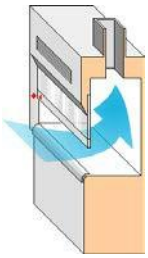
DANGER!  

Duke OESO Guidelines for Safe Use of BLEACH

(sodium hypochlorite solution)

 DANGER!

Hazards	**Potential Hazards**	• **Destroys tissue** at site of contact (usually skin or eyes). May cause **respiratory irritation**. • In contact with **acids** may release **toxic chlorine gas.** • Contains sodium hypochlorite, an **oxidizer.** • **Incompatible** with many chemicals found in labs. (See page 2.) • See **Safety Data Sheet** (SDS) for specific hazard information.
Hazard Controls	**Selection & Purchase**	• Purchase at the **lowest concentration** & volume practical.
	Storage & Transportation	• **Tightly recap** bleach bottle for storage. • Label bleach solutions with **expiration date** (one week after preparation). • Store **below eye level** but **not on the floo**r. • Do not store with **incompatibles**. (See Page 2.) • If storing in or on **metal** cabinets/shelves, use secondary containment or other means to **keep bleach off the metal** (causes corrosion over time). 
	Engineering Controls	**For solutions with > 2% sodium hypochlorite:** • **Eyewash** required in immediate work area. **Eyewash-drench** hose preferred. • *Safety shower may be required when using large quantities.*  • Work in a chemical fume hood if toxic gases may be created or to limit irritation when using large quantities of bleach. 
	Work Practice Controls	• **Never mix bleach with an unknown** compound or mixture. • **Avoid** pouring bleach down **metal sinks** (causes corrosion over time). • **Always check chemical compatibility on the SDS** (and/or page 2) **before adding bleach.**
	Personal Protective Equipment (PPE)	**Minimum PPE:** • Fastened lab coat • Safety goggles • Nitrile or powder-free latex gloves     **Risk of splash/use of large quantity, ADD:** • Face shield • Impervious apron and sleeves (or coverall)    *Consult the manufacturer's glove guide for glove effectiveness with the chemical you are using.*
Other	**Emergencies**	See **Emergency Response Flip Chart** and/or lab specific chemical hygiene plan.
	Waste	See lab-specific chemical hygiene plan, or Lab Chemical Waste and Drain Disposal practices. **Flush drain with flowing water under medium pressure immediately after disposing bleach.**
	Training	Sign signature page in lab-specific plan to indicate review.
	Questions	Contact OESO Laboratory Safety at 919-684-8822.

Bleach Incompatibility Information

Incompatible Chemicals and Agents	Possible Results of Mixing with Bleach
Hydrogen Peroxide	• Violent reaction producing oxygen
Acids and Acidic Compounds such as: • Hydrochloric Acid • Sulfuric Acid • Hydrofluoric Acid • Fluorosilicic Acid • Phosphoric Acid • Aluminum Sulfate • Aluminum Chloride • Ferrous or Ferric Chloride • Ferrous or Ferric Sulfate (Including chlorinated solutions)	• Release of toxic chlorine gas (reaction/release **may occur violently**)
Ammonia-containing compounds such as: • Ammonium Hydroxide • Ammonium Chloride • Ammonium Silicofluoride • Ammonium Sulfate • Quaternary Ammonium Salts	• Formation of chloramine compounds (**toxic and potentially explosive**)
Organic chemicals such as: • Organic solvents • Organic polymers • Amines • Ethylene Glycol • Formic acid • Insecticides • Fuels and fuel oils • Propane • Methanol	• Formation of explosive compounds • Release of toxic chlorine gas • Formation of chlorinated organics which may be **toxic** or **carcinogenic**.
Metals such as: • Cobalt • Copper • Nickel • Iron • Avoid piping and equipment containing aluminum, carbon steel, stainless steel, and other metals	• Release of oxygen which could cause overpressurization and rupture of a closed system
Reducing agents such as: • Sodium Bisulfite • Sodium Hydrosulfate • Sodium Sulfate • Sodium Thiosulfate	• Production of heat from reaction may cause **boiling/splashing**
Guanidine Salts (found in many **lysis buffers**) such as: • Guanidine Hydrochloride • Guanidine Thiocyanate	• Release of toxic gases which can include chloramines, chlorine, and hydrogen cyanide