

LABORATORIES: CHOOSING AN APPROPRIATE DISINFECTANT

INTRODUCTION:

Choosing the right disinfectant for a location or specific situation depends upon many factors, including; microorganism being targeted, degree of contamination, organic matter load, contact time required, toxicity of the chemical present in the disinfectant, type of material being treated, and cost.

Failure to select an appropriate disinfectant or improper use of a disinfectant can lead to failure to remove all contamination, which can lead to exposure. Alternatively, damage to equipment may occur due to the properties of the chemicals present in the disinfectant applied.

BEST PRACTICES¹:

- Evaluate your biological material:** Specific target: Lipid enveloped virus? Vegetative bacteria? Spore? Intracellular? Broad spectrum: Targets all three major classes of organisms, bacteria, fungi, and virus. If available, refer to the relevant [pathogen safety data sheet](#)².
- Evaluate the organic content:** Organic load can impact the effectiveness of a disinfectant
- Evaluate your equipment:** Is the equipment sensitive to chemical exposure? Can it be immersed?
- Contact time matters:** Follow the instructions for the specific disinfectant selected and apply for the correct duration
- What Personal Protective Equipment (PPE) is required?** Ensure you evaluate what PPE is required; for both the biological material and the chemical nature of the disinfectant
- Consider any potential chemical reactions:** What else is potentially present on the surfaces to be cleaned? How will it react with the disinfectant?

LABORATORY DISINFECTANTS CONSIDERATIONS:

- Bleach:** Standard bleach (sodium hypochlorite) is broad acting, but once diluted remains effective for only 24 hours. Additionally, it will corrode stainless steel; therefore a follow-up cleaning with 70% ethanol is recommended to remove bleach residue.
- Alcohol:** 70% ethanol is widely used in laboratories but can require a contact time of up to 20 minutes. Due to the rapid evaporation rate it is ineffective as a surface disinfectant; especially in biosafety cabinets with additional airflow.
- Liquid Waste:** Treating liquid biological waste with a chemical disinfectant is a common practice. However, waste treated with a chemical

disinfectant other than sodium hypochlorite must be collected and handled as a chemical waste.

- Spill Clean-up:** Use of an effective disinfectant in spill response is critical. Management of the waste materials associated with the clean-up must be considered. The addition of a chemical disinfectant will necessitate the collection and disposal of the materials as chemical waste.

ENVIRONMENTAL PROTECTION AGENCY (EPA) REGISTERED DISINFECTANTS

The EPA³ provides lists of antimicrobial products that have been proven to be effective against common pathogens. Use of listed EPA-registered products consistent with the product labeling complies with OSHA requirements for Occupational Exposure to Blood Borne Pathogens⁴. Users must read the label to locate the EPA registration number and ensure product is approved for the intended biological agent.

EXPOSURE RESPONSE CONTACTS:

- Principal Investigator (PI):** *(Add relevant phone number before printing)*
- WSU Public Safety:** 313-577-2222, emergency transportation
- Occupational Health Services (OHS-4K):** 313-745-5123, available 7am-4:30pm
- Detroit Receiving Hospital ER:** 313-745-3355, available outside OHS-4K hours
- Office of Environment Health & Safety:** 313-577-1200, spills or clean-up

REFERENCES:

- [Disinfectant Selection: Cornell University, Environmental Health and Safety](#)
- [Public Health Agency of Canada](#)
- [United States Environmental Protection Agency](#)
- [OSHA, Occupational Exposure to blood borne pathogens](#)