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"Anyone who allows his or her name to appear among the authors of a paper assumes major responsibilities...Coauthorship should denote at least that there has been meaningful participation in the planning, design, and interpretation of the experiments and in the writing of the paper."

Arnold S. Relman (cit. in ref. 1)

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## Authorship-coauthorship

**KEYWORDS:** Authorship; Publishing; Science; Research; Ethics

### ABSTRACT

*The scientific authorship is based on creativity and originality. Apart from being the means for the attribution of the credit, the authorship also comprises the responsibility and accountability, and it is also the basis for evaluation of scientists. Because of steady rise in the number of multiauthored articles in biomedical sciences, the problem of undeserved authorship has emerged. Since the false authorship undermines the very basis of the publication ethics, the scientific community has undertaken measures for the prevention and remedy of such a highly unethical issue.*

Scientific publication is the most important way to communicate scientific information.

However, it is not only just this: it is also the primary means whereby priority is established and academic promotion is determined (2). Authorship is often the sole basis for academic advancement, and because of that, the authorship issue is of great importance for all scientists.

*Authorship.* An author is the originator of both information and written work. The intellectual creativity and originality are the primary basis for scientific authorship. It implies credit for creative work, but also accountability and responsibility. In single-author articles, the author does not share the responsibility, and both credit and criticism are addressed to him only. However, in medical sciences multiauthored articles are on exponential rise, and the term "author" has some additional meanings.

*Multiauthorship and problems that may arise thereof.* In multiauthor articles, the term "authorship" refers to the listing of names of participants in all communications of experimental results and their interpretation. Coauthorship implies personal responsibility for the content of the paper.

It is assumed that all persons listed in byline are qualified for authorship, i.e., that they meet the criteria for authorship. These criteria, the core of which is given below, are made and widely distributed by the members of the International Committee of Medical Journal Editors (ICMJE), also known as the Vancouver group (3):

All persons designated as authors should qualify for authorship, and all those who qualify should be listed. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. One or more authors should take responsibility for the integrity of the work as a whole, from inception to published article.

Authorship credit should be based only on 1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content; and 3) final approval of the version to be published. Conditions 1, 2, and 3 must all be met. Acquisition of funding, the collection of data, or general supervision of the research group, by themselves, do not justify authorship.

The ICMJE criteria for authorship, as well as those of other institutions of science (4,5) clearly state that authors must assume responsibility, as well as accept credit, for publications that they sign. However, in multiauthored articles, which now prevail in biomedical sciences (2,6,7) the responsibility and accountability are often obscured and diluted, and many ethical problems have emerged.

*Undeserved authorship.* Along with increasing number of coauthors, the percentage of undeserved (false) authorship also increases (8,9). Various forms of false authorship are defined and classified in two major groups:

- Honorary (gratuitous, gift) authorship is the assigning authorship to persons because of their authority or prestige, or as courtesy. The reasons for including an undeserved coauthor are pressure to publish, sense of obligation, fear of offending someone, pressure from another coauthor, or explicit demand - all in hopes of reciprocation, or gaining favor. Such an unethical behavior is motivated primarily by academic promotion policies, which favor publication quantity rather than quality (8, 10).

The acceptance of gift authorship is also a culpable act of deliberate misrepresentation (1). Although recognized as such, the authors justify this common practice on grounds of pressure to publish, improving chances of publication, encouraging collaboration and maintaining good working relationships (11).

Almost an inversion of honorary authorship is

- Ghost authorship, i.e., excluding from the list the persons that meet the authorship criteria. In this case, the person who actually wrote the article is

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The manuscript was received: 31. 07. 2003.

Accepted for publication: 18.09.2003.



not included in byline and therefore is deprived of authorship (2). This person (ghost author) may be hired by someone else who either does not know or do not have time to write paper, or is not fluent in the language (1). A variant of this practice is some drug manufacturers' practice to hire academics to communicate the results of research done by their own staff (2).

Usually, the victims of depriving of authorship are junior researchers (1,12), which makes this unethical behaviour even more serious.

Awarding honorary authorship and concealing ghost authorship is incompatible with the principles, duties, and ethics of publication endeavor (13). Authorship cannot be conferred but must be earned. This is why the misapplication of authorship criteria and inappropriate assignment of authorship are classified in the central area of dishonesty.

It is undisputable that traditional values of authorship are inextricably linked with integrity in research (1). The scientific community is now very much (and righteously) concerned with persistent and obviously increasing abuses of authorship. It is recognized that the practice of unearned (undeserved) authorship is unacceptable (14,15).

Almost all researchers had experienced problems with authorship: many had assigned inappropriate coauthorship, and many had been excluded when they thought they deserved it (16). Since quarrels over authorship constitute the bulk of misconduct cases (11), and since the author disputes undermines the atmosphere of cooperation in research groups, all actors in the publishing process (authors, reviewers and editors) are undertaking measures for dealing with this issue.

Development of the authorship criteria. First of all, it is agreed that clear guidelines and criteria for authorship must be developed and made widely known (9). This is not sufficient: these criteria should be accepted by all investigators. It seems that existing Vancouver criteria are either insufficiently known or, when known, they are not workable (17).

Sceptics argue that "a set of guidelines will not influence the behaviour of authors" (18) and that trying to apply them would "encounter insurmountable obstacles" (19). However, the guidelines certainly provide information how to resolve dilemmas relating to authorship issues (20).

Many major and reputable medical journals require that each individual coauthor of a submitted manuscript sign that he made sufficient contribution to the research to merit authorship. It is an attempt to make it clear to coauthors that, as they take credit, they accept responsibility as well (21). This is based on the experience that coauthors of fraudulent scientists defend themselves by denying knowledge of fraud (2).

The explicit criteria for evaluating authorship according to the order in the byline are still lacking; the current practice is that credit for publication is given to all coauthors equally, while the responsibility is diminished and diluted (2). This practice exacerbate the multiauthorship - undeserved authorship problem. In order to stop exponential rise of coauthors and irresponsible coauthorship, it is advisable to address this problem even before the preparation of the manuscript, using the formulas that determine exact contribution, according to the Vancouver criteria, of each coauthor (8).

Drummond Rennie, deputy editor of JAMA, proposed a radical conceptual and systematic change to reflect the realities of multiple authorship. His proposal imply the replacement of authorship system by the contributor-guarantor system. Instead of simple listing the (co)authors names, the specific contribution of each of them (that is, who did what) should be clearly stated at the end of the article; at least one person should take the responsibility for the whole published research (guarantor).

*The proposal has faced both approval and opposition.* Meanwhile, some journals (Lancet, BMJ) have adopted the contributor system. They ask contributors "to sign statement that they accept full responsibility for the conduct of the study, had access to the data, and controlled the decision to publish" (17). It is hoped that would ensure fair allocation of authorship. Time is needed to assess whether such a policy helped to diminish the authorship problems; meanwhile, the self-constraint of the researchers is the best way to avoid the conflicts that may arise from the irresponsible attribution of authorship.

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