



The Use of Popular Fiction to Present a Professional Scientific Career to High School Students†

Caylib Durand¹ and Santiago Ramón-García^{2*}

¹Life Sciences Institute Graduate Student Association (LSI-GSA). ²University of British Columbia Post-Doctoral Association (UBC-PDA). Department of Microbiology and Immunology, University of British Columbia Life Sciences Institute, Vancouver, BC V6T 1Z3

INTRODUCTION

Students finishing high school have a daunting task of deciding on a successful and rewarding career. An absence of information and experience, exposure to multiple career possibilities, lack of mentoring, and the social pressures to choose a respectable career complicate the decision process. In a previous Tips & Tools article, Patricia J. Baynham advocated for the introduction of science to students by hosting scientists in classrooms (1). We approached the issue from a different perspective. Since the ability of scientists to demonstrate science could be hampered with limited time and classroom resources, we proposed to introduce students to a professional and active scientific environment for a one-day outreach program. Our goal was to give students hands-on training, mentorship, career information, and an opportunity to ask questions to facilitate a possible career choice in research.

Briefly, the “CSI at the LSI” outreach program (LSI, Life Sciences Institute), based on the popular fiction “Crime Scene Investigation” (CSI) TV show, was a murder mystery involving a plot with real characters (grad students, postdocs, and professors) to generate a fun and interactive learning environment. The students carried out experiments using modern scientific techniques to collect “evidence.” At the end of the day, they share the results to identify the suspect. Most of the activities were designed with basic scientific resources so that they are suitable to be performed in other research institutes or universities.

PROCEDURE

The educational student manual given to the teachers, students, and volunteers is included as supplementary information.

Prior to the event, a call for applications from high school teachers was made through the local school board. Applications were evaluated based on merit, and a class of thirty students was selected. On the day of the event, students were introduced

to the safety procedures for the institute, and given a schedule of the day. After this, the storyline and suspects were presented in an entertaining fashion. To promote interactions among the students, they were encouraged to introduce themselves to the group. In addition, folders of four different colors were randomly distributed. Those students with the same color folder were grouped together.

The schedule was divided in two main blocks. For the first two-hour block, each group of students attended only one of the four hands-on workshops. The hands-on workshops covered: (i) DNA analysis techniques, (ii) protein analysis techniques, (iii) classic microbiology procedures, and (iv) fluorescence imaging techniques. Two graduate students or postdocs were in charge of every module to allow a ratio of three to four students per instructor. For the second block, students were divided into two groups and given a tour of the electron microscopy and mass spectroscopy facilities. Here, the students were introduced to the equipment and to the potential uses of the technology.

After the completion of the two blocks, students were reassembled and one representative from each group was asked to present the techniques they had been taught. Each group had limited information on the “case.” By combining the “evidence” collected in every module, they could eliminate suspects to identify the “murderer.” For authenticity and entertainment, the real suspect was in the room at the time the students solved the case. To add to the drama, a security guard came into the room to arrest the suspect. Finally, at the end of the day, a brief anonymous questionnaire was distributed to students and teachers to provide feedback for subsequent years.

CONCLUSION

The general public is often curious to know how their tax dollars and donations support scientific research. However, research institutes around the country are often isolated from the community with little public access. Because of this, there is often a social disconnection between scientist and the general public. This creates a lack of appreciation for sustainable basic research that is needed to lay the foundation for new discoveries to benefit our society. As scientists we have a unique opportunity and obligation to promote, mentor and introduce science to future generations. In addition, outreach programs allow universities and research institutes to promote themselves and give back to the community through education.

*Corresponding author. Mailing address: Department of Microbiology and Immunology Life Sciences Center, University of British Columbia, 2350 Health Science Mall - Room 2502, Vancouver, BC V6T 1Z3 Canada. Phone: 822 8094. Fax: 822 6041. E-mail: ramon@interchange.ubc.ca.

† Supplemental material available at <http://jmbe.asm.org>

Although high schools play a fundamental role in educating students, they often lack facilities and highly trained scientific personnel. The outreach program that has taken place for the past three years in the LSI at the University of British Columbia allows some of these challenges to be addressed, and provides students with insight to the scientific process.

We took advantage of the extensive diversity of the LSI facilities and research groups to create hands-on workshops in the fields of molecular biology, microbiology, chemistry, and biochemistry. This all-day interactive outreach program allows student from grades 11 and 12 to observe and work in an active scientific environment. The activity provides students a chance to network with local researchers, grad students and postdocs, and to ask questions about different career paths in science. The modules are designed to introduce basic scientific techniques to the student in an entertaining and interactive way, allowing them to explore science while being mentored by senior graduate students and postdoctoral fellows. At the same time, the outreach program encourages students to have fun with an elaborate story line, real suspects, and social time. Finally, by asking the students to present their results as evidence to the entire group, this activity promotes communication and team-building skills.

In summary, the activities presented here could easily be implemented in any scientific institution. With the first block addressing basic scientific concepts any research center should be able to host the event. In addition, the modules can be adapted or changed to best fit the institution facilities. Our experiences organizing and hosting such an event were highly rewarding. Similarly, the students enjoyed their time in the lab and it gave them the opportunity to network with scientists.

SUPPLEMENTARY MATERIALS

Student Manual for the "CSI at the LSI" Outreach Program.

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REFERENCES

1. **Baynham, P. J.** 2010. Want to inspire science students to consider a research career? Host a scientist in your classroom. *J. Microbiol. Biol. Educ.* 11:62–63. DOI: 10.787/jmbe.v11.i2.147.