DEAR Labby

Fraud: On Alert

Dear Labby,
It seems that I read about another case of scientific misconduct and forged or "fudged" data every week. Often the misconduct is by a junior member of a research team without the principal investigator's knowledge. As a junior investigator who has just hired my first postdoc, and who has two technicians in the laboratory, I worry about how to guard against misconduct and maintain the integrity of my research. Will putting pressure on the postdoc to generate the data needed for a grant/publication be too much? Do you need to examine all of the raw data coming out of the laboratory? I was wondering if Labby can give some advice in this area.

—Worried PI

Dear Worried PI,
This is an issue of profound importance. Honest scientists are properly horrified by fraud because it seems such an alien concept and fraudulence a foreign trait. Experts have argued about whether fraud is on the rise or whether the microscope has simply been flipped to a higher magnification objective. In either case, you have the right instinct to be on guard. That said, there is only a reasonable degree of control a lab head can exercise. (Incidentally, Labby is the Research Integrity Officer at Labby's institution, so the following advice flows in part from that perspective.)

The first line of defense is less a guideline or advice than a core principle of being a scientist: Be skeptical of all results. This is not just a special step against fraud but a canon of our profession. If a lab head, and indeed all lab members, are constantly trying to think up alternative interpretations and propose additional control experiments, this creates both a climate of rigor and a key element of an ideal training experience for lab members. The probability of fraud in such a setting is by no means zero, but the chances are certainly reduced.

It is also useful to bear in mind that some cases of fraud have occurred in labs characterized by excessive zeal to obtain/provide results that fit a gestalt. When a concept is passionately (and possibly uncritically) favored by the PI, it sometimes becomes the basis of the lab's reputation. Such a "lab doctrine" can create an intense "desire to please the boss" mentality in some lab members, unconscious in some cases.

There should always be pressure from the lab head. But it should be solely to instill in members the zeal to obtain the truth, *not to seek certain results.* Part of Labby's PhD thesis was an endeavor to either overcome or validate my skepticism about the lab head's foundational career findings. Impressively, he was both open to this and actually encouraged it, proving his mettle. (Labby's results proved the lab head was right.)

Third, in response to your specific question: Yes, you should review all primary data. Fourth, all the lab members working on a project should be in open communication, both at lab meetings and especially as a manuscript is being prepared. A lab member who noticed a figure in a publication didn't look right launched the South Korean stem cell fraud case. That lab member had not participated in the discussions leading up to the submission of the paper. Even if that individual was not going to be granted coauthorship, the failure of the lab head to keep all appropriate lab members in the loop led to the discovery of fraud, and to the PI's undoing once it was uncovered.

If one looks at corrections published by journals, many relate to the spellings of coauthor names, and others concern the addition of an author. It is unlikely these spelling-corrected or added authors had seen the manuscript before submission. One page they would not have missed was the title and author page.

There is more, nuanced advice Labby could offer, especially in light of several prominent cases now in the news (including a set of papers recently retracted by a Nobel laureate when a lab member's findings could not be reproduced). However, I hope that this response is sufficient to suggest some constructive general principles.

The fact that you have had the thoughtfulness to ponder this issue, especially so early in your independent career, is a good sign. It suggests that your lab will be a setting less conducive to fraud. While the danger always lurks in the shadows, your commitment to questioning results and repeating experiments makes it far less likely. ■

—Labby

Direct your questions to labby@ascb.org. Authors of questions chosen for publication may indicate whether or not they wish to be identified. Submissions may be edited for space and style.