

TECHNICAL NOTES

Collection of small Volumes of Urine
from Laboratory Rodentsby *Andre J. Jackson*, University of Maryland, USA

A reusable urinary collection device (1) (US Patent Number 4476879) was developed to collect uncontaminated small volumes of urine (0–7 ml) in laboratory rodents. The device can be attached to the pelvic skin within 5 min. to the unanesthetized animal using an adhesive. Application of the device was determined by doing a two-way crossover study with the control leg of the study being done using a commercially available metabolism cage.

Method

Urine-Collecting Device Design. The collection device apparatus is shown schematically in Fig. 1, with portions represented in phantom.

The mounting plate has a projecting funnel which receives the penis of the rat (or urethral region for female animals), with

the plate being adhered to the pelvic skin by a quick-drying methylcyanoacrylate adhesive. The mounting plate is made from either acetal resin or acetal resin coated with polymethyl methacrylate with the container being constructed of either material. The urine collector and funnel are separate units joined by screw threads disposed around a cylindrical projection or annulus at the mouth of the funnel. Screw threads couple with screw threads in an opening through the top wall of the container, with the container being essentially a chamber that is vented in the top wall.

To empty the container, a drain is positioned in the end wall. The drain is threaded and plugged with a nylon screw. Urine can be sampled with a syringe or by merely removing the container from the

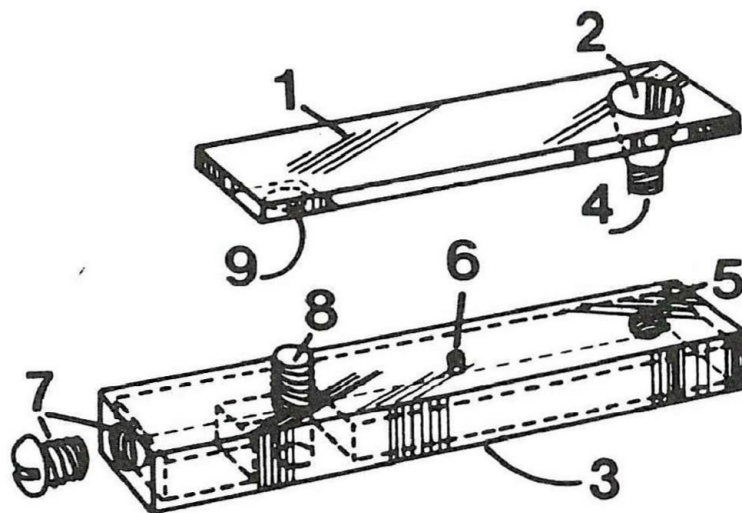


Figure 1. Representation of the urine-collection device showing the major components. Key: (1) mounting plate; (2) removable funnel; (3) urine container; (4, 5) screwthreads; (6) vent; (7) drain; (8) set screw; (9) indentation.

funnel. A metal set screw, which is not in contact with the collecting chamber, is utilized as a detent to keep the longitudinal axes of the container and mounting plate aligned. The set screw is advanced to set in an indentation formed in the bottom surface of the funnel mounting plate. When the screw is advanced to set tightly in the indentation, the container rotates

with difficulty about the axis of the funnel. Consequently, the container remains in place and thus eliminates urine loss and the amount of gnawing which the rat can do to the mounting plate.

Attachment of the Urine Collecting Device – The hair was removed from the region around the penis using small animal clippers fitted with a size 40 blade, without

SCAND-LAS NYE AUDIOVISUELLE PROGRAMMER

Laboratory Animals: Handling and Basic Techniques

	Pris i n.kr.
1. The laboratory mouse	250
3. The laboratory guinea pig	250
5. The nude mouse	225

er på lager. Prisen er ekskl. moms og forsendelsesomkostninger.

Hvert program består af ca. 35 dias og kasettebånd med kommentar på norsk, engelsk og tysk. Der medfølger teksthæfte på norsk, engelsk og tysk.

Programmerne kan bestilles ved at udfylde og indsende kopi af denne side til:

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Dyreavdelingen SIFF
N-0038 Oslo 1.

Flg. programmer ønskes tilsendt:

- | | |
|-------------------------------|--------------------------|
| 1. The laboratory mouse | <input type="checkbox"/> |
| 3. — — guinea pig | <input type="checkbox"/> |
| 5. — — nude mouse | <input type="checkbox"/> |

Navn

Adresse

the use of soap since surfactants interfere with subsequent bonding of the funnel to the skin. In addition, the abdomen of female animals was shaven using a disposal razor (again without soap). The skin was then cleaned with isopropyl alcohol, and the methyl cyanoacrylate glue was applied as a thin film to the mounting plate to effectively bond it to the skin. Attachment was accomplished by having the rat restrained by hand while the mounting plate was positioned. (During the attachment the animal can be restrained by hand with careful alignment of the penis or urethral opening (female rats) with the funnel opening; contact between the respective urethral opening and the adhesive should be avoided.) Bonding was rapid (1–5 min). Curing occurs best at a relative humidity of 58 %–68 %. Once the plate was firmly attached, the container was screwed onto the funnel.

Although still in place at 24 h, the edges of the mounting plate may not be as securely bonded to the skin due to normal turnover of epidermal cells and the animals tendency to gnaw at this surface, but the device can be rebonded readily by application of the adhesive to the mounting plate in any exposed area. Although not done in these studies, the animal can be lightly anesthetized with ether and the funnel sutured around the edges after attachment with the glue.

Either acetone or nail polish remover can be applied to the skin to remove the device at the termination of the study if only glue is used for attachment. The collection device can also be gently pulled from the abdomen with some minor discomfort to the animal.

Results and discussion

There were no statistically significant differences in food and water consumption, urinary volume, and per cent Inulin recovery for either method of urinary collec-

tion (2). The major pathologic abnormality observed was intradermal abscesses of the abdomen which was seen in control (shaven without device attached) and device carrying animals.

The device which has a limited volume capacity will not allow for quantitative collection over 24 hours without emptying the device. However, it does assure the investigator the capability of collecting small non-contaminated (i.e., animals environment) samples which is important for bioavailability and pharmacokinetic studies in rodents.

References

1. Available thru Jackson and Weems Inc. P. O. Box 4407, Alexandria, Va. 22303, USA.
2. Jackson, A. J. and J. C. Sutherland: Novel Device for Quantitatively Collecting Small Volumes of Urine from Laboratory Rats. *J. Pharm. Sci.* 73, 816–818, 1984.

Blodtapping, Fengsling, Intravenøs injeksjon av rotte

Skal vi ha større mengder med blod av rotta må vi bruke hjelpemidler. Jeg bruker vacuumpumpe, gummikort, glassrør og en spesiell glassklokke. Se tegning nedenfor.

Fengsling: Jeg bruker et gjennomskiktig plastrør med sperring og luftehull foran (se tegning). Reguleres etter størrelse.

Blodtapping: Sett rotta inn i røret trekk frem begge bakbena, stram rundt det ene låret (stase). På den nederste del på benet, mellom hel og tå (på oversiden), svulmer det opp en stor tydelig vene. Barber med et skalpellblad, smør et tynt lag silikon-salve rundt låret. Punkter venen med et skalpellblad nr. 11, rett ovenfra. Sett benet inn i glassklokka og sett vacuumpumpa i gang, bruk minst mulig sug ikke over 0,3