Recent References (2015-2020) on the Administration of Bromodeoxyuridine Using ALZET® Osmotic Pumps

**Q8621**: B. G. Lake, *et al.* Piperonyl butoxide: Mode of action analysis for mouse liver tumour formation and human relevance. Toxicology 2020;439(152465

**Agents**: Uridine, 5-bromo-5′-deoxy-  
**Vehicle**: PBS;  
**Route**: SC;  
**Species**: Mice;  
**Pump**: 2001;  
**Duration**: 7 days;

**ALZET Comments**: Dose (15 mg/mL); animal info (Male Crl:CD-1 mice, approximately 42 days old); 5-bromo-5′-deoxyuridine aka BrdU; dependence;

**Q8564**: K. Kawamoto, *et al.* Cell proliferation analysis is a reliable predictor of lack of carcinogenicity: Case study using the pyrethroid imiprothrin on lung tumorigenesis in mice. Regul Toxicol Pharmacol 2020;113(104646

**Agents**: uridine, bromodeoxy-  
**Vehicle**: DMSO;  
**Route**: SC;  
**Species**: Mice;  
**Pump**: 2001;  
**Duration**: 7 days;

**ALZET Comments**: Dose (40 mg BrdU/mL); 10% DMSO used; animal info (Male mice aged 9 weeks); bromodeoxyuridine aka BrdU; cancer (carcinogenicity);


**Agents**: Arabinofuranoside, cytosine-beta-D-; deoxyuridine, 5-bromo-2′-  
**Vehicle**: Not stated;  
**Route**: CSF/CNS;  
**Species**: Mice;  
**Pump**: Not stated;  
**Duration**: 1 week;

**ALZET Comments**: neurodegenerative (missing NPAS3 impaired hippocampal neurogenesis ); Therapeutic indication (Missing NPAS1 enhanced hippocampal neurogenesis);


**Agents**: 5-bromo-2′-deoxyuridine  
**Vehicle**: Saline;  
**Route**: SC;  
**Species**: Mice;  
**Pump**: Not stated;  
**Duration**: 5 days;

**ALZET Comments**: Dose (200-250 mg/ml); animal info (C3H/He, 8-11 weeks old, 22.1 g); 5-bromo-2′-deoxyuridine aka BrdU; cancer (Tumor Cells);


**Agents**: Arabinofuranoside, cytosine-beta-D-; deoxyuridine, 5-bromo-2′-  
**Vehicle**: CSF, Artificial;  
**Route**: CSF/CNS (lateral ventricle);  
**Species**: Mice;  
**Pump**: 1004;  
**Duration**: 4 weeks;

**ALZET Comments**: Dose (AraC 15 mg/ml, 2.69 μl/day), (BrdU 4 mg/ml)); Controls received mp w/ vehicle and BrdU; animal info (3-4 or 23–24 months, C57BL/6J); functionality of mp verified by residual volume and BrdU staining; cytosine beta-D-arabinofuranoside (AraC) is an antimitotic agent previously shown to suppress hypothalamic proliferation and neurogenesis; Brain coordinates (2 mm dorsal to the lateral ventricle (LV: anterior-posterior, −0.3 mm; dorsal-ventral, 2.5 mm; and lateral, 1.0 mm from the bregma)); Cannula placement verified via photomicrograph of histological section; “We used micro-osmotic pump and ICV administration for chronic delivery of aCSF or AraC, which provided good control of drug concentration and continuous delivery without disturbing animals. This method also reduced the likelihood that treatment effects on sleep–wake function could be due to stress of daily or multiple IP injections or mechanical or inflammatory responses of the sites examined in this study due to local manipulation.” pg.552; "We also noted that, unlike the control group, the AraC+BrdU-treated mice did not maintain their nests well." p.545;

**Q6967**: M. Kondo, *et al.* Involvement of peroxisome proliferator-activated receptor-alpha in liver tumor production by permethrin in the female mouse. Toxicol Sci 2019;

**Agents**: Uridine, Bromodeoxy  
**Vehicle**: DMSO;  
**Route**: SC;  
**Species**: Mice; Rat;  
**Pump**: 2001; 2ML2;  
**Duration**: 7 days; 14 days;
ALZET Comments: Dose (8.4 mg BrdU/mouse.; 33.6 mg BrdU/rat); 10% DMSO used; cancer (liver); stress/adverse reaction: One animal was dead due to anesthesia at implantation of osmotic pump;

Agents: Uridine, 5-bromo-2'-deoxy-; Uridine, 5-Ethynyl-2'-deoxy-; Uracil, 5-fluoro- Vehicle: Water, Deionized, DMSO buffered; Route: SC; Species: Mice; Pump: Not stated; Duration: 7, 25, 28 days;
ALZET Comments: Dose ((BrdU 50 mg/kg/day), (EdU 50 mg/kg/day), (5-FU 15 mg/kg/day)); 50% deionized water and 50% DMSO used; Controls received mp w/ vehicle; animal info (12 weeks, male, C57BL/6J, Tg -myh6(MCM), and Tg-myh6MCM: R26(mT-mG/+)); cardiovascular; mp used for BrdU and EdU labeling or for ISO + 5-FU induced cardiomyopathy;

Agents: uridine, 5-bromo-2'-deoxy- Vehicle: water, DMSO; Route: IP; Species: Mice; Pump: 1003D; Duration: 72 hours;
ALZET Comments: Dose (16.25 mg/ml); 1:1 ratio of DMSO to water used; animal info (female, CD-1); pumps used for BrdU labeling of pregnant mice;

Agents: uridine, 5-bromo-2'-deoxy- Vehicle: Saline, physiological; Route: SC; Species: Mice; Pump: Not Stated; Duration: 5 days;
ALZET Comments: Dose (250 mg/mL); animal info (7-8 weeks, female, C3H/He); cancer (squamous cell carcinoma); pumps used for BrdU labeling;

Q8139: H. Mziaut, et al. miR-132 controls pancreatic beta cell proliferation and survival in mouse model through the Pten/Akt/Foxo3 signaling. bioRxiv 2018;
Agents: Uridine, Bromodeoxy- Vehicle: DMSO; Route: IP; Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Dose (0.5 ul/hr/day); 50% DMSO used; animal info (C57Bl/6N mice with an age of 13-19 weeks and a body weight of 28-34 g); Bromodeoxyuridine aka BrdU ; cardiovascular;

Agents: Thymidine, 5-bromo-2'-deoxyuridine Vehicle: Saline; Route: SC; Species: Mice; Pump: 1007D; Duration: 5 days;
ALZET Comments: Dose (3 mg); animal info (2.5 months old, Nestin-GFP mice);

Q8107: E. Magrinelli, et al. Simultaneous production of diverse neuronal subtypes during early corticogenesis. bioRxiv 2018;
Agents: Uridine, Bromodeoxy Vehicle: Saline; Route: SC; Species: Mice; Pump: 1003D; Duration: 3 days or 7 days;
ALZET Comments: Dose (16 mg/ml both 0.1 ul/hr); animal info (CD1); Bromodeoxyuridine aka BrdU ; neurodegenerative (Corticogenesis);

Q8074: F. C. Lewis-McDougall, et al. Senescent, dysfunctional human cardiac progenitor cells (CPCs) accumulate in the aged heart and elimination of senescent cells enhances CPC activation and cardiomyocyte proliferation in aged mice. bioRxiv 2018;
Agents: Bromodeoxyuridine Vehicle: Saline; Route: SC; Species: Mice; Pump: Not stated; Duration: 14 days;
ALZET Comments: Dose (0.2 M); animal info (22-32 months); Bromodeoxyuridine aka BrdU , thymidine analogue ; dependence;

Agents: Uridine, 5-bromo-2'-deoxy Vehicle: DMSO, Water; Route: SC; Species: Mice; Pump: 2002, 2006; Duration: 9 days and 12 weeks;
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Bibliography

ALZET Comments: Dose (10 mg/kg/day); 50% DMSO/water used; animal info (16 weeks old male mice); post op. care (bupivacaine, 8 mg/kg, buprenorphine, 0.075 mg/kg); Model 2006 pumps replaced after 6 weeks; long-term study; 5-bromo-2′-deoxyuridine aka BrdU; cardiovascular;

Q7824: C. Haines, et al. Comparison of the effects of sodium phenobarbital in wild type and humanized constitutive androstane receptor (CAR)/pregnane X receptor (PXR) mice and in cultured mouse, rat and human hepatocytes. Toxicology 2018;396-397(23-32
Agents: uridine, 5-bromo-2′-deoxy- Vehicle: PBS; Route: SC; Species: Mice; Pump: 2001; Duration: 7 days;
ALZET Comments: Dose (15 mg/ml); PBS (pH 7.4) used; Controls received mp w/ agent; animal info (12 weeks, male, C57BL/6J or hCAR/hPXR); toxicology; minipumps used to measure replicative DNA synthesis;

Q7823: C. Haines, et al. Comparison of the hepatic and thyroid gland effects of sodium phenobarbital in wild type and constitutive androstane receptor (CAR) knockout rats and pregnenolone-16alpha-carbonitrile in wild type and pregnane X receptor (PXR) knockout rats. Toxicology 2018;400-401(20-27
Agents: uridine, 5-bromo-2′-deoxy- Vehicle: PBS; Route: SC; Species: Rat; Pump: 2ML1; Duration: 7 days;
ALZET Comments: Dose (15 mg/ml); PBS (pH 7.4) used; Controls received mp w/ agent; animal info (14 weeks, male, Sprague-Dawley, CAR KO and PXR KO); toxicology; minipumps used for measure replicative DNA synthesis;

Agents: Uridine, bromodeoxy-, Deoxyuridine, 5-ethynyl-2′ Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 1003D; Duration: 3 days;
ALZET Comments: Dose (16 mg/ml BrdU or 10 mg/ml EdU);

Agents: uridine, bromodeoxy- Vehicle: PBS; Route: SC; Species: Mice; Pump: 1002; Duration: Not Stated;
ALZET Comments: Dose (16 mg/ml); animal info (12 weeks, MHC-ECT2; MHC-nLAC double transgenic or MHC-nLAC single transgenic); cardiovascular; mp used for BrdU labeling;

Q8178: C. Carresi, et al. Anti-oxidant effect of bergamot polyphenolic fraction counteracts doxorubicin-induced cardiomyopathy: Role of autophagy and c-kit(pos)CD45(neg)CD31(neg) cardiac stem cell activation. J Mol Cell Cardiol 2018;119(10-18
Agents: Bromodeoxyuridine Vehicle: Saline; Route: SC; Species: Rat; Pump: Not stated; Duration: 21 days;
ALZET Comments: Dose(0.6 M);Controls received mp w/ vehicle; animal info (Wistar male rats (n = 40) at 6–8 weeks of age (body weight 300 ± 10 g)); Bromodeoxyuridine aka BrdU; cardiovascular;

Agents: Uridine, bromodeoxy-; Fibroblast growth factor, basic Vehicle: CSF, artificial; Route: CSF/CNS (right lateral ventricle); Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Dose (3.2 mg/ml BrdU; 100 μg/ml bFGF); animal info (12- to 18-week-old Npy-GFP mice and Ai14(tdTomato) mice); Brain coordinates (anteroposterior −0.3 mm, lateral +1.0 mm to bregma and dorsoventral −2.5 mm below skull);

Agents: Uridine, 5-bromodeoxy- Vehicle: PBS; Route: SC; Species: Mice; Pump: 2001; Duration: 5 days;
ALZET Comments: Dose (2.4 mg/ml); animal info (B6C3F1 mice); 5-bromo-20-deoxyuridine aka BrdU;
Agents: Uridine, 5-bromo-2-deoxy Vehicle: Not Stated; Route: SC; Species: Rat; Pump: 2ML1; Duration: 7 day; 14 days;
ALZET Comments: animal info (Wistar strain rats aged 9 weeks; CAR Knockout rats with a Crl:CD genetic background aged 10 weeks and wild-type Crl:CD rats aged 11 weeks);

Agents: Uridine, bromodeoxy; Vehicle: PBS; Route: Not Stated; Species: Rat; Pump: 2ML1; Duration: 7 days;
ALZET Comments: controls received mp w/ vehicle; animal info (Ten-week old male F344/DuCrl rats); Bromodeoxyuridine is a structural analog of thymidine that incorporates into nuclear DNA and is used as a surrogate marker of cell proliferation);

Q6358: R. I. Menzies, et al. Transcription controls growth, cell kinetics and cholesterol supply to sustain ACTH responses. Endocrine Connections 2017;6(7):446-457
Agents: ACTH; Uridine, bromodeoxy; Vehicle: Saline; Route: SC; Species: Mice; Pump: 2002; Duration: 2 weeks;
ALZET Comments: Dose (ACTH: 3 μg/day; BrDU: 1mg/mL); 0.154 M NaCl used; animal info (25g male C57BL6 mice);

Agents: Uridine, Bromodeoxy Vehicle: Water; Route: Not Stated; Species: Mice; Pump: 2001D; Duration: Not Stated;
ALZET Comments: Controls received mp w/ vehicle; animal info (6-10 week old Ppara wild-type (Ppara_/_) and conventional Ppara-null (Ppara_/_) mice);

Agents: Uridine, bromodeoxy Vehicle: PBS; Route: SC; Species: Mice (knockout); Pump: 2001D; Duration: 7 days;
ALZET Comments: animal info (6-7 weeks; 17-20g); Therapeutic indication (THF, Liver tumor); Dose (15 mg/mL);

Agents: Uridine, bromodeoxy; Vehicle: Not Stated; Route: SC; Species: Mice (knockout); Pump: 2ML1; Duration: 7 days;
ALZET Comments: animal info (8-10 week old Ppara wild-type (Ppara_/_) and conventional Ppara-null (Ppara_/_) mice);

Agents: Uridine, bromodeoxy; Vehicle: Not Stated; Route: SC; Species: Mice (transgenic); Pump: 2004; Duration: 3 days; 28 days;
ALZET Comments: animal info (Wnt2 +/-); cardiovascular;

Agents: Uridine, bromodeoxy; Vehicle: PBS, Dulbecco’s; Route: SC; Species: Mice; Pump: 2007D; Duration: 7 days;
ALZET Comments: animal info (adult male C57BL/6 J mice.); Controls received mp w/ vehicle;

Agents: Uridine, bromodeoxy Vehicle: Not Stated; Route: Not Stated; Species: Rat; Pump: 2ML1; Duration: 7 days;
ALZET Comments: animal info (inbred male and female Lewis rats); 5-Bromo-20-deoxyuridine AKA (BrdU); cancer (Hepatocellular carcinoma);

**Agents:** Uridine, 5-bromodeoxy; Growth factor, basic fibroblast **Vehicle:** CSF, artificial; Albumin, mouse serum; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** animal info (3 month old Prss56Cr mice); Brain coordinates (-0.5 mm; L: +1.2 mm; DV:-2.5 mm);


**Agents:** Uridine, Bromodeoxy **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (15-week old Mp/+ mice); functionality of mp verified by corneal imaging; Dose (50 mg/ml);


**Agents:** Uridine, Bromodeoxy **Vehicle:** Not Stated; **Route:** SC; **Species:** mice; **Pump:** Not Stated; **Duration:** 30 days;

**ALZET Comments:** post op. care (500 μl glucose solution (5% glucose/physiologic solution), analgesic Atradol (3 mg/kg); Dose (0.6 M);


**Agents:** Uridine, Bromodeoxy **Vehicle:** Saline, DMSO; **Route:** SC; **Species:** bird (sparrow); **Pump:** 1007D; **Duration:** 5 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info; 7.5% NaCl and 15% DMSO used; Therapeutic indication (Neurogenesis, plasticity); Dose (50 mg/kg);

Q4584: V. V. Sherstnev, et al. Long-lived newly formed neurons in the mature brain are involved in the support of learning and memory processes. Neurochemical Journal 2015;9(13-19

**Agents:** Uridine, 5-bromo-2-deoxy **Vehicle:** Saline, sterile; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** Animal info (male, Wistar, 12 weeks old, 220-250g); behavioral testing (morris water maze); pumps removed after 14 days;


**Agents:** Uridine, 5-bromo-2-deoxy **Vehicle:** PBS; **Route:** SC; **Species:** Rat; **Pump:** 2ML2; **Duration:** 14 days;

**ALZET Comments:** Animal info (male, Crl:CD(SC), 14-16 months old); “This implantation method insured a constant, uniform, systemic delivery of BrdU during the two week exposure period.” pg 396;

Q4053: D. Pruthi, et al. Exposure to Experimental Preeclampsia in Mice Enhances the Vascular Response to Future Injury. Hypertension 2015;65(863+-

**Agents:** Uridine, bromodeoxy **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Animal info (female, CD1, 2 months postpartum); cardiovascular; bp measured using tail cuff;


**Agents:** Norepinephrine; uridine, 5-bromo-2’-deoxyuridine **Vehicle:** Ascorbic acid; **Route:** Not Stated; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (C57BL6J or tdTomato);

Q4481: J. E. Klaunig, et al. Mechanism of 1,3-Dichloropropene-Induced Rat Liver Carcinogenesis. TOXICOLOGICAL SCIENCES 2015;143(6-15

**Agents:** Uridine, 5-bromo-2-deoxy **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Rat; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Animal info (male, F344 rat, 6-4 weeks old);
Agents: Uridine, bromodeoxy-; furosemide Vehicle: DMSO; Route: SC; Species: Mice; Pump: 1007D; 2001; Duration: 7 days;
ALZET Comments: Animal info (WT or Hsd1 1b2 -/-); 50% DMSO used; pumps primed overnight in 37C saline;

Agents: Uridine, bromodeoxy- Vehicle: Not Stated; Route: IP; Species: mice; Pump: 1004; Duration: 6 hours; 4 weeks;
ALZET Comments: animal info: SCID mice, females, 20–24 g; GFP+ transgenic mice, males, 35–44 g; gene therapy;

Agents: Uridine, bromodeoxy Vehicle: Not Stated; Route: SC; Species: Mice; Pump: Not Stated; Duration: 5 days;
ALZET Comments: Animal info (C57BL6 or CYP2F2, 8-11 weeks old);

Agents: Uridine, bromodeoxy Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 1007D; Duration: 1 week;
ALZET Comments: Animal info (female, C57BL6, 25g); cardiovascular;