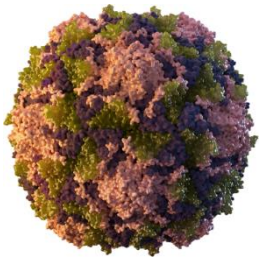
Recognizing and Containing Poliovirus Risk Materials at Vanderbilt University

Recognizing Poliovirus Risk

Poliovirus is a type of Enterovirus with three known serotypes. Often poliovirus infections are asymptomatic or cause flu-like symptoms. However, disabling and life-threatening disease including meningitis and paralysis (called poliomyelitis or "polio") can occur. The virus is very contagious and can be spread through contact with feces, respiratory droplets, and contaminated food and water. Globally, vaccines are available to prevent polio and two of the three serotypes have been declared eradicated. Even so, the potential for an accidental introduction of poliovirus from lab-related environments exists.

Containing the Risk at VU



The U.S. National Authority for Containment of Poliovirus (NAC) at the Centers for Disease Control and Prevention (CDC) is tasked with helping reduce the risk of the release of poliovirus from U.S. laboratory facilities as part of the Polio Global Eradication Initiative. Vanderbilt University is committed to following the CDC and the World Health Organization (WHO)'s guidance and processes for identifying, inventorying, and reporting all materials covered by this initiative to the NAC. VU Biosafety is supporting this effort through the distribution of awareness guides and surveying investigators in departments that may work with biomaterials or samples that may be considered potential infectious for poliovirus.

Investigator's Responsibilities

Principal investigators have specific responsibilities relating to poliovirus containment, including:

- **Assessing the potential for poliovirus in samples** in storage or in use in their research program. (Refer to the Poliovirus PIM list on the next page.)
- **Reporting any poliovirus infectious materials or potentially infectious materials** to VU Biosafety at VUBiosafety@vanderbilt.edu.
- **Notifying VU Biosafety** if they plan to obtain poliovirus or samples that may contain poliovirus.
- **Following all NAC biocontainment guidance** for inventorying, handling, and disposing materials that contain or may contain poliovirus (if determined applicable once declared to VU Biosafety).

Certain environmental, clinical, and other research samples may be known to contain poliovirus. However, poliovirus also may unknowingly be found research materials in depending on their country of origin and the timeline when they were collected based on the circulation of poliovirus or the poliovirus vaccine, including:

- Sewage,
- Environmental waters,
- Human fecal or respiratory secretions,
- Respiratory and enteric virus stocks,
- Cell cultures,
- Infected animals and samples from them, and
- Other specimen types.

For a full list of poliovirus infectious materials (IM) and potentially infectious materials (PIM) see the NAC's Definitions and Examples and the PIM identification tool.

For additional information about Polio please see Polio (Poliomyelitis) and Polio: For Health Professionals.

Do you have poliovirus or materials that could harbor poliovirus in use or storage?

The U.S. National Authority for Containment of Poliovirus (NAC) at the Centers for Disease Control and Prevention (CDC) is tasked with helping reduce the risk of the release of poliovirus from facilities as part of the global poliovirus containment and eradication initiative. Certain environmental and clinical/research samples that may be known to contain WPV, VDPV, or OPV (infectious materials) or may potentially contain these materials depending on their country of origin and the timeline when they were collected based on the circulation of WPV/VDPV and/or OPV use (PIM) must be identified and reported to the NAC. A summarized list of sample types is described with full details from the NAC of all poliovirus infectious materials and potentially infectious materials noted below for your review and reference.

Regardless of your research focus, please review the list below in its entirety to determine if you have any research materials in storage that meet the description. ***NOTE: For purposes of this survey, potentially infectious material (PIM) refers specifically to biological materials/samples that may harbor poliovirus.***

If you have or plan to have any research materials (in use or in storage) that are described on the poliovirus/PIM list please contact VU EHS Biosafety immediately.

If you possess poliovirus/PIM, VU Biosafety will contact you to collect more information about your samples to determine next actions with the CDC on your behalf.

Abbreviations & Acronyms	
WPV	Wild poliovirus
VDPV	Vaccine-derived polioviruses
OPV	Oral poliovirus vaccine
PIM	Potentially infectious material (that may harbor poliovirus)

Environmental Samples that May Contain Poliovirus or are PIM*

- Environmental sewage
- Untreated wastewater (e.g., grab or composite influent samples) or surface water samples
- Primary sludge and primary effluent
- Derivatives (e.g., wastewater solids retained on filter media, concentrated sewage, extracted nucleic acids, etc.)

Clinical and Research Samples that May Contain Poliovirus or are PIM*

- Clinical materials from confirmed infections
- Fecal or Respiratory secretion samples and their derivatives (e.g., stool suspensions, extracted nucleic acids, etc.); including products of these materials from poliovirus permissive cells or animals
- Respiratory and enteric virus stocks handled under conditions where contamination or replication is possible
- Uncharacterized enterovirus-like cell culture isolates
- Cell culture isolates and reference strains of wild poliovirus and Sabin/OPV strains
- Seed stocks and live virus from vaccine production
- Virus stocks, derivatives, full-length RNA or cDNA that have capsid sequences from WPV or Sabin/OPV strains
- Cells persistently infected with polio strains whose capsid sequences are derived from WPV or Sabin/OPV strains
- Infected animals or samples from such animals, including human poliovirus receptor transgenic mice

Wild Poliovirus (WPV)/Vaccine-derived Poliovirus (VDPV)

- Naturally occurring isolates known or believed to have circulated persistently in the community
- Vaccine-derived polioviruses (VDPVs)
- Attenuated strains not licensed for use as live vaccines (Cox/Lederle and Koprowski/Wistar series)

Infectious materials:

- Clinical materials from confirmed poliovirus (including VDPV) infections

- Environmental sewage or water samples that have tested positive for wild poliovirus
- Cell culture isolates and reference strains of wild poliovirus
- Seed stocks and infectious materials from Inactivated Poliovirus Vaccine (IPV) production
- Infected animals or samples from such animals, including human polio receptor transgenic mice
- Viruses or derivatives produced in the laboratory that have capsid sequences from wild polioviruses, unless demonstrably proven to be safer than Sabin strains
- Viruses that include capsid sequences derived from wild poliovirus, unless viruses derived from them are demonstrably of viruses proven to be safer than Sabin strains as assessed by WHO, but that include wild poliovirus capsid sequences
- Full-length RNA or cDNA that includes capsid sequences derived from wild poliovirus, unless viruses derived from them are demonstrably proven to be safer than Sabin strains
- Cells persistently infected with poliovirus strains whose capsid sequences are derived from wild poliovirus

Potentially Infectious Materials (PIM):

- Respiratory secretion, fecal, or untreated environmental surface water samples (e.g., concentrated sewage, wastewater, etc.) and their derivatives (e.g., stool suspensions, extracted nucleic acids, etc.) collected for any purpose*
- Products of such materials from poliovirus permissive cells or animals
- Uncharacterized enterovirus-like cell culture isolates*
- Respiratory and enteric virus stocks handled under conditions where poliovirus contamination or replication is possible

Sabin/Oral Poliovirus Vaccine (OPV)

- Attenuated poliovirus strains approved for use in oral polio vaccines (OPV), principally Sabin strains
    - Trivalent OPV (tOPV) containing all three serotypes of Sabin strains (1, 2, 3)
    - Bivalent OPV (bOPV) containing Sabin strains 1 and 3
    - Monovalent OPV (mOPV) contains only one serotype of Sabin strain

Infectious Materials:

- Cell culture isolates and reference Sabin/OPV strains
- Seed stocks and live virus materials from OPV production
- Environmental sewage or water samples that have tested positive for the presence of Sabin/OPV strains
- Fecal or respiratory secretion samples from recent OPV recipients
- Infected animals or samples from such animals, including poliovirus receptor transgenic mice
- Derivatives produced in the laboratory that have capsid sequences from Sabin/OPV strains
- Full-length RNA or cDNA that includes capsid sequences derived from Sabin/OPV
- Sabin/OPV strains of viruses proven to be safer than Sabin strains, but that include Sabin/OPV poliovirus capsid sequences
- Cells persistently infected with polio strains whose capsid sequences are derived from Sabin/OPV strains

Potentially Infectious Materials (PIM):

- Respiratory secretion, fecal, or untreated environmental surface water samples (e.g., concentrated sewage, wastewater, etc.) and their derivatives (e.g., stool suspensions, extracted nucleic acids, etc.) collected for any purpose*
- Products of such materials from poliovirus permissive cells or animals
- Respiratory and enteric virus stocks handled under conditions where Sabin/OPV strain contamination or replication is possible

***These items may be PIM based on when they were collected and from where they were collected geographically based on the circulation of WPV/VDPV and OPV use. VU Biosafety will assist in final determination.**