

An occasional column, in which Mole and other characters share their views on various aspects of life-science research. Correspondence for Mole and his friends can be sent to mole@biologists.com, and may be published in forthcoming issues.



When conflicted becomes corrupted II – the Molette doctrine

Dear Uncle Mole,

Thanks for waiting: I am delighted to report that the splicing and dicing of DNA for my latest experiment is coming along just brilliantly. This is one of those projects you do on the side, without really telling anyone. If things don't work it's only a few (relatively) low-cost reagents... but if something does come of it all, then guess who will be the darling of the next lab meeting?

Speaking of slicing and dicing, these days I'm also quite enjoying the produce from my weekly farm share. For a modest sum upfront, I get a weekly box of fresh produce from a local farm. There are only two problems I have identified thus far: beets and kale. Uncle Mole, I do not know what to do with beets and kale. If you have any ideas, let me know. For now I am stashing them in the back corner of my refrigerator until I come up with a definitive plan.

Yet all jesting aside, I'm still pondering the topic of our last correspondence, namely the problems with scientific integrity that may be more widespread than any of us would like to

believe. Looking at the (long) list of investigators who have been pulled into what can only be described as unethical behavior, I've come up with my own strategies for how to avoid becoming one of them. It's too easy to go with platitudes like 'pick a good mentor' or 'always tell the truth'. Those are both important to be sure, but does anyone go into science *planning* to fudge their data or model their career trajectory on an unethical nincompoop? Of course not – yet it happens. I'm not exactly *tabulae rasa* when it comes to my career development, but I have enough years ahead of me that I'd prefer to avoid the entanglements that have trapped some of my colleagues. So here's what I've come up with, Uncle Mole. Let me know what you think of the Molette doctrine.

1. Relish the unknown: This is an important one, I think. How many scandals that have shaken the scientific community started because an important experiment didn't go the way it was supposed to... and instead of running with the new data, someone tried to cover it up instead? Hypotheses are all well and good: we're supposed to generate hypothesis-driven specific aims in our grant proposals instead of genome or proteome fishing expeditions, after all. Yet when was the last time we sat down to remind ourselves that far more hypotheses go the way of the straw man than the theory? The very nature of science is about being curious and the endless pursuit of the 'whys' and 'hows' that drive this marvelous universe we call home. There is nothing safe or predictable about chasing the unknown: being wrong is simply part of the game. The problem is when we do have that shining moment of being right – because ooooh, does it feel good – only to delude ourselves into thinking this is the new status quo. In truth, we should be delighted by the discoveries that make us scratch our (fuzzy) heads in bewilderment. After all, didn't Isaac Asimov himself remind us, "The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka' but 'That's funny'..." The way I see it, if we're not routinely jettisoning research hypotheses, then we're not exercising adequate powers of creativity. The unexpected should be our greatest inspiration, the elusive promise that gets us up in the morning, not something that drives us to hide, twist, or even alter our data.

2. Forget the fame monster: Funny thing, Uncle Mole. When I look back at some of the scientists who have most prominently made the news for fudging their data, none of them were doing so about an issue anyone would deem inconsequential. No, it's always the big issues – stem cells, cancer, renewable energy. What I'd like to know is this: to what extent does the need to be famous drive smart, hard-working

people into fibs that ultimately become falsification? I think there's more to that urge than we'd like to think. When you get right down to it, we live in an era of instantaneous drama, from reality television to endless updates from Facebook and Twitter (not that I know what Twitter is, exactly, since I refuse to join). Scientists don't often share the limelight in this world, and even amongst ourselves the list of 'Who's Who' isn't that extensive. The thing is, once a person becomes seduced by the need to be important and to be noticed, there's no telling what lines he or she will cross. It doesn't really matter whether those lines are in politics, professional sports, or our world of laboratory science. Aiming high and setting lofty goals are admirable traits and characterize high-achieving individuals, including the brilliant (and yes, sometimes famous) scientists we all admire. The subtlety lies in distinguishing the end from the means. And this brings me to my next thought...

3. You are more than your work: Becoming a scientist means accepting oneself as a workaholic. It's true, Uncle Mole, and we both know it: you don't choose this field as a career otherwise. Yet the more time I spend hanging about the lab after hours, sitting in the pub talking about the lab even more after hours, emailing grant ideas or half-finished manuscripts back and forth to friends across the country, the more I am noticing that even workaholic scientists fall into one of two categories. There are those for whom their work is a defining part of their lives... and then there are those whose work becomes their life. It's this latter group that makes me nervous. My peers who work in their labs seem to be the ones who are terrified to report any data that is not part of the foregone conclusion supporting the boss's every hypothesis. The pressure to conform and to churn out exactly the results the PI demands has driven several of the most brilliant junior scientists I know away from science entirely (as we discussed previously; *J. Cell Science* **123**, 2523). For those who stay and begin to make their own way in the world as independent PIs, I can't help but wonder: is this how taking shortcuts and intellectual dishonesty starts? It's not hard to connect the dots. Once your work becomes inseparable from your sense of self, the end has to justify the means or your own existence has no value. In stark contrast to this approach stand the scientists I'd like to think of as my mentors, whether I know them personally or not. These are the people who come in on weekends and work late because science is hard and their work is important, but who also see the way in which the work is done as being just as important as the final outcome. These are the groups in which intellectual

honesty and personal integrity are the cultural underpinnings of the lab. And interestingly enough, no matter the size of the group (or the relative fame of the PI), these are the labs that seem to turn out trainees with a commitment to the spirit of inquiry that represents the very best of our field.

I'll be honest, Uncle Mole, I've had my moments of wondering what it would be like if something I discover turns out to be important. The thing is, when I think about what people will say about me many years from now when I'm old (but not gray, since I have no intention of ever letting that show!), I don't want to be famous if it comes at the price of shady ethics or political games. Just recently a close colleague told me that I am "a character". It made me laugh at the time, but the more I thought about it, the more I realized that was the perfect description for what I hope my career will be. "Ahh, that Professor Molette," I hope my colleagues will say, when I'm still tottering into the lab in my old age since I can't seem to resist a good project. "Still as much of a character as ever!" And you know what they say, Uncle Mole: it takes one to know one...

Until next time,
Molette

Dear Molette incorruptible,

Oh my dear, you are so right – we do know that there are investigators who fudge, and we fear that they teach their trainees by example. But don't worry, we don't let them do this, and I'll tell you how. It's why we have committees who oversee our students, working to instill the values of the community. And now we are trying to ensure that every student, and every postdoc, spend time learning the ethics of our profession – what is acceptable and what most definitely is not. And we have trainees, like you, who lead by example.

In my black moods (I have them once in a very great while), I am outraged that we do not punish the cheats enough. Yes, we parade them in front of the press and ban them from further funding, but I often think (when I'm dark and angry) that we should bring back the pillory. Hey, there's a use for beets and kale for you!

I know a case of outright fraud – a 'scientist' who simply made it all up, fully fabricating the data. And I continue to be outraged when I hear that after being tossed out on his poxy ear he has made a career of consulting, and that anyone would actually pay this, this, pustule (I'm being polite) for his so-called expertise. But there is a sunny side to the story. I know, I can't help but be sunny. He was actually exposed by his trainees, who were pretty traumatized by the whole thing. And one of them ended up (for now) working with me. I can tell you that he is utterly honest,

hard working, and a terrific scientist; and when he becomes independent, which I know he will, I'll be proud to call him my valued colleague (of course, he already is). Far from learning the wrong path, he knows very well where that highway leads.

I love that you're a character. So am I. One of our rewards for doing this thing we do is that we get to be characters. We can show others that we can be quirky and have fun, while being absolutely true to this enterprise, this amazing and utterly human exploration we call science.

*And yeh, I hate beets, too.
Love,
Uncle Mole*

Molette

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