

# nature chemical biology

## The English patients

**A required course in communication at the graduate school level may help cure the disorder of poor scientific writing.**

Some scientists are superb writers. But it is certainly not news that others produce tortured prose that is as easy to read as income tax law or a computer manual. Scientific research demands a specialized vocabulary and a grasp of abstract concepts, but when some authors take on the task of explaining themselves, good grammar is the first casualty. Sir John Maddox, former editor of *Nature*, observed in 1983 that

“...there is a hard core of would-be authors who write as if the work of grammarians over several centuries is something between an impertinence and a gross interference with personal liberty.”

Dangling constructions are one of the leading symptoms of the malady. For example, “Searching the database, three proteins were found.” Who searched the database? From this sentence, it appears that the proteins did. Dangling clauses are usually the result of an author beginning a sentence with a verb in active voice and switching to passive voice halfway through, thereby dropping the verb’s subject (often the author) into the void. Usually, reinserting the subject brings the sentence into focus: “Searching the database, we found three proteins.”

Scientists tend to favor passive voice, because it removes the appearance of bias from their writing. Instead of “We chose model X,” they write “Model X was chosen.” This makes the prose bloodless and remote, and it leaves the reader uncertain about exactly who did the choosing. Many authors have been trained to write this way, and for a methods section, passive voice is more appropriate. However, when authors are explaining their motivation, results or interpretation, they will find the active voice is more concise and direct.

Convolved writing seems to become a barrier to communication in graduate school, when students face the challenge of explaining their own research. In a 1967 essay in *Science*, F. Peter Woodford (then editor of the *Journal of Lipid Research*) observed,

“When science students enter graduate school they often write with admirable directness and clarity of purpose....Two years later, these same students’ writing is verbose, pompous, full of fashionable circumlocutions as well as dangling constructions, and painfully polysyllabic...The student can no longer write: he pontificates.”

Woodford felt so strongly about this issue that he taught a course, Principles of Scientific Writing, and wrote a manual for teachers on the topic that was published by the Council of Biology Editors (now the Council of Science Editors, which released an updated edition in 1999).

Nearly 40 years later, such a course and such a manual should still find a welcome in every graduate program in the sciences. The simplest and most direct approach to improving the quality of writing is not merely to offer graduate students a course in scientific communication, but to require that they take it.

Most science departments recognize the value of teaching graduate students how to speak in public; they require students to teach, join journal clubs and give talks so they will be able to explain their work to their peers in seminars and at conferences. But because papers are the primary avenue by which scientists make their research known, and because grant applications are essential in securing funding, departments also need to ensure that their graduates are able to express themselves articulately in writing. Computer science departments (spurred on, perhaps, by dissertations that read like C++ programs) have led the way in this area. Many require that their graduate students take a course in technical communication. In the sciences such a course could also train students how to draft a journal article and prepare a grant application.

In graduate school, students learn how to succeed in science from their dissertation supervisors. Faculty, therefore, share the responsibility for teaching their students to communicate science in an effective style. As faculty write their submissions to journals and grant committees, they should set an example by using the clear, plain English that serves science best, and as they strive for this ideal, they should actively involve their students in the process of writing and revision.

Busy scientists may feel they do not have the time it takes to write elegant prose. But responsible researchers will make the effort to be as succinct and straightforward as they can, to convey their meaning to their readers. With this goal in mind, it is in the interest of authors to take the time to write as clearly as possible. Often, the economy of a shorter format, such as a Letter instead of an Article, can constrain an author to clarity. On the other hand, though acronyms are certainly shorter than words, too many of them quickly render a manuscript cryptic.

The international language of science is currently English, but if another language took its place, good writing would remain just as important. We commend those scientists who learn English (which may differ substantially from their native tongue in form and logic) in order to disseminate their research and correspond with colleagues worldwide. Indeed, some authors whose first language is not English have a stronger grasp of grammar and write in a more elegant style than many native speakers. Regardless of our background, we all benefit when scientists’ writing reflects lucid thinking and quick insight. ■