Scientific Misconduct in Japan: The Present Paucity of Oversight Policy

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Scientific misconduct can jeopardize scientific progress and destroy the credibility and reputation of academic institutions and their faculty and students; ultimately it can compromise scientific integrity and result in a loss of confidence for the entire scientific community. Only recently in Japan has scientific misconduct become a central public topic.[1] This increased attention to the topic, in turn, has highlighted a paucity of ethical standards within the Japanese scientific community and a lack of an apt process for conflict resolution. In this brief report, we first provide an overview of several high-profile cases of scientific misconduct recently uncovered in Japan. Next we consider how a recent rise in competition within the academic and scientific communities is possibly related to a concurrent increase in reported cases of scientific misconduct. Last, after discussing what actions have already been taken, we recommend further actions needed to deal with the problem of scientific misconduct in Japan.

Recent High-Profile Cases

In December 2004, internal whistle-blowing at RIKEN, a prestigious federally funded research institute with more than 3000 staff scientists, led to the discovery of published falsified data.[2] Two researchers had manipulated DNA analytic results to provide better evidence for the discovery of a new protein. These fallacious data were reported in three papers published in American medical journals between 1998 and 2003. To date, all reports have been withdrawn.

In May 2005, *Nature Medicine* withdrew an article previously published in its October 18, 2004, issue on the relationship between insulin production and the Pten enzyme.[3] According to the coauthors of the paper, Professor Iichiro Shimomura of Osaka University and Professor Junji Takeda of the Division of Mammalian Development of the National Institute of Genetics, suppression of the Pten enzyme resulted in improved insulin function, which allowed a mouse to remain the same weight regardless of dietary intake. This claim was based on data fabricated by a medical student.

In September 2005, the Graduate School of Engineering, University of Tokyo reported that data published in a series of 12 articles between 1998 and 2004 in *Nature* and other journals could not be scientifically confirmed.[4] Professor Kazunari Taira, a specialist in RNA-related research, was an author of all reports. The RNA Society of Japan had formally asked the University of Tokyo

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Graduate School of Engineering to investigate the reproducibility of Professor Taira's results after having conducted its own in-depth investigation.[5]

Questionable behavior related to the submission of federal grant applications has also been discovered recently. In September 2005, the Japan Society for the Promotion of Science, a subdivision of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) discovered that a professor at Nagoya University had fabricated his curriculum vitae by claiming three articles to be in press despite having not yet submitted any one of them to an academic journal.[6] The professor was applying for the renowned "21st Century Center of Excellence Program," a highly competitive multi-million dollar grant.[7]

Background: Increased Competition

The recently reported questionable behavior among Japanese scientists may be related to a concurrent rise in competition for academic appointments and scientific funding. An increase in competition for appointments is primarily the result of (1) fewer appointments and, thus, a larger number of researchers competing for a limited number of positions and (2) a major shift in administration policy among national universities.

As of April 2004, Japan's 89 national universities and four university collaborative research institutions, which were all previously subsidized by the government, began to function as independent administrative institutions (IAIs). This new policy, which was originally announced in December 2001 by the Council for Science and Technology Policy (CSTP), was created to (1) bring greater independence and autonomy to universities, (2) realize dynamic and strategic management through a private-sector approach, (3) enable top-down management under the university president, and (4) make university management more transparent. Interestingly enough, all recently reported high-profile cases of scientific misconduct have occurred at an IAI—RIKEN, Osaka University, Nagoya University, and the University of Tokyo.

Given freedom in their management of financial and human resource allocation, IAIs determine professional appointments and allocation of funding based on research output.[8] This evaluation system has resulted in a highly competitive atmosphere among Japan's scientific and academic communities. In fact, for researchers accustomed to the former academic system, where appointments were tenured automatically from the level of assistant professor and salaries were guaranteed until retirement, regardless of research accomplishments, this change in administrative policy may be quite disturbing.

The other major factor related to the gradual rise in competition within Japan's scientific and research communities is an increase in competitive grants—the most prominent being the 21st Century Center of Excellence Program (COE). In 2001, the MEXT established a budget to launch the 21st Century COE Program as a means "to cultivate a competitive academic environment among Japanese universities by giving targeted support to the creation of world-class research and education bases through Centers of Excellence in a range of disciplines."[9] This program, among others, reflects an overall reform in governmental funding policies for scientific research. Although the Japanese government introduced these policies "to improve efficiency and increase productivity," they apparently overlooked the possible ethical ramifications of increased competition.

Necessary Actions

To date, there exists not a single agency for the oversight and assessment of scientific misconduct in Japan. In fact, an official definition of scientific misconduct did not exist in Japan until 2003,[10] when the Science Council of Japan, a special agency that functions under the jurisdiction of the prime minister to promote science in academia, industry, and government,[11] adopted the classification used by the United States Office of Research Integrity: *any intentional act of fabrication, falsification or plagiarism* (FFP).[12] The Science Council of Japan has laid out and underlined three necessary actions to deal with FFP effectively: (1) the need to make individual researchers aware of research ethics, (2) the need for academic and scientific societies and foundations to develop ethical guidelines on FFP and a system for enforcing those guidelines, and (3) the need for the Science Council of Japan to create an independent organization for the monitoring and assessment of scientific misconduct. This independent organization could then act as a central oversight committee in Japan.

A central oversight committee makes consistent regulations governing scientific misconduct among academic institutions, research institutes, and the private sector.[13] Indeed, the United States and several Scandinavian countries use, with success, a central committee to oversee scientific misconduct. A central agency, in general, (1) relies on expertise provided by scientists, clinical investigators, and other academics, and (2) functions independently of individual academic institutions, funding agencies, or other professional regulatory bodies. Although the use of a central committee to oversee scientific misconduct is one model for the oversight of scientific misconduct, other more decentralized models may also be an option. In fact, most European countries including France, Germany, and the United Kingdom rely on each university and research institute to oversee and regulate any type of scientific misconduct on their own.

For Japan, the present question is precisely what type of model will be most efficient and effective. Relevant factors to be considered include, but are not limited to, (1) the possibility that whistle-blowing is socially discouraged, (2) the risk that academic societies in Japan would be unwilling to cooperate with a central agency when an internal investigation is needed given their exclusivity, and (3) the fact that Japan has a long history of not using a central independent agency for regulatory matters related to research.

Conclusion

In this brief report, we have explored the present state of scientific misconduct in Japan. Arrival of a more competitive environment among scholars and researchers must be accompanied by a system in which fair play is the enforceable rule of the game. Considering the impact of the recent cloning scandal revealed in Korea, we believe that scientific misconduct in Japan presents not only a risk to the integrity of Japanese research, but also to that of our entire international scientific community. Japan needs to recognize that the near lack of systematic policy for the oversight of FFP could possibly have severe implications if not dealt with within the near future.

Notes

1. RIKEN-kenkyūin, de-ta kaizan [RIKEN Researcher. Data falsification]. Mainichi Newspaper 2004, Dec 24 (Morning Edition) (in Japanese); Meidai, kyogi shinsei mondai de COE henjyō he hojyokin mo jitai [Nagoya University. Problem of false submission. Permanent leave and return of COE funds]. Asahi Shimbun 2005, Sep 12 (in Japanese); Ōsaka kenkyū guru-pu ronbun de-ta wo kaizan. Beiigakushi ni torisage shinsei [Data falsification by Osaka research group. Motion to withdrawal from American medical journal]. Mainichi Newspaper 2005, May 19 (in Japanese); Tōdai kyōjyu ronbun ni gimon honnin ni saijikken yōsei daigakugawa "shinrai kakunin dekizu" [Suspicion regarding a report published by a University of Tokyo Professor. Motion to have experiment repeated. University declares "unable to confirm reliability"]. Asahi Shimbun 2005, Sep 14 (in Japanese).
2. See note 1, RIKEN-kenkyūin, de-ta kaizan 2004.
3. See note 1, Ōsaka kenkyū guru-pu ronbun de-ta wo kaizan 2005; Komazawa N, Matsuda M, Kondoh G, Mizunoya W, Iwaki M, Takagi T, et al. RETRACTION: Enhanced insulin sensitivity, energy expenditure and thermogenesis in adipose-specific Pten suppression in mice. *Nature Medicine* 2005;11:691.
4. See note 1, Tōdai kyōjyu ronbun . . . 2005; Fuyuno I. Lack of lab notes casts doubt on RNA researcher's results. *Nature* 2005;437:461.
5. Japan RNA Society. Concerning the ongoing investigation of papers submitted by Professor Kazunari Taira; 2005. Available at: http://wwwsoc.nii.ac.jp/rnaj/tahira_eng.html (accessed Nov 1, 2005).
6. See note 1, Meidai, kyogi shinsei . . . 2005.
7. Japan Society for the Promotion of Science. 21st Century COE Program. Available at: http://www.jsps.go.jp/english/e-21coe/index.html (accessed Nov 1, 2005).
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9. See note 7, Japan Society for the Promotion of Science 2001.
10. Science Council of Japan. Kagaku ni okeru fuseikōi to sono bōshi ni tuite [Ethical misconduct in science and its prevention]; 2003 Jun 24 [in Japanese].
11. Science Council of Japan. Available at: http://www.scj.go.jp/index.html (accessed Nov 2001) [in Japanese].
12. Commission on Research Integrity. Integrity and misconduct in research. Report of the Commission on Research Integrity to the Secretary of Health and Human Services, the House Committee on Commerce and the Senate Committee on Labor and Human Resources. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service; 1995; National Academy of Sciences. Responsible science. Ensuring the integrity of the research process, vol II. Washington, DC: National Academy Press; 1993.
13. Rennie D, Evans I, Farthing MJG, Chantler C, Chantler S, Riis P. Dealing with research misconduct in the United Kingdom • An American perspective on research integrity • Conduct unbecoming—the MRC's approach • An editor's response to fraudsters • Deception: difficulties and initiatives • Honest advice from Denmark. *British Medical Journal* 1998;316(7146):1726–33.