aka (E2)*


**Agents:** 17 B-Estradiol **Vehicle:** DMSO; Propylene Glycol; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (0.5 ug/day); 50% DMSO used; Controls received mp w/ vehicle; animal info (C57BL/6 mice, 2-3 months old); 17 B-Estradiol aka E2; replacement therapy (estradiol);


**Agents:** Estrogen receptor beta; Oxytocin; Lentivirus **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** Animal info (Male mice, 6 weeks old); behavioral testing (Animal Behavior Test); Brain coordinates (anteroposterior (AP) = −1.4, mediolateral (ML) = ±3.5, dorsoventral (DV) = −5.1); neurodegenerative (Autism spectrum disorders);


**Agents:** Oestrogen; ICI 182780 **Vehicle:** Hydroxypropyl-b-cyclodextrin; **Route:** CSF/CNS (intracerebral); **Species:** Rat; **Pump:** 2002; **Duration:** Not Stated;

**ALZET Comments:** 20% hydroxypropyl-b-cyclodextrin used; Controls received mp w/ vehicle; animal info: Sprague-Dawley rats, 6–7weeks of age; post op. care: antibiotic (ubacillin); Blood pressure measured via: Tail cuff; Telemetry method; Blood pressure results (see pg.11); Oestrogen aka E2; ICI182780 aka (ICI); Brain Infusion Kit 2 used; Brain coordinates ((AP: 1.0mm from the bregma, ML: 1.6mm from the midline, DV: 4mm below the surface of the skull); cardiovascular;


**Agents:** Estrogen **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Dose: (80 nM); Controls received mp w/ vehicle; animal info: male Trp53/-/- mice, wild type strain C57BL6/Jcancer (Lymphoma); dependence;

**Agents:** Liraglutide; Compound C; 2-methoxyestradiol **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 4 weeks;

**ALZET Comments:** Dose: Lira (200 μg/kg/day); Cpd C (1.5 mg/kg/day); 2-ME (40 mg/kg/day); Controls received mp w/ vehicle; animal info: 8-week-old mice Diabetic db/db mice; Liraglutide aka (Lira); Liraglutide is a GLP-1 Receptor Agonist; Cpd C aka (Compound C); 2-ME aka 2-methoxyestradiol is an inhibitor of Hif-1a; dependence;


**Agents:** G protein-coupled estrogen receptor 1 **Vehicle:** DMSO; Saline; **Route:** IP; **Species:** Rat; **Pump:** 2ML4; **Duration:** Not Stated;

**ALZET Comments:** Dose (400 μg/kg/day); 75% DMSO in Saline used; Controls received mp w/ vehicle; animal info (female Dahl SS rats, 12-14 weeeks old); Blood pressure measured via telemetry; G protein-coupled estrogen receptor 1 aka GPER1; cardiovascular;


**Agents:** Estradiol, 17B-; Tamoxifen; Raloxifene; BE360 **Vehicle:** PEG 300; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** Dose (0.1 μg/day 17B-Estradiol; 1000 μg/day Tamoxifen; 1000 μg/day Raloxifene; 30 and 100 μg/day BE360); animal info (Female ddY mice (8 weeks old)); behavioral testing (Forced swimming test); 17B-Estradiol aka (E2); Tamoxifen aka TAM, Raloxifene aka RAL; replacement therapy (estradiol);


**Agents:** Estradiol, 17-B **Vehicle:** PEG300; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** Not Stated;

**ALZET Comments:** Dose: (0.04 mCi per kg body weight); Controls received mp w/ vehicle; animal info: 9–11-month-old (Study 1) and 40 9–10-month-old (Study 2) female Fischer-344CDF virgin rats; post op. care: carprofen (5 mg/mL/kg) for pain; behavioral testing: Water Radial-Arm Maze; Morris Water Maze; Visible Platform; Open Field 17 B-Estradiol aka (E2); neurodegenerative;


**Agents:** Estradiol, 17B-; Testosterone, 17a-methyl **Vehicle:** Ethanol; Saline; **Route:** IP; **Species:** Fish; **Pump:** 1007D; **Duration:** 21 days;

**ALZET Comments:** Dose (0.48 ug/day); Controls received mp w/ vehicle; animal info (male and female catfish); functionality of mp verified by residual volume; 17B-estradiol aka E2, 17a-methyltesosterone aka MT; replacement therapy (testosterone; estradiol);


**Agents:** Estradiol, 17B- **Vehicle:** Cyclodextrin; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Dose (0.0167 mg); 20% Cyclodextrin used; Controls received mp w/ vehicle; animal info (three-month-old ovariectomized female mice); behavioral testing (Barnes Maze; Novel Object Recognition Test); 17B-Estradiol aka E2; ischemia (Ischemic Brain);
Q8591: S. V. Koebele, et al. Characterizing the effects of tonic 17beta-estradiol administration on spatial learning and memory in the follicle-deplete middle-aged female rat. Hormones and Behavior 2020;126(104854
Agents: Estradiol, 17-beta- Vehicle: PEG; Route: SC; Species: Rat; Pump: 2006; Duration: 6 weeks;
ALZET Comments: Dose (3 ug/day); Controls received mp w/ vehicle; animal info (female, virgin, Fischer-344 rats, 11 months old); 17-beta-estradiol aka E2; replacement therapy (estradiol);

Agents: 17 B-Estradiol; 4,4′,4″-(4- Propyl-[1H]-pyrazole-1,3,5-triyl) trisphenol; Diarylpropiolnitrile; G-1 Vehicle: DMSO; Hydroxypropyl-ß-Cyclodextrin; Route: SC; Species: Rat; Pump: 2002; Duration: 30 days;
ALZET Comments: Dose (3 ug/day 17 B-Estradiol; 5 ug/day other agonists); 10% DMSO, 20% Hydroxypropyl-ß-Cyclodextrin used; Controls received mp w/ vehicle; animal info (Female Sprague–Dawley rats, 11 weeks of age); 17 B-Estradiol aka E2; 4,4′,4″-(4- Propyl-[1H]-pyrazole-1,3,5-triyl) trisphenol aka PPT; Diarylpropiolnitrile aka DPN; G-1 aka GPER1 agonist; replacement therapy (estradiol);

Agents: Estradiol benzoate, 17-beta- Vehicle: Not stated; Route: Intraovarian; Species: Mice; Pump: Not stated; Duration: 8 weeks;
ALZET Comments: Dose (750 ng/6 ul/day); animal info (Transgenic male (300 g) and female Long Evans rats (260 g)); replacement therapy (estradiol);

Agents: Estradiol, 17B- Vehicle: Not stated; Route: Intraovarian; Species: Mice; Pump: Not stated; Duration: 8 weeks;
ALZET Comments: Dose (20 ug/kg/day); animal info (Six-month-old WT C57Bl6 mice); 17B-Estradiol aka E2; replacement therapy (estradiol);

Agents: Estradiol, 17 beta- Vehicle: Not Stated; Route: SC; Species: Rat; Pump: 2ML4; Duration: 5 weeks;
ALZET Comments: Dose (75 μg/kg/d); Controls received mp w/ vehicle; animal info (Male 8 week old Sprague–Dawley rats (300–350 g)); cardiovascular; Therapeutic indication (Pulmonary arterial hypertension);

Agents: 17B-Estradiol Vehicle: DMSO; Route: SC; Species: Mice; Pump: 1004; Duration: Not Stated;
ALZET Comments: Dose (13.9 mM); Controls received mp w/ vehicle; animal info (Female, 6-8 weeks old, 20-23 g); post op. care (Buprenorphine); gene therapy;

Agents: 17B Estradiol Vehicle: PEG/DMSO; Route: SC; Species: Rat; Pump: 2ML4; 2006; Duration: 7 days; 35 days;
ALZET Comments: Dose (0.5 mg/kg/day); Controls received mp w/ vehicle; animal info (Sprague Dawley, 57-70 days old, Female); cardiovascular;

Agents: Estradiol, 17b- Vehicle: Not Stated; Route: SC; Species: Mice; Pump: Not Stated; Duration: 8 weeks;
ALZET Comments: Dose (2 ug/day); animal info (male non-transgenic (NTG) and DTG mice); behavioral testing (Water Maze Test); 17b-estradiol aka E2; neurodegenerative (neurodegeneration);
Agents: 17B-Estradiol Vehicle: Propylene Glycol; Route: SC; Species: Mice; Pump: 1004; Duration: 28 days;
ALZET Comments: Dose (0.2 mg/kg/day); animal info (C57BL/6J, 5 months old); 17B-Estradiol aka Estrogen; dependence;

Agents: Estrogen, conjugated; Bazedoxifene Vehicle: Cyclodextrin, hydroxypropyl-beta; HEPES buffer; Route: SC; Species: Mice; Pump: Not Stated; Duration: 3 weeks;
ALZET Comments: Dose (BZA (10 mg/kg/day), CE (3 mg/kg/day)); animal info (Female C57BL/6J mice 4 weeks old); replacement therapy (ovariectomized);

Agents: Estradiol, 17 beta- Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Dose (0.0167mg); Controls received mp w/ placebo; animal info (Chimera male); replacement therapy (ovariectomy);

Q7292: C. B. Herber, et al. 2', 3', 4'-trihydroxychalcone is an Estrogen Receptor Ligand Which Modulates the Activity of 17β-estradiol. bioRxiv 2019;1-10
Agents: Estradiol, 17beta-; trihydroxychalcone, 2', 3', 4'- Vehicle: DMSO, Ethanol, Water; Route: Not Stated; Species: Mice; Pump: 2006; Duration: 4 weeks;
ALZET Comments: Dose (1 µg 17beta-estradiol, 2 ug CC7); 50% DMSO, 25% ethanol, 25% deionized water used; Controls received mp w/ vehicle; animal info (8 week old C57bl/6J female ovariectomized mice); 2', 3', 4'- trihydroxychalcone aka CC7; Therapeutic indication (menopausal hormone therapy);

Agents: Estradiol, 17b - Vehicle: Saline; Route: SC; Species: Rat; Pump: Pump model not stated; Duration: 10 weeks;
ALZET Comments: Dose (0.025 mg/day); Controls received mp w/ vehicle; animal info (female, Sprague-Dawley, 12 weeks old, 250-300 g); neurodegenerative (Alzheimer’s disease);

Agents: Estradiol Vehicle: CSF, artificial; Route: SC; CSF/CNS (lateral ventricle); Species: Mice; Pump: 1004; Duration: 3 weeks;
ALZET Comments: Dose ((SC 50 µg/kg/day), (ICV 1 µg/kg/day)); Controls received mp w/ vehicle; animal info (16 weeks, female, C57BL/6); behavioral testing (Open field, Light-dark box, Tail suspension, Forced swim); Multiple pumps per animal (2 for SC group); comparison of SC mp vs ICV mp; ALZET brain infusion kit 3 used; Brain coordinates (0.3 mm posterior to the bregma, 0.9 mm lateral to the central sulcus, 2.5 mm below the skull); replacement therapy (estradiol); Therapeutic indication (mouse model of postmenopausal obesity that exhibited anxiety disorder and depression phenotypes were improved by E2 replacement.);

Agents: Estrogen-dendrimer conjugate Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 2004; Duration: 28 days;
ALZET Comments: Dose (240mg/kg/day); Controls received mp w/ vehicle; animal info (C57BL/6J mice);

**Agents:** estradiol, 17-beta-; DHED  **Vehicle:** PEG;  **Route:** SC;  **Species:** Mice;  **Pump:** Not Stated;  **Duration:** 8 weeks;

**ALZET Comments:** Dose ((E2 2 μg/day), (DHED 2 μg/day)); Controls received mp w/ vehicle; animal info (5.5-6 months, male, C57BL/6 and APPswe/PS1dE9); behavioral testing (radial-arm water maze); pumps replaced every 4 weeks;

10beta,17beta-dihydroxyestr1-4-dien-3-one (DHED) is a brain-selective prodrug of E2; neurodegenerative (Alzheimer’s); pump model not stated but flow rate listed as 0.025 μL/min; Therapeutic indication (DHED-based estrogen treatment shown to decrease APP and Abeta peptide levels concomitantly improving learning in male animals at an early stage of the neuropathology.);


**Agents:** Estradiol, 17b  **Vehicle:** Cyclodextrin, B-;  **Route:** SC;  **Species:** Rat;  **Pump:** Not Stated;  **Duration:** 14 days;

**ALZET Comments:** Dose (0.0167 mg); 20% β-cyclodextrin used; animal info (3 month old, female, Sprague Dawley); ischemia (Cerebral);


**Agents:** estradiol, 17-beta-  **Vehicle:** PEG;  **Route:** SC;  **Species:** Rat;  **Pump:** 2002;  **Duration:** 13 days;

**ALZET Comments:** Dose (10 μg/kg/d); Controls received mp w/ vehicle; animal info (PND 21, male, Sprague-Dawley); comparison of soy protein isolate vs mp;


**Agents:** Estradiol; Estrogen-dendrimer conjugate  **Vehicle:** Not stated;  **Route:** Not stated;  **Species:** Not stated;  **Pump:** Not Stated;  **Duration:** 2 weeks;

**ALZET Comments:** ischemia (placental); replacement therapy (ovarectomy);


**Agents:** 17B-Estradiol  **Vehicle:** Not stated;  **Route:** SC;  **Species:** Rat;  **Pump:** Not stated;  **Duration:** 1, 3, 7 days;

**ALZET Comments:** animal info (Female, Wistar;) dependence;


**Agents:** Angiotensin II, estradiol, 17beta-  **Vehicle:** PBS, Ethanol;  **Route:** SC;  **Species:** Mice;  **Pump:** Not Stated;  **Duration:** Not Stated;

**ALZET Comments:** 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);


**Agents:** Estrogen-dendrimer conjugate, angiotensin II, Estetrol  **Vehicle:** DMSO;  **Route:** SC;  **Species:** Mice;  **Pump:** 2004;  **Duration:** 28 days;

**ALZET Comments:** Dose (80 ug/kg/day-EDC, 0.5 mg/kg/day- Ang II, 6 mg/kg/day -estetrol ); Controls received mp w/ vehicle; animal info (C57Bl/6); cardiovascular;
Q7779: M. Buscato, et al. The antagonist properties of Bazedoxifene after acute treatment are shifted to stimulatory action after chronic exposure in the liver but not in the uterus. Mol Cell Endocrinol 2018;472(87-96)
Agents: Estrogen, Conjugated Equine; Bazedoxifene Vehicle: Hydroxypropyl-beta-cyclodextrin; HEPES buffer; Route: SC; Species: Mice; Pump: Not Stated; Duration: 14 days;
ALZET Comments: Dose (CE- 3 mg/kg/day, BZA- 10 mg/kg/day); animal info (Female, C57BL/6J); Conjugated Equine Estrogen aka CE, Bazedoxifene aka BE; replacement therapy (Estrogen);

Agents: Estradiol, 17b- Vehicle: Not Stated; Route: SC; Species: Rat; Pump: 2006; Duration: Not Stated;
ALZET Comments: Controls received mp w/ 20% cyclodextrin; animal info (male, Sprague Dawley, 250-300g, adult); functionality of mp verified by serum levels; behavioral testing (Morris water maze); replacement therapy (estradiol infusion); long-term study; cardiovascular; Dose (0.05 ug/h); “exogenous E2 replacement produced E2 levels of 25-33pg/ml” (pg 2);

Agents: Estradiol Vehicle: Not Stated; Route: Not Stated; Species: Mice; Pump: 2006; Duration: 6 weeks;
ALZET Comments: Dose (6 μg/d); animal info (5-month-old C57BL/6 male mice); replacement therapy (orchiectomy);

Agents: Estradiol, 17b- Vehicle: Cyclodextrin, 2-hydroxypropyl-b- ; water; Route: SC; Species: Rat; Pump: 2002; Duration: 14 days;
ALZET Comments: 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);

Agents: Estradiol, 17b-; Progesterone sulfate Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 2002; Duration: 14 days;
ALZET Comments: Dose (17b-estradiol : 0.1 mg/kg/d, progesterone sulfate: 0.25 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
Agents: Estradiol; Dendrimer; Estrogen-dendrimer conjugate; ICI182,780 Vehicle: Not Stated; Route: SC; Species: Mice; Pump: Not Stated; Duration: 2 weeks;
ALZET Comments: 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);

Q6143: S. Laouafa, et al. Estradiol Protects Against Cardiorespiratory Dysfunctions and Oxidative Stress in Intermittent Hypoxia. Sleep 2017;40(8);
Agents: Estradiol Vehicle: Not Stated; Route: SC; Species: Rat; Pump: 2ML4; Duration: 28 days;
ALZET Comments: 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 bupivacaine 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);
**Agents:** Bazedoxifene; Estradiol, 17b-
**Vehicle:** DMSO; **Route:** IP; **Species:** Rat; **Pump:** 2ML1; **Duration:** Not Stated;
**ALZET Comments:** 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);

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

**Agents:** Estradiol, 17b-
**Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 3 weeks;
**ALZET Comments:** Dose (75 mg/kg/day); animal info (male Sprague-Dawley rats weighing 250–300g); cardiovascular; Therapeutic indication (Pulmonary arterial hypertension);

**Agents:** Estradiol
**Vehicle:** DMSO, PBS, Ethanol; **Route:** IP; **Species:** mice; **Pump:** 1004; **Duration:** 3.5 weeks;
**ALZET Comments:** 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);

**Agents:** Estrogen receptor antagonist ICI 182,780
**Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2004; 2002; **Duration:** 6 week;
**ALZET Comments:** Dose (0.1 mg/kg/day); animal info (9- to 10-wk-old female Sprague-Dawley rats weighing ~190–200 g); cardiovascular;

**Agents:** Estrogen receptor agonist
**Vehicle:** Not Stated; **Route:** IP; **Species:** Mice; **Pump:** 2006; **Duration:** Not Stated;
**ALZET Comments:** Dose (0.5 ug/d); Controls received mp w/ vehicle;

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

**Agents:** Estradiol, 17B-
**Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2004; **Duration:** 28 days;
**ALZET Comments:** 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);

**Agents:** DHED; estradiol, 17B- **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Mice (transgenic); **Pump:** 2004; **Duration:** 8 weeks;

**ALZET Comments:** 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-dihydroxyestra-1,4-dien-3-one; Dose (2 ug/day);

Industry authored (AgyPharma LLC);


**Agents:** Estradiol, 17B- **Vehicle:** Cyclodextrin, B-; **Route:** SC; **Species:** Rat; Mice; **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** 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

**Agents:** BE360; estradiol, 17b-; tamoxifen; raloxifen hydrochloride **Vehicle:** PEG 300; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** 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);

Q10265: O. Nakagawasai, 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(315-22

**Agents:** Estradiol, 17-B; Tamoxifen; Raloxifen hydrochloride; **Vehicle:** BE360 **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; animal info: Female ddY mice, 8 weeks of age; behavioral testing (Sucrose preference test and Y-Maze test); Carborane Compound aka BE360 is a novel selective estrogen receptor modulator; neurodegenerative (Depression and Memory-Impairment);

Q8904: O. Nakagawasai, 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(315-22

**Agents:** 17 B-Estradiol; Tamoxifen; Raloxifen hydrochloride; Carborane compound **Vehicle:** Ethylene Glycol; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** Animal info (Female ddY mice, 8 weeks of age); behavioral testing (Sucrose preference test, Y Maze Test); Carborane Compound aka BE360; neurodegenerative (Depression and Memory-Impairment);


**Agents:** Estradiol **Vehicle:** Cyclodextrin, B-; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (C57BL6 or AnxA1 -/-, 2 months old, OVX ); replacement therapy (estradiol infusion); immunology; dose: 100nM
Agents: Estrogen-17B Vehicle: Ethanol; PBS; Route: Not Stated; Species: Mice; Pump: 1002; Duration: 1 week;
ALZET Comments: Controls received no mp; Controls received no mp; Controls received no mp; replacement therapy (estrogen infusion); Dose (0.2 mg/kg/day);

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
Agents: Estradiol, 17b; leuprolide acetate Vehicle: Saline; Route: SC; Species: Mice; Pump: 1004; Duration: 2 months;
ALZET Comments: Controls received mp w/ vehicle; animal info (C57BL6/J, 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);

Agents: Estrogen, cyclodextran-coated Vehicle: Water; Route: Not Stated; Species: Mouse; Pump: 1004; Duration: Not Stated;
ALZET Comments: animal info (8 weeks old); Cyclodextran-coated estrogen (Sigma E4389); Mice were allowed to recover for 2 weeks after pump implantation prior to experiment initiation; Therapeutic indication (obesity); Dose (2 ug/kg/day);

Agents: Estradiol, 17-beta- Vehicle: Ethanol, Propylene Glycol; Route: SC; Species: Rat; Pump: 1003D; Duration: 3 days;
ALZET Comments: 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);

Agents: Methoxyestradiol, 2- Vehicle: DMSO, PEG; Route: SC; Species: Mice; Pump: 2001; Duration: 7 days;
ALZET Comments: 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);

Agents: Aldosterone; G protein-coupled estrogen receptor 15 antagonist Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 1004; Duration: 2 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (BALB/c male mice, 2 month old); cancer (Orthotopic renal cancer); dose-response (pg. 2093); Dose (200 ug/kg/day for both);

Agents: Estradiol, estrogen dendrimer conjugate Vehicle: Not Stated; Route: IP; Species: Mice; Pump: 2006; Duration: 12 weeks, 84 days;
ALZET Comments: 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);