Measurement of Uroflow Rate and Urination Frequency using Metabolic Cages

Author: Zunyi Wang

Creation Date: 5/19/2016

References:

- Wood R, Eichel L, Messing EM, Schwarz E. (2001) Automated noninvasive measurement of cyclophosphamide-induced changes in murine voiding frequency and volume. J Urol. 165:653-9.
- Leung YY, Schwarz EM, Silvers CR, Messing EM, Wood RW. (2004) Uroflow in murine urethritis. Urology. 64:378-82.
- Wood RW, Baggs RB, Schwarz EM, Messing EM. (2006) Initial observations of reduced uroflow in transgenic adenocarcinoma of murine prostate. Urology. 67:1324-8. Nicholson TM, Ricke EA, Marker PC, Miano JM, Mayer RD, Timms BG, vom Saal FS, Wood RW, Ricke WA. (2012) Testosterone and 17β-estradiol induce glandular prostatic growth, bladder outlet obstruction, and voiding dysfunction in male mice. Endocrinology. 153:5556-65.
- Lai H, Gereau RW 4th, Luo Y, O'Donnell M, Rudick CN, Pontari M, Mullins C, Klumpp DJ. (2015) Animal Models of Urologic Chronic Pelvic Pain Syndromes: Findings From the Multidisciplinary Approach to the Study of Chronic Pelvic Pain Research Network. Urology. 85:1454-65.

1. Two days prior to test, mice will be transferred to the test room and provided (ad libitum) with a drinking water solution supplemented with 3 % glucose and 0.125 % saccharin to increase urine output.
2. Assembly of metabolic cages:
    - Place the support grid on the top of the stand. Place the upper chamber on the top of the support grid. Secure the chamber with attached stainless steel holder.
    - Load sipper tube with 6 ml sweet solution. Place the tube in water bottle support tray. * Two hours prior to and throughout testing, food will be removed from the cage to reduce feces output and its potential interference on measuring urine output.
3. Turn balances on. Place urine collection pan on each balance. Tare each balance.
4. Weigh mice and place mice individually in the chamber. Remember to put cage cover on the chamber.
5. Go to computer. Click on WCOM2 icon.
    - Go to file/open port/ select metabolic cages to be used (six metabolic cages are labeled as COM6 to COM11).
    - Go to settings. BAUD rate: 38400; Date bits: 8 bits; Parity: none; Stop bits: 1; Flow control: none. Ok.

For more information contact: Zunyi Wang
School of Veterinary Medicine
1656 Linden Drive, Madison, WI 53706
Phone: (608) 263-8374
www.urology.wisc.edu/research/u54-george-m-obrien-center-for-benign-urology-research/

- Select each metabolic cage. Go to Port/File transfer/Send ASCII/Let's go. *Re-zero balance. This needs to be done for all metabolic cages to be used.
- Select each metabolic cage. Go to Port/File transfer/receiving ASCII/provide file name/save. This needs to be done for all metabolic cages to be used.
- At the end of experiment, remember to save files.

6. Return mice to their original cages.
7. Recorded data can be analyzed using software such as Excel and SAS/JMP to determine uroflow rate, urination frequency and voided volume, etc.

End protocol

Materials:

PC computer (with USB port) for data visualization, storage, and offline analysis.

Nalgene* Metabolic Cage System (Model: 650-0322. Colonial Scientific. https://www.colonialscientific.com).

METTLER TOLEDO precision balance (Mettler Toledo. http://us.mt.com).

For more information contact: Zunyi Wang
School of Veterinary Medicine
1656 Linden Drive, Madison, WI 53706
Phone: (608) 263-8374
www.urology.wisc.edu/research/u54-george-m-obrien-center-for-benign-urology-research/