

enterprises (SMEs) in Europe in such numbers that they are fully and individually represented. As secretary general of EuropaBio, I would like to stress that my association aims to represent in a balanced way the interests of all biotech companies, large or small; green, white or red. That said, I agree that more could be done for SMEs.

Despite the reticence of SMEs to engage more actively in EuropaBio, successful outcomes have been achieved on their behalf because of the commitment of our national associations, the SMEs that are direct members of EuropaBio and the EuropaBio board. For example, in addition to the successes that you mention in your editorial, we are also defending the interests of SMEs as service providers to the Innovative Medicines Initiative; and we are promoting European biotech SMEs and protecting their innovations so that they can get a return on investment from innovative tests aimed at reducing the need for animal testing, a *sine qua non* for progress in this field.

Europe's 1,800 SMEs dedicated to biotechnology are traditionally represented by national associations and by the Emerging Enterprise Council at EuropaBio. National associations hold one-third of the seats in the EuropaBio board and today they make up three out of the five executive committee members. National associations can offer their board seats to CEOs of their member firms, which many do. SMEs can also join EuropaBio at specially reduced SME rates.

As there is a minimum three-year time warp between discussions at European Union (EU, Brussels) level and the effect on SMEs at the national level, the active engagement of SMEs in directing the associations' campaign work, however fundamental, is not always easy. Therefore, I would ask, What can make SMEs more interested to actively represent their interests at EU level?

Here, *Nature Biotechnology* could help encourage SMEs to get actively engaged in joining the associations' efforts, certainly when the issues that matter—or will matter—to them are being debated in Brussels. A focus on advance representation in Brussels could avoid unfavorable EU legislation being voted in the European decision-making process; a focus on repairing the damage when the rules are already being transposed into national law is often too late. The engagement of SMEs in the Brussels' scene is proof in itself to EU decision makers that young innovative enterprises really exist, and need to be nurtured.

Biotech SMEs are a motor for innovation, for future prosperity, growth and jobs in Europe, but they must also become a motor for influencing EU policy and be ready to take direct action on EU lobbying activities.

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1. Anonymous. *Nat. Biotechnol.* **25**, 693 (2007).

Where did the scientific method go?

To the editor:

The Brief Communication published by Mazor *et al.* in the May issue of your journal (*Nat. Biotechnol.* **25**, 563–565, 2007) contained what is becoming an increasingly alarming trend not only in your journal but many other so-called 'top-tier' journals—a lack of documented methodology and information that is essential to faithfully reproduce the science claimed in the manuscript. Surely, the aim of scientific publication is to disseminate scientific information to further advance our knowledge and to allow others to use such information for expansion and possible improvements to the work. Mazor *et al.* are clearly not the only authors being forced into abbreviated paper formats that follow this trend, which suggests the problem goes significantly deeper.

The communication of scientific information largely requires the evaluation of data and concepts generated by scientific experimentation through the rigorous peer review process and the subsequent publication of approved information by scientific periodicals. Basic scientific research has more or less followed this process since its inception. Nowadays, the sheer volume of research and its fast pace is coupled with the increasingly common practice of scientific publications to overlook, reduce or omit scientific methodology from the pages of published manuscripts. For example, in certain journal manuscripts, critical methodology sections do not physically appear in the final published version—an event contributing to a lack of appropriately reviewed and documented scientific methodology hindering the faithful reproduction of the science claimed in the manuscript. This is a worrying issue that needs addressing for the continued good standing of scientific publication. If the aim

of scientific publication is to disseminate scientific information that further advances our knowledge and to allow other researchers to use such information for expansion and possible improvements to the work, then every attempt should be made to include the most critical details in the published manuscript. Although one could argue that the evolution of scientific publication is necessary because of the intense competition for space in the pages of scientific journals, we feel that the current inclination toward the covert display of the scientific

method in scientific publications will risk compromising the reproducibility of the science and diminish its significance. In addition, the trend toward the online version of manuscripts becoming the article of record, rather than the longstanding but seemingly outdated printed version, potentially adds to this problem by often relegating methods to supplementary online files that are referred to, but do not physically appear, in the final manuscript.

To illustrate this lessening of scientific methodology from published scientific manuscripts one simply needs to look at the recent publications within scientific journals. Many journals publish brief communications or short reports which, most likely owing to their small size and format, contain an extremely short methodology section or in many cases, no methodology at all to help explain exactly how the results were obtained by the investigators (in the case of *Science*, published manuscripts are called articles or reports and neither contains a methods section). Here, scientific methods are mainly made available as separate supplementary online bulky text documents that also contain supporting results and other



information somehow deemed superfluous to the printed manuscript. Although the additional publication of supporting material as supplementary online information is often necessary and even commendable, how can a reviewer possibly wade through all this information in a timely manner to provide a rational recommendation to the editors on the merits of the manuscript for publication? We suggest that the lack of rigid criteria applied to such supplemental information promotes mistakes and omissions in methodology explanations that can lead to frustrating attempts by colleagues to reproduce the experiments and results claimed in the original publication. In contrast, many journals also publish full-length research articles that adopt the traditional publication format containing the introduction, methods, results and discussion sections. However, too often these methods are minimal and still necessitate augmentation by supplementary online documents that suffer from the same inadequacies as outlined above. The underlying theme is that the poorly described methodology is no longer the exception; it occurs far too frequently.

Several theories may explain this trend of peer-reviewed scientific journals to lack rigorous methodology sections in too many of the published manuscripts: first, due to publishing constraints on space, journal editors are required to keep manuscripts shorter, so authors opt to truncate the methodology or relegate this necessary section to the supplementary online files to avoid restricting the results on display; second, reviewers are overwhelmed with information and simply do not have the time to properly evaluate manuscripts or do not recognize the importance of appropriate methodology sections of manuscripts; third, authors may be somewhat superficial with methods and/or knowingly withhold vital aspects to protect their status as the exponents in the field or to pursue personal financial rewards through patenting and licensing agreements. Although these last two points are extreme views, it is conceivable that reviewers and authors, in addition to the space limitations already determined by journal guidelines, do contribute to the overall insufficiency of methodology currently commonplace in scientific manuscripts. How many of us as authors, when faced with editorial reviews recommending manuscript shortening decide to trim the methods section because it is less important? Additionally, as reviewers how often do we carefully inspect scientific methodology and its consistency?

It is evident that the evolution of scientific publication is warranted due to the extreme competition for journal space brought about by more papers being written. This increased volume is good for scientific communication and its subsequent globalization; however, the process of publication of, and debate over, data and theories needs to remain well regulated. The continued neglect of scientific methodology in publications will, in our opinion, only lead to a reduction of overall scientific quality. Attempts to address this problem by scientific journals have largely centered on the practice of 'attaching' supplementary online files to manuscripts. Although on one hand this approach allows a larger amount of information to be communicated, on the other it produces an almost unlimited quantity of data that are not always sufficiently screened, probably because of the large volume and its assumed secondary importance. Admirably, *Nature* has recently implemented new guidelines for the addition of methods to their published research articles and letters. Authors are given multiple options (<http://www.nature.com/nature/authors/gta/index.html#a5.3>) for the appropriate presentation of methods within their manuscripts, avoiding the demotion of Methods to the supplementary section. This approach should be commended and we hope adopted universally by additional scientific periodicals. Aside from these rules, we should all make an extra effort as authors and reviewers to ensure that scientific methodology resumes its rightful position as the foundation of basic scientific research.

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Nature Biotechnology responds:

Nosedà and McLean raise interesting points. With regard to the ability to reproduce a paper's methodology and findings, the fact that descriptions of methods in Supplementary Material online are not copy edited for grammar or clarity at *Nature Biotechnology* (or at any other *Nature* research journal for that matter) could be argued to potentially compromise the lucidness and ease with which a reader can repeat a published experiment. As the authors also point out, *Nature's* new guidelines (<http://www.nature.com/nature/authors/gta/index.html#a5.3>) for the addition of methods to its published papers provide authors with flexibility in how to present their methods within the final printed issue and online. One additional benefit to *Nature's* approach, not mentioned by Nosedà and McLean, is that references to methods or protocols that appear in the Methods section remain in the printed paper rather than being relegated to online only (where they are less likely to be cited). We would welcome feedback from our readers as to whether they feel *Nature Biotechnology* should follow a similar model to *Nature*.

Ethics of research on human biological materials

To the editor:

I would like to clarify some of the Council of Europe's (Strasbourg, France) legal instruments—in particular the Convention on Human Rights and Biomedicine, and Recommendation (2006) 4 on Research on Biological Materials of Human Origin—that are referred to in the correspondence 'Ethical framework for previously collected biobank samples' by Gert Helgesson *et al.*¹, published in the September issue.

On page 975, in discussing consent procedures for previously obtained biobank samples, the authors recommend that "When the study is not particularly sensitive, and on the condition that (i) strict coding procedures are maintained, (ii) secrecy laws apply to any handling of sensitive information and (iii) vital research are at stake,...that genetic analyses of identifiable samples should be permitted without (new) consent." They go on to say that "This is in

