Better Safe than Sorry
Safe science is good and responsible science.

What hazards can you potentially be exposed to while doing your job? How are you mitigating exposure risks? If you were exposed, what would you do?

These are questions pertinent to us working in laboratory animal science and medicine and are covered in the institutional occupational health and safety program (OHSP). Hazards include allergens like those found in animal urine and dander, chemicals like disinfectants and compounds used for experimental purposes, animal bites and scratches, ergonomic injuries, and zoonotic diseases like Macacine herpesvirus 1 (herpes B virus or B virus).

Who Was Elizabeth R. Griffin?
Most of us have heard of Elizabeth R. Griffin’s tragic and premature death 20 years ago, but the younger generation may not exactly know what happened nor how safety for research personnel, including the use of personal protective equipment (PPE), changed nationwide as a result. Beth was an artistic, intelligent and compassionate young woman who worked as a research assistant studying hormonal influences on macaque behavior.

While performing annual physical examinations on a group of rhesus macaques, Beth experienced an ocular exposure. During the transfer of a monkey to a cage, Beth received a splash in her eye presumably from material at the bottom of a cage which had transported multiple monkeys. The eyewash station was a few feet away, but Beth had not been trained in its use for these circumstances, nor was it common practice in monkey facilities to use eye protection at that time. Beth was instructed to continue the examination and was told no incident report was necessary.

Ten days later, on a weekend, “matter” began oozing out of her exposed eye. Over the next 6 days, Beth made persistent attempts to get help for possible B virus infection, first from her internist who referred Beth to the emergency room which diagnosed pink eye (conjunctivitis). Finally, the occupational health nurse required Beth to complete an incident report, but this stated, “No follow-up necessary.” Beth called Infectious Disease (ID) department directly for evaluation, but was told, “a physician must make the referral.” Her internist referred her to an ophthalmologist who treated her for cat scratch fever. Beth’s symptoms worsened. Six days after an emergency room visit, the ophthalmologist consulted the ID physician who immediately admitted Beth to the hospital for B virus testing and treatment with intravenous acyclovir. Beth was discharged two weeks later on intravenous ganciclovir with a central line. She was readmitted to the hospital the following day. Assuming that B virus infection was resolved, her physicians diagnosed ascending demyelinating...
encephalomyelitis due to post-viral auto-immune
disease. With paralysis involving the second
uppermost vertebra (C2), she was given doses
of intravenous steroids and received 5 days of
plasmapheresis. On full life-support, she died 42
days after the exposure.

Beth’s was the first documented case of
acquiring B virus from an ocular exposure. Most
previously reported cases of B virus documented
the transmission of the virus via bites, scratches and
other cutaneous exposures, although there were
cases in which exposure was of unknown origin.

Beth’s 1997 incident and death highlighted
vulnerable areas in OHSPs, including practic-
eses which potentially impacted work safety and
effective emergency response to hazard exposures.
Resulting changes in safety practices continue
to keep personnel safer today. Current standards
recognize that OHSP is integral to an animal care
and use program and thus dictate that institutions
conduct a regular review of its OHSP. With Beth’s
20th death anniversary this December, it is import-
ant for us to remember and honor her by ensuring
the conduct of safe science.

How Can the Institution Keep Me Safe
and Healthy?
The Occupational Safety and Health Act of 1970
was promulgated to protect employees from hazards
in the workplace. The Guide for the Care and Use
of Animals (NRC, 2011) also emphasizes that an
animal research institution must establish
an OHSP.

A robust program contains three related components:
• engineering controls that include the use of
  safety equipment and a well-designed facility;
• administrative controls that clearly describe
  processes and standard operating procedures; and
• personal protective equipment (PPE).

Communication, education, and training are
embedded in these three components and will
ensure full implementation of safety standards and
practices and personnel compliance.

Identifying the hazards is the first step to risk
assessment. Each individual and each task to be
performed need to be then evaluated to properly
mitigate risks. You may remember filling out a form
asking you what animals you would be working
with and what kind of contact you would have
with them, whether you have existing allergies or
perhaps are immunocompromised, pregnant or
planning to be pregnant, and whether you have
experienced any clinical symptoms such as chronic
cough. This form is routinely part of an OHSP and
is designed to evaluate individual susceptibility to
risks. Task risk evaluation also needs to be per-
formed. For example, changing nonhuman primate
cages is different from changing mouse cages. Even
for mouse cages, changing those that house animals
administered biohazards typically requires more
stringent practices than changing cages of animals
not administered a biohazard.

All personnel involved in the animal care and
use program must be enrolled in the OHSP. This
program especially covers researchers and husbandry
and veterinary staff. However, special consideration
should be provided to certain groups like visiting
scientists, students in instructional courses, field
researchers, physical plant and equipment personnel,
and public members of the institutional animal care
and use committee who can get involved in facility
inspections.

What Can I Do?
Besides the institution having a responsibility in
the conduct of safe science, each one of us have
safety responsibilities, too. Recognizing this respon-
sibility is important and will ensure that the OHSP
runs well.

Below is a list of things one can do:
• The key is to be committed to achieving a safe
  work environment.
• Be aware. This is certainly true of the inherent
  and potential risks, but also entails being aware
  of one’s movement and environment.
• Be trained. Know and follow your institutional
  policies, guidelines, and standard operating
  procedures (SOPs). Use safety equipment like
cage changing stations properly. Wear the
required PPE. This also includes knowing the
system for addressing and reporting exposures.
• Identify and report incidents, hazards, and near
  misses, and solutions to prevent these.
• Support your peers, especially those who need
  help because of an exposure.
• Provide feedback. Each group involved in the
  animal care and use program is unique.
  Husbandry and veterinary personnel may be
seeing things differently than researchers do. Our
experiences are different. If you see and know
something that may compromise safety, report!
• Be engaged in reviews and improvements to the
  program. Think of new and improved ways in
  providing a safe work environment for everyone.
• If you don’t know, ask! Environmental health and
  safety personnel, veterinarians, and your supervi-
sors can especially provide relevant information
pertaining to the OHSP.
What Are The Impacts of Work Injuries and Hazard Exposures?

There can be a huge impact on the individual, team, and workplace when a hazard exposure occurs. Injuries like animal bites and physical illness such as fever associated with the exposure are the most commonly observed. However, an exposed individual can also suffer from a consequent mental and emotional distress. This may be especially true if there is a resulting health and physical impairment. As an example, herpes B virus patients who survive central nervous system complications usually suffer serious long-term neurologic deficits.

Besides the individual, the team and the general workplace can be affected. An especially prolonged medical leave of one person in the team may lead to increased work load for the rest of the team because of responsibility coverage. The team morale may also be affected, especially that we consider our colleagues as friends. Questions like, “What if this happened to me?” may arise.

Finally, the institution most likely would need to conduct an investigation and review the OHSP. Questions that need to be answered include, “What went wrong? How did it occur? Why?” The most important question though is, “How future incidences can be prevented?,” especially ensuring that processes are in place and the system does not have loopholes. This question, 20 years ago and still now, is key to continually improving and facilitating safety for all personnel.

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**Safer Together**

The Elizabeth R Griffin Research Foundation is a US-based, private, 501c3 foundation that collaborates globally with organizations, associations, government ministries and other private and public entities that are engaged in health security on local, national, regional and/or global scale. The Foundation was established in 1999 by the family of Elizabeth R ‘Beth’ Griffin following her death in 1997 that was the result of an ocular exposure that occurred while she was a nonhuman primate research worker in Atlanta, GA. Our focus is on the management and mitigation of biological risks that occur in research and clinical environments. Our special interest within that sphere is in strengthening occupational health awareness and response.

In its advocacy of safer science, the Foundation has supported the development and delivery of numerous training programs as well as the development of professional associations. Along with Eagleson Institute, the Foundation has held an annual occupational health colloquium directed specifically at potential occupational exposures to biological hazards. The Foundation is a charter member and coordinator of the Global Health Security Agenda Consortium and serves as a non-government representative on the Global Health Security Agenda Steering Group and the Joint External Evaluation Alliance.

The Foundation has also served as a source for innovative programs in building safety cultures, leadership training, and technical biological risk management. For further information, please contact:

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