References on the Administration of Erythropoietin Using ALZET® Osmotic Pumps


Agents: Human recombinant erythropoietin Vehicle: Saline; Route: SC; Species: Rat; Pump: Not Stated; Duration: 14 days;
ALZET Comments: Dose (1333 IU/kg, 667 IU/kg, and 333 IU/kg.); 0.9% Saline used; Controls received mp w/ vehicle; Human recombinant erythropoietin aka rHuEPO; dependence;

Q8440: S. Dey, et al. Sex-specific brain erythropoietin regulation of mouse metabolism and hypothalamic inflammation. JCI Insight 2020;5(5);

Agents: Erythropoietin, recombinant human Vehicle: Saline; Route: CSF/CNS (lateral cerebral ventricle); Species: Mice; Pump: 2006; Duration: 14 days;
ALZET Comments: Dose (3000 U/kg); Controls received mp w/ vehicle; animal info (Tg21 mice); recombinant human Erythropoietin aka recombinant human EPO; ALZET brain infusion kit 3 used; Brain coordinates (midline, 1.00 mm; antero-posterior, 0.34 mm; doroventral, 2.30 mm); dental cement used; replacement therapy (Erythropoietin);


Agents: Erythropoietin Vehicle: Saline; Route: SC; Species: Mice; Pump: 1007D; Duration: 1 week;
ALZET Comments: Dose (1,000 IU of EPO); animal info (36 weeks old, CD-1, Male, 20-25 g); EPO aka hemangiogenic and antiapoptotic factor; dependence;


Agents: Erythropoietin, recombinant human Vehicle: Not Stated; Route: CSF/CNS; Species: Mice; Pump: Not Stated; Duration: 30 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (C57BL6); good methods (Jove Video; picture of pump and implantation pg. 4); ischemia (cerebral); post op. care (Carprofen 4 mg/kg); behavioral testing (rotarod test; hand grip strength); cyanoacrylate adhesive; “In this work we have shown the method of implantation of minipumps with a cannula connected to the skull in order to deliver the plasticity promoting protein rhEpo directly into the ventricle, thus circumventing the BBB.” pg 8; Cannula placement verified via histologic analysis “The are no evident severe tissue alterations based on Nissl staining as compared to the corresponding contralateral area”;


Agents: Erythropoietin, recomb. human Vehicle: Not Stated; Route: SC; Species: Mice (knockout); Mice (transgenic); Pump: Not Stated; Duration: 30 days;
ALZET Comments: Dose (3 U EPO/day or 10 U EPO/day ); Controls received mp w/ vehicle; animal info (8-12 week old WT and Osx:cre-PHD2f/f and Vav:cre-PHD2f/f mice);

Q4450: S. Hiram-Bab, et al. Erythropoietin directly stimulates osteoclast precursors and induces bone loss. FASEB JOURNAL 2015;29(1890-1900

Agents: Erythropoietin Vehicle: Not Stated; Route: SC; Species: Mice (transgenic); Pump: Not Stated; Duration: 10 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (female, Tg6, 12 weeks old);


Agents: Erythropoietin, human recombinant Vehicle: PBS; BSA; Route: SC; Species: Rat; Pump: Not Stated; Duration: 1 week;
ALZET Comments: Controls received mp w/ vehicle or sham surgery; animal info (Sprague Dawley, 120 days old, 240-280g); behavioral testing (open field exploration, inhibitory avoidance, Morris water maze);
Agents: Epidermal Growth Factor, erythropoietin Vehicle: CSF, artificial; Route: CSF/CNS; Species: Rat; Pump: 2001; Duration: 14 days;
ALZET Comments: Animal info (male, Sprague Dawley); pumps replaced every 7 days; ischemia (cerebral); behavioral testing (staircase test); pumps removed 7 days after serial implantation;

Agents: Epidermal growth factor, erythropoietin Vehicle: CSF, artificial; Route: CSF/CNS; Species: Mice; Pump: 1007D; Duration: 14 days;
ALZET Comments: Animal info (male, C57BL6, 9-11 weeks old); EGF-PGF pumps replaced after 7 days with pump filled with ETO; ALZET brain infusion kit 3 used; comparison of epicortical composite vs mp; stress/adverse reaction: “Unlike the ICV catheter/minipump, which causes significant tissue damage, the epicortical composite provides a minimal invasiveness and no tissue damage.”(see pg.9); immunology; Pumps implanted 4 days after stroke; BIK implanted same day as stroke;

Agents: Erythropoietin Vehicle: Saline; Route: IV (jugular); Species: Rat; Pump: 2001D; 1003D; Duration: 72 hours;
ALZET Comments: Control animals received mp w/ vehicle; animal info (Wistar, male, 300-350 g); silastic tubing used;

Agents: Erythropoietin Vehicle: Saline; Route: IP; Species: Mice (NOD/SCID); Pump: 1007D; Duration: Not Stated;
ALZET Comments: Animal info (male, C57/BL6, 8-10 wks old); pumps replaced after 7 days; ALZET brain infusion kit 3 used;

Agents: Erythropoietin Vehicle: NaCl; Route: CSF/CNS; Species: Mice; Pump: Not Stated; Duration: 4 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (C57BL6/j, male, 23-25 g, 8-10 wks); ALZET brain infusion kit 3 used; ischemia (focal cerebral);

Agents: Epidermal growth factor, recomb. human; erythropoietin; cyclosporine A Vehicle: Not Stated; Route: CSF/CNS; SC; Species: Mice (NOD/SCID); Pump: 1007D; Duration: Not Stated;
ALZET Comments: Animal info (male, C57/BL6, 8-10 wks old); pumps replaced after 7 days; ALZET brain infusion kit 3 used;

Agents: Erythropoietin, asialo- Vehicle: Saline, sterile; Route: SC; Species: Rat; Pump: 2001; Duration: 4 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 250-275 g);

Agents: Erythropoietin, human, recomb.; antibody, anti-EPO Vehicle: Saline; Route: CSF/CNS; Species: Rat; Pump: Not Stated; Duration: 6 days; 24 hours;
ALZET Comments: Controls received mp w/ rat serum albumin, or control mouse IgG; animal info (male, Fischer 344, 10-12 wks old, 200-250 g, SLC)
ALZET Comments: Controls received mp w/ vehicle; animal info (Sprague Dawley, 220-250 g.)

ALZET Comments: Controls received mp w/ saline; animal info (male, CD, 250 g, splenectomy)

ALZET Comments: Controls received mp w/ vehicle; animal info (male, 190-210 g)

ALZET Comments: Controls received mp w/ vehicle; animal info (male, Long-Evans, 280-330 g., MCAO)

ALZET Comments: Controls received mp w/ vehicle; animal info (male C57/BL6, 3 months old, hypoxia)

ALZET Comments: Controls received mp w/ saline; peptides; animal info (male, Sprague Dawley, 300-350 g., splenectomy).
“We used implantable osmotic minipumps to guarantee continuous systemic delivery of the tested cytokines over the first even days upon intraperitoneal deposition.” pg. 353

ALZET Comments: Controls received mp w/ vehicle; ALZET brain infusion kit used; animal info (male C57/BL6, 3 months old, hypoxia)

ALZET Comments: Controls received mp w/ vehicle; peptides; animal info (male, Long-Evans, 90-110 days old); ischemia (cerebral); behavioral testing (forelimb assymetry, forelimb inhibition (swimming), reaching); some animals received 7 days EGF

**Agents:** Erythropoietin  **Vehicle:** Not Stated;  **Route:** Ear (round window);  **Species:** Guinea pig;  **Pump:** 1007D;  **Duration:** 1 week;

**ALZET Comments:** Controls received mp w/ saline; replacement therapy (noise-induced hearing impairment); comparison of acute admin. vs. mp; peptides; animal info (male, Dunkin-Hartley); tissue perfusion (round window); mp primed 6 hours in 37 Celsius saline; correct catheter placement confirmed


**Agents:** Erythropoietin receptor, soluble  **Vehicle:** PBS; BSA;  **Route:** CSF/CNS;  **Species:** Rat;  **Pump:** 1007D;  **Duration:** 5 days;

**ALZET Comments:** Controls received mp w/ vehicle; peptides; ischemia (cerebral); animal info (male, Wistar, 200-225 g); MCAO


**Agents:** Erythropoietin, soluble receptor  **Vehicle:** PBS; BSA;  **Route:** CSF/CNS;  **Species:** Mice;  **Pump:** 1003D;  **Duration:** 64 hours;

**ALZET Comments:** Controls received mp w/ vehicle; peptides; ischemia (cerebral); human EPO used; 0.1%BSA used in vehicle


**Agents:** Erythropoietin; antibody, rabbit anti-EPO neutralizing; rabbit IgG  **Vehicle:** Saline; albumin, mouse serum; rat serum;  **Route:** CSF/CNS;  **Species:** Mice;  **Pump:** 1007D;  **Duration:** 6 days;

**ALZET Comments:** Controls received mp w/ vehicle; peptides; Erythropoietin (EPO) Recomb. Human, antibody & IgG were dissolved in 0.9% saline with 1 mg/ml mouse serum albumin; pump/cannula schematic (p. 9739 fig A)


**Agents:** Erythropoietin  **Vehicle:** Saline;  **Route:** Not Stated;  **Species:** Rat;  **Pump:** Not Stated;  **Duration:** 2 weeks;

**ALZET Comments:** controls received mp w/vehicle; peptides; cardiovascular


**Agents:** Interleukin-11; Stem cell factor; Granulocyte-colony stimulating factor, PEGylated; Erythropoietin  **Vehicle:** Not Stated;  **Route:** SC;  **Species:** Mice;  **Pump:** 2002; 1007D;  **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ saline; functionality of mp verified by pilot studies; no stress (see pg. 3223); peptides; recomb. human interleukin-11, EPO, & G-CSF used; recomb. rat stem cell factor used (pegylated);agents were given in every combination;


**Agents:** Erythropoietin; Granulocyte-colony stimulating factor; Etoposide  **Vehicle:** Not Stated;  **Route:** SC;  **Species:** Mice;  **Pump:** Not Stated;  **Duration:** 7 days;

**ALZET Comments:** Dose-response curves (pg. 326-328); cancer; peptides; etoposide is VP-16-213; EPO and VP-16-213 given in same pump initially, but this inactivated the G-CSF; multiple pumps per animal (1-2) for G-CSF/VP-16 mice


**Agents:** Erythropoietin  **Vehicle:** Not Stated;  **Route:** Intrauterine;  **Species:** Rat;  **Pump:** 2002;  **Duration:** 5 days;

**ALZET Comments:** controls received intrauterine bolus of saline; replacement therapy (gentamicin-induced anemia); comparison of iv bolus and intrauterine bolus vs. mp; peptides; mp implanted subdermally in abdomen; "administration of drug at a constant rate produces considerably greater biological effect than that observed in the pulsatile mode." (pg. 200); tissue perfusion (uterus); recomb. human EPO used
**Agents:** Erythropoietin; Interleukin-3; Colony-stimulating factor, GM  **Vehicle:** PBS; Glycerol;  **Route:** SC;  **Species:** Mice;  **Pump:** 2002;  **Duration:** 14 days;  
**ALZET Comments:** Immunology; peptides

**Agents:** Interleukin-3; Colony-stimulating factor, GM; Erythropoietin  **Vehicle:** PBS; Glycerol; LPS, e. coli;  **Route:** SC;  **Species:** Mice;  **Pump:** 2002;  **Duration:** Not Stated;  
**ALZET Comments:** Controls received mp with vehicles +/- LPS; immunology; peptides; recomb. mouse GM-CSF & IL-3 used; recomb. human EPO used