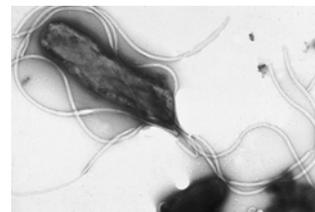


## BioMaterial Fact Sheet: *Helicobacter pylori*

*Helicobacter pylori* (*H. pylori*) is a gram-negative, curved, rod-shaped bacillus (bacteria) that causes chronic inflammation of the inner stomach lining in humans. It is the most common cause of peptic and duodenal ulcers. Although *H. pylori* infection does not cause illness in most infected people, it is a major risk factor for peptic ulcer disease and is responsible for the majority of ulcers of the stomach and upper small intestine. The infectious dose for humans is unknown; however, infection in the Rhesus monkey occurred with a minimum of  $10^4$  *H. pylori* bacteria intake by orogastrical inoculation. Transmission, while incompletely understood, is thought to be by the fecal-oral or oral-oral route, and transmission via aerosol remains uncertain.



**Containment Level:** Biosafety Level 2 (BSL2) criteria and animals infected with the agent should be handled and housed according to Animal Biosafety Level 2 criteria (ABSL2) for the duration of the experiments. *Concurrent approvals are needed from the Institutional Biosafety Committee (IBC) and the Institutional Animal Care and Use Committee (IACUC) prior to initiating work.*

**Required Training:** To work with *H. pylori*, laboratory and animal staff must have completed the Bloodborne Pathogen (BBP) training offered by EHS as well as specialized *H. pylori* training which is coordinated by the IBC Administrator. In addition, staff should receive 'hands-on' training from their laboratory supervisor or animal facility manager prior to manipulating the agent. Training should cover the hazards associated with the work, required practices and procedures and, if manipulating infected animals, proper handling of bedding, caging, and all other husbandry materials associated with the experiment.

**Personal Protective Equipment (PPE):** In laboratory, back-closing, impervious, disposable gown; or apron with Tyvek sleeves plus two pairs of gloves while manipulating agent. In animal facility, facility dedicated clothing is worn to prevent contamination of personal clothing in addition to facility dedicated personal protective equipment (PPE). Gloves must be worn to protect hands from exposure to hazardous materials. They must not be worn outside the animal rooms. *Additional PPE required to enter an ABSL2 lab or animal room includes: Tyvek; back-closing, impervious, disposable gown; or apron with Tyvek sleeves and one pair of shoe covers.* Recommended additional PPE includes: face shield or eye protection and two pairs of gloves. **All non-facility dedicated PPE must be removed prior to exiting the ABSL2 room. If working with concentrated titers and highly aerosolizing procedures contact the Biosafety Officer 301-846-5038.**

**Engineering Controls:** *No work on the open bench!* All laboratory manipulations and manipulations of animals (dosing, cage changes, dissections, tissue harvest, etc.) MUST be performed within a Biological Safety Cabinet (BSC). Animals must be placed in ventilated caging racks maintained under negative pressure with HEPA-filtered supply and exhaust post-infection or in static cages. Alternate caging options may be determined and implemented on a case-by-case basis by the Animal Facility in conjunction with EHS concurrence. The direction of airflow into the animal facility is inward; animal rooms maintain inward directional airflow compared to adjoining hallways.

**Additional Safety Practices:** Animals anesthetized for injections per Animal Study Protocol (ASP). Precautions must be taken with sharp items, including but not limited to needles, scalpels, pipettes, and broken glass. Safety needles; retractable, disposable scalpels; blunt end scissors/forceps; and plastic pipettes should be implemented whenever feasible. All sharps (one-time use) should be immediately disposed of into sharps container (located *within* the BSC) and disposed of as hazardous waste. When a sharps container is full, it must be closed and wrapped with autoclave tape (the tape will ensure the cap does not pop off if dropped).

**Disinfection:** Disinfect all work surfaces and materials *both* prior to and immediately following all work practices and procedures. Ensure that the disinfectant is appropriate for the agent in-use. (also see *Biological Technical Bulletin for Decontamination*)

- **Caging / Bedding:** Microisolator technique should be used throughout the entirety of the experiment. Bag cages/bedding inside the BSC. The outer bag should be sprayed with disinfectant then placed in a second autoclave bag. Disinfect the outer bag, remove it from the BSC, and immediately autoclave and dispose of according to facility requirements. Cages must be autoclaved prior to cage wash.
- **Surfaces:** The area should be disinfected with freshly prepared 10% bleach with a contact time of 5 minutes. Alternately, 80% ethanol for a 15 second minimum contact time (preferably one minute) can be used. (See reference: [http://www.cdc.gov/hicpac/Disinfection\\_Sterilization/3\\_2contaminatedDevices.html](http://www.cdc.gov/hicpac/Disinfection_Sterilization/3_2contaminatedDevices.html).) Other EPA approved disinfectants are also suitable so long as they are applicable to the agent in-use.
- **Liquid Waste:** Liquid wastes should be disinfected with bleach to a final concentration of 10% with a minimum contact time of 30 minutes. Alternately, 80% ethanol can be used. (See reference: [http://www.cdc.gov/hicpac/Disinfection\\_Sterilization/3\\_2contaminatedDevices.html](http://www.cdc.gov/hicpac/Disinfection_Sterilization/3_2contaminatedDevices.html)). Other EPA approved disinfectants are also suitable so long as they are applicable to the agent in-use.
- **Solid Waste:** All solid wastes should be treated as hazardous waste according to FNLCR handling procedures.

**Employee Exposure:**

- **Eye Exposure from splash or aerosols:** Flush eyes for a *minimum* of 15 minutes in eyewash and then report to OHS immediately afterwards. Follow the NCI-Frederick Exposure Control Plan (<http://home.ncifcrf.gov/ehs/ehs.asp?id=12>) procedure for reporting occupational exposures to potentially infectious material. Dial 911 after-hours to report exposure and obtain assistance.
- **Needlesticks and/or non-intact skin exposure:** Wash contaminated skin for 15 minutes using a 10% povidone iodine solution (such as Betadine), a chlorhexidine scrub kit, or soap and copious amounts of water. Report to OHS immediately after scrub. If the exposure occurs during after normal business hours contact the 911 emergency numbers. Follow NCI-Frederick Exposure Control Plan.

References:

- BMBL 5<sup>th</sup> edition: <http://www.cdc.gov/biosafety/publications/bmb15/index.htm>
- Biological Technical Bulletin for Decontamination: <http://ncifrederick.cancer.gov/ehs/ibc/FactSheets.aspx>
- MSDS for Infectious Substances – Helicobacter pylori: <http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/heli-pylori-eng.php>
- CDC Fact Sheet for Health Care Providers: <http://www.cdc.gov/ulcer/files/hpfacts.PDF>
- Photo: [http://www.redorbit.com/education/reference\\_library/health\\_1/bacteria/2584154/helicobacter\\_pylori/](http://www.redorbit.com/education/reference_library/health_1/bacteria/2584154/helicobacter_pylori/)
- Disinfection: [http://www.cdc.gov/hicpac/Disinfection\\_Sterilization/3\\_2contaminatedDevices.html](http://www.cdc.gov/hicpac/Disinfection_Sterilization/3_2contaminatedDevices.html)