References on Using ALZET® Osmotic Pumps in Space

Q3922: E. R. Horn*, et al.* Gender- Related Sensitivity of Development and Growth to Real Microgravity in Xenopus laevis. Journal of Experimental Zoology Part A-Ecological Genetics and Physiology 2014;321(1-12
ALZET Comments: Nettle powder; Water, spring; In vitro; Toad (tadpole); 2ML2; 12 days; Animal info (Xenopus laevis); teratology; spaceflight;.

P4504: O. Rasmussen*, et al.* Plant protoplast development on "Biokosmos 9". ESA 1990;307(527-530
ALZET Comments: Growth medium; In vitro (cell culture); 14 days; mp used to deliver growth medium to protoplasts during spaceflight.

P4282: G. R. Adams*, et al.* Effects of spaceflight and thyroid deficiency on hindlimb development. I. Muscle mass and IGF-I expression. J. Appl. Physiol 2000;88(894-903
ALZET Comments: Propylthiouracil; IP; Rat (lactating); 2ML4; 16 days; Teratology; Propythiouracil was delivered to neonates via dam's milk; pilot studies showed that this resulted in similar depression in plasma T3 and T4 to direct PTU injection to neonates; Propylthiouracil is an antihyperthyroid that blocks the conversion of L-thyroxine T4 to T3; spaceflight.

P4138: R. T. Turner. Effects of short-term spaceflight and recombinant human growth hormone (rhGH) on bone growth in young rats. Aviation Space Environ Med 1995;66(763-769
ALZET Comments: Growth hormone, recomb. human; Phosphate; F68 detergent; SC; Rat; 5 days; controls received mp w/vehicle; peptides; spaceflight.

P3948: F. K. Gmunder*, et al.* Mammalian cell cultivation in space. Adv. Space Res 1989;9(11):119-127
ALZET Comments: Culture media; Glucose; Fetal calf serum; HEPES buffer; Gentamycin;; in vitro (cell culture); 2001; 2002; diagram of dynamic cell culture system on page 123; in vitro; spaceflight.

P3604: G. Lorenzi*, et al.* Cultivation of hamster kidney cells in a dynamic cell culture system in space (spacelab IML-1 mission). Microgravity Sci. Technol 1993;VI/1(34-38
ALZET Comments: NaHCO3; Glucose; HEPES; DMEM; Serum, fetal calf; Gentamicin; in vitro (cell culture); 2001; no duration posted; mp connected to cell culture chamber; "...the osmotic pump delivered sufficient fresh medium to support cell growth in the perfusion chambers." p. 37; spaceflight.

P3289: B. Jiang*, et al.* Absence of a growth hormone effect on rat soleus atrophy during a 4-day spaceflight. Am. Physiol. Soc 1993;74(2):527-531
ALZET Comments: Growth hormone, recomb. human; Phosphate; F-68; SC; Rat; 4 days; controls received mp w/ vehicle; functionality of mp verified by immunoassay; stability verified by HPLC; musculoskeletal; spaceflight.

P2163: M. Cronin*, et al.* Delivery of recombinant human growth hormone to rats during exposure to microgravity on NASA space shuttle discovery. Physiologist 1992;35(1):S51-S52
ALZET Comments: Growth hormone, recomb. human; F68 detergent; Phosphate; SC; Rat; 5 days; functionality of mp verified upon removal by immunoassay; peptides; mp performed well in microgravity; spaceflight.

P1382: F. K. Gmunder*, et al.* Dynamic cell culture system: a new cell cultivation instrument for biological experiments in space. J. Biotechnol 1988;7(217-228
ALZET Comments: Culture media, DMEM; HEPES; Serum, fetal calf; Gentamicin; Glucose; in vitro (cell culture); 2001; 7 days; Mp connected to cell culture chamber; cytotoxicity described; spaceflight.