

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.

Too Hot to Handle

Recently, a researcher in a Columbia University laboratory was performing mouse tissue harvesting inside a biosafety cabinet (BSC). The individual was sterilizing dissection tools by dipping them into a petri dish of ethanol and passing them over a flame. During this procedure, another member of the lab approached the cabinet to disinfect their gloves with a spray bottle, also containing ethanol. Unaware of the open flame inside the hood, the second lab member began spraying the ethanol which inadvertently ignited. In a moment of panic, trying to prevent the open petri dish of ethanol from igniting, one of the researchers quickly removed the dish from the cabinet and tossed it into a trash container, unaware that it was already alit. The fire quickly started growing as it burned the contents of the container. Seeking to contain the fire, one of the members reached in to remove the dish, and in the process sustained burn injuries as a result of contact with the growing fire. A third lab member, acting in accordance with their C-14-training, eventually came on scene to put out the fire by discharging a fire extinguisher. A somewhat similar incident occurred at the University of Zimbabwe earlier this year, in which a student was heating slides for staining when their lab coat accidentally caught fire. In this incident, the student sustained severe burns and was rushed to emergency medical treatment, but ultimately succumbed to their injuries.

Lessons Learned

- In the nearly microorganism-free environment of a biosafety cabinet, flaming is unnecessary since pre-sterilized serological pipettes and pipette tips are readily available. Metal dissection tools should be sterilized ahead of time by autoclaving or baking in a lab oven. In a biosafety cabinet an open flame is counterproductive because of the turbulence it creates which disrupts the flow pattern of filtered air at the work interface and compromises the containment barrier provided by the cabinet. The heat from a Bunsen burner will also affect the integrity of the HEPA filters. If working in conjunction with ethanol, flaming instruments represent a particular hazard because ignited ethanol may drip onto combustible material. Furthermore, ethanol burns with a clear flame that is hard to see and burning instruments may be reintroduced into a dish of ethanol creating a fire. If dissection instruments need to be sterilized mid-procedure, a glass bead sterilizer (for example, [GERMINATOR 500](#)) is preferable to an open flame.
- In a Class II BSC, the type present in most Columbia University laboratories, the use of volatile organics such as ethanol and xylene is not recommended. Biosafety cabinets recirculate vapors

CLOSE ENCOUNTERS OF THE LAB KIND

THE SANTAYANA REPORT

from these chemicals into the lab, therefore a fume hood should be used as an engineering control.

- There are several other work practices and procedures which reduce the chance of contamination in a BSC, examples of which can be reviewed on the Centers for Disease Control and Prevention website (https://www.cdc.gov/biosafety/publications/bmbl5/bmbl5_appendixa.pdf).
- Extreme precautions must be taken while working with an open flame in any situation. Labs that regularly conduct such work should consider investing in flame resistant lab coats.
- .

For further information, or to view previous Santayana Reports, please visit our [lessons learned website](#). For any other safety related matter, please contact the [EH&S office](#).