



Lj. VUČKOVIĆ-DEKIĆ

INSTITUTE FOR ONCOLOGY AND RADIOLOGY OF SERBIA,
BELGRADE, YUGOSLAVIA

Good Scientific Practice

ABSTRACT

This educational lecture is motivated by the need, widely recognized worldwide, for professional self-regulation in science. It discusses the proposals of the International Commission for safeguarding Good Scientific Practice (GSP). These proposals are principally addressed to institutions of science - universities, independent research institutes and funding organizations, but through them also to all their individual members. The Commission advises these institutions to establish guidelines of scientific conduct, to set up rules and codify positive norms of science, as well as policies regarding misconduct. The funding organizations are advised not to grant projects in scientific institutions that lack institutional safeguards. It is strongly suggested that research ethics education, largely neglected worldwide, should be addressed not only to trainees, but also to senior scientists; the positive conception of good conduct in science is a promising approach for education and reform in professional ethics. The activities of two scientific institutions - the Institute for Oncology and Radiology of Serbia and the Institute for Medical Research, Belgrade - related to these internationally accepted initiatives and proposals, are described.

Key words: Good scientific practice; Professional ethics; Scientific misconduct; Quality assurance; Professional education

Address correspondence to:

Dr Ljiljana Vučković-Dekić, Institute for Oncology and Radiology of Serbia, Pasterova 14, POB 228, 11000 Beograd, Yugoslavia

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"Science sans conscience n'est que ruine de l'âme"

(Rabelais)

Short history. During the last two decades, several extremely serious cases of scientific misconduct (1-3) have alarmed not only the entire scientific community, but also the general public worldwide. After wide discussions about the frequency of such highly undesirable cases, and whether the science in its institutions has sufficient control mechanisms for quality assurance, scientists became aware of the need for new regulations to protect science. They also understood that the science had to regulate itself - or the trust of the community would be lost forever.

Several countries that had experienced dishonest scientific conduct have already published definitions of scientific misconduct and regulations for handling allegations thereof. The USA, in which the vast majority of alleged scientific dishonesty has been raised and confirmed, did it in late eighties; in analogy to the USA, the United Kingdom encouraged its universities and research institutions to set up and publish rules of conduct. Denmark was the first European country to form a national body to handle scientific dishonesty. After an extensive analysis of the causes, the phenomenology and the consequences of dishonesty in science (4), and a broad discussion among the Danish scientific community, the Danish Committee on Scientific Dishonesty was established in 1992; since 1996, it is within the competence of the Danish research ministry (5). The Danish practice promoted similar regulations in other Scandinavian countries.

Background. An unusually serious case of scientific misconduct in Germany (6,7) prompted the appointment of the International Commission on Professional Self Regulation in Science; in 1998, the Commission published its Proposals for Safeguarding Good Scientific Practice (8). The important aim of these is to pursue discussion of good scientific practice not only in Germany, but also at the European level. The recommendations are principally addressed to the institutions of science, but through them also to all their individual members; they emphasize that the conscious observance of high ethical professional standards of science is the best preventive measure against dishonesty. Therefore, all scientists should regard as their duty not only to observe, but also to promote the principles of good scientific practice through lectures and publications.

The institutional responsibilities for proper care regarding the promotion of good scientific practice should include the following:

- good scientific practice should be an integral part of each institution's corporate identity,
- an organisational framework to be provided, with clear assignment of such tasks as mentorship and quality assurance in research,
- to have procedures to be established for dealing with allegations of scientific misconduct,
- impartial mediators ("ombudpersons") to be appointed, to deal with conflict situations, including cases of suspected scientific misconduct,
- quantitative shortcuts when evaluating the science and scientists to be avoided,
- good scientific practice to be an integral part of the education of the next generation of scientists.

The institutions of science should define rules of good scientific practice in a discussion and decision-making process involving their academic members. Thus the Commission avoided recommending a nation-wide authority (like the USA's and Denmark experiences). The rationale for this solution was the fear of over-regulation, which might suppress creativity (7). In order to spare unnecessary individual efforts, smaller research institutes are advised to accept common rules for institutional safeguards.

The efforts of the Commission to promote academic and procedural safeguards in favor of professional self-regulation in science have met with great success in Germany. Some universities and medical faculties have already set up and published their own regulations; others are expected to do so in the near future. A strong motive for such activity is the decision of principal research funding organizations not to award grants to institutions which do not have internal procedures to safeguard good scientific practice (9).

Situation in Yugoslavia. In our country, no awareness of the need for regulations concerning good scientific practice exists. In our medical schools, the teaching of proper conduct in science is ignored not only during the undergraduate, but very much so during the postgraduate studies. Therefore, the young generation of scientists lacks formal education to meet the highly demanding ethical standards of science. Moreover, when performing science within a group of researchers, young people frequently deplore the lack of attention, insufficient guidance, and exploitation by their superiors. A great many other scientific misconduct issues - from an unhealthy, conflicting atmosphere within a research group, to the violation of basic ethical rules of authorship, peer review system, editorial policy and evaluating research - are often heatedly discussed, but rarely published (10-12). The same is true for the most serious forms of dishonesty - fabrication, falsification and plagiarism - some of which had become notorious, but always silenced in institutions in which they had happened.

Within the institutions of science, there is a complete lack of institutional safeguards for both promoting good scientific practice and dealing with alleged or real infringements. Therefore, in our country, like in many others, this issue has been dormant for too long, and consequently, the lack of constructive guidance and support for good scientific behavior remains.

The Institute for Oncology and Radiology of Serbia's response. In order to sensitize our scientific community to the above-mentioned problems, the Institute for Oncology and Radiology of Serbia (IORS) has lately undertaken several steps. A discussion among its own academic staff about the basic ethical principles of science, phenomenology of misconduct, preventive procedures and sanctions, was initiated. For educational purposes, several lectures on this topic were given, the leading motive for these being teaching scientific integrity and responsible conduct of research; such topics as History of scientific misconduct, Authorship, "Publish or perish" syndrome, Evaluating the science, and the Publishing ethics, were included. Some lectures were addressed to a wider audience (including other research institutions, and also learned societies such as Yugoslav Association of Physiologists). In addition, a considerable part of the seminar "Publishing in biomedicine", organized by the IORS earlier this year, was dedicated to questions of standards and norms of professional conduct of science.

Developing general and discipline-specific codes of conduct is an important element of quality assurance for research; some of them are already incorporated in the Quality System of the IORS (Standard ISO 9001) (13).

In order to achieve the desirable uniformity and avoid excessive individual efforts, the Commission advised that codes of conduct and rules of procedures may be developed jointly for several institutions; accordingly, a joint cooperative working group of scientists affiliated with the Institute of Oncology and Radiology of Serbia and Institute for Medical Research, Beograd, has set down discipline-specific codes of conduct. These codes are now debated among academicians at both institutions; it is expected that they will be confirmed by their Scientific Councils in the near future. The two institutions intend to inform The Ministry of Science of Serbia, our

main funding organization, about these activities, in the hopes of providing an incentive for similar future actions of the Ministry itself.

Future directions. Some of Proposals are addressed to funding organizations, advising them to exercise an influence on the consolidation and the protection of standards of scientific practice. This may be done on occasions such as evaluating grant proposals, the scientific output of individual scientists, or the science of an institution, a region or a nation. The funding agencies should set out the rules of their own, designing specific legal relationship between themselves and the grantees. Their requirements for the proper conduct of research should be layed down and published, and their reaction to violation of the rules specified. A matter of the greatest concern is the emphasis that institutions which do not conform to the codes shall not be eligible to receive grants. This point was cited as the strongest motive for German universities and research institutes to address the problems of scientific misconduct and to issue regulations; since the initiative for safeguarding good scientific practice is accepted internationally, it may be expected that our Ministry of Science will soon follow this trend.

It is in the best interest of scientists to strictly adhere to the principles of good scientific practice during their day-to-day activities; they should also regard as their duty to promote these principles whenever possible (14). This is how this plenary lecture was born; it is also a means the authoress pays tribute to the extraordinarily high ethical standards of science, valid in all countries and in all scientific disciplines.

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