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Welcome to our newsletter specific to radiation, laser safety and X-Rays. Each bi-monthly newsletter will cover educational topics to assist lab personnel and students that work with radioactive isotopes or use lasers within the lab.

Radiation,X-Rays, and Laser Safety Focus

In the News

Cause of skin cell death due to UV radiation better understood

In a recent study at Johns Hopkins Medicine, researchers suggest that the cell's messenger RNA (mRNA) and the critical protein ZAK, spurs a cells initial response to UV radiation damage and plays a vital role in whether the cell lives or dies. It has been well documented that UV radiation can damage DNA. These latest findings indicate that mRNA also gets damaged and may act as the first line in defense in determining how the cell reacts to the radiation damage. ZAK is also a key component in the process of identifying cellular damage by sensing the collision of ribosomes. Collisions happen when ribosomes move along MRNA with UV damage and are unable to decode the damaged message, which causes the ribosomes to collide and get backed up like rush hour traffic. These collisions activate ZAK, which triggers a cellular signaling program called robotoxic stress response. ZAK then starts a series of events that ultimately decides the

fate of the damaged cells. Understanding how cellular life and death decisions are made from exposure to UV radiation could help researchers understand underlying causes of cancers in the future.

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Training Opportunities

Radiation safety culture in health care encompasses every action taken to improve the protection and safety of patients and personnel involved in medical exposure. This publication provides a framework to establish, maintain and enhance radiation safety culture in health care. It highlights patterns of organizational and individual thinking/behaving which define a positive safety culture and provides a set of tools to assess the existing level and quality of radiation safety culture and good practice examples. It is addressed to health professionals and stakeholders having an interest in radiation protection – including regulators, manufacturers of medical devices, and health care managers. To download a copy of the publication, please visit https://www.who.int/publications/i/item/9789240091115.

Case Training Opportunities

Are you caught up on your mandatory EHS training? Environmental Health and Safety (EHS) offers several courses for training the Case Western Reserve community in safe practices. Pre-registration is required for all training (in person or zoom) and class sizes may be limited. Training includes:

Biosafety

Driver Safety

Formaldehyde

Hazard Communication

Hazardous Materials Shipment

Laboratory Safety

Laser Safety

Radiation Safety

Respiratory Protection

Ultraviolet Safety

X-Ray Safety

Go to case.edu/ehs/training for more information!

Name that Isotope!

In every newsletter we will introduce a new isotope for you to identify as well as provide the answer to the previous newsletter's isotope. Some may be easier than others to identify but have fun with it!

I am produced by nuclear fission and found in blood irradiators and medical equipment all throughout the world. I decay in the environment by emitting beta and gamma radiation. You can still find plenty of me in areas around the Chernobyl accident of 1986. I enter the body through inhalation or ingestion. After I enter the body, I get distributed uniformly throughout the soft tissue with more of me absorbed into the muscles than the fat cells.

You can find me throughout campus mostly as a calibration source for radiation equipment like the GM meter. My half-life is a little over 30 years. Who am I?

Last Newsletter Answer: Tritium

Safety Tips

What is a Personal Radiation Monitor?

A personal radiation monitor is often referred to as a "badge" or a "film badge." Some types of these monitors still use film while others use a small, thin crystal (often called a "TLD"), or a special powder. These devices are used to measure the amount of radiation to which someone has been exposed, usually in an occupational setting (e.g., Lab worker doing research with P-32).

Each type of "badge" measures radiation differently. These may include:

- **The degree of darkening on a film badge is directly related to the amount of radiation exposure.**
- **The amount of light given off when the thin crystal is heated directly relates to the amount of radiation exposure.**
- **The amount of light given off when a special powder is excited by a laser of a certain wavelength directly relates to the amount of radiation exposure.**

These monitors are generally issued to lab personnel exposed to penetrating radiation such as X rays and gamma rays. If you are working in a research capacity and using any radionuclides, please contact EHS immediately so we can determine if we need to issue you a badge for personal radiation exposure measurement.