References on the Administration of Progesterone
Using ALZET® Osmotic Pumps

**Agents:** Progesterone  
**Vehicle:** Cyclodextrin, 2-ß-Hydroxypropyl-  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML4  
**Duration:** 28 days  
**ALZET Comments:** Dose (4 mg/kg/day); Controls received mp w/ vehicle; animal info (Sprague-Dawley female rats (220-250g/57-70 days old)); post op. care (buprenorphine); Blood pressure measured via tail cuff method; 93.3 mmHg - 105.2 mmHg; Progesterone aka prog; dependence;

**ALZET Comments:** Estradiol, 17b-; 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.

**ALZET Comments:** Chenodeoxycholic acid, progesterone, 11b-hydroxy-, corticosterone, deoxy-, corticosterone, 3α,5α-TH-, progesterone, 3α,5α-TH-11β-hydroxy-; SC; Rat; steroidal derivatives of corticosterone; Review presents the role of gut microbial metabolism of endogenous adrenocorticosteroids as a contributing factor in the etiology of essential hypertension.

**ALZET Comments:** Progesterone; Prolactin; Cyclodextrin, 2-hydroxypropyl-b; SC; Mice; 2002; 14 days; Dose (progesterone 250 μg/day; prolactin 7 μg/day); 20% (w/v) 2-hydroxypropyl-beta-cyclodextrin used; Controls received mp w/ vehicle; animal info (7–8 week old female mice with bilateral oophorectomy); replacement therapy (oophorectomy).

**ALZET Comments:** Corticosterone; progesterone, hydroxy-; SC; Rat; These infused steroids produce glucocorticoid induced mineralocorticoid receptor mediated Na+ retention.

**ALZET Comments:** Progesterone; DMSO; SC; Mice; 1003D; 7 days; Controls received mp w/ vehicle; animal info (male, C57BL6 or BPH2/2, 15-25 weeks old, 25.9-41.2g)); 100% DMSO used; ischemia (cerebral); behavioral testing (Foot fault test, t-maze test); "...mini-pump delivery could offer a more suitable dosing method with the advantages of reducing peaks and troughs in drug levels, the stress associated with repeated injections, and diminishing levels of release over time as seen with pellet implants. Infusion methods are commonly used clinically to maintain drug concentrations and osmotic mini-pump release of agents at a constant rate mimics this approach." pg 2; "Our previous pharmacokinetic study demonstrated that progesterone delivered via i.p. injection has a very short half-life in both plasma and brain but high progesterone concentrations in the brain can be achieved via mini pump infusion." pg 6; pumps primed overnight in 37C saline;

**ALZET Comments:** corticosterone; progesterone, hydroxy-; Propylene glycol; sc; Rat; 14 days; Controls received mp w/ vehicle; animal info: adrenally intact rats; functionality of mp verified by measuring systolic blood pressure pg 46; replacement therapy (the agents infused); Dose: 5 ug/hr of both agents.

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ALZET Comments: estrogen; progesterone; dehydroepiandrosterone; DMSO; SC; Rat; 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).


ALZET Comments: Progesterone; DMSO; SC; Mice; 1003D; animal info (C57BL/6, male, wks old); 100% DMSO used; "AUC shows that far higher progesterone concentrations were reached and maintained in both plasma and brain using osmotic minipump delivery with loading dose compared with a bolus dose alone." pg 1616; comparison of bolus dosing vs mp; "Osmotic minipumps were used as the method of infusion as they release progesterone at a constant rate, therefore avoiding diminishing release levels over time as is the case with pellet implants." pg 1617; pk study; comparison of mp vs pellet.


ALZET Comments: Progesterone; Ethanol; propylene glycol; Monkey (macaca radiata); 2ML1; 24 hours; Animal info (adult, female, bonnet, macaca radiata, 3.3-5.1 kg); multiple pumps per animal (3); replacement therapy (corpus luteum); endocrinology.


ALZET Comments: Progesterone; Polyp propane glycol; ethanol; DMSO; SC; Rat; 1007D; 2 weeks; Controls received mp w/ vehicle; animal info (Wistar); 1% ethanol used; 1% DMSO used; replacement therapy (ovariectomy).


ALZET Comments: Progesterone; medroxyprogesterone acetate; Propylene glycol; SC; Rat; 2ML2; 14 days; Controls received mp w/ vehicle; animal info (adult, female, male, multiparous, Sprague Dawley); estradiol and progesterone in same pump; replacement therapy (ovariectomy).


ALZET Comments: Estradiol, 17b-; progesterone; megestrol acetate; Cyclodextrin, b-; water; SC; Mice (nude); Replacement therapy (ovariectomy); animal info (female, athymic); cancer (ovarian).


ALZET Comments: Estradiol; progesterone; Propylene glycol; SC; Rat; 2ML2; 14 days; Controls received mp w/ vehicle; animal info (adult, female, male, multiparous, Sprague Dawley); estradiol and progesterone in same pump; replacement therapy (ovariectomy).

**ALZET Comments:** Progesterone; Propylene glycol; SC; Rat (lactating); 2ML2; 9 days; Controls received mp w/ vehicle; animal info (female, postnatal day 1, lactating); "This approach ensures adequate hormonal exposure in pups since steroids are excreted through the milk, and prevents the potential confounding influences of pup's manipulation on respiratory or metabolic variables." (p. 14).


**ALZET Comments:** Estradiol, 17B-; testosterone; progesterone; pregnane-3, 20-dione, 5B-; pregnane-3a-ol, 20-one, 5a-; dehydroepiandrosterone; testosterone, 5a-dihydroxy; Ethanol; water, distilled; CSF/CNS; Rat; 2ML1; 3, 7 days; Controls received mp w/ vehicle; ALZET brain infusion kit used; 3% ethanol; animal info (Sprague-Dawley, 250-325 g).


**ALZET Comments:** NE-100; progesterone; pregnenolone; dehydroepiandrosterone; pregnane-3,20-dione, 5B; pregnane-3ol, 20-one, 5a; pregnane-3,20-dione, 5a; pregnane-5B-ol,20-one, 3a; pregnane-3B-ol,20-one, 5B; Water, distilled; ethanol; SC; CSF/CNS; Rat; 7,14,21 days; 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.


**ALZET Comments:** Testosterone; dehydroepiandrosterone; dihydrotestosterone, 5-alpha-; androstenediol, delta 5-3B, 17B; estradiol; progesterone; PEG; SC; Rabbit; 2002; 2 weeks; Controls received placebo; functionality of mp verified by serum hormone levels; replacement therapy (ovariectomy); multiple pumps per animal (2).


**ALZET Comments:** Estradiol, 17B-; Progesterone; Gonadotrophin, human chorionic; SC; Mice (nude); 2004; 4 weeks; Replacement therapy (castration); cancer (prostate); CWR22 xenograft used; flutamide is an anti-androgen; animal info (5-6 week old, nude ,ORX).
carbenolone and hydroxyprogesterone high dose groups; some pumps became disconnected from cannula; glucocorticoids; comparison of sc vs. icv infusion.


**ALZET Comments**: Progesterone, 11a; Hydroxyprogesterone, 11b; RU-28318; Corticosterone; Propylene glycol; SC; Rat; 2002; 14 days; controls received mp w/vehicle; functionality of mp verified by residual volume; replacement therapy (adrenalectomy); agents infused singly and concomitantly in same pump; cardiovascular.


**ALZET Comments**: Estradiol, 17B-; Progesterone; Propylene glycol; SC; Rat; 2ML1; 7 days; controls received sham oophorectomy and/or mp w/ vehicle; replacement therapy (oophorectomy).


**ALZET Comments**: Progesterone; Cortisol; Cortisone; Corticosterone; Dehydroepiandrosterone; Androstenedione, 4-; Androstenediol, 5--; Testosterone; Nortestosterone, 19--; Estradiol, B-; Estrone; Estriol; Deoxycorticosterone; PEG 400; IV (lower cava); Rat; 2002; 15 days; controls received mp with PEG; no stress (see pg. 351); pumps placed into peritoneal cavity and sutured to musculature; surgical wound sprinkled with sulphathiazol.


**ALZET Comments**: Estradiol, B-; Progesterone; Propylene glycol; Ethanol; Ascorbic acid; IP; rabbit; 2001; 4-5 days; controls received mp w/pg; functionality of mp verified by plasma levels; comparison of injections vs. mp.


**ALZET Comments**: EM-170; Progesterone acetate, medroxy-; DMSO; mice; 40 days; replacement therapy (ovariectomy); long-term study, pumps replaced every 20 days; cancer; antiestrogen.


**ALZET Comments**: Progesterone; Ethanol; propylene glycol; SC; Pig; 2ML1; 7 days; Multiple pumps per animal (12); "implanted pumps effectively suppressed follicular growth" (p. 296).


**ALZET Comments**: Estradiol, 17B-; Progesterone; Propylene glycol; Guinea pig; 7 days; Pump model not stated; controls received mp w/vehicle; separate and simultaneous infusion of agents; replacement therapy (oophorectomy).


**ALZET Comments**: Aldosterone; Corticosterone; Dexamethasone phosphate; Estradiol, 17B--; Progesterone; Testosterone; PEG 400; PEG 600; IP; Rat; 1701; 2001; 3-8 days; comparison of agents effects; replacement therapy (adrenalectomy & ovariectomy); controls received mp with solvent or glass rods of mp size; no stress implied G125, weight regained; functionality of mp verified.


**ALZET Comments**: Estradiol, 17B-; Progesterone; SC; Rat; 2001; 24 hours; separate and simultaneous infusion of agents; 2 doses of E2 infused; functionality of mp verified by radioimmunoassay.
**ALZET Comments:** Progesterone; IP; rabbit; 2ML1; no duration posted; replacement therapy (ovariectomy).

**ALZET Comments:** CI-628; Progestins; R-5020; Catecholestrogens; Estradiol, 17B-; Progesterone; Ascorbic acid; PEG; SC; Rat; 2001; 2-3 days; organ replacement therapy (ovariectomy); agents used alone and/or in combination; Cl-628 is an anti-estrogen; R-5020 is a progestin.

**ALZET Comments:** Aldosterone acetate; Progesterone, 19-nor-; Ethanol; Propylene glycol; Water; SC; Rat; 1701; no duration posted; pumps replaced after 7 and 14 days.

**ALZET Comments:** Progesterone; Ethanol; Propylene glycol; IP; rabbit; 2001; 4 days; organ replacement therapy (ovariectomy); 1-2 pumps/animal.

**ALZET Comments:** Aldosterone; Corticosterone; Deoxycorticosterone acetate; Dexamethasone acetate; Estradiol, 17B-; Hydrocortisone; Progesterone; Spironolactone; Testosterone; PEG; PEG 400; PEG 600; IP; Rat; 1701; no duration posted; 3-7 days aldosterone, 6 days PEG only; replacement therapy (adrenalectomy).

**ALZET Comments:** Progesterone; Ethanol; Propylene glycol; SC; cat; 1701; 8 days; comparison of injections 2x/day vs. infusion; organ replacement therapy (ovariectomy).