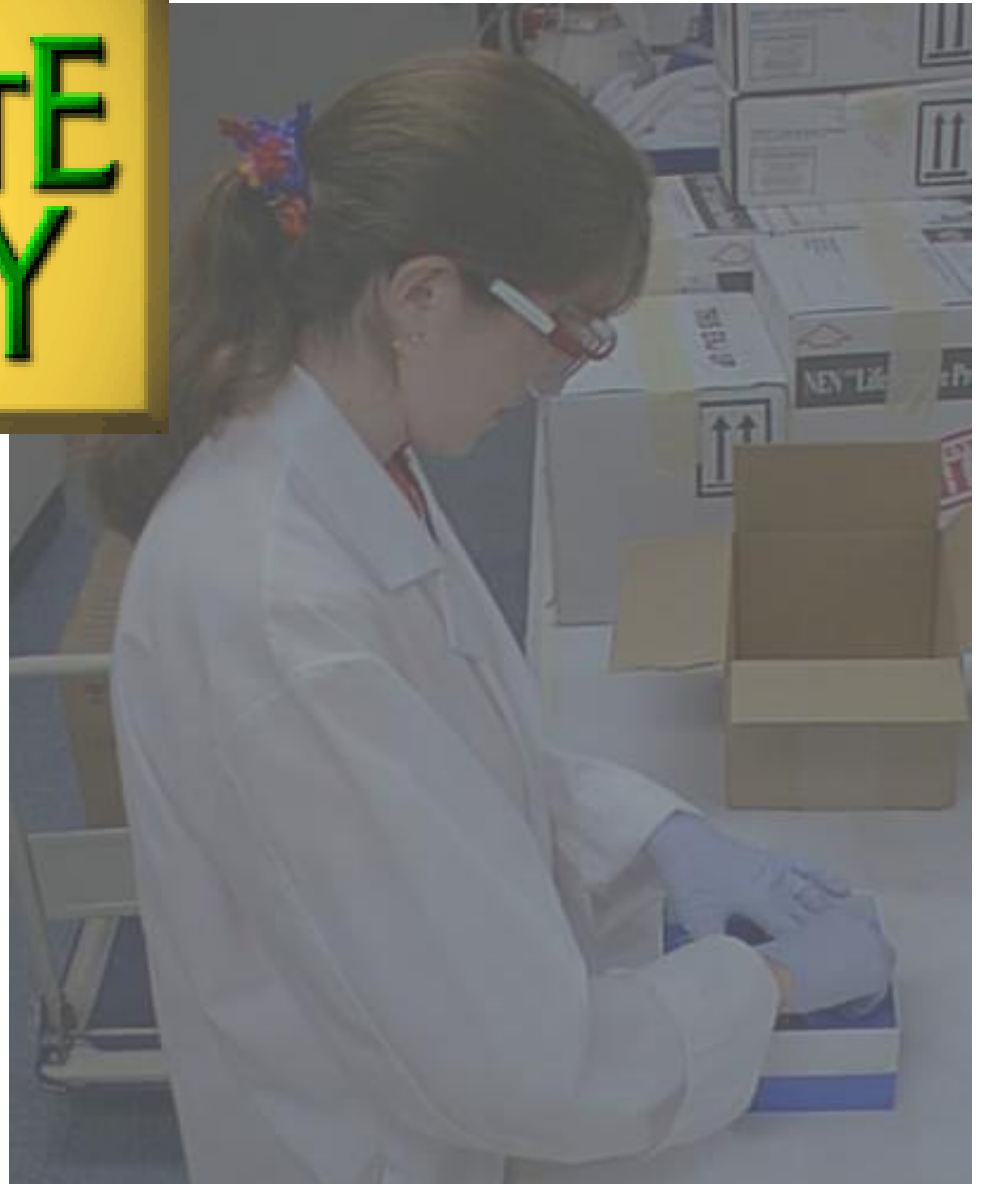


# WAYNE STATE UNIVERSITY

Office of Environmental  
Health and Safety



**Radiation Safety Awareness Training**

# Office of Environmental Health and Safety

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5425 Woodward Ste 300

Detroit, MI 48202

Office: 313.577.1200

Fax:313.993.4079

[www.oehs.wayne.edu](http://www.oehs.wayne.edu)



# Health Physics / Radiation Safety

The Health Physics staff are specialists in radiological health and safety, and are ready to provide assistance so you may work safely with radioactive material. Please contact us if you have questions or concerns about radioactive materials on campus.

**Maha Srinivasan MS**

Health Physicist &  
Radiation Safety Officer

577-0019 [mstriniva@wayne.edu](mailto:mstriniva@wayne.edu)

**Wendy Barrows**

Assistant Radiation Safety Officer

577-9505 [ac5502@wayne.edu](mailto:ac5502@wayne.edu)

**Ryan Boyd**

Health Physics Specialist

577-9518 [ag1515@wayne.edu](mailto:ag1515@wayne.edu)

**Diane Gilbert**

Health Physics Assistant

577- [eh3547@wayne.edu](mailto:eh3547@wayne.edu)

# Sources of Radiation @ WSU

- Researchers use
  - biochemical compounds labeled with low amount of radioactivity
  - x-ray machines for analysis of materials
  - Irradiators for irradiation of materials or animals

# Regulatory Compliance



- Nuclear Regulatory Commission : Federal Body, regulates Radioactive Material use



- Michigan Department of Community Health: Regulates Radiation Generating Machine



- Radiation Safety Committee: Group of university faculty and staff oversee and advice

Office of Environmental Health and Safety



- OEHS Staff: enforces and safety and compliance in university research labs

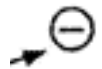
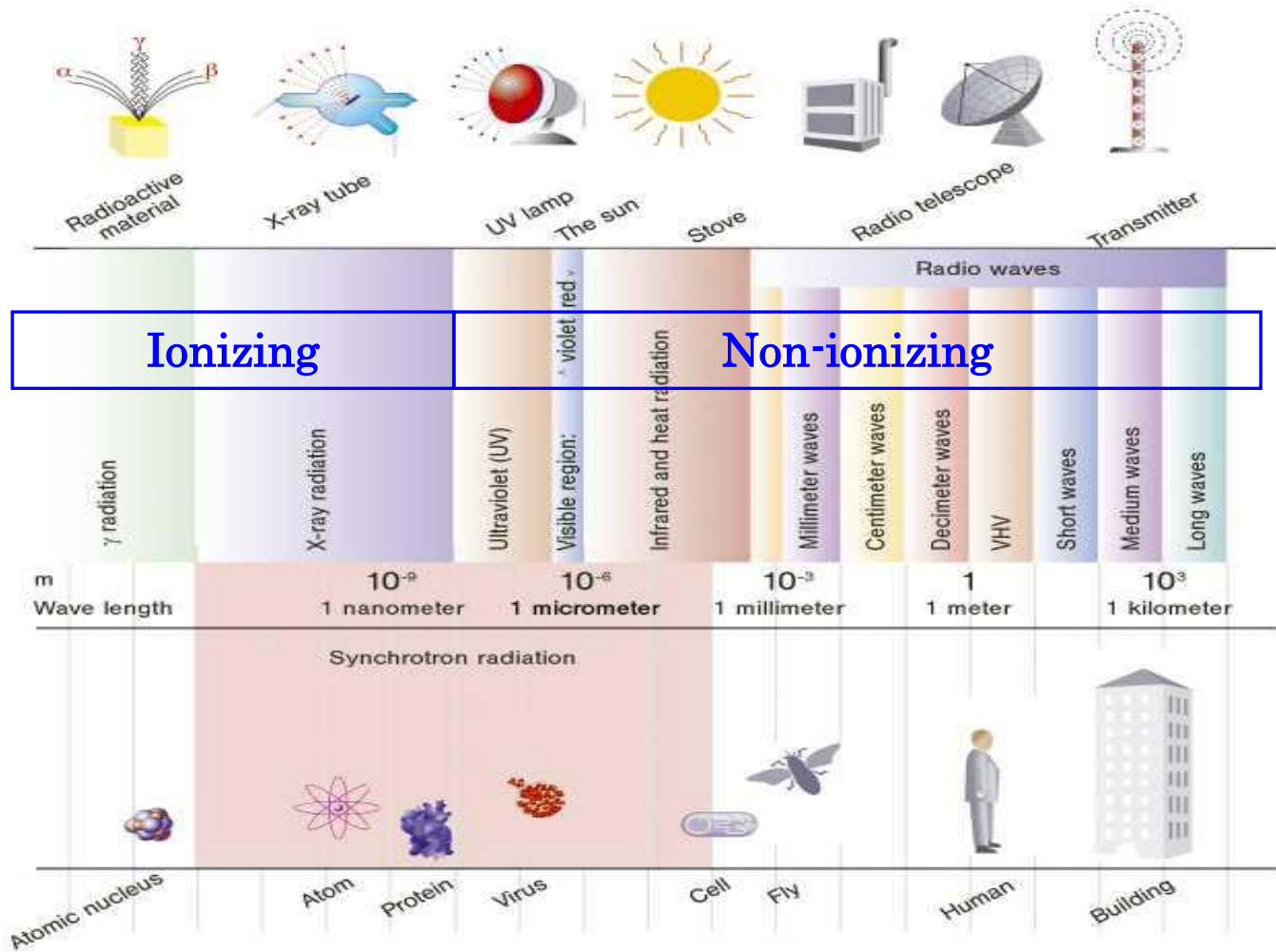
# Job Duties

- Your job may require you to work in areas where radioactive material is used or stored. However you may not handle radioactive materials directly

# Things to Know

- What is radiation, what is radioactive material?
- Where is it located on campus?
- How to know if there is radiation source or radiation area – symbols?
- How to protect from radiation exposure?
- What to do in case of emergency?

# What is Radiation?





# Ionizing Radiation

- All emissions from Radioactive Material and X-ray machines are Ionizing Radiation
- Ionizing Radiation have energies which can cause irreversible damage to the DNA structure in our body
- Some of the early and late effects due to Radiation exposure are skin rash, diarherrea, long term genetic effects like Cancer

# Radiation and Radioactive Material

- Alpha, beta and gamma radiation from radio-chemical compounds used by researchers
- X-rays produced by x-ray machines

# Radioactive Materials at WSU

- Low activity labeled compounds used by researchers, original vials are usually stored in refrigerators or freezers
- Radioactive waste in the laboratories generated by the researchers
- Radioactive waste stored by the radiation safety office

# How to know if there is a radiation source or radiation area- Symbols?



**CAUTION**  **RADIATION AREA**

# How to know if there is a radiation source or radiation area- Symbols?

"CAUTION RADIATION AREA"



"CAUTION RADIOACTIVE MATERIALS"



# RAM Use – work areas

- RAM is only to be used in designated use areas that are marked with radiation tape and protected with plastic backed absorbent paper (or equivalent).
- Also, any equipment or other areas such as hoods, refrigerators, centrifuges, etc must be labeled with rad tape or labels.





## Radioactive material work areas in labs

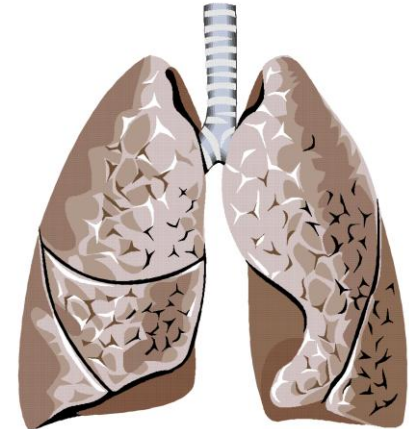


# Internal Hazards

## Sources of inhalation hazards

- Generation of gases

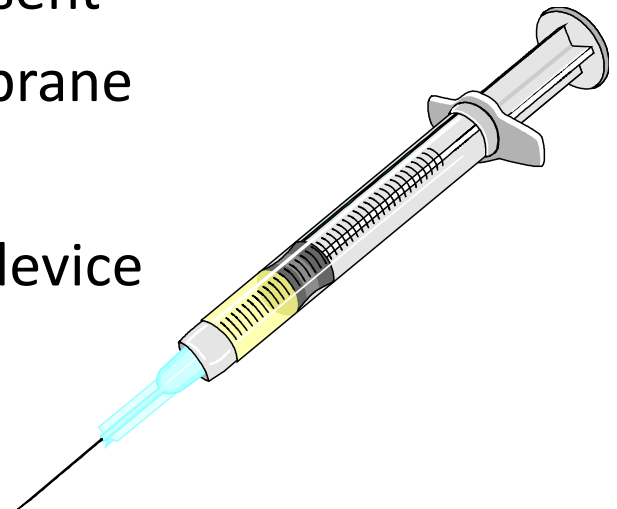
Use fume hood



## Sources absorption or injection hazards

- Cuts in skin – double glove if a cut is present
- Absorbed through skin or mucous membrane
- Puncture wounds
- Injection with syringe or other delivery device

Be cautious with sharps



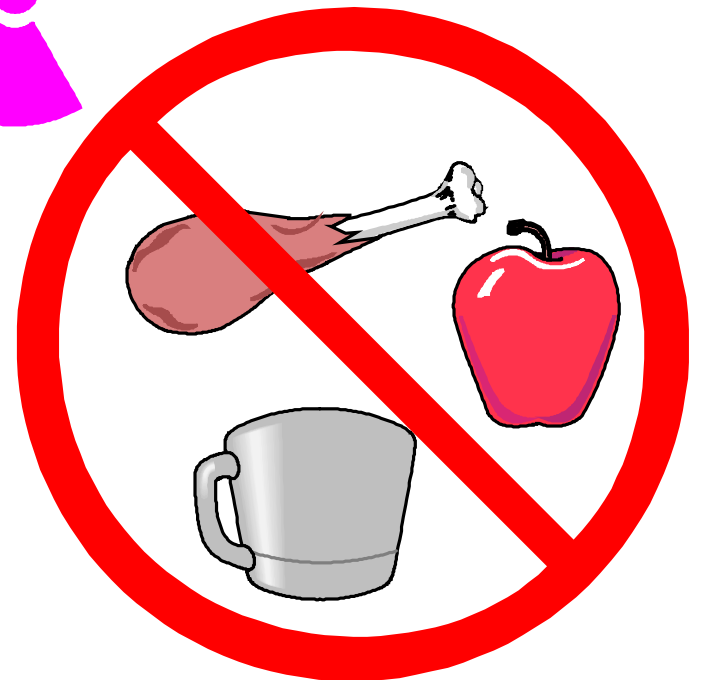
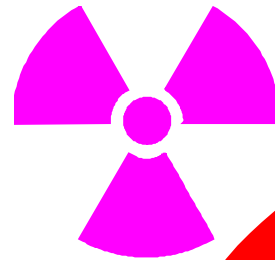


# Ingestion

## WSU Food Policy

- No consumption in areas where hazardous materials are used, stored or disposed
- No food storage or disposal
- No cosmetics ie lotion
- No mouth pipetting

Floor to ceiling enclosures must separate food areas from hazardous materials areas



# WSU Rules for Ancillary Personnel

- Call the Radiation Safety/Health Physics Office:
  - if any radioactive material is found
  - any incident involving radioactive material
  - call 313-577-1200 during normal operation or 313-577-2222 during non-working hours
- Do not open, discard or handle radioactive waste

# Radiation Package Symbols



**Radioactive Material Excepted Package**

This package contains radioactive material, excepted package and is in all respects in compliance with the applicable international and national governmental regulations.

**UN** 2910

The information for this package need not appear on the Notification to Captain (NOTOC)

# Dangerous Goods Shipping: Regulatory Overview (awareness)

- By law, anyone who packs, ships, transports or receives dangerous goods must be properly trained.
- Who's the law? US Department of Transportation (DOT)
- Training must be **renewed every 2 years.**  
*These slides do NOT count as your initial training!*
- The shipper bears ultimate legal responsibility and liability for properly performing these tasks.
- Penalties for non-compliance with shipping regulations can result in the following fines:
  - Up to \$250,000 and up to a year jail sentence for individuals
  - Up to \$500,000 per incident for organizations

# What is a Dangerous Good?

- A **dangerous good** is any article or substance capable of posing a risk to health, safety, property, or the environment and fall into one or more UN Hazard Class:
  - Explosives
  - Gases
  - Flammable Liquids
  - Flammable Solids (reactives, spontaneous combustibles)
  - Oxidizers and Organic Peroxides
  - Toxic and Infectious Substances
  - Radioactive Materials
  - Corrosives
  - Miscellaneous: dry ice, lithium batteries, magnetized items, etc.
- ALL shipments on dry ice are considered Dangerous Goods

# Shipping Dangerous Goods

- Common materials shipped include: human and animal samples, bacteria, DNA, proteins, chemicals (solids or liquids), dry ice, etc.
- OEH&S is the designated authority for shipping Dangerous Goods from WSU.
- **Fines for shipping undeclared dangerous goods can be upwards of \$50,000!**
- Contact OEH&S at 577-1200 for further guidelines on shipping Dangerous Goods.