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Communicating Discovery-Based Research Results to the News: A Real-World Lesson in Science Communication for Undergraduate Students

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Communicating science effectively to the general public is a necessary skill that takes practice. Generally, undergraduate science majors are taught to communicate to other scientists but are not given formal training on how to communicate with a nonscientist. An opportunity to appear on a news segment can be used as a real-world lesson on science communication for your students. This article will describe how to contact a producer to get your class on a news segment, ideas for types of research that may be of interest to the media, and how to practice communicating the results effectively.

INTRODUCTION

Most scientists agree that communication with the media is important, and they consider it to be a professional duty (1–3). However, articulating science to a layperson can be difficult for scientists who are accustomed to a highly technical communication style geared toward other scientists. To prepare future scientists to communicate effectively to the general public, undergraduate students should be assigned communication exercises in their basic science laboratory courses and be given a real audience for practice (4). An opportunity to appear on a news segment can be used as a real-world lesson on science communication for your students. This article will describe how to contact a producer to get your class on a news segment, ideas for types of research that may be of interest to the media, and how to practice communicating the results effectively.

PROCEDURE

The first step of this activity requires a request to appear on a news segment. Start by contacting a representative from the college's public affairs office and expressing your interests. If they are contacted by the media, they can direct them to you. Ask them for the contact information of producers who have interviewed other professors at your college. Many networks solicit tips for stories through their website or social media. Alternatively, research different news segments that have featured science topics and find out who the producer was so that you can contact him or her directly.

If your laboratory course uses a discovery-based research approach, you may already be conducting research that could be of interest to the media. If not, consider developing a course-based undergraduate research experience as described by Cooper *et al.* (5). We were approached by the media to identify bacteria collected from everyday items found in hotel rooms, gas stations, restaurants, and around the home. The items were swabbed, streaked onto nutrient agar, and incubated overnight at 37°C. Selective and differential media were used for identification of the isolates. Eosin methylene blue agar, mannitol salt agar and Hektoen enteric agar were used for the detection of fecal coliforms (*E. coli*), *Staphylococcus aureus,* and *Salmonella* and *Shigella,* respectively (6). The isolates that displayed negative results were identified via colony PCR of the 16S rDNA using universal primers and sequencing (7).

Communicating the results to the media

Once the results are collected, it is very helpful to generate simple and clear summary points for the producer as described in the Scientist's Guide to Talking with the Media Desk Reference (8). The class results should be compiled into an easy-to-read table or graphic. Prior to filming, discuss the results during class and determine the main points that should be conveyed to the media, keeping in mind that the audience is made up of nonscientists. Students sometimes forget the amount of jargon used in the classroom or laboratory that might be confusing for those without a science background. To learn how to identify and reduce jargon, students should use resources such as https://readable.io/, Rakedzon *et al.* (9), and Sommerville and Hassol (10). For our

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project, students needed to be able to convey the purpose of nutrient agar, why plates were incubated at 37°C, the definition of a colony, and the interpretation of various colony morphologies in layman's terms. Each student group should be assigned a section of the results to report on camera. Once the students have reviewed tips for communicating with the media (https://www.aaas.org/page/tips-scientists-communicating-press; https://www.elsevier.com/connect/top-tips-from-science-writers-before-you-speak-to-the-media; https://www.coursera.org/learn/sciwrite/lecture/Nhtaz/8-1-talking-with-the-media; www.sciencemediacentre.org/publications/publications-for-scientists/), they should be encouraged to practice their delivery with friends in other disciplines or with family members who don't have a science background prior to practicing with the instructor.

On the day of filming, students will be required to sign a release form to appear on camera. A designated area should be identified for students who do not wish to be on camera. A good strategy for teaching students how to communicate science effectively is to lead by example. As the main commentator on the segment, you should be sure to explain the project using layman's terms. In our case, the important points that we stressed to the media were: 1) bacteria are commonly found everywhere; 2) we have bacteria in and on our bodies (normal flora) that are not harmful; 3) the benefits of encountering bacteria daily for our immune systems; and, 4) the importance of handwashing to prevent the spread of disease. Once the news segment has aired, watch it during class and discuss how communication could be improved. If an appearance on a news segment is not possible, an alternative approach would be to have the students work in groups to give an oral presentation to the class in the style of a news segment or invite the campus newspaper to send a reporter to interview the students about their work. Brownell *et al.* provide additional tips for training students to communicate their science effectively (4).

Safety issues

For the safe handling of unknown microorganisms, the ASM Biosafety Guidelines for Teaching Laboratories should be followed. Students must show competency in handling BSL1 organisms prior to starting this project. A BSL2 laboratory is needed to further isolate and grow the organisms for identification.

The university will verify that the network has the proper insurance to cover accidental injuries that may occur while filming on campus. For the safety of the news crew, they should be informed of the proper attire (i.e., long pants and closed-toed shoes) prior to coming to film in the lab. Floors should be devoid of tripping hazards and students should remain in their seats to give the camera operator ample space to walk around.

Plates with the environmental samples should remain sealed while the news crew is present and only handled by persons wearing gloves.

CONCLUSION

Based on anecdotal evidence, the students enjoyed being a part of the news segments and it motivated them to take greater care in following the protocols to obtain accurate results. Although there was no formal evaluation done for this exercise, those interested in assessment should refer to Spicer (11). When the news reporter asked one of the students whether the public should be concerned with the findings, she responded that the goal was not to turn viewers into germophobes, but instead to make them "germ-aware." This statement was evidence that the student had learned the importance of communicating the science responsibly.

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