Journal of Cell Science

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

Collaboration

Dear Uncle Mole,

Wasn't the summer glorious? Even though the days have shortened and the night air carries more than a hint of a bite, I'm still re-living those summer days where the sky stays light into the wee hours and even the fireflies seem determined not to let the night slip away…but I don't mean to get too lost in thought! To be honest, though, I must admit I love the thoughts one can have upon taking time to smell the roses (and the lilacs and the lilies – like I said, a glorious summer). In fact, now that fall has arrived, I'm finding that I can't get one of those thoughts out of my head. If John Donne was right and no man (woman or mole) is an island, then why don't scientists collaborate more with each other or – gasp – those who aren't scientists at all? If interdisciplinary work matters, how can a gregarious and symbiosis-inclined molette keep the peace with her direct supervisors and still find a way to think outside the box?

After all, the most interesting things in life seem to happen when we work together on a problem. Without multidisciplinary collaboration, we wouldn't have email or the ipod, to name a few of my favorite perks of modern living. Yet the more I pay attention to my time outside the lab, the more I have noticed that many scientists prefer to remain holed up

inside. In fact, I think some of our colleagues do a better 'mole' than those of us born into the species. I'm not saying we should all be extroverts or abandon passion and dedication for the fascinating work we do, but it seems a bit absurd to avoid the rest of the world. For one thing, there are far too many interesting things happening out there, not to mention the questions and quandaries that need input from those of us who understand the science involved. Last time I checked – and I can't stop eying my diploma to disprove the hypothesis that it was a figment of my imagination – PhD doesn't stand for Professional hiding and Detachment [or Distance Professional (hiding in library) for Oxonians].

The way I see it, there are several areas in which scientists could truly make a positive difference in the world by reaching out just a wee bit from the bench. The first is a tricky one to even suggest – I can hear the gasps of horror now – but seriously, don't you think we'd make more progress faster if scientists and physicians could work together effectively? I know there's a lot of baggage with that relationship, but I can't escape the logic: they deal with patients, and we study the molecules and cells of disease. It seems that this should make for the beginning of a beautiful friendship, and not in the Rick-and-Ilsa-doomed-attraction kind of way.

Even worse, the same crossed signals that sometimes characterize our interactions with clinically inclined colleagues often extend to our relationships with other scientists. I'll be the first to admit that, as my scientific focus has developed, my quantitative skills have slid downhill faster than the stock market. I can still calculate reagent concentrations, but graphic representation of complex polynomials over time? HA! Yet, although my heart lies with signaling pathways instead of computational chemistry, I'm not allowed to hide in the mole-hole and ignore the bailiwick of others: the world of ideas is too interconnected for that. After all, mass spectrometry might be the best way to identify the downstream substrate of my favorite kinase, and organic chemists might be the ones who can synthesize a molecule to block its activity. I'm sure I could spend the rest of my career hobnobbing exclusively with biologists, even specific kinds of biologists, but frankly, I think that would be more than a little boring, like seeing the world in only one color.

And if that isn't enough of a radical idea for a crisp, fall weekend, here's another: I think scientists need to be more engaged with the public. You're my favorite uncle because you understand all of the musings that go on in my furry head, so I know you won't think I've abandoned reason with that statement. But seriously, I'm not suggesting we forget our science and storm the halls of government. It's just that when so many of the most complex challenges facing our world involve science, it seems that we, the scientific community, should be actively engaged in clearly communicating about the issues. If we don't, then others will. And doesn't it drive you batty when the people who do are so often completely clueless? We can't complain about a lack of public support for our work if we don't offer in return any indication of who we are, what we do and why our work matters.

The real challenge, then, is maintaining our primary experiment and manuscript responsibilities while not forgetting the connections our work has with the world around us. The balancing act is tricky, especially as a mole-let in someone else's lab. After all, the boss hires us to do science, not ponder its philosophical connections. But, as a molette who can't stop poking her head outside of the lab during incubations or between western blots, there are a few tricks I've learned to do both. First, if this sort of big-picture thinking is something that matters, it pays to do a little investigation before joining the lab. With whom does the boss publish? Does s/he have regular collaborations established with other groups, maybe groups in a different field? How often is s/he asked to write the news-and-views-type piece that puts a big discovery into its wider context? It's also worth noticing how a potential boss decorates the office. Are there indications of *any* outside interests? Do the pictures ever change? If someone is still displaying a dusty photo of a two-year old when the kid has gone off to college, well, that might tell you something worth knowing.

On the practical side, to keep one's mind fresh amidst doing excellent science, the first thing I find helpful is reading. It doesn't take long to peruse the editorials or commentaries in the big journals of other fields – or, gasp, a humanities publication – and this can be a wealth of information for placing one's own work into a wider context. It helps to pay attention to the rest of the world, too. I love my 15 minutes online with the news and my coffee every morning: pondering material for the rest of the day. Then there's the oft-overlooked value of simple conversation. Quite honestly, Uncle Mole, hiding in the lab must be so dull! I've gotten more interesting ideas than I can count from chatting away with the gang (plus their significant others, of course), both at work and outside of it. One never knows how the casual interaction can lead to an idea that takes on a life of its own. (By the way, did I mention Goose is dating Duck? Ooooo, the drama!)

In the end, I guess what I'm trying to say is that I think it's okay to be a scientist *and* have a life beyond science. In fact, I think the balance is what allows our work to thrive. The sun neither rises nor sets in the lab, no matter how many hours some of us spend there. As I move forward towards the blend of interdisciplinary work my career is becoming, I think I've found my new motto. Whether we go into the world of academia or not, those of us in science have all spent time at university. And when you break that word down, I can't help but smile: unity from diversity. Doesn't that stop you in your tracks with goosebumps of inspiration?

Back to work now – I promise!

Always,

Molette

Dear Molette,

Wonderful to hear from you, as always. And equally wonderful to read your lovely scribblings about a wide range of very important issues for all scientists, not only the very young. Each point deserves a response: collaborations among scientists in the same field; collaborations among scientific disciplines; collaborations between the arts and sciences; collaborations with the public (if I can paraphrase); not to mention just poking our heads out of our holes. It happens that I agree with everything you say.

Collaborations in the same field. *When I was just a little mole, working as a grad student, I was in a wonderfully interactive lab. I found that every project I worked on went more smoothly, and was much more fun, when I worked with others, and the work progressed at breakneck speed. Great! So when I got my own lab, I talked with my colleagues about collaboration, and I was thrilled to see how easy it seemed to become involved in projects that expanded my universe. But there was a catch. None of us had much money, and once we agreed that the project was worth doing, reality hit – we had to figure out how to pay for it. So we wrote grants together, and sometimes they were funded. But so much time slipped by before we saw any money that the impetus was often lost, and it was a struggle to revamp the collaboration in the face of the lost time (and more often than not, we did something else, if anything). I had to revise my thinking on this – I worked doubly hard to obtain funds, and then when opportunities arose I could 'front the bill' to facilitate the joint work in advance. That meant giving priority to collaborations at the expense of ongoing projects, so I had to choose carefully. I still work this way, as much as possible. So part of the trick about choosing a lab that might be uncomfortable is practical – does the lab have the semolians (cash, wherewithal, pocket money, bucks) to support these all-important flyers?*

Collaborations outside our field. *Same problem, but also other challenges. Undoubtedly, finding folks who speak a different scientific language and have a fundamentally different take on the world who want to talk to us is a remarkable way to take your science in a new direction. But bear in mind that they do speak a different language, and they might not understand yours. Like tourists, the unenlightened among us seem to think that they just have to state their questions more loudly to be understood. If you plan to collaborate outside your field, you will have to spend a lot of time and mental energy learning their language, and you will probably never speak it as they do. But it is undoubtedly worth the trouble. The project might never get off the ground, but the adventure is wonderful for your development as a scientist. A note on this – it is often perceived that such collaborations are not welcomed by funding agencies; this simply isn't true. The problem with proposals for such things is not that they are outside the box, but rather that the applicants have often not taken the time and effort to make the collaboration intelligible to researchers in both of the fields. If they can't explain to us why the work is exciting and feasible, how can they speak effectively to each other? (For more on scientific collaborations, see* J. Cell Sci. *120, 201-203; http://jcs.biologists.org/cgi/content/short/120/2/201.)*

Collaborations with the arts. *Ditto, and more so. Few of us sojourn into such rarified space (where no one can hear you scream – because it's a vacuum), but this is rich territory. As far as I know, local communities that are fabulously enriched by the arts are rarely, if ever, enriched by the sciences in the same way. We often feel that the sciences are far better supported than the arts because of what we bring to society, but what would life be without art? It would be television, and not the good kind.*

Collaborations with the public. *Which brings us to what is perhaps your most important point. I know so many trainees who contend that they cannot explain what they do and why it is exciting to their friends and family who are not scientists. But the problem is often not simply that they do not know their work well enough to do so – non-scientists usually do not have the interest to patiently listen to a long discourse on how things work. So we do a short cut – we put everything into the context of something the public cares about (curing disease, making gadgets, cool methods, television shows – not the good kind). We present ourselves as engineers. Don't get me wrong, I love engineers. But the difference between scientists and engineers is that, while scientists try to figure out how things are, engineers make things. Before you try to explain how you are curing cancer (ultimately an engineering problem, albeit a very challenging one), think about how finding out about a secret hiding in the deep shadows may be a beautiful thing. And tell someone about it. Remember, the public are paying the bills. (For more on collaborations with the public, see* J. Cell Sci. *116, 4687-4688; http://jcs.biologists.org/cgi/content/full/116/23/4687 and* J. Cell Sci. *116, 4865-4866; http://jcs.biologists.org/cgi/content/full/116/24/4865.)*

Of course you should get out of your hole as much as you can, reading outside your field, experiencing the arts, learning and developing. The more you do that, the more you will find that you can talk to the people who count (the public) about how what we do is a truly human endeavor, with all the problems, frustrations and crashes they know so well, but that there is something magic in the process.

Be well, Molette! Live well.

Love,

Uncle Mole

Molette

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