



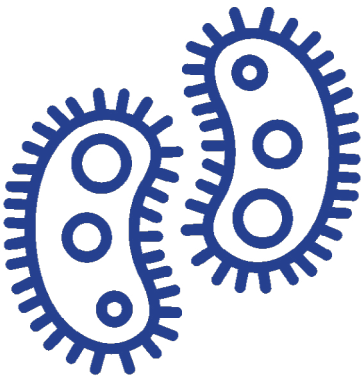
Human Gene Transfer (HGT) Hazards for Clinical Staff

Introduction

Human Gene Transfer (HGT) is a novel category of biological therapeutics that involves the use of genetic materials (RNA or DNA) and/or genetically altered human cells, bacteria, or viruses, to treat human disease. To protect healthcare workers, it is important that the unique exposure and transmission risks associated with HGT study agents and FDA approved drugs be outlined in advisory notices to the healthcare community.

Sabai IBC Services has designed this advisory notice to help ensure healthcare workers are aware of these risks. It is through this awareness that healthcare workers are prepared to safely store, compound, transport, and administer these products.

Bacteria



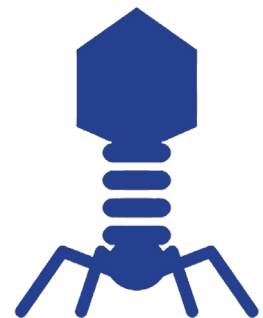
- Many different types of bacteria can be genetically modified to treat disease. Modified bacteria often maintain their ability to infect or colonize; however, the methods used to alter the bacteria often reduce the organism's ability to cause disease.
- It is important to understand the route of transmission for bacterial agents being used in a clinical trial and how handling of the product could result in accidental exposure.
- Modified bacteria may be shed by human participants and all potential routes of shedding should be considered a potential risk until clinical data confirms that shedding does not occur.
- Examples of bacteria or bacterial products used in clinical trials include *Listeria monocytogenes*, *Lactococcus lactis*, and Bacillus Calmette-Guerin (BCG).
- Most bacteria can be safely handled if personnel wear gowns, gloves, and mucous membrane protection (if splash is anticipated) when handling the study agent(s).

Human Cells & Genetic Material (e.g., mRNA, plasmids)

- To produce human cellular therapies, an individual's blood may be removed, processed, and specific cells collected for further modification. The product of this process will be infused back into a study participant to treat certain conditions, such as hematological malignancies or solid tumors.
- Blood, blood products, and other potentially infectious materials (OPIM) should be handled according to infection control practices employing standard precautions, which are generally described in the Site's Biosafety Manual and policies.
- Human cells can be modified using different molecular methods, including viral mediated genetic alteration. The end product should be handled with the same precautions as human blood/tissue (per standard precautions).
- Genetic material used for therapy generally poses a low exposure risk, as it is not usually inherently infectious.

Bacteriophages

- Bacteriophages are a type of virus that infect bacterial cells.
- Bacteriophages are being investigated as an alternative to antibiotics to fight serious bacterial infections.
- Since bacteriophages do not target human cells, they are considered relatively safe to work with.





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Viruses

- Viruses are important tools that can be directly used to treat diseases (oncolytic viruses), as vaccine vehicles (vaccinia, adenovirus), or to modify human cells.
- Viral vectors can generally be handled safely by personnel wearing gloves, gowns, and mucous membrane protection (if splash or spray is anticipated).
- Additional personal protective equipment (PPE) and engineering controls may be needed based on the study agent's route of administration (injection, inhalation via nebulizer, etc.).

A Risk Assessment is Generated for Every Study

The Risk Assessment functions to not only describe the investigational agent, but also to include important information, such as potential routes of exposure, controls needed to mitigate these risks, and emergency procedures necessary to control spills and to properly respond to exposures associated with these biologics.

THIS IS INTENDED AS A GENERAL GUIDE ONLY