



ASM Guidelines for Biosafety in Teaching Laboratories

Biosafety considerations regarding at-home or DIY microbiology kits

The safety of our students is of paramount concern. ASM published Biosafety Guidelines for Teaching Laboratories in an effort to help instructors recognize the risk of Laboratory Acquired Infections (LAI) and provide tools to help build a Culture of Safety in our microbiology labs. Due to the COVID-19 pandemic and the resulting move to online education, many instructors are considering at home laboratories. After having considered current at-home and DIY microbiology kits, the Instructional Biosafety Group has come up with the following recommendations when considering using such kits.

1. BSL designations are based on an overall analysis of risk involving facility design features, equipment, institutional operational procedures, and good microbiological practice. Institutional oversight and risk analysis of the procedures and environment are needed to determine the BSL level. With no institutional oversight or risk assessment, BSL is not an appropriate classification scheme to use in assessing a person's home.
2. Risk Group 1 (RG1) organisms are generally considered safe, but these still pose a risk if mishandled or propagated. For example, a 10^7 culture of *Escherichia coli* (RG1) is above the infectious dose of the organism.
 - a. We must emphasize that Risk Group is not the same as Biosafety Level; they are not equal terms and cannot be used interchangeably.
 - b. Do not assume an RG1 organism is safe in all conditions, for all people, and with all procedures.
 - c. Any culturing of microbes from the environment (student's body, home surfaces, soil, etc.) should be done on plates that are sealed after sampling. The identity and Risk Group of these microbes are unknown, so colonies should only be observed and never handled further (staining, streaking, etc).
3. The companies that manufacture at-home microbiology kits have liability coverage.
 - a. Make sure you check with your institutional Legal Affairs department to see if the company's liability insurance is sufficient.
 1. Check with your institution before making and sending out kits you make as your institution may not have liability coverage to protect the institution in case of a LAI or accident due to the kit.
 - b. Any procedure that deviates from the standard kit procedure will likely negate the company's liability coverage.
 - c. Be aware that some procedures used by commercial kits do not align with the published ASM Biosafety Guidelines for Teaching Laboratories.
4. Students have a right to know of any potential risk involved with the use of commercial kits, so it is advisable to make sure that students know there is inherent risk in working with microorganisms.



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- a. It is equally important that students understand that this risk increases if they or any of their family members are immunocompromised.
 - b. Any kit you use should include a safety statement that the students must acknowledge.
 - c. At times it may be necessary to include additional safety guidelines if the company you are using does not cover them all, such as emphasizing the use of appropriate personal protective equipment (PPE) and decontamination procedures.
5. While all microbiological work poses potential problems, in an institutional setting, there is direct instructional oversight during the lab. This includes observing the students to ensure they are practicing good microbiological practices, the most basic practice in biosafety.
- a. Without direct oversight and mentoring, there is a question as to whether students gain sufficient mastery over skills to be career ready and career competitive.
 - b. Working physically provides better skills training than virtual, but not as good as direct mentorship.
 - c. We all understand that these are very unique times, however it is our job as professors to continue to protect students even out of the laboratory setting. Requiring and assuming that students are trained enough to practice proper biosafety in the comfort of their home is a concern.
6. **Therefore, the use of at-home kits is an ethical question, which you, your colleagues, and institution must resolve: do the benefits of an at-home or DIY microbiology kit outweigh the potential risks?**

Authors of the 2019 ASM Guidelines for Biosafety in Teaching Laboratories Version 2.0:
<https://www.asm.org/Guideline/ASM-Guidelines-for-Biosafety-in-Teaching-Laborator>

Jeffrey Byrd
St. Mary's College of Maryland

Elizabeth Emmert
Salisbury University

Robert Maxwell
Georgia State University

Heather Townsend
Community College of Rhode Island