VEHS Biological & Animal Care Safety:
How can we help you?

https://www.vumc.org/safety/bio
VEHS is a VUMC department that serves both VUMC & VU through a service level agreement.

**BACS DUTIES:**
- Administrative support for all aspects of VU & MC institutional biosafety committees (IBC);
- Lab activity surveillance and risk assessments to support IBC & Biosafety Program mission;
- Biosafety Program development...training (lots!), guidance & policy documents;
- Safety “management” of research-related hazards used on animal protocols.

Chemical/Lab Safety Section contacts
- Kevin Warren & Mark Bogard

Radiation Safety Section contact
- Christopher Helstern

BACS contacts
- Robin Trundy & Julianne Baron
What is biosafety?

Biosafety is the application of
– knowledge,
– techniques and
– equipment,
to prevent
– personnel,
– laboratory and
– environmental exposure to potentially infectious agents and other biohazards.

Biosafety = Biocontainment = “Keeping the bug in the jar!”
How does the “bug” get out? (How does contamination spread?)

*Aerosols* are the main culprit!

The introduction of energy into viable biological materials disperses it to surrounding surfaces.
Biohazard Categories

These can be an exposure risk to workers and the environment:

1. Recombinant or synthetic nucleic acid molecules
2. Agents infectious to humans, animals or plants
3. Human-derived materials
4. Nonhuman primate-derived materials
5. Biological toxins
Recombinant DNA (RDNA): defined in non-techno terms...

RDNA includes any animals, plants, or microorganisms that:
- have been genetically altered, and
- that alteration involves introduction of foreign DNA (including synthetically-developed) that will be expressed

Common examples:
- “Roundup-ready” crops
- Transgenic lab animals
- Gene therapies

Frog expressing green fluorescence protein in muscle cells. - Jonathan Slack, U of Minnesota
## Risk Groups for Agents Infectious to Humans

<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Agent Description</th>
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<tbody>
<tr>
<td>1</td>
<td>NOT associated with disease in healthy human adults</td>
</tr>
<tr>
<td>2</td>
<td>Associated with human disease; rarely serious; preventive or therapeutic interventions often available.</td>
</tr>
<tr>
<td>3</td>
<td>Associated with serious or lethal human disease; medical interventions may be available; high individual risk but low community risk.</td>
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<tr>
<td>4</td>
<td>Likely to cause serious or lethal human disease; medical interventions not usually available; high individual AND high community risk.</td>
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Generally speaking, the Risk Group of the agent will correspond with the Biosafety Level (BSL) that will apply to the work.
Higher BSL = Increased Risk & Complexity

BSL-1: Non-airborne containment (mainly environmental protection)

BSL-2: Non-airborne containment (including enhanced personnel safety)

BSL-3: Airborne/elevated aerosol containment (including negative-pressure facilities & personnel safety enhancements)

BSL-4: Maximum containment (highly specialized facilities, equipment & training)

Highest Risk

Lowest Risk
IBC Best Practices Policies Relevant for Cores

Best Practices for Use of Human-derived Materials and Bloodborne Pathogens in Basic Research Applications

- Outlines specific lab practices for reducing exposure risk associated with human clinical materials, tissues, cells and bloodborne pathogens.

Best Practices for Use of Macaque-derived Materials in Basic Research Applications

- Outlines expectations for labs receiving and submitting macaque materials including enrollment in the herpes B awareness program with Occupational Health
Herpes B virus & Macaques

- In these monkeys, the disease is generally undetectable or minimal.
  - Sometimes, oral and/or genital lesions are seen.
- All macaques, their tissues & fluids should be considered a Herpes B exposure risk.
- Herpes B infections in humans have a 70% mortality rate.
Operational questions for determining how much Biosafety your core needs...

If you do not:

• receive or handle of viable clinical/biological materials; or

• have equipment that “customers” can use that will introduce viable clinical/biological materials into the environment.

Minimal Biosafety considerations!
Operational questions for determining how much Biosafety your core needs...

Receipt of materials

• Internal or external customer?
• Species (or population) of significance?
• Tissue of significance?
• RDNA-modified?
Operational questions for determining how much Biosafety your core needs...

Services provided

• Does your core generate RDNA? (If yes, IBC registration is needed.)

• Does your core ship viable clinical/biological materials? (If yes, bioshipping training may be needed.)

• Does your core allow customers to bring RDNA or RG2 materials into the lab space? (If yes, containment/decontamination procedures should be in place.)
Why is IBC registration needed?

- To satisfy NIH and other funding agency requirements;
- To ensure that lab activities are performed in accordance with applicable biosafety standards;
- To support safe conduct of research by all research personnel including students in training.
How do you register with the IBC?

• Request registration materials from VEHS BACS.
• Submit a draft registration to BACS by the first Monday of the month to be considered for that month’s agenda.
• Each entity’s IBC meets the 4th Tuesday of the month; the IBC of the PI’s “home” department will review the submission for approval.

More information about the IBC process can be found at the following location.
Who serves on the IBC?

<table>
<thead>
<tr>
<th>VU Faculty/Research Members</th>
<th>MC Faculty Members</th>
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<tbody>
<tr>
<td>Julian Hillyer- Chair</td>
<td>Mark McClain- Chair</td>
</tr>
<tr>
<td>Jamey Young</td>
<td>Mark Boothby</td>
</tr>
<tr>
<td>Barbara Fingleton</td>
<td>Holly Algood</td>
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<tr>
<td>Lisa McCawley</td>
<td>Dawn Newcomb</td>
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<td>Anthony Tharp</td>
<td>Dan Perrien</td>
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<td>Tom Voss</td>
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<td>Cara Sutcliffe/Kevin Weller</td>
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Both committees also have these voting members:
- 2 community representatives
- Biosafety Officer
- Veterinarian
- Occupational Health Professional
Biosafety Resources

- Lab Equipment Release Form
- Biosafety Cabinet Move/Maintenance Guide
- Biological Spill & Exposure Response Guide
- Biosafety Training Guide
- Biosafety Orientation Training Checklist

What questions do you have today?