

## Authorship and Publication

### 8.1 Authorship and Publication

#### Background

Authorship is the most visible form of academic recognition and credit. However, because credit for publication is also important in disputes and allegations of research misconduct, it is worth considering why authorship credit is more than a matter of personal gratification. Indeed, attribution of credit and responsibility is central to the structure of science. The framework of science depends in part on the ability of institutions, policy makers, and the public to identify who is responsible for the work and its interpretation. Funding agencies consider past success, as evidenced by authorship, in the allocation of research grants. Research institutions often use authorship as evidence of creative contributions that warrant promotion. Scientists themselves may use credit for past work as a mechanism to attract both new trainees and willing collaborators. Finally, in an era of increasing emphasis on commercialization, authorship and credit help to define intellectual property rights. These and other reasons explain scientists' desire for the credit of authorship, and also make clear why the assignment of authorship is central to the responsible conduct of research.

#### Publication

Publication of results is an integral and essential component of research. All researchers are encouraged to promote their work through publishing and other forms of dissemination. Publishing includes:

- Publishing in peer-reviewed journals and books
- Publishing in non-peer-reviewed journals
- Conference presentations (peer-reviewed and non-peer-reviewed) and/or published in proceedings
- Posters presented at conferences
- Reports commissioned by external organizations
- Promotional reports and materials on research
- Articles in the popular press and other media
- Publication in web-based journals and project web sites

As the aim of research (particularly publicly funded research) is to promote the advancement and dissemination of knowledge, publication and presentation of results to the specialist research and wider community is recognized as a fundamental part of the research process. As research is assessed by mechanisms such as the Research Excellence Framework, the impact of outputs and publication are of considerable importance. Researchers are encouraged to publish their work in peer-reviewed publications and media, including research journals. Researchers

should give priority to publishing in those publications which employ rigorous standards of peer review.

Researchers are also encouraged to follow best practice in publication as detailed in guidelines issued by, for example, the Singapore Medical Journal (SMJ) or the widely acceptable International Committee of Medical Journal Editors (ICMJE). Researchers can also receive guidance in press liaison from their institutions' guide or policy with respect to articles in the press, the broadcast media and other high profile reporting

### Good conduct in publication practice

In publication and authorship, as in all other aspects of research, researchers are expected to follow the principles of good research conduct supported by the institutions they worked with. It is essential that the parties involved in research and publication discuss and agree on:

- Authorship
- Recognition of other contributions
- Acknowledgement of sponsors
- Declaration of any conflicts of interest

### Authorship

Generally, an author is considered to be someone who has made substantive intellectual contributions to a published study. This includes anyone who:

- Made a significant contribution to the conception, design, execution or interpretation of the research study
- Drafted or substantively reviewed or revised the publication
- Approved the final version of the publication

There is great variation in practice among different disciplines and research fields. Thus there are no universal sets of standards for authorship which can easily be formulated. The widely accepted ICMJE guidelines set a high standard but there are different practices about who should be included as an author on a paper. This places most of the responsibility for decisions about authorship on the researchers who participated in the work reported in each publication. These decisions are best made early and at the start of each project to avoid misunderstanding and authorship dispute later on.

The SMJ also stipulates that all individuals designated as authors should qualify for authorship. However, each author should have sufficiently participated in the work material submitted to SMJ to justify the authorship according to the ICMJE guidelines on Uniform Requirements for Manuscripts Submitted to Biomedical Journals (see 8.2 for further information).

### Authorship guidelines

Researchers should seek to publish their results in a manner which conforms with current best practice and in compliance with any relevant sponsors/ grant's terms and conditions. In doing so they should take steps to ensure that they:

- Use the most appropriate means to publish the results of their research;
- Publish their data in an appropriate form, typically as papers in refereed journals;
- Comply with the Institution policies and funder requirements in the dissemination of the results of research and, where appropriate, seek guidance and approval to report data to the media;
- Publish a coherent report of the work and not report the data more than once (unless in a secondary analysis) or sub-divide the data (unless this was a predefined approach), reproduce the data in total, or in part, in a number of reports (unless clearly referenced and justified);
- Report and discuss the findings of their research and include all data generated by the study;
- Analyze the data using appropriate methods of statistical analysis;
- Provide a summary of the work written in terms that will enable the layman to comprehend the work and to provide appropriate feedback to those who took part in the study, including any professional or lay groups that have contributed to, or took part in, the study;
- Acknowledge and cite the work of others where appropriate, fully and accurately attributing relevant sources;
- Take steps to ensure the accuracy of the data reported and act immediately to correct any genuine errors or misunderstanding that might subsequently be revealed in the data or its interpretation;
- Acknowledge the funding, support, sponsorship and other forms of input (including that of the Institution) to the work in an appropriate way;
- Give notice of intention to publish and seek approval, where appropriate, to publish, from all partner organizations;
- Openly declare all relevant interests, as required by the publisher and by the Institution's conflict of interest policy;
- Do not seek media exposure for research which has not been subject to peer review, unless sanctioned by the Institution and all other parties involved in the research;
- Handle the release of research data which might have high impact and/or which might have an impact in the commercial world (positive and negative) with appropriate care and sensitivity, consulting the Institution and other partners as appropriate;

Where the work has more than one author, the researchers should also:

- Agree on the contribution each will make to reporting the work and review this commitment regularly as the work progresses;

- Appoint a lead or executive author to lead for communication on the work;
- Report the work fairly according to the contribution each author has made to the work and neither omit nor underplay a contributor's input or overplay such input or add in someone who did not contribute to the work in a way that would justify their inclusion as an author or co-author
- Comply with the definition of author and co-author as defined by the journal in question or that of international organizations such as International Committee of Medical Journal Editors
- Provide a formal offer of authorship (which should be accepted or declined in writing) to those meeting the agreed definitions (see above)
- Maintain a file of all relevant signatures in case of disputes

### Ranking of multiple authors

Well, how should the order of authors be determined? The ICMJE now says only that "The order of authorship on the byline should be a joint decision of the co-authors. Authors should be prepared to explain the order in which authors are listed."

This provides precious little guidance, let alone advice for dispute resolution. An earlier version of the guidelines required the following process:

Step 1. Conception of the work represented by the article, design of the work, analysis and interpretation of data or other evidence presented in the article, or all of these.

Step 2. Drafting the article or revising it for critically important content.

Step 3. Approving the final version of the article for publication.

The relative contributions of authors to the intellectually most critical aspects of the work should determine their sequence. Contributions in Step 1 should be given the greatest weight. The first author should have made major contributions in Steps 1 and 2; the following sequence of authors should represent progressively lesser contributions. But this process met with a number of objections and was omitted. Still, it gives a sense of the values that should be brought to bear in making these decisions. What emerges as the best strategy, in any case, is open and frank discussions about the publication plan, the authors to be named and their order should be held early in the life of a scientific project, and revised as necessary.

## **8.2 INTERNATIONAL COMMITTEE OF MEDICAL JOURNAL EDITORS**

### International Committee of Medical Journal Editors

Perhaps the best-known attempt in all the sciences to establish criteria for authorship is that of the International Committee of Medical Journal Editors (ICMJE). The group's periodically revised "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" provides a suite of standards for publication and authorship. Here, from the ICMJE Web site, are the criteria for authorship.

Authorship credit should be based on:

- Substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;
- Drafting the article or revising it critically for important intellectual content; and
- Final approval of the version to be published

#### Conditions to be met

When a large, multi-center group has conducted the work, the group should identify the individuals who accept direct responsibility for the manuscript. These individuals should fully meet the criteria for authorship defined above and editors will ask these individuals to complete journal-specific author and conflict of interest disclosure forms. When submitting a group author manuscript, the corresponding author should clearly indicate the preferred citation and should clearly identify all individual authors as well as the group name. Journals will generally list other members of the group in the acknowledgements. The National Library of Medicine indexes the group name and the names of individuals the group has identified as being directly responsible for the manuscript.

- Acquisition of funding, collection of data, or general supervision of the research group alone does not justify authorship of data;
- 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.

These guidelines are imperfect and open to debate, but what emerges is crystal clear in terms of maintaining the credibility and utility of the biomedical corpus. Moreover, it is important to note that these guidelines have been developed and refined by journal editors themselves, often physicians and scientists with their own track records as authors. This means that the rules have not been imposed by outsiders or regulators or moralizers looking for trade, or to pass judgment. The guidelines should be seen as internal to the professions to which they apply. Of these requirements, one is particularly vexing to graduate students and certain others: "... collection of data ...alone, does not justify authorship." One might speculate that thousands of people have been made co-authors precisely and exclusively because they did no more than collect data. While data collection is an essential and non-trivial task, it is not a sufficient justification for credit as an author: The data collector has not

contributed intellectually to the project in a way comparable to the effort of those cited by the ICMJE. There is a happy solution to this: include graduate students in the intellectual life of the project so that they participate in design of the work, drafting of the article, and final approval of the manuscript. This approach would not only ensure that their authorship is deserved and bona fide, but that it also produces a more comprehensive education and training experience.

### **8.3 HOW SHOULD MULTIPLE AUTHORS BE RANKED?**

#### Determining the One

There is some reason to believe that authorship (what is required to be listed as an author, as above) and the order of authors' names are the greatest sources of conflict among scientists. How should multiple authors be ranked? A number of social forces and customs are at work here, too.

Generally, the "first author" is and should be regarded as the most important one, that is, the one who made the most critical contribution. This practice, however, has been diluted. Now, senior scientists and mentors, hoping to advance their protégées' careers, have adopted what has been called an "after you, Alphonse" approach whereby the junior scholar is made the first author and the senior is demoted; in multi-authored papers, the senior might even become the last author listed. A number of codes for the "most important" author have also evolved. In papers with many authors listed alphabetically, the "first author" is the nth author, identified as the "corresponding author" or the one from whom to request reprints.

#### Ranking

The ICMJE now says only that "The order of authorship on the byline should be a joint decision of the co-authors. Authors should be prepared to explain the order in which authors are listed." (See 8.2)

### **8.4 PROFILING**

#### Redundant Publication and Self-plagiarism

There are additional ways to inflate one's CV besides "getting one's name on a paper" without doing any of the research. These include publishing the same paper more than once. According to the ICMJE, "Redundant (or duplicate) publication is publication of a paper that overlaps substantially with one already published in print or electronic media". Why is this wrong? The answer *should* be obvious by now. Redundant publication corrupts - and unnecessarily bloats - the scientific corpus by suggesting that a particular scholar is more prolific than he or she actually is, which is

deceptive. Any student or scholar hoping, for instance, to study or review the work of Professor So-and So, and who goes to any length to obtain copies of that work, will be frustrated, disappointed and perhaps angered to find that more than one article says the same thing. The feeling will be of frank betrayal when it is discovered that two or more articles are literally the same, word for word - except perhaps for the title. Such cases, in which one copies one's own work and then passes it off as novel, are sometimes called "self plagiarism". This is a particular problem for many students across the curriculum, as for instance when a term paper written for one course is resubmitted later for another. There are some justifications for what the ICMJE calls "secondary publication," but they all require some sort of disclosure in print, permission of both editors, etc. It should be uncontroversial to point out that not only must such redundancy be disclosed in print but also that it should also be disclosed or labeled in one's CV.

### Fragmentation

Another way to inflate one's CV is to divide the results so as to generate several articles, or even as many as possible. That is, one might want to analyze data in such a way as to justify their reporting in as many journals as possible. Such fragmentation has come to be called the search for the "least publishable unit" or LPU. While there is something droll about that term, its acronym and their use, the actions involved might constitute another corpus-bloating deception. The rationale for such fragmentation matters. If a scientist's intent is to generate as many articles as possible, the better to impress colleagues, get grants, or win promotion, and then we should regard this strategy as deceptive and therefore blameworthy. If, however, a compelling or even reasonably adequate scientific case can be made for subdividing the reports, then the strategy might be permissible. Suppose, for instance, that an experiment or research program credibly addresses different questions, and that these questions are of interest to different audiences. In such a case the multiple publications would be appropriate (though their relationship to each other should be disclosed in print). As with the order of authors' names, the question of what constitutes an appropriate publication strategy should be discussed and debated by the research team early in the research process.

### Acknowledge other contributions fairly

Even the act of thanking someone can raise ethical issues. One of the most interesting deceptions is the acknowledgment of someone of status in hopes of enjoying a halo effect or benefiting from reflected glory. Therefore, researchers must ensure that all those who have contributed to the research, such as facilities and materials are properly acknowledged. This includes researcher assistants and technical support as well. Written consent must be obtained from individuals if they are to be named. It is not clear how great or what kind of contribution is adequate for an acknowledgment; this is a judgment call. But the demand for permission from the acknowledged is one way to try to reduce this kind of deception. One might surmise

that some of those who are asked for such permission will not feel collegial if they refuse, which makes their consent a kind of acquiescence to the deception. Moral courage is perhaps the only way out of such tight spots.

## 8.5 REFERENCES & ACKNOWLEDGMENT: AUTHORSHIP AND PUBLICATION

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