

CLOSE ENCOUNTERS OF THE LAB KIND

THE SANTAYANA REPORT

George Santayana was a Spanish-American philosopher, essayist, poet, and novelist. In 1905, he penned the famous aphorism “those who cannot remember the past are condemned to repeat it.” More than a century later, the saying reverberates with professionals the world over. The following is a summary of a recent incident at Columbia University. The information presented is intended to provide awareness and help readers plan against the occurrence of a similar situation in their laboratory or work area.

Stereo Overtaxed?

While positioning a mouse in a stereotaxic apparatus prior to performing an intracranial pressure injection, a technician was stuck in the hand by a pulled glass pipette positioned above the animal, resulting in a potential exposure to recombinant DNA in a viral vector. The stuck investigator notified his Principal Investigator, received a medical evaluation at Workforce Health and Safety and filed an accident report form. These notifications are of particular importance in the event of potential rDNA exposures to ensure EH&S can provide requisite notice to the NIH Office of Biotechnology Activities as required under the NIH Guidelines. Biosafety Officers met with the PI and technician as well as several other investigators who perform stereotaxic viral vector work to identify best practices that could prevent similar accidents occurring in others.

Lessons Learned

- Thorough training and competency is necessary before performing stereotaxic pressure injections. These procedures consolidate a number of activities, including animal anesthesia and surgery, handling infectious material, entering coordinates, microinjection and binocular microscopy. Each step should be mastered on its own before combining them. The most experienced person in the laboratory should be responsible for training others. Written protocols should be available. Novices should gain experience with a surrogate marker before performing the procedure with viral vectors. Investigators should not be overly ambitious in the number of consecutive surgeries they perform while they are acquiring competency.
- The design of the stereotaxic apparatus influences safety. An apparatus where the pulled glass pipette overhangs the animal is more likely to cause a stick. In comparison, an apparatus where the pipette is on a swingable arm that can be rotated away from the work space is much safer. When making purchasing and retrofitting decisions, investigators should procure a stereotaxic apparatus with a swingable arm.
- The prescribed order of steps can reduce the likelihood of an accident. Backfilling the pipette with mineral oil, then anesthetizing and positioning the animal, and finally loading the pipette with viral vector reduces the likelihood of a viral vector exposure while handling the animal in the apparatus. This procedure will also minimize degradation of viral vectors that have a short half-life, such as rabies virus.
- Equipment in perfect working order is safer. Unlubricated equipment requires unnecessary force that can result in sharp parts slipping in unanticipated directions.

EH&S reminds investigators that an accident report should be filed for all stereotax-related accidents (http://hr.columbia.edu/sites/default/files/document-files/2014/09/08/departments_accident_report.pdf). Post exposure prophylaxis for exposure to lentiviral vectors is available at the Workforce Health and Safety clinic. For further information on this or any other safety related matter, please visit www.ehs.columbia.edu.