EDITORIAL

nature chemical biology

Correcting the scientific record

The retraction of a *Nature Chemical Biology* paper is a step toward a full accounting of a case of scientific misconduct.

This month we are publishing a retraction of a paper by Won *et al.* entitled "Small molecule–based reversible reprogramming of cellular lifespan." The Letter, which appeared in our July 2006 issue (*Nat. Chem. Biol.* **2**, 369–374, 2006), described the discovery by high-throughput screening of CGK733, a small molecule that was reported to modulate the 'senescence clock' in human cells. In the paper, the authors applied their previously published technology called magnetism-based interaction capture (MAGIC, *Science* **309**, 121–125, 2005) to identify the ATM-ATR system as the molecular target of CGK733. Unfortunately, the paper includes several misrepresentations and data fabrications that undermine the scientific integrity of the study. Accordingly, the authors are retracting the paper.

From an editorial standpoint, the review process for the Won *et al.* paper was unremarkable, following a course typical of papers that are published at *Nature Chemical Biology*. Upon initial submission of the manuscript, the editorial team agreed that the paper was interesting, that it was within the scope of the journal and that it satisfied our editorial criteria for external review. The manuscript was sent to three referees, who were selected to cover the scientific breadth of the study, and it underwent a total of three cycles of revision and review. Throughout the process, the referees provided critical comments while expressing enthusiasm for the methodology of the study and its potential insights into cellular senescence. At each stage, the authors revised and added experimental data to address the technical concerns of the referees. After the final round of review, the editorial team concluded, based on referee feedback, that the paper was acceptable for publication.

Following publication, the Letter attracted considerable media attention for its potential applications in anti-aging research—particularly in Korea where the corresponding author, Tae Kook Kim, a faculty member at the Korean Advanced Institute of Science and Technology (KAIST), was touted as an emerging leader in Korean science. The response of the scientific community was more muted, as reflected in a modest number of citations of the 2006 paper by the end of 2007. The authors published a corrigendum at the end of 2006 that included a revised 'competing financial interests' statement clarifying financial ties between Kim's KAIST laboratory and CGK Co., Ltd. (CGK), a company for which Kim was a scientific founder (*Nat. Chem. Biol.* **3**, 126, 2007).

Concerns about the reproducibility of the *Nature Chemical Biology* paper and the earlier *Science* report were first raised to the journals' editors in December 2007 by Yong-Weon Yi, a coauthor on both papers who had subsequently moved from Tae Kook Kim's laboratory at KAIST to CGK. In late February 2008, a KAIST committee charged with investigating these two papers issued a preliminary report to the KAIST administration and the press, concluding that "the two papers do not contain any scientific truth." At the time the concerns were initially raised, we set out to determine whether the scientific integrity of the Won *et al.* paper was indeed compromised and, if so, to correct the scientific literature as quickly as possible. Though the KAIST committee has not issued its final report, over the past several months they have been forthcoming with emerging information on the case. In parallel, we have been in contact with all of the authors of the Letter, and this has enabled us to recommend a course of action. We concur with the authors and the investigating committee that the scientific facts of the case warrant prompt retraction of the paper.

As stated in the retraction text, all nine of the paper's authors have agreed that the paper must be retracted. However, Tae Kook Kim, the principal investigator and corresponding author, did not agree to the retraction statement signed by the other authors and asserts that any scientific irregularities are limited to a subset of the paper's experiments. Although circumstances did not allow complete agreement among the paper's authors and the text does not list all of the scientific concerns that were raised in the initial inquiries, the published retraction statement and 'Editor's note' provide abundant explanation for why the paper must be removed from the scientific literature.

We commend CGK scientists for raising the initial concerns with the *Science* and *Nature Chemical Biology* papers and the KAIST investigating committees for their efforts to date. It is reassuring that Korean institutions are taking a hard line on scientific misconduct. However, we do question the timing and content of the KAIST press release of February 29, 2008, which was made public without advance notice to the journal. It is not unusual for an institute to announce that an investigation is underway and to make another announcement at its conclusion. Ideally, though, investigating committees contact journals well in advance of making public statements, thereby ensuring that the information communicated is accurate at all stages. The potential negative impacts of scientific misconduct allegations on the accused and on the public perception of science cannot be underestimated. Statements to the press are useful, but first priorities should always be determining the facts quickly, giving due process to investigators under suspicion and correcting the literature.

Although the reasons for retracting the *Nature Chemical Biology* paper are well established, the course of events in the Kim laboratory that led to the reported scientific misconduct remain unclear. We fully agree with a recent *Nature* editorial (*Nature* **453**, 258, 2008) that has urged greater transparency from authors and institutional investigators in cases involving scientific misconduct and insisted on clear and complete final reports of "what went wrong." As the KAIST committee completes its deliberations, we urge them to provide a full accounting of the case and make their findings widely available in English. This example would serve as a model for future investigations committed to maintaining the integrity of science and the scientific literature. The scientific community and the public deserve nothing less. ■