

Is the system dumbing down research?

As biologists, we are all familiar with the feedback mechanisms that control gene expression, enzyme activity and other biological processes. The cell detects a deficit in a certain protein or compound and switches on gene expression or activates the enzymes that metabolize the required compound. As soon as supply meets demand, the product itself then serves as a signal to stop gene expression or bring the enzymatic reaction to a halt. Two articles in this issue (pages 402 and 405) suggest that there is a similar phenomenon at work in the realm of peer review. Our peers work anonymously to critically evaluate research proposals and publications. Increasingly, however, critics of this process maintain that these peers have become so effective that the material they see is safe and sterile enough to render the review process almost unnecessary. As a consequence, the intellectual quality of research suffers. Indeed, some suggest that in the era of the worldwide web, there is no longer a need for Caesars to give a thumbs up or thumbs down—let the readers decide. But do the Caesars of peer review contribute to a dumbing down of research when they give a predictable thumbs down?

Whatever the cause, there is a widespread view that science is not as wild an intellectual pursuit as it once was, but I am not sure if the peer-review system is to blame. The reality is that all areas of life have become safer. Politicians do not veer too far from the centre because that is where most votes are—as leaders, they follow the crowd. Passionate support for divergent political systems and visions are long gone, often for good reasons. There is a low level of engagement in such discussions, with no sign of change. Investors prefer companies with one or more promising products in the pipeline, rather than placing their bets on blue-sky research, no matter how large the poten-

tial returns. Even more striking is the fact that people today do not express themselves without a major, and increasingly instinctive, degree of self-censorship. Corrections swiftly follow any statement that might have caused offence to sensitive parties. Straight talk is polluted by diplomatically crafted words such that the message has drifted to cagey territory between the lines. Power was once with those who clawed their way to the top; today it is with those who avoid conflict and controversy.

Science is no exception to these developments and it is not surprising that strong opinions have been kneecapped by political correctness, the latest blight against freedom. There is a temptation to distinguish between the dreaded conservative reviewers—universally and uncritically described as peers—and the free-spirited scientists who would pursue their exciting ideas if the other side did not exist. But both groups overlap to a large extent. In my opinion, the problems with peer review are not caused by over-cautious reviewers. Instead, if applicants and authors were more forthright about their ideas and conclusions, they would not suffer at the selection stage. A fresh approach or idea still evokes a lively response from real peers—they would enter the debate with gusto and also, I suspect, an open mind.

I do not think that the best scientists are seeking safe science, but many authors and applicants do not trust the system and instead dumb down their presentation. When *EMBO reports* started, we invited authors to speculate and extrapolate their data more than usual in an accordingly labelled section of their paper. The outcome is disappointing: almost no speculation. And thus we have lost access to the insights of the people who have reflected most on the full meaning of the data. All we can do is re-issue the invitation and hope that other journals follow suit. As a further attempt to

liberate brains and promote dialogue, our new journal *Molecular Systems Biology* (www.molecularsystemsbiology.com) accepts comments on published papers. Please take advantage of this forum to stimulate open discussions.

My experience with fellowship committees suggests that most reviewers are open to strong and different ideas. However, very few of these ideas are presented. Maybe the maturation of biological research means that novelty is a thing of the past, and new and exciting insights are increasingly hard to come upon. The framework of how cells function and develop into organisms is sketched out with a strong pencil and in many areas all that remains to do is some painting by numbers to finalize the image. Or is it? This is the real challenge. Focusing on an unpredictable outcome rather than confirming what has already been proven will lead to stimulating intellectual work after the data are collected. It is relatively rare now that a real experiment is performed, in the sense that either of two options could be the result.

Researchers should let engineers and technicians build the bridges between well-established pillars of knowledge and instead focus their efforts on unravelling the unknown. Similarly, reviewers should judge the latter for what they are: potential new insights into nature. But this is only possible if the referees themselves are aware of the difference between the obvious but not yet shown, and the unknown that will enlighten. It might happen. More and more people within and outside science are growing tired of the bland mediocrity that comes from following the crowd. Scientists must recover their dangerous side and help reinvigorate this domain and lead others. It would be a welcome development.

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