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The 2 Out of 3 Rule for Authorship

By Heidi M. Dierssen

Determining the authorship of scientific manuscripts is no easy task in today's world of large co-investigator, interdisciplinary research. I first stumbled upon this problem as a graduate student when one of my supervisors pulled a thick three-ring bound notebook from his shelf in answer to one of my questions. Curious, I asked about the origins of this "book." He mentioned that he and several others had prepared it many years ago, but that it had never been published because they could not decide on first authorship—a fatality of scientific egos and rivalries. Sadly, the objectivity of the scientific method is not always relayed into the business of doing science.

The question of first authorship isn't always so contentious, but determining who else should be listed as an author is a recurrent challenge. What level of effort constitutes authorship of a research publication? Back in 1985, Roger Winston came up with a point-based system for determining order and merit of authorship of a research manuscript that involved 12 different activities, but that approach was likely too complex and never took hold. However, one of my mentors, Richard Zimmerman, passed along the "2 out of 3 rule" that has served me well over the years. To warrant authorship, an individual must play a substantive role in at least 2 out of 3 of the following tasks:

- 1. Ideas.** Was the individual involved in the developing the concept for the research, either through writing the proposal or through informal discussions?
- 2. Data & Analysis.** Did the individual collect and/or process data that is integral to the research? Work up figures, tables, or methods that were used in the paper?
- 3. Writing.** Did the individual provide substantial input in the writing and/or editing of sections of the manuscript?

The 2 out of 3 rule means that an individual is not an author if he or she merely collects an organism or provides a piece of equipment for the research. It means that technicians who "plug and chug" through many samples do not necessarily warrant authorship of a paper unless they are involved in analysis and writing, as well. A co-investigator who facilitated writing the grant proposal does not necessarily get authorship of a manuscript unless he or she contributed to data collection, analysis, or writing for the publication. All the above warrant acknowledgment, but not authorship in a manuscript. An advisor who procures funding for the research (*Ideas*) and provides editing of a paper (*Writing*) would be included as an author.

I know that in this "I scratch your back, you scratch mine" world, there is often no disadvantage to adding someone as an author. Who doesn't need one more publication to their credit? However, I humbly submit that authorship should mean something about the level of effort in the research. The 2 out of 3 rule is simple to apply and clears up much of the ambiguity. ☑

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