



Online Ethics Center
FOR ENGINEERING AND SCIENCE

Whose Lab Is It?

Year

1999

Description

This case discussed the ethical and moral issues intertwined in the relationship between students and their mentors.

Body

Syphilis, which is caused by the bacterium *Treponema pallidum*, occurs in 3.2 per 100,000 U.S. inhabitants. Biomedical research groups at a major health care center have determined that the cambin protein is essential for infectivity, the capacity of the bacterium to cause syphilis.

Scene 1 -- 9 a.m., Monday, Baker lab's weekly meeting

Professor Beverly Baker: Alex, how is the expression and purification of the cambin protein going? We have to hurry and produce active protein as soon as possible, because several big labs are hot on our trail. We don't want to get scooped on this, since it's a big part of the grant renewal I am preparing. This funding is necessary for your dissertation. Purified protein will strengthen our application and make it clear we can do the proposed work.

Alex Archibald: Well, the initial steps worked fine, but the later ones are giving me trouble. Your protocol doesn't seem suited for cambin, and tends to inactivate it.

Beverly: Let me take a look at what you have been trying. [Scans Alex's notebook.] It seems to me that we need to dialyze much more slowly due to the unique properties of cambin. The method you have been using most likely results in aggregates that precipitate out.

Alex: I tried doing something similar to your suggestion and found no real improvement. I read several articles that suggested adding small amounts of CTAB detergent to minimize aggregation. I might try that. What do you think?

Beverly: Don't try CTAB. I want you to focus your effort on my purification technique. This method is unique to our lab and is a cornerstone of our work and of the grant proposal. No other labs use a detergent-free method. I developed this method, and my lab has used it for many other proteins. The last summer student also wanted to change protocols for her project, but eventually worked out the purification conditions using my protocol as a guide.

[Beverly jots several changes to the method.] Try this.

Throughout the week, Alex performs the requested experiments, which fail to produce the desired result. Frustrated, but eager to overcome this technical obstacle, he comes in on the weekend and ponders what to do. Should he contact his professor at home and discuss the results? Should he wait until the next lab meeting? Alex finally decides not to bother his adviser; he decides to test the effect of CTAB on the solubility of cambin.

Scene 2 -- Monday lab meeting, one week later

Alex: Good News! I got a yield of nearly 90 percent active protein from the new purification protocol! I cannot believe it works so well. As far as I can tell, this is the highest percentage ever seen in this lab!

Beverly: Wonderful! That will put you in a great position to move right along with the experiments you have planned and get out a manuscript before our competitors do.

In addition, my grant renewal can hardly be turned down with these preliminary results. So what did it?

Alex: I tried the purification with several modifications, as you suggested last week, with no luck. So over the weekend I came in and experimented with CTAB. After a few trials, it worked!

Beverly: Alex, I told you explicitly not to do that! Why did you directly go against me? I am in charge of this lab, and the use of proteins purified without detergents is central to our unique position in the field! Without funding, we can all go home. I do not appreciate you doing things behind my back. From now on, never conduct experiments without my explicit approval! All you've done this weekend is waste your time, and the time and money of my laboratory!

Discussion Questions

1. Did Alex make the right decision in testing the effect of CTAB? Why or why not? If not, are there any circumstances in which testing with CTAB would be justified?
2. What criteria should be used to determine whether Alex's actions were appropriate? Does the fact that the protocol is the basis of Beverly's niche in the protein field play a role? Assume that Alex did not observe any improvement in the yield when he tried CTAB. Should he still report his result to Beverly?
3. Does Beverly have the authority to control all research conducted in her lab? Does this right extend equally over graduate students, post-docs and technicians? Should Alex report the incident to his dissertation committee?
4. Tenure-seeking professors are often under greater pressure than established faculty, particularly with respect to obtaining funding in a limited amount of time. Would this pressure justify Beverly's viewpoint that experiments must be done her way?
5. A second relevant issue is budget restrictions that threaten to close existing labs. If Beverly's method significantly improves her chances of funding, does that justify her insistence on use of her method?
6. As a future independent investigator, what are Alex's rights and responsibilities? What expectations should he have regarding his adviser's authority? What are Beverly's responsibilities toward those in her lab (grad students, post-docs and technicians)? How might these responsibilities vary?

7. Could this situation have been avoided? Who should have taken responsibility for avoiding this unpleasant confrontation? In retrospect, what could either Alex or Beverly have done? In the future, what could both parties do with regard to this incident?

Notes

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