

Responsible writing in science

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"Verba volant, scripta manent" (Latin)
(engl. *spoken words fly away, written words remain*)

Proverb at beginning of this editorial is quite old, but as simple as it is, it very well describes scientific legacy of our time. Science is one of the most exciting human activities and the greatest achievement. Scientific work is complex and hard, requests much effort and discipline. Of all phases of scientific work, writing the final report (e.g. scientific paper) is the hardest one. It is not easy to find out good idea and hypothesis, to design research, to plan and conduct an experiment, to measure and collect data, to process data and extract conclusions but at the end it is the outmost challenge to face an empty paper. That is the final stage of scientific research and it needs to be done well, and if not all previous efforts and results would be in vain.

Written words are scientist's trace that is left for long time, something that "manent", that is the legacy and contribution in magnificent mosaic of global science. Science is of great responsibility, it will influence humans' lives in many ways so it is important to be permanently publicly accessible. Each contribution, no matter how small, improves human knowledge but only if it is honest and original (1). Fraudulent and plagiarised science once published stays publicly exposed for criticism and checking.

There is another proverb well known in scientific world: "Publish or perish". Scientists are recogni-

zed through papers published in respectable and recognizable journals cited in databases such as Current Contents, Science Citation Index, Index Medicus (Medline), EMBASE/Excerpta Medica, Scopus, etc. Citation databases introduced high standards and strict entry criteria for journals that consequently have the strict criteria for publishing papers (2). It is impossible to advance in science (or to gain funds for research) if there is no appropriate number of papers published. In such demanding environment the motive for publishing is not only to share and to contribute, but also to "survive". To shorten this uphill way one can be in temptation to "borrow" words, data, methods or ideas from others and than claims to be his own. That is called: plagiarism – a theft, stealing of intellectual property and trying to gain undeserved benefits.

There are various motives for plagiarism. Some will do it because of lack of knowledge and skills in scientific methodology and scientific integrity but other will do it just to gain undeserved benefits. At the end of the day, regardless of motive, plagiarized papers are useless, misleading, and do not contribute to science. Perpetrators of plagiarism who hope to stay uncovered and get away with it, deceiving themselves. Nowadays, those chances become quite small, especially with development of computer technology and evidence based medicine. Computer technology enables widely accepted electronic publishing leading to quick search and easy access to citation databases, journals' contents and published material that can be compared. Evidence based medicine introduced

meta-analysis and systematic reviews for evaluation of medical procedures. While writing systematic reviews researchers collect papers with particular subjects very thoroughly and besides guidelines and conclusions based on all available studies in field, they also discover plagiarism and scientific misconduct (3). Furthermore, there are efficient computer tools for detecting plagiarism such as plagiarism detecting software and services searching for similar texts published on the internet and comparing them. Scientific community does not tolerate plagiarism. Journals editors trying to stop plagiarised papers before publishing and they became gatekeepers for responsible science.

In this special issue of *Biochemia Medica* Ana Marušić, co-editor-in-chief of Croatian Medical Journal and past president of Council of Science Editors and World Association of Medical Editors summarizes editorial policies in scientific integrity, papers processing, flowcharts and recommendations for editors to ensure the integrity of published material (4). It is very important for authors to be aware what criteria they have to fulfil and what to expect from editors in the publishing process.

It is obvious that plagiarism is not solution for "empty paper" and that great effort should be made for responsible writing. It is not allowed to copy those "perfect sentences" already published and expressing exactly the same thoughts regardless who is the author. Reusing the same text and presenting it as new is self-plagiarism, unacceptable act and can not be considered as responsible writing (5).

Another issue often connected to plagiarism and self-plagiarism is issue of language. The extended version of previously mentioned proverb is: "Publish in English or perish". Vast majority of scientific publications are in English and it is highly requested to write and publish in English to be recognized in broader scientific community. "English as the second language authors" with limited English proficiency have further obstacle when writing. Copying text from already published papers that have been language proof and just inserting own data is not solution for overcoming language barrier. Such papers can be detected and authors

can be revealed as plagiarist without real intention to plagiarize (6).

What every author needs to know about scientific misconduct, plagiarism and self-plagiarism and how to avoid it is well explained in another paper in this special issue. Miguel Roig writes about plagiarism and self-plagiarism in scientific and academic community explaining why such acts are harmful to science and how to avoid them (7).

Plagiarism and other forms of academic misconduct are present among students (8,9). Inadequate education in academic and scientific integrity opens "behavioural grey zone" in which students make their own "code of conduct" what is acceptable and justifiable behaviour. Results from two researches studying prevalence and attitudes towards plagiarism published in this special issue revealed an urgent neediness for education especially in communities with high tolerance of plagiarism. Ruben Comas-Forgas presented data on prevalence of plagiarism among students in Spain (10) and Vanja Pupovac data on students attitudes toward plagiarism in Croatia (11). Both studies point out that students still tolerate plagiarism, they find different justification for such act and do not have clear attitude towards it. Dishonest students will likely grow to dishonest experts or scientists. The base for responsible science lies in responsible education that has to start early in educational process. That is the only way that leads to necessary changes in attitudes of whole society. Attitudes are strongly connected with cultural environment (12). Societies with higher tolerance of plagiarism are those with higher rate of corruption that is characteristic to post-communist and transitional countries (13,14).

There is no scientific community that is resistant to fraud and misconduct, but there are communities that strongly condemn that. Vedran Katavić, research integrity editor in Croatian Medical Journal, in this issue gave an overview of the most famous cases of scientific misconduct, what happened, how they have been discovered and sanctioned and what can we learn from that, emphasising importance of responsible conduct of research and how to gain good bases in responsible science (15).

The idea of special issue of *Biochemia Medica* with topic of responsible conduct of research and responsible writing in science rose from neediness for promoting high standards in publishing and wish to help authors and readers in their effort in scientific work and writing. Introducing high standards

of integrity in journal policy rise up its reputation (16) and that is the aim for editors in *Biochemia Medica*. Editors and authors of special issue hope that papers will strike their goal, point out important, crucial prerequisite in science that is often neglected.

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