

But even good communication can't prevent all mishaps. In December 2010, Constantine's team learnt that two Hector's beaked whales (*Mesoplodon hectori*) had washed ashore in northern New Zealand. After her team took samples, rangers buried them. Several months later, genetic analysis revealed that the animals were actually spade-toothed whales (*Mesoplodon traversii*). It was the first time scientists had seen entire specimens of the rare creatures, rather than isolated bones and teeth. Realizing that the discovery was a big deal, the researchers returned to the site to retrieve the skeletons. When they got there, the elder whale's skull was missing. Constantine suspects that the skull had either been washed away or perhaps removed.

When another skull had gone missing in the 1990s, her colleagues had spotted it in a remote community, on a doorstep. Asked about the skull, the homeowner was happy to leave it where it was. It was a frustrating situation, but Constantine says now that maintaining relationships is more important than any single specimen.

Having an open mind about fieldwork failures can, in some cases, lead to new insights and ideas, adds Erin Ashe, a marine biologist with Oceans Initiative (who is married to Rob Williams). As a graduate student, Ashe planned to study Pacific white-sided dolphins in British Columbia, Canada. On her first day of fieldwork for her PhD in 2009, she found hundreds of dolphins and began taking pictures for photo identification. Soon, the dolphins started acting strangely as they raced for the shore. Ashe worried that she had disturbed the animals and that, if they were so easy to startle, it might be impossible to complete her study. Then a killer whale attacked and killed one of the dolphins in front of her.

The unexpected interference — by an animal, in this case — led her to shift her research and study predation instead. That work formed the basis of two of her thesis chapters, and paved the way for a major grant from the US Navy and subsequent studies that turned out to be more interesting than her original plan. "Fieldwork is all about flexibility," Ashe says, adding that the uncertainty and challenge is part of what attracted her to fieldwork. "It makes things interesting — the fact that I can go out there and discover new things or see things that have never been seen before." ■

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COLUMN

The importance of agendas

Have talking points ready for meetings with your supervisor, say **Tess L. Veuthey** and **Samuel Thompson**.

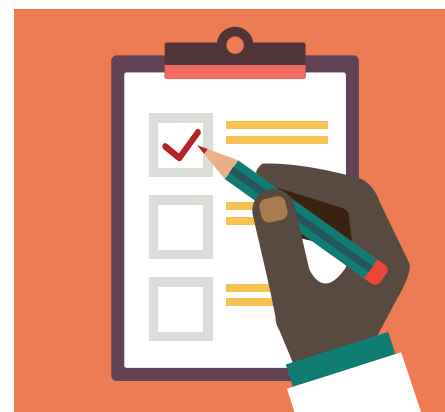
As PhD students, we often find ourselves discussing our interactions with our principal investigators (PIs) and swapping advice for improving our mentoring meetings. We have found three practices to be consistently helpful: asking our PIs about all aspects of their job; preparing an agenda for each meeting; and negotiating new experiments without explicitly saying 'no'.

We both see our PhD programmes as academic apprenticeships. One crucial goal is to flesh out our understanding of life as a PI. By collaborating with our PIs and observing how they work, we learn how to plan experiments and how to write papers. But we don't get to practise other skills, such as interacting with journal editors and recruiting lab members. To learn these, we ask our PIs about how they plan when running the lab. For example, when people leave Samuel's lab, he asks his PI about her plans for reallocating shared lab responsibilities.

Face-to-face time with our PIs must be focused, so we use agendas to organize the conversation. We habitually start with, "I made a list of topics I wanted to talk to you about." Tess often starts her agendas with an update on her efforts to develop new research equipment so that her PI can evaluate their importance to her project. When Tess was designing new probes for electrophysiological recordings, her PI helped her to balance testing new research hardware against continuing data collection with older technology. Preparing an agenda also helps us to learn our PIs' priorities. Before Samuel discusses new data or his progress on experiments, he always asks his PI, "Is there anything else you wanted to talk about?"

Setting an agenda helps us to introduce uncomfortable topics. For example, including 'summer course funding' in her agenda helped Tess to request funding for a course on computational neuroscience — something she had been avoiding doing for weeks. It turned out that Tess's PI was happy to provide support.

We and our PIs see our projects from different perspectives. Whereas they focus on the big picture, we wrestle with implementation. Because of this disconnect, we can discount their advice as being out of touch. Conversely, if we shoot down all their suggestions for ambitious



experiments, our PIs grow frustrated.

When we realize we're saying 'no', we try to engage with our PI's idea by asking specific questions. These moments of potential conflict can turn into opportunities to hash out experimental strategies. We might say, "I think that would be an exciting direction, and it would be helpful for me if we could discuss specific metrics for measuring that result." Instead of searching for flaws, we try to discuss a realistic road map for an optimistic outcome.

We are never going to be perfect mentees. We remind each other to take an active role in our mentoring relationships and to seek mentorship from multiple sources. Tess has great conversations with her physician-scientist PI about her clinical interests as an MD-PhD student. But she also has female mentors for advice about working within a male-dominated field. Samuel routinely discusses personal career goals with his PI, but relies on collaborators for advice on experimental techniques outside his PI's expertise.

Discussions on mentorship often place the onus solely on the mentor. But, as mentees, we also need to ask ourselves, "What's working and not working in this interaction? Where can I try something new? What would be ideal?" No template can solve all PI-student concerns. But simple steps can go a long way in helping these relationships to thrive. ■

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