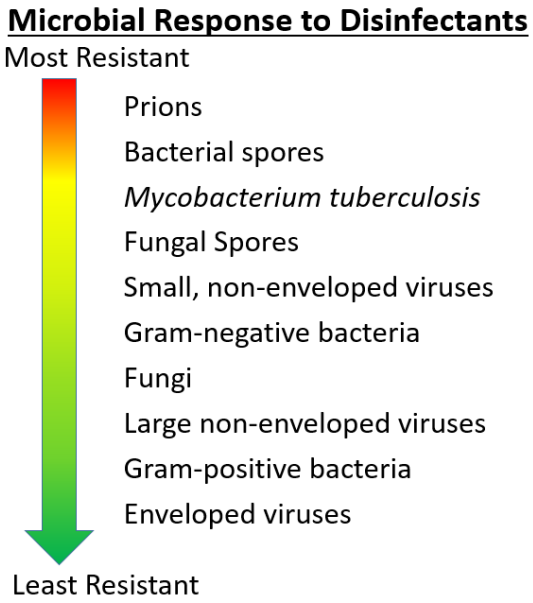
Disinfectants

The decontamination of laboratory surfaces and equipment is critical to preventing the transmission of infectious agents to laboratory workers, the general public, and the environment. An assessment of the infectious agents present as well as surfaces and equipment to be decontaminated must be considered before selecting an appropriate decontamination technique.

Choosing disinfectants

Microorganisms vary greatly in their resistance to chemical disinfectants. The image below gives a general overview of the resistance of different microorganisms to disinfectants. Consider the intrinsic resistance mechanisms of the microorganisms you are working with when choosing disinfectants.



In addition to the effectiveness of a disinfectant, consider the following:

- type and level of microbial contamination
- contact time
- the corrosive or hazardous properties of the disinfectant
- ease of use
- presence of organic matter or soil load
- chemical reactions-some disinfectants will interact with the chemicals you are using in the lab (such as bleach and ammonia).
- The stability and shelf life of the disinfectant. **Some diluted disinfectants degrade rapidly and must be freshly prepared before use (such as a 10% bleach solution)**.

Consult manufacturer directions to determine the efficacy of the disinfectant against the biohazards in your lab and be sure to allow for sufficient contact time. A guidance table on commonly used laboratory disinfectants is provided at the end of this document.

Using disinfectants

- After each experiment, decontaminate work surfaces using appropriate disinfectant.
- Do not skip your PPE – Just as disinfectants are toxic to the material you are working with, they can harm you as well.
- Allow sufficient contact time after applying the disinfectant. If the contact time is too brief, the surface will not be thoroughly disinfected.
- Disinfectants placed in a secondary container must be labeled with the following:
  - Product name
  - Concentration
  - Expiration date
  - Relevant hazard data
- Do not spray in a BSC – Spraying disinfectants allows more of the chemical to get into parts of the cabinet that you cannot access, leading to potential corrosion and recirculation back into the room. Use a squeeze bottle instead.
- Wipe surfaces with DI water following decontamination if disinfectant residues are a concern.

Questions? Please contact **UNMC Biosafety** at biosafety@unmc.edu or unmcehs@unmc.edu

Properties of Common Laboratory Disinfectants for Surface Cleaning

Class	Examples	Advantages	Disadvantages
Alcohols	Isopropanol, Ethyl alcohol	• Non-Corrosive • Effective with detergent • Leaves no residue	• Not appropriate for BBP/human material • Flammable • Sufficient contact time can be challenging • Some incompatibility with rubber and plastic material
Chlorine Compounds	Bleach, Sani-Cloth Bleach Wipes, Defender, MB-10, Bleach-Rite, Clidox	• Low cost • Broad spectrum effectiveness • Deodorizing/sanitizing	• Inactivated by organic material • Corrosive • Irritates mucus membranes, eyes, and skin • Limited shelf life once diluted unless RTU w/stabilizers • Produces toxic chlorine gas if mixed with acids or ammonia compounds • Prolonged deterioration on standing
Quaternary Ammonium Compounds	Sani-Cloth AF3, Bacdown, Conflikt, Lysol IC, Enviro Care	• Strong surface activity • Low toxicity • Non-Corrosive • Effective over a wide pH range • Longer shelf life	• Easily inactivated by organic materials, anionic detergents, and salts of metals in water (hard water) • Generally ineffective against Gram-negative, tubercle bacilli spores, and hydrophilic (nonenveloped) viruses
Phenolics	Vesphene, LpH®, CiDecon	• Good effectiveness in organic material • Has some residual effectiveness • Stable in storage	• Toxicity varies with specific compound • Can be absorbed through skin and Latex gloves • Unpleasant smell • Corrosive • Not effective against spores and some viruses
Iodophors	Wescodyne	• Stable if kept cool & tightly covered • built-in indicator (active if brown or yellow) • readily miscible with water	• Inactivated by organic matter • Poor activity against spores • Vaporizes at 120°F (should not be used in hot water) • May stain surfaces • Relatively expensive
Accelerated Hydrogen Peroxide	Accel, PREempt	• Stable in storage •Effective against a broad spectrum of microbes • Lower contact times • Non-corrosive	• Check the product label to determine the contact times required to be considered tuberculocidal and virucidal. • May require additional PPE • Generally not active against bacterial spores

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University of Nebraska Medical Center