Background information

Biosafety Level 3 is applicable to clinical, diagnostic, teaching, research, or production facilities where work is performed with indigenous or exotic agents that may cause serious or potentially lethal disease through the inhalation route of exposure. Laboratory personnel must receive specific training in handling pathogenic and potentially lethal agents, and must be supervised by scientists competent in handling infectious agents and associated procedures. A BSL-3 laboratory has special engineering and design features.

The minimum requirements to participate in a BSL3 training certification program are:

- Bachelor’s degree
- Two years of experience working at BSL2 within the last 5 years
- Nomination by Principal Investigator

Personnel must complete the training plans outlined below to be authorized to work in BSL3 laboratories at ASU. All personnel working in BSL3 laboratories must adhere to the BSL3 Facility Standard Operating Procedures (SOPs) which may include following federal regulations for CDC Select Agents and Toxins if these agents are in use in the same facility. Working with animals or arthropods at animal biosafety level III (ABSL-3) or arthropod biosafety level III (ACL-3) requires additional training and is agent specific as outlined below. Working with CDC Select Agents and Toxins requires additional requirements as outlined in this policy.

Training plans for individuals with 1 year or more of BSL3 experience

Individuals who have 1 year or more of experience working in BSL3 will need to complete steps 1-2 and 6-8 listed below to be certified to work at the ASU BSL3 facilities.

Training plans for individuals with <1 year of BSL3 experience

Individuals who have <1 year of experience working in BSL3 laboratories may obtain specialized training to become certified to work in the BSL3 laboratories at ASU. Depending on their previous experience, personnel may follow the Tier 1 or Tier 2 training programs.
Tier 1 BSL3 Training Requirements

Tier 1 requirements apply to personnel with <1 year of experience working in BSL3, but 1 year or more of BSL2+ experience.

1. **Medical Surveillance Requirements:**
   a. Complete agent-specific medical surveillance requirements, e.g., fit test questionnaire, serum banking, recommended vaccinations/declinations.

2. **Respiratory Protection Training.**
   a. Hands-on respirator training.
   b. Respirator use SOP.

3. **Practice BSL3 procedures in BSL2 lab.**
   - **Option 1: Supervised training.**
     - 10 directly supervised hours practicing BSL3 procedures in a BSL2 lab. Personnel will follow BSL3 practices and procedures but work with a BSL2 agent. Training verification will be completed using the attached checklist. Trainee must demonstrate proficiency and competence in all areas on the BSL3 Training Certification Checklist.
     - Qualifications for supervisors:
       - Minimum of 5 years of BSL3 experience.
       - Experienced working with the specific agent that they will be working with in BSL3 or closely related agent.
       - Approved to work with the agent independently.
       - Must be full time faculty, researchers, or senior staff.
       - Trainers must submit a request to the IBC at IBC@asu.edu to be approved as trainers. The training request must include a section on training qualifications. IBC approval may be granted through the IBC designated review process.
   - **Option 2: Complete BSL3 training at certified outside BSL3 training facility or participate in training by certified BSL3 contractors at ASU.**
     - Receive certification/completion of training certificate from certified BSL3 training facility or certified BSL3 contractors.
     - PI would fund the training.

4. **Microbiological techniques evaluation at the BSL2 level.**
   - Trainees will be evaluated by an approved trainer for proficiency with microbiological techniques and procedures at BSL2.
   - Three evaluators will conduct the evaluation. Evaluators may be ASU internal or external persons, and minimally include a representative from the ASU Biosafety staff.
   - Evaluation will be performed to identify competence in the areas described in the enclosed BSL2 Microbiological Techniques Evaluation Worksheet.
• Once the evaluators determine that the Trainee has successfully completed the evaluation, the Trainee may be added to an IBC disclosure via modification approved by the IBC.

5. **Mentoring Period:** After completing steps 1-4, personnel must be mentored and directly supervised at all times by an IBC approved mentor until they are proficient in all BSL3 practices and procedures. The mentoring period will vary for each trainee and will be determined by the mentor. Training verification will be documented using the attached checklists. Trainee must demonstrate proficiency and competence in all areas on the BSL3 Training Certification Checklist.
   • After the mentoring period ends, the mentor will complete the first column in the attached training verification checklists and the mentor/training certification section to certify the trainee has demonstrated competency in each of the areas specified in the training checklist. The mentor will submit the completed checklist to the Laboratory Supervisor or Facility Manager.

6. **Facility Training with BSL3 Facility Manager**
   • Personnel will complete the annual CDC select agent BSL3/ABSL3 training.
   • Personnel will complete the facility tour/training including donning/doffing areas, emergency showers, autoclaves, emergency equipment.

7. **BSL3 SOP Training**.
   • Personnel will complete shared agent-specific BSL3 SOP training to ensure all lab personnel working within a shared space are following the same procedures as outlined in the SOPs.
   • The SOP training will include a reporting mechanism for personnel to report incidents, accidents, near misses or concerns to Facility Manager, Dr. Karen Kibler ([Karen.Kibler@asu.edu](mailto:Karen.Kibler@asu.edu)); IBC ([IBC@asu.edu](mailto:IBC@asu.edu)) or Biosafety Officer ([Irene.Mendoza@asu.edu](mailto:Irene.Mendoza@asu.edu)).
   • After personnel complete the facility and BSL3 SOP training, the Facility Manager or Lab Supervisor will complete the second column in the attached training verification checklists and the Lab Supervisor/Facility Supervisor certification section to certify the trainee has demonstrated competency in each of the areas specified in the training checklist. The Lab Supervisor/Facility Supervisor will submit the completed checklist to the IBC for final authorization.

8. **BSL3 Independent Access**
   • The Facility Manager or Lab Supervisor will submit the completed training checklists to the IBC and notify the PI.
   • The PI will submit an IBC modification to request independent access for each trainee that has completed the mentoring period and required trainings.
• The IBC will review the training checklists and authorize trainees to have independent access. The IBC will notify the PI and Biosafety Officer when final authorization is issued.
• The biosafety officer will coordinate with the IT team to issue a PATH card and PIN # for each individual for independent access.

**Tier 2 BSL3 Training Requirements**

Tier 2 requirements apply to personnel who have **no previous experience working in BSL3 or BSL2+ laboratories**, **<1 year of experience working in BSL2+ but have 2 years or more of BSL2 experience within the last 5 years.**

1. **Medical Surveillance Requirements:**
   a. Complete agent-specific medical surveillance requirements, e.g., fit test questionnaire, serum banking, recommended vaccinations/declinations.

2. **Respiratory Protection Training.**
   a. Hands-on respirator training.
   b. Respirator use SOP.

3. **Practice BSL3 procedures in BSL2 lab.**
   - **Option 1: Supervised training.**
     - 80 directly supervised hours practicing BSL3 procedures in a BSL2 lab. Personnel will follow BSL3 practices and procedures but work with a BSL2 agent. Training verification will be completed using the attached checklist. Trainee must demonstrate proficiency and competence in all areas on the BSL3 Training Certification Checklist.
   - Qualifications for supervisors:
     - Minimum of 5 years of BSL3 experience.
     - Experienced working with the specific agent that they will be working with in BSL3 or closely related agent.
     - Approved to work with the agent independently.
     - Must be full time faculty, researchers, or senior staff.
     - Trainers must submit a request to the IBC at IBC@asu.edu to be approved as trainers. The training request must include a section on training qualifications. IBC approval may be granted through the IBC designated review process.

   - **Option 2: Complete BSL3 training at certified outside BSL3 training facility; or participate in training by certified BSL3 contractors at ASU.**
     - Receive certification/completion of training certificate from certified BSL3 training facility or certified BSL3 contractors.
       - PI would fund the training.
       - Qualifications for supervisors:
         - Minimum of 5 years of BSL3 experience
- Experienced working with the specific agent that they will be working with in BSL3 or closely related agent.
- Approved to work with the agent independently.
- Must be full time faculty, researchers, or senior staff.
- Trainers must submit a request to the IBC at IBC@asu.edu to be approved as trainers. The training request must include a section on training qualifications. IBC approval may be granted through the IBC designated review process.

4. **Microbiological techniques evaluation at the BSL2 level.**
   - Trainees will be evaluated by an approved trainer for proficiency with microbiological techniques and procedures at BSL2.
   - Three evaluators will conduct the evaluation. Evaluators may be ASU internal or external persons, and minimally include a representative from the ASU Biosafety staff.
   - Evaluation will be performed to identify competence in the areas described in the enclosed BSL2 Microbiological Techniques Evaluation Worksheet.
   - Once the evaluators determine that the Trainee has successfully completed the evaluation, the Trainee may be added to an IBC disclosure via modification approved by the IBC.

5. **Mentoring Period:** After completing steps 1-4, personnel must be mentored and directly supervised at all times by an IBC approved mentor until they are proficient in all BSL3 practices and procedures. The mentoring period will vary for each trainee and will be determined by the mentor. Training verification will be documented using the attached checklists. Trainee must demonstrate competence in all areas on the BSL3 Training Certification Checklist.
   - After the mentoring period ends, the mentor will complete the first column in the attached training verification checklists and the mentor/training certification section to certify the trainee has demonstrated competency in each of the areas specified in the training checklist. The mentor will submit the completed checklist to the laboratory supervisor or Facility Manager.

6. **Facility Training with BSL3 Facility Manager**
   - Personnel will complete the annual CDC select agent BSL3/ABSL3 training.
   - Personnel will complete the facility tour/training including donning/doffing areas, emergency showers, autoclaves, emergency equipment.

7. **BSL3 SOP Training.**
   - Shared agent-specific BSL3 SOP training to ensure all lab personnel working within a shared space are following the same procedures as outlined in the SOPs.
• The SOP training will include a reporting mechanism for personnel to report incidents, accidents, near misses or concerns to Facility Manager, Dr. Karen Kibler (Karen.Kibler@asu.edu); IBC (IBC@asu.edu;) or Biosafety Officer (Irene.Mendoza@asu.edu.)
• After personnel complete the facility and BSL3 SOP training, the Facility Manager or Lab Supervisor will complete the second column in the attached training verification checklists and the Facility Manager/Lab Supervisor certification section to certify the trainee has demonstrated competency in each of the areas specified in the training checklist. The Facility Manager/Lab Supervisor will submit the completed checklist to the IBC for final authorization.

8. **BSL3 Independent Access**

• The Facility Manager or Lab Supervisor will submit the completed training checklists to the IBC and notify the PI.
• The PI will submit an IBC modification to request independent access for each trainee that has completed the mentoring period and required trainings.
• The IBC will review the training checklists and authorize trainees to have independent access. The IBC will notify the PI and Biosafety Officer when final authorization is issued.
• The Biosafety Officer will coordinate with the IT team to issue a PATH card and PIN # for each individual for independent access.

**Mentorship period:** Mentorship periods will vary in length for each trainee and may last up to 12 months. After 12 months, if independent access is not granted, trainees may continue to work under supervision in BSL3 laboratories. Trainees may also work at BSL2 for an additional year and then request to receive additional training to be granted independent access for the BSL3 laboratories. Mentors will consult with the PIs to determine the best solution in a case-by-case basis.

**Animal Biosafety Level III (ABSL3) and Arthropod biosafety level III (ACL-3) Policies**

**Policy for animal and arthropod work with BSL3 agents (**non-select agents**)

*Non-select agents other than any that are specifically identified in this policy.*

For those who are interested in doing animal or arthropod research with BSL3 agents (non-select agents) the following steps will be required:

• Authorization to work independently with the BSL3 agent in the ABSL3 or ACL3.
• Certification (at ABSL2/ACL2) of Level 3 Training for all procedures that will be done at ABSL3/ACL3;
• Fourteen days of mentoring during the first experiment at ABSL3/ACL3. All mentoring will be done by the ABSL3 Facility Manager, ABSL3 Laboratory Supervisor or Principal Investigator or ACL3 Facility Manager, ACL3 Laboratory Supervisor or Principal
Investigator. **Laboratory Supervisors for the ABSL3 and ACL3 must be BSL3-approved for the specific agent.**

**Policy for work with CDC Select Agents or Toxins**

For those who are interested in doing work with CDC Select Agents and Toxins including animal or arthropod research with CDC Select Agents or Toxins, the following steps will be required:

- Principal Investigator specific requirements and approval to work with CDC Select Agents and Toxins.
- Federal Bureau of Investigation (FBI) background check/Criminal Justice Information Service-Bioterrorism Risk Assessment Group (BRAG) approval and CDC Federal Select Agent and Toxin approval.
- ASU CDC Select Agent and Toxin Training (annual requirement)
- Authorization to work independently with the select agent in the BSL3, ABSL3 or ACL3.
- For animal and arthropod work: certification (at ABSL2/ACL2) of Level 3 training for all procedures that will be done at ABSL3/ACL3;
- For animal and arthropod work: Fourteen days of mentoring during the first experiment at ABSL3/ACL3. All mentoring will be done by the ABSL3 Facility Manager, ABSL3 Laboratory Supervisor or Principal Investigator or ACL3 Facility Manager, ACL3 Laboratory Supervisor or Principal Investigator. **Laboratory Supervisors for the ABSL3 and ACL3 must be BSL3-approved for the specific agent.**

**Policy for SARS-CoV-2 Animal Work**

For those who are interested in doing animal research with SARS-CoV-2 and its mouse-adapted derivatives, the following steps will be required:

- Authorization to work independently with SARS-CoV-2 in the BSL3;
- Certification (at ABSL2) of Level 3 Training for all procedures that will be done at ABSL3;
- Fourteen days of mentoring during the first experiment at ABSL3. All mentoring will be done by the ABSL3 Facility Manager or the SARS-CoV-2 Laboratory Supervisor.
BSL3 Microbiological Techniques Evaluation Worksheet

1. Set up the BSC with the following supplies in a manner that will minimize entry/exit into the BSC during work and not disrupt airflow. **Supplies:** Pipetter, micropipetter, 50 mL tube with media, 15 mL conical tube, tube racks, microcentrifuge tube with “virus solution”, micropipette tip box, plate, waste container, secondary container.

   ☐ Setup of BSC

   ☐ Describe three things that will disrupt airflow in the BSC.

   **Evaluator's comments:**

2. Conduct the following steps:

   ☐ Pipet 10 mls of media from the 50 mL tube into the 15 ml conical tube.

   ☐ Pipet 200 µL of “virus” from the microcentrifuge tube into the 15 ml conical tube.

   ☐ Transfer 1 ml from the 15 ml conical tube to each in the plate.

   ☐ Transport the infected plate from the BSC to the incubator and back.

   ☐ Dispose/describe of waste generated in the BSC and clean up the BSC.

   **Evaluator's comments:**
BSL3 Training Certification Checklist

Name of trainee: ____________________________________
Principal Investigator: ________________________________
List organisms worked with: __________________________
List protocols performed: _____________________________
Name of mentor/supervisor: ___________________________
Number of hands-on BSL3 training hours: ______________

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<thead>
<tr>
<th>Date</th>
<th>Mentor/Trainer Certification</th>
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<tbody>
<tr>
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<td>*Mentor/Trainer must complete this section to certify the trainee has demonstrated competency in each of the areas specified in the training checklist.</td>
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<tr>
<th>Laboratory Supervisor or Manager</th>
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<tr>
<td>* Laboratory supervisor or Facility Manager must complete this section to certify the trainee has demonstrated competency in each of the areas specified in the training checklist.</td>
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<tr>
<th>IBC Approval IBC Chair or IBC Alternate Chair Certification</th>
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<tr>
<td>IBC Chair/Alternate Chair authorizes trainees to work in BSL3 and receive independent access after all requirements have been met.</td>
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<tr>
<th>BSL3 entry</th>
<th>Date</th>
<th>Mentor/Trainer Certification</th>
<th>Laboratory Supervisor or Manager</th>
<th>IBC Approval IBC Chair or IBC Alternate Chair Certification</th>
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<tbody>
<tr>
<td>Path card and pin access</td>
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<td>Anteroom procedures</td>
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<tr>
<td>PPE donning- training</td>
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<td>PPE donning- verification of procedures</td>
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<td>Transfer of items into BSL3</td>
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<tr>
<td>Activity</td>
<td>Description</td>
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<td>Respiratory protection donning (e.g, Powered Air Purifying Respirator (PAPR) use; N95 respirator use) training</td>
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<td><strong>BSL3 Exit</strong></td>
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<tr>
<td>Exiting the room</td>
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<td>PPE doffing- training</td>
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<td>PPE doffing- verification</td>
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<td>Respiratory Protection cleaning and storage- (e.g., PAPR cleaning and storage) training</td>
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<tr>
<td><strong>BSL3 working practices</strong></td>
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<td>Transfer of agents from the freezer</td>
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<tr>
<td>Setting up BSC</td>
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<tr>
<td>Working in BSC</td>
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<td>Glove changes when working in BSC</td>
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<tr>
<td>Transfer of plates out of BSC to incubator</td>
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<tr>
<td>Taking plates in secondary containment from the incubator to the BSC to do manual rocking (agent specific)</td>
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<tr>
<td>Rocking cells in a mechanical rocker at room temperature/keeping dishes contained (agent specific)</td>
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<td>Viewing of plates in microscope</td>
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<tr>
<td>Bleaching ice after using it to process tubes that could have virus on the surfaces</td>
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### Trash in BSC

### Trash outside of BSC

### Centrifuge operation with sealed cups, transfer to BSC and cleaning

### Data transfer to main lab (paper records etc.)

### Inventory management (lab specific, group inventory)

### Cleaning of BSC after work completed; items to be decontaminated before leaving the BSC, trash generated in BSC

### Autoclaving of waste; or inactivation of waste as appropriate

#### Emergencies

### Small spill in BSC

### Large spill in BSC

### Spill outside of BSC

### Spill outside of room

### Centrifuge spill

### Phone system

### Alarm triggered

#### Exposures

### Medical emergency with/without contamination

### Freezer failure

### Location of emergency equipment and emergency exit button

### Security breach
Training Certification

___________________ (Name) has successfully demonstrated proficiency in the BSL3 practices and procedures listed in the ASU BSL3 Training Certification Checklist and is authorized to work in the BSL3 laboratories and receive independent access to work in the _________ (list facility BSL3, ABSL3, ACL3) facility.

Mentor/Supervisor (Name, please print):_____________________________________

Signature:_____________________________________________________________

Date:_________________________________________________________________

Lab Supervisor/Facility Manager (Name, please print):________________________

Signature:_____________________________________________________________

Date:_________________________________________________________________

IBC Chair/Alternate Chair: (Name, please print):_____________________________

Signature:_____________________________________________________________

Date:_________________________________________________________________