

# The SCOOP, an effective device for scavenging waste anesthetic gas from a stereotaxic apparatus

F.C. Martin<sup>1</sup>, S. P. Kasberger<sup>2</sup>, and J. T. Houts<sup>3</sup>

VA Greater Los Angeles, Departments of <sup>1</sup>Research and Development and <sup>2</sup>Industrial Hygiene, Los Angeles, California.

<sup>3</sup> Molecular Imaging Products Company, Bend, Oregon



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## INTRODUCTION

Gas anesthesia for rodent stereotaxic surgery is increasingly popular and recommended by laboratory animal veterinarians. However, gas anesthesia presents problems for waste anesthetic gas removal.

Stereotaxic nose cones normally have a notch for the animal's lower jaw incisors. Since anesthetic gases such as isoflurane are heavier than air, some gas comes out through this bottom notch leading to potential operator exposure.

There are two traditional ways to address this problem:

- Do the surgery inside a chemical fume hood, but these are not always available and can be inconvenient to work in.

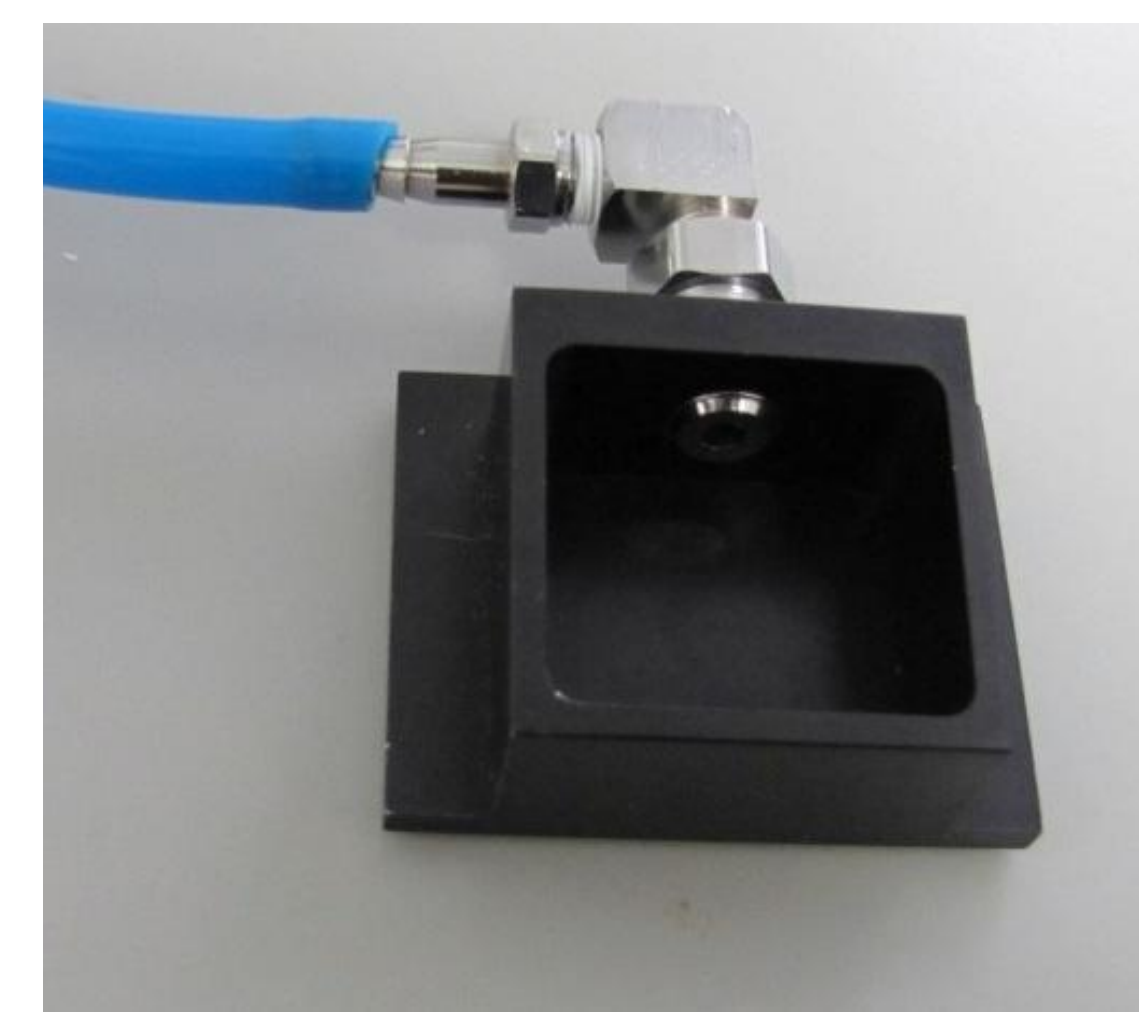
- Do the surgery on top of a downdraft table, but these introduce vibrations which may make precise electrode positioning difficult, and the high velocity down-draft can chill the animal.

## PROBLEM

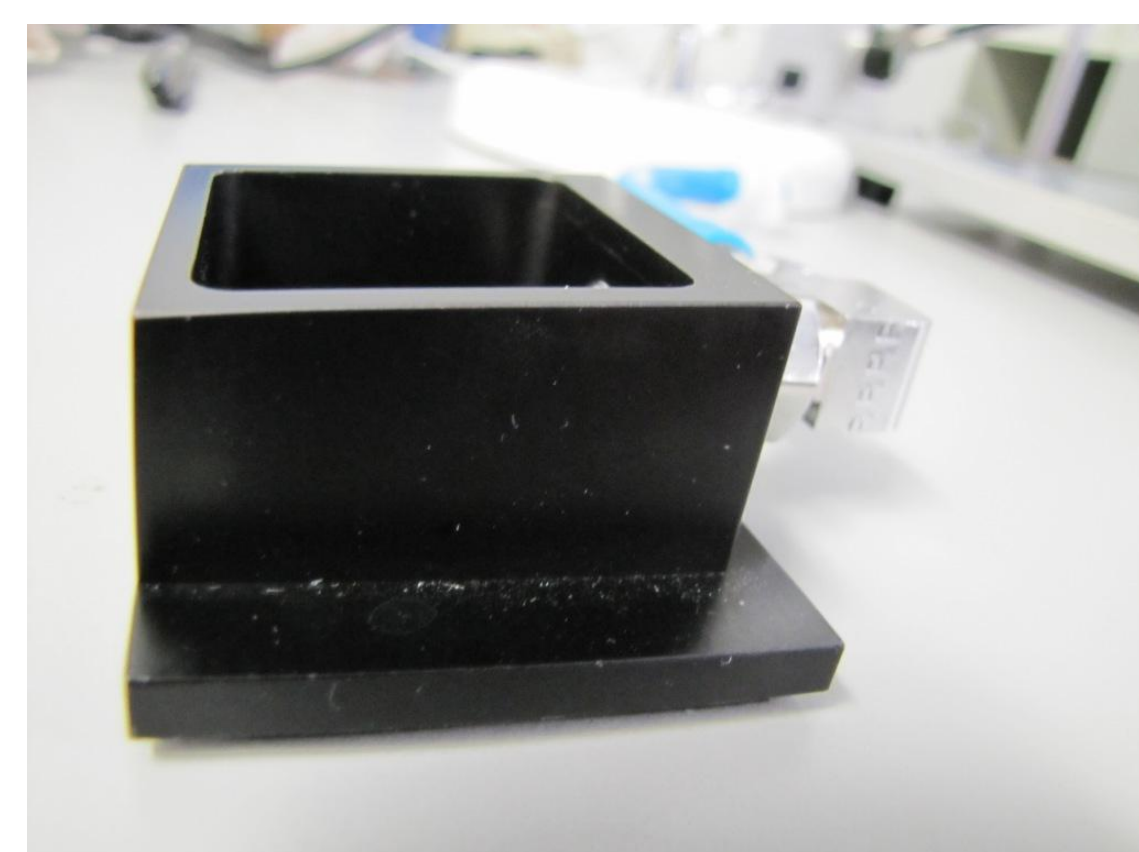
Our industrial hygiene department detected excessive levels of isoflurane exposure to laboratory staff during a typical stereotaxic surgery in one of our laboratories.

The laboratory did not have a fume hood, and the vibrations from a traditional downdraft table would have made it very difficult to achieve accurate electrode placement, so we needed an alternative.

We tested the SCOOP scavenging device (Molecular Imaging Products Company, Bend, Oregon, <http://www.mipcompany.com/>) as a possible solution. The SCOOP acts as a miniature downdraft table which fits right beneath the nose cone of the stereotaxic device, without exposing the animal to vibration or excessive drafts.



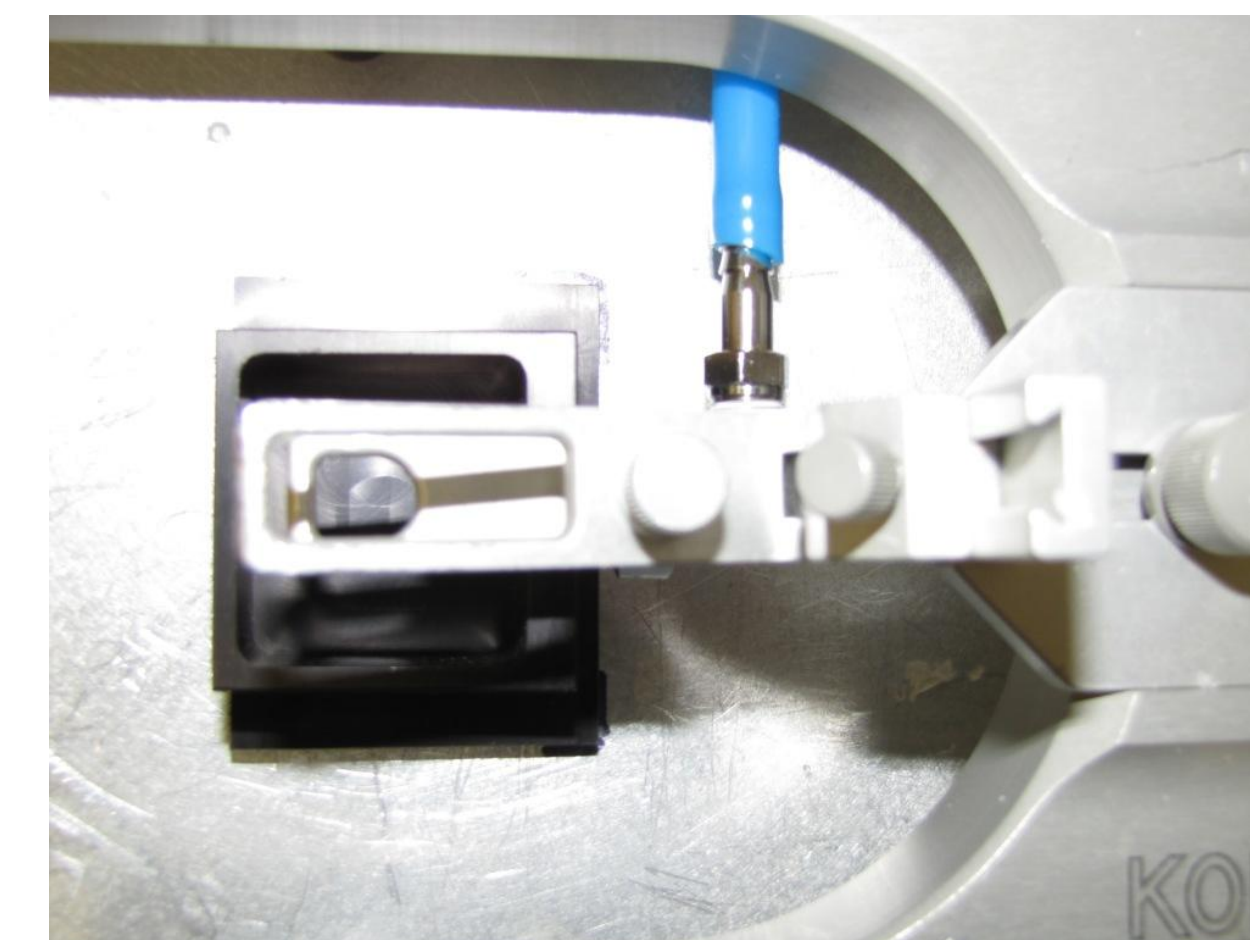
1. Top view of SCOOP. The blue tubing connects to a regulator on the vacuum outlet in the lab. Patent Pending\*



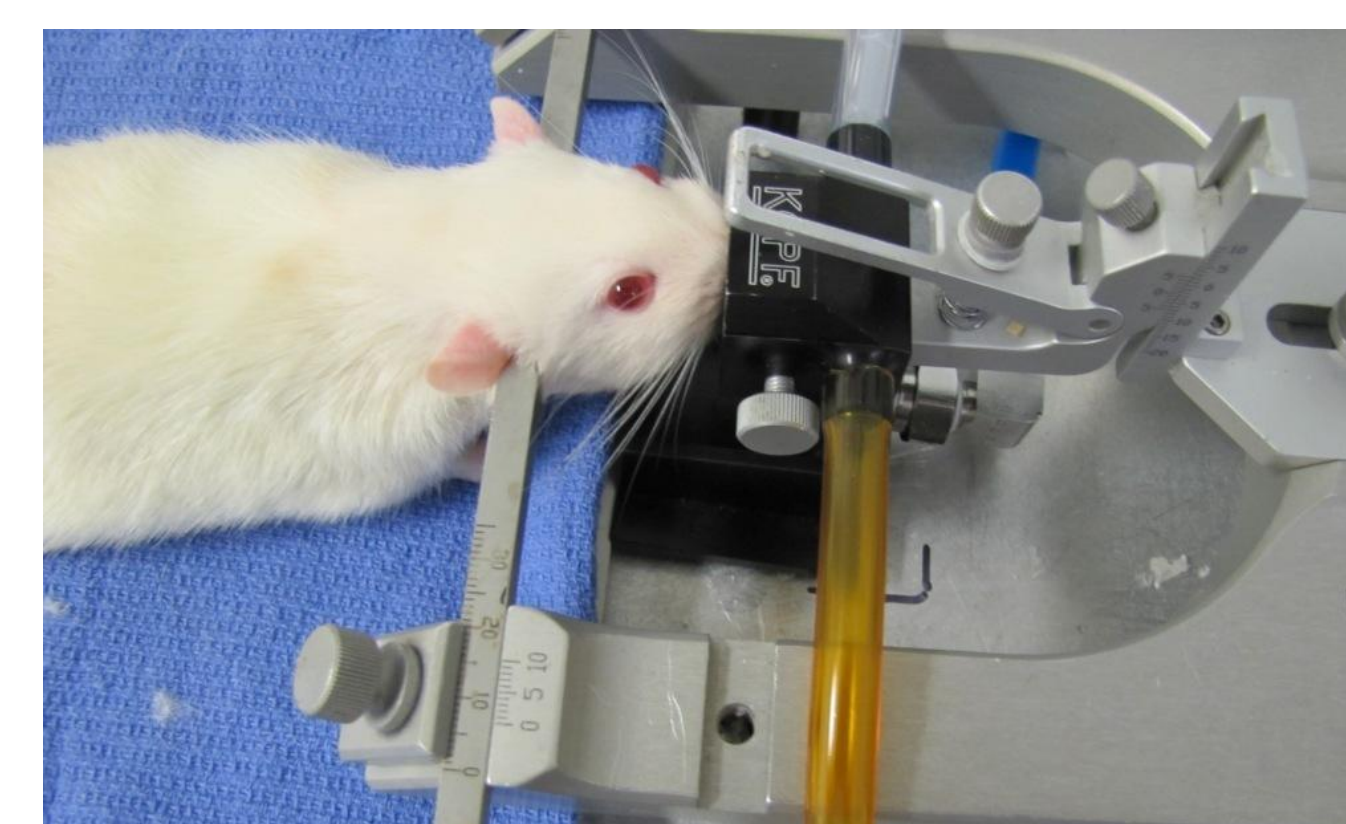
2. Close up side view of SCOOP.



3. View of regulator on the vacuum outlet. The vacuum flow rate must be carefully set or the SCOOP may fail to scavenge all the anesthetic gas, or may pull the gas so fast that the animal is not properly anesthetized.



4. The SCOOP positioned under the nose and toothbar assembly of the stereotaxic apparatus (David Kopf Instruments, Tujunga, California, <http://www.kopfinstruments.com/>)



5. Rat in nose cone with SCOOP positioned underneath.

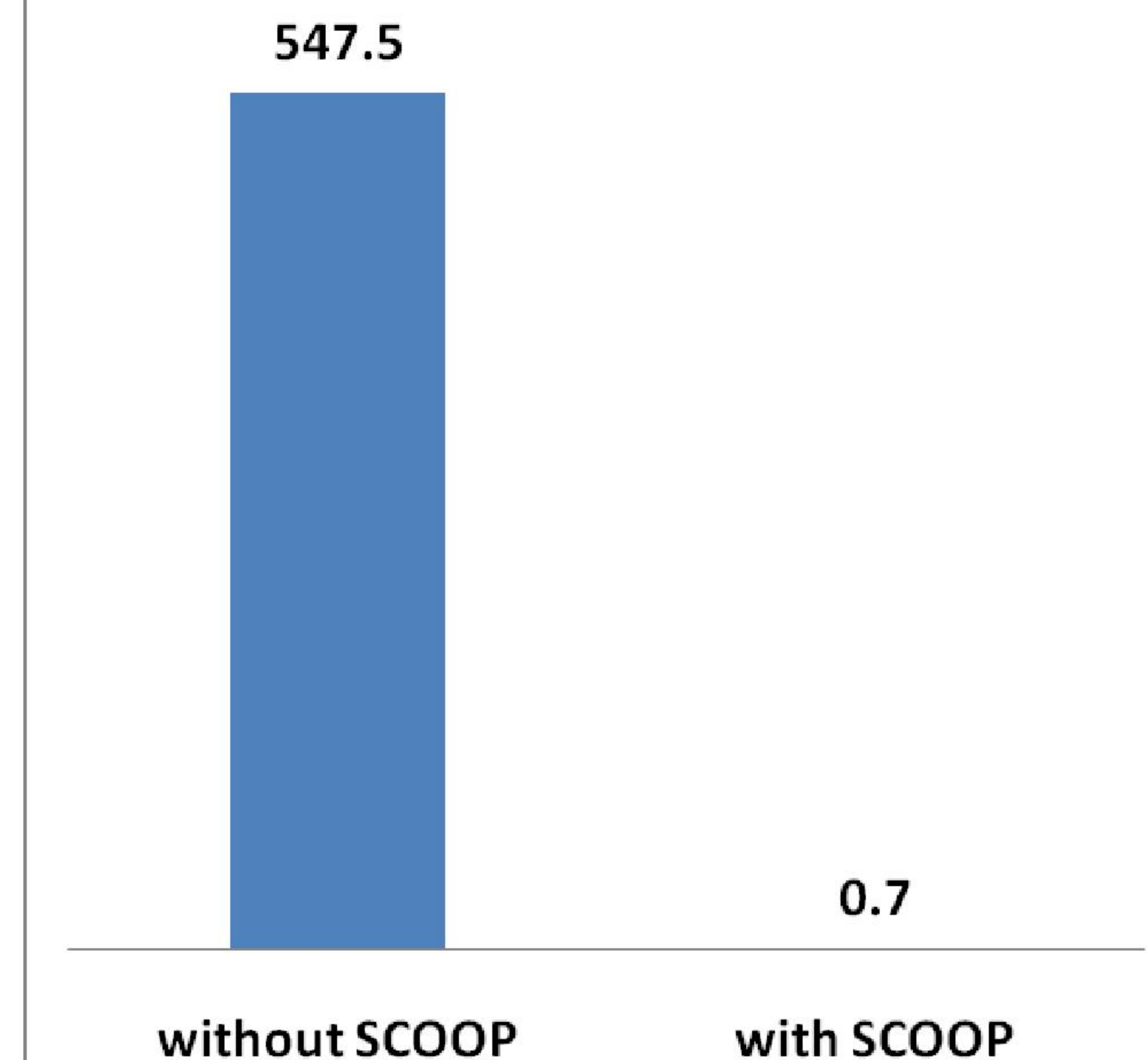


6. Top view of rat in nose cone with the SCOOP underneath.

\* US Patent Office has granted a Provisional Patent for the SCOOP

Approximate isoflurane levels one inch from nosecone (NIOSH limit is 2 PPM)

■ isoflurane in PPM



Measurements of isoflurane leakage were made using a Miran SapphIRe direct read portable spectrophotometer (Thermo Scientific, Franklin Massachusetts <http://thermoscientific.com/wps/portal/ts/HOME>) with the sensor positioned next to the rat's head and about one inch (2.5 cm) from the nose cone.

## CONCLUSION

We concluded that the SCOOP is an effective engineering solution to the problem of scavenging waste anesthetic gases from the nose cone of a stereotaxic apparatus.

Please note: it does not fit under the Stoelting mouse stereotaxic adapter.

The Department of Veterans Affairs does not endorse the SCOOP or any other product mentioned in this poster.