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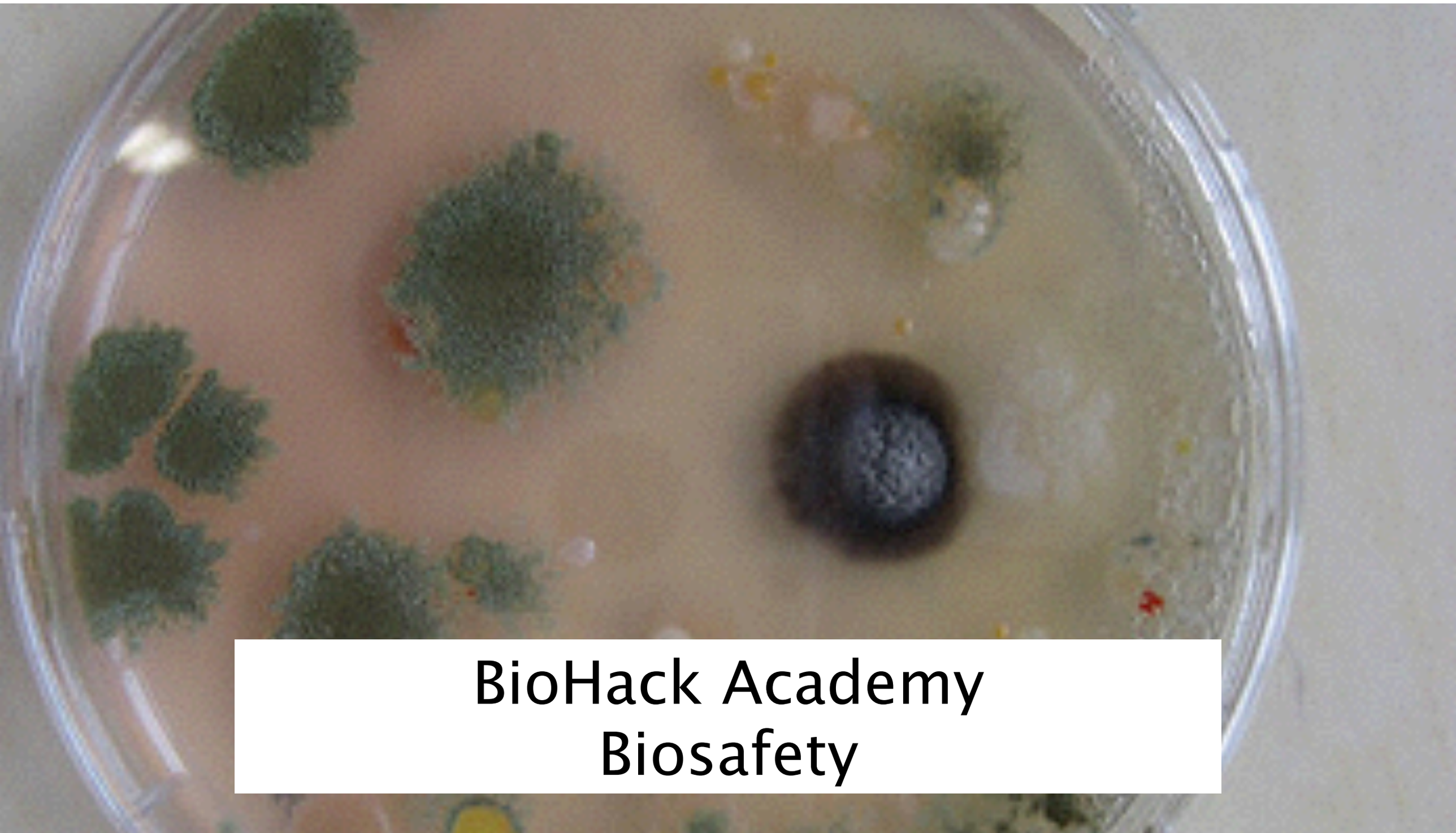


BioHack Academy
Biosafety

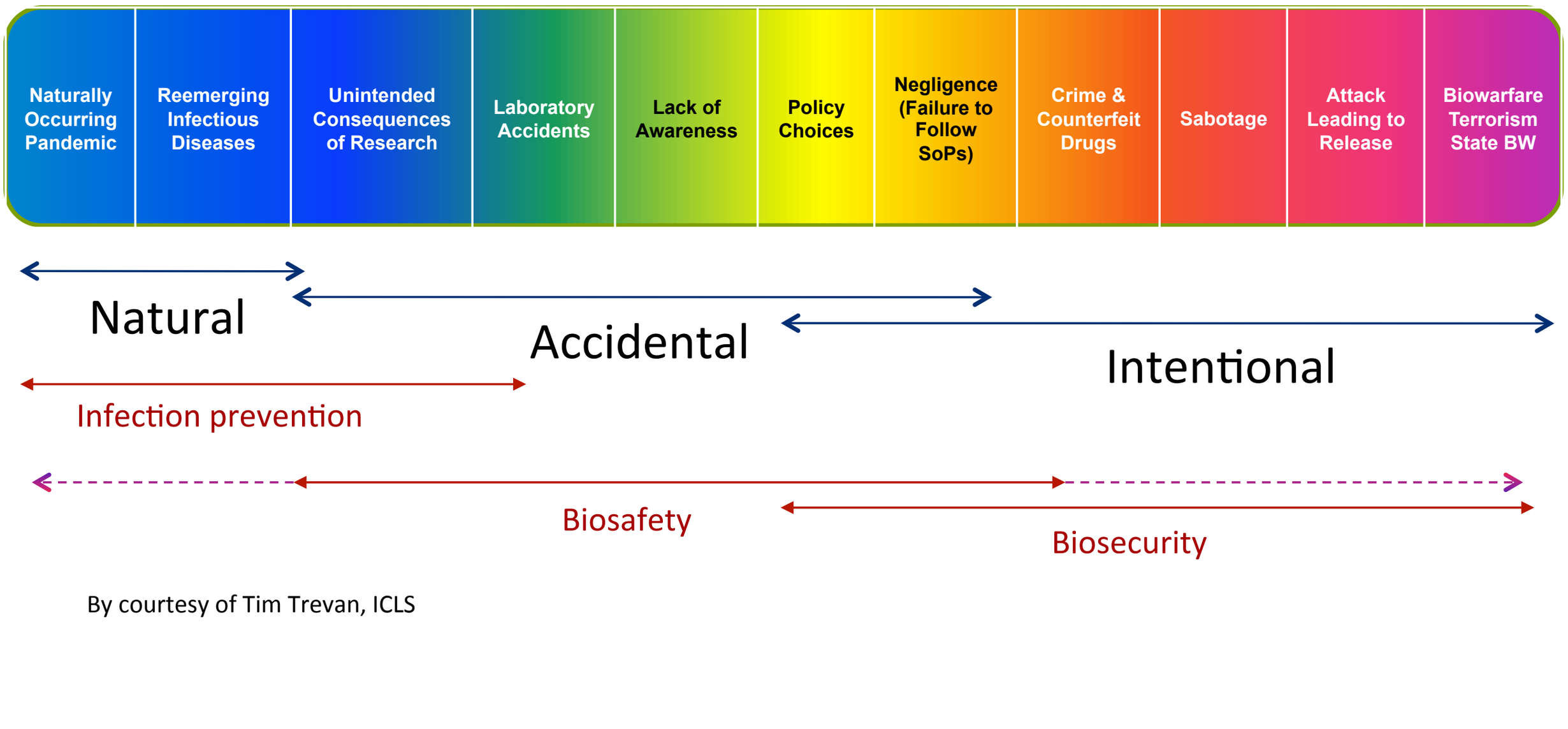
Importance of safety

Safe procedures protect:

1. The environment
2. Your colleagues
3. Yourself

Spectrum of Risk

Biological risks can be seen as a spectrum:



By courtesy of Tim Trevan, ICLS

Ways of infection

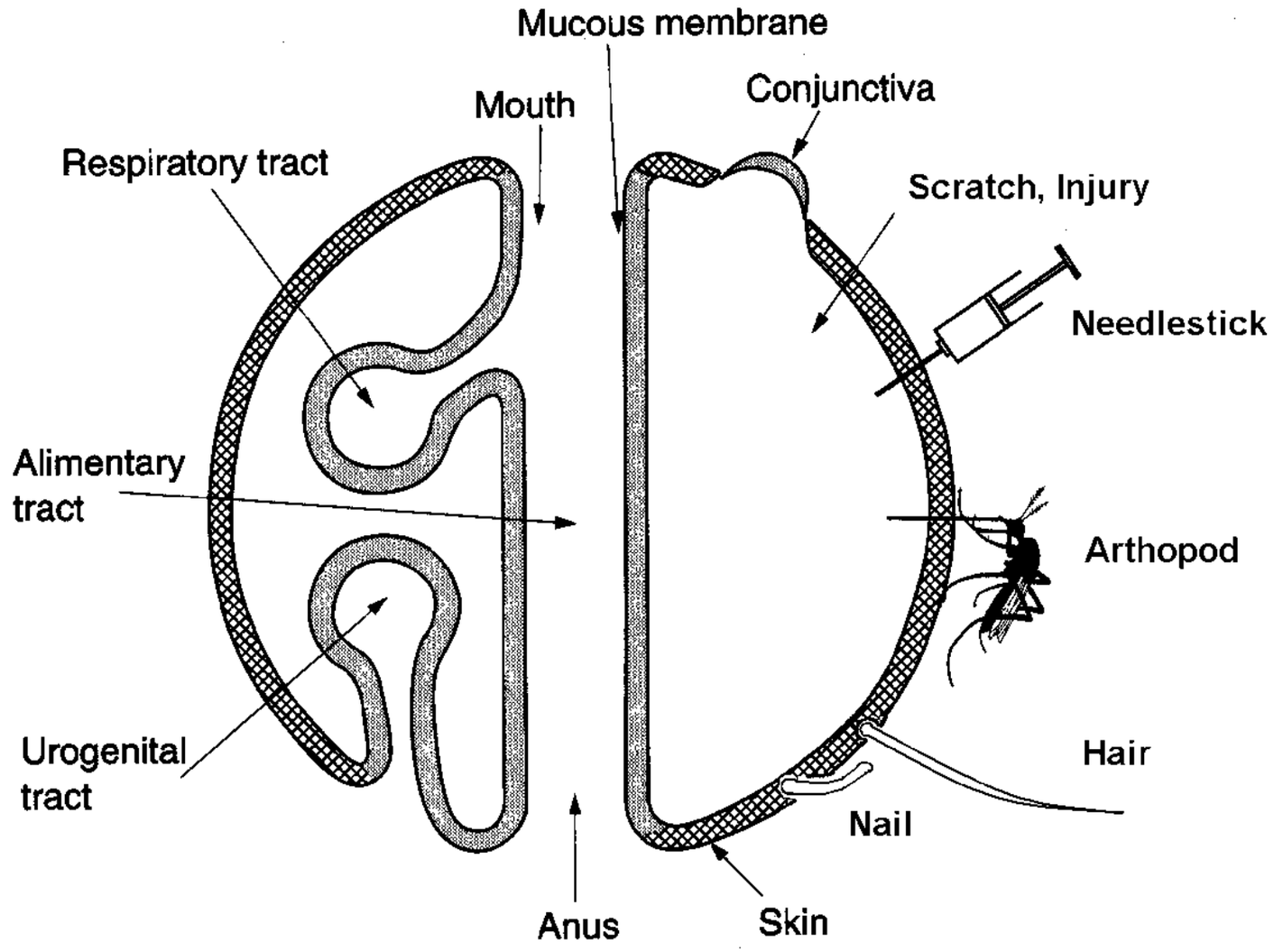


Figure 2.1 Routes of infection: the body's portals of entry ot microbes. (From Mims, 1982, by permission of Academic Press)

Please note

- Only non-pathogenic microbes are used in the Academy

- **Wash your hands** before and after experimenting
- **Do not eat or drink** next to the microbes

Danger of biological agents

- The danger of a biological agent is influenced by numerous factors such as:
    - Pathogenicity
    - Spread to the community
    - Infective dose
    - Availability of effective therapeutic treatment or vaccin

Contamination in the lab

- Bio safety level number indicates the level of regulations that are in place to prevent contamination.
- Types of organisms allowed per level:
  - 1) Well characterized non pathogenic organisms to humans
  - 2) Micro organisms with high infection doses, and known cures
  - 3) Micro organisms with low infection doses, and known cures
  - 4) Micro organisms with extremely low infection doses, severe disease and no cure

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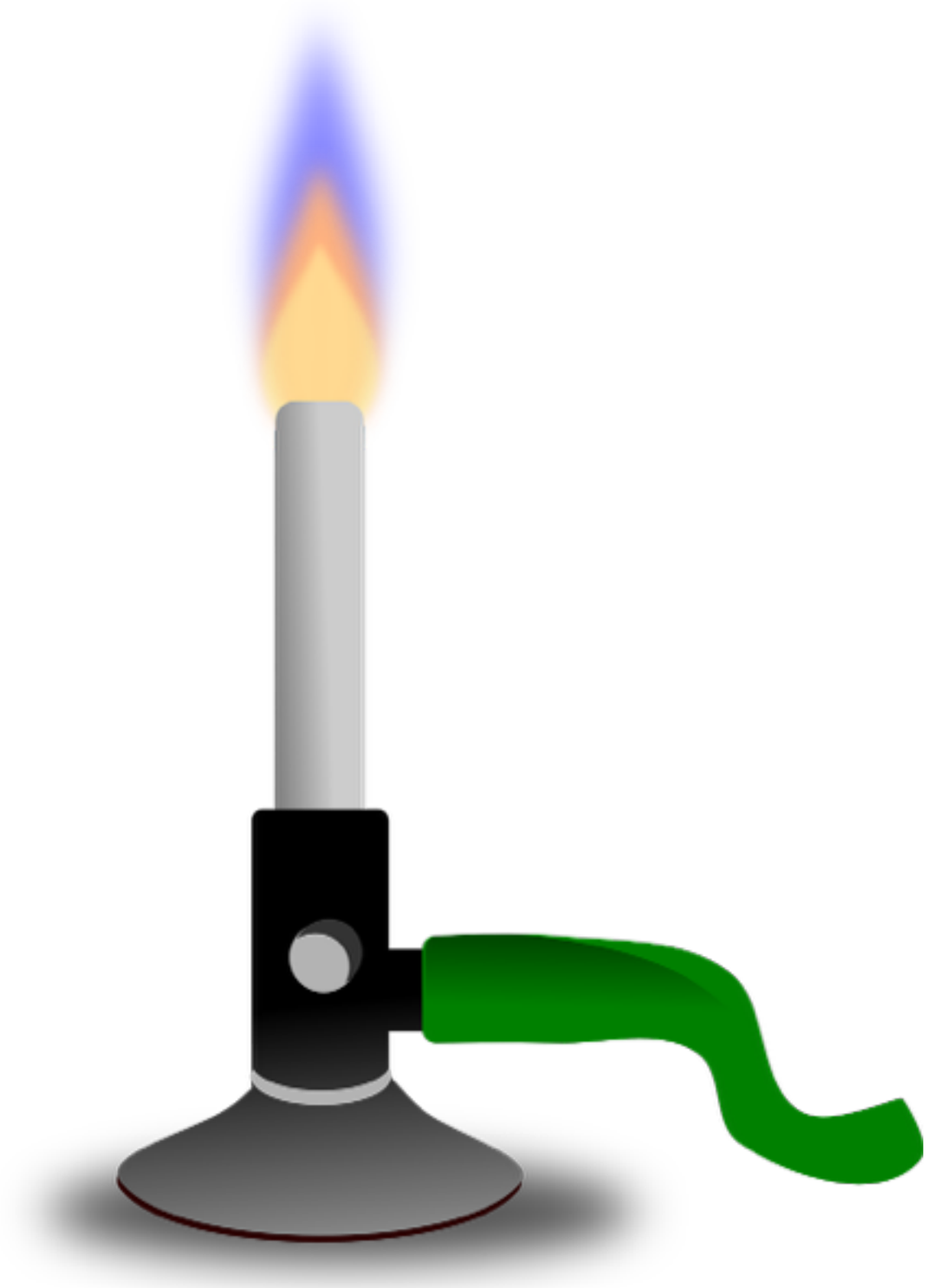
Personal Protection

Equipment for protection yourself

Working sterile



Pixabay - Public Domain

Personal Protection

These items are recommended in the lab

Wash your hands!

Remember, before and after experiments:

- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Wash your hands
- Even after wearing gloves

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Chemicals

Label everything

- Use labels on everything!!
- You are the only one who knows what is in the container
- Labels must consist of:
  - Content
  - Date
  - Name

Global Harmonized System Labels

Familiarize yourself with the meaning of these symbols:

Explosive

Flammable

Oxidizing

Skin Irritation

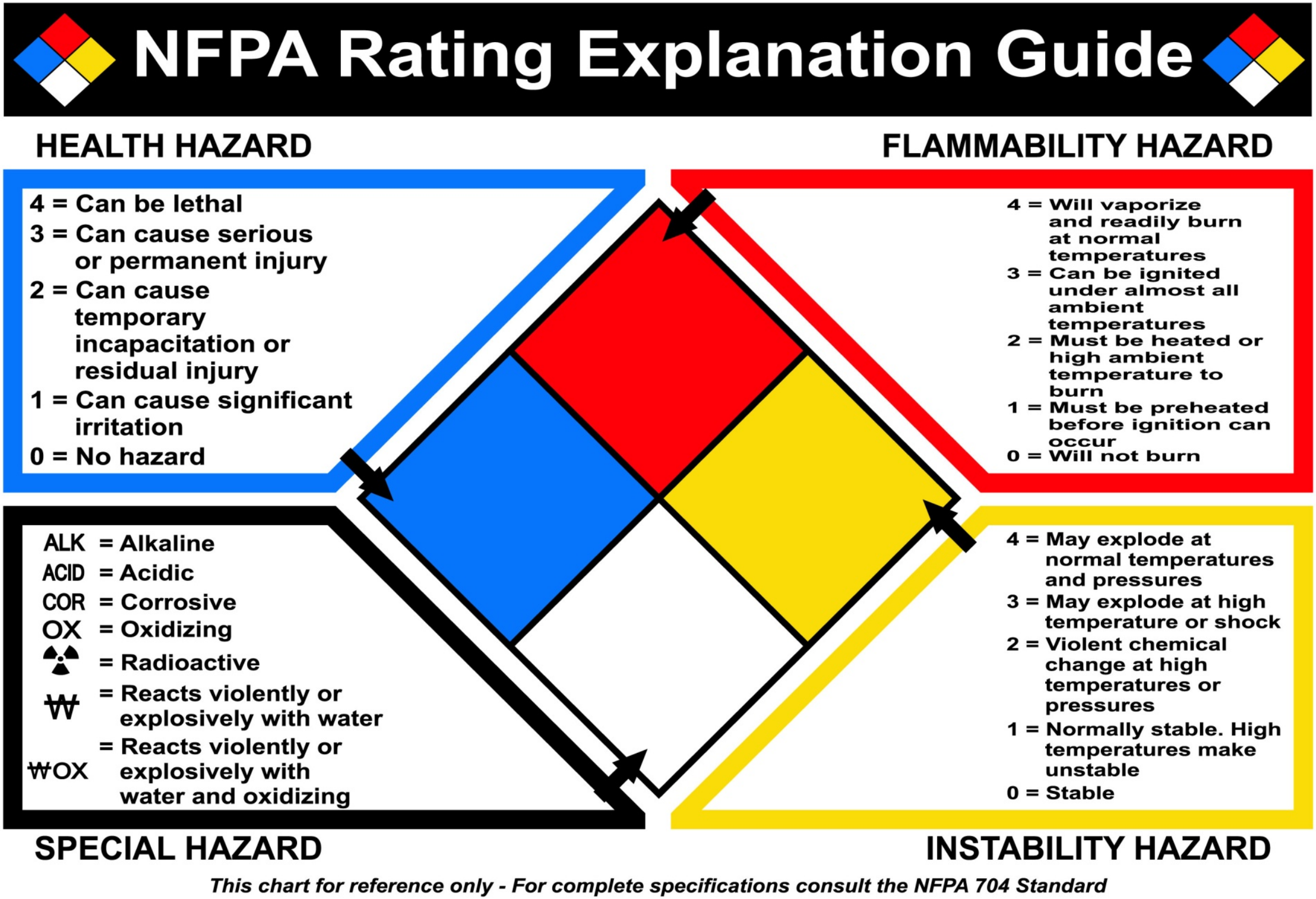
Pollution

Corrosive

Compressed

NFPA safety diamond

NFPA diamonds are often used as well



Special labels

Do not bring anything with such label to the Open Wetlab

MSDS

- Material Safety Data Sheets come with every chemical and contain information about all safety aspects such as:
  - Procedures for safe handling
  - Physical Data
    - Melting point
    - Boiling point
    - Toxicity
    - Reactivity
  - Storage
  - First aid procedure

- Read the MSDS before you use any chemical!

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Waste Disposal

Waste disposal

- Think of how to dispose of things **before** you bring it into the lab

Biological Waste

You are responsible for killing anything you grow:

- Kill of any culture with 10% hypochlorite bleech
  - Incubate for 24h before disposal

- Clean any used surface and object with 70% ethanol (red capped bottles)

- Autoclave for 20 minutes

Broken glassware

- Do NOT dispose in the normal trash bin

- Special “broken glass” container
- Use broom to clean up, because you can easily cut yourself

Chemical waste

- Check what is allowed to store in the lab with the labmanager
- Check what is allowed to go down the sink with the labmanager

- Do NOT mix / bomb guide:
  - Concentrated Acids and Bases
  - Oxidizers and Flammables
  - Water reactive substances and aqueous solutions
  - Cyanides and acids => cyanide gas
  - Bleach and acids => chloride gas

- Search for reactivity on the internet!
- Read the MSDS before using a chemical!