

## Great expectations

Howard A. Rockman

*J Clin Invest.* 2012;122(4):1133-1133. <https://doi.org/10.1172/JCI63462>.

### Editorial

On the occasion of the 200th anniversary of Charles Dickens's birth, I am struck by his creative genius and by the parallel between the intellectual development of his protagonists and the evolution of peer review. Like many of his novels and serial writings, the story of the history of peer review is a bildungsroman, one that has followed a process of growing up, sought answers through a journey marked by achievement and disappointment, and ultimately matured to be accepted by a community.

**Find the latest version:**

<https://jci.me/63462/pdf>





## Great expectations

**On the occasion of the 200th anniversary of Charles Dickens's birth, I am struck by his creative genius and by the parallel between the intellectual development of his protagonists and the evolution of peer review. Like many of his novels and serial writings, the story of the history of peer review is a bildungsroman, one that has followed a process of growing up, sought answers through a journey marked by achievement and disappointment, and ultimately matured to be accepted by a community.**

While the first documented description of a peer-review process is in a book called *Ethics of the Physician* by Ishap bin Ali Al Rahwi (CE 854–931), our current concept of peer review as a mechanism for quality control in science can be traced back to the mid-1700s (1). It was in 1752 that the Royal Society of London for Improving Natural Knowledge adopted a process previously used by the Royal Society of Edinburgh to send materials submitted to their journal, *Philosophical Transactions*, to knowledgeable people to inspect its contents and make recommendations to the editor concerning its publication (1).

At the *JCI*, peer review began in 1942 when James Gamble, then Editor in Chief, established a policy of sending papers to experts beyond the Editorial Board for evaluation of scientific rigor and consideration for publication (2, 3). The next Editor in Chief, Eugene Ferris, Jr., extended this practice by requiring two outside critiques and also allowed non-ASCI members to act as reviewers (2, 3). At the *JCI*, scholarly peer review has evolved over the years to its present-day form, whereby manuscripts are assigned to appropriate Associate Editors who make a decision on whether it merits external review.

Since historically, approximately two-thirds of submitted manuscripts are editorially rejected, you may be wondering what criteria we will be using to determine worthiness for a full review. As I mentioned in my March editorial, we are looking for papers that show scientific excellence and clinical significance (4). Essentially, I have instructed the board to ask themselves the following questions: If all the experiments in the manuscript are rigorously performed, will the data provide new insights into a disease? Does the study demonstrate mechanism and generate new knowledge? Does it have the potential to alter the practice of medicine? If the answer to any of the above is yes, then your paper will likely be sent out for review.

Some have argued that since the traditional peer-review system is imperfect, newer approaches need to be implemented (5). However, I believe that scholarly peer review need not be replaced, but strengthened by enhancing transparency of the data (6). I have therefore instituted a number of policy changes at the *JCI* to help the Editorial Board – and ultimately you, our readers – be able to better evaluate studies for their scientific rigor and data integrity (<http://www.jci.org/kiosk/publish>). To maintain the highest level of trustworthiness of data, we are encouraging authors to display data in their raw form and not in a fashion that conceals their variance. Presenting data as columns with error bars (dynamite plunger plots) conceals data (7). We recommend that individual data be presented as dot plots shown next to the average for the group with appropriate error bars (Figure 1). Adequate sample size is a must, particularly for animal experiments, in which biological and technical variability can be substantial. For animal experiments, small sample sizes will be discouraged. We will require that all submissions be accompanied by a supplemental file that displays entire unedited versions of all representative cropped gels displayed in the figures of the manuscript. For manuscripts ultimately accepted, publication of this file will not be

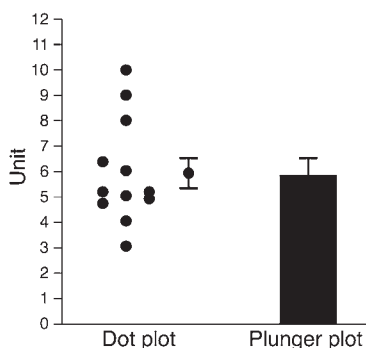
required, but authors may choose for us to publish it. To reproduce published work, the cornerstone of scientific integrity, the scientific community needs to be able to clearly know the methods used. Therefore, we encourage authors to submit a supplemental file detailing the precise methods and methodology used for their experiments, instead of back referencing to multiple years of previous publications. Methods and procedures change over time, and even seemingly minimal changes can have important consequences for reproducibility. Lastly, we would like authors to limit manuscript titles to ten words, preferring descriptive titles that are clear and succinct.

At the *JCI*, the Editorial Board relies on transparency of data to evaluate the scientific rigor and integrity of studies so that we can publish the best research in biomedicine. Unfortunately, misbehaviors often thought of as less serious (dropping data points, poor record keeping, poor research design, etc.) are all too common. In a survey of a little over 3,200 mid-career scientists, it was found that many scientists engage in these types of bad behaviors. While they do not make attention-grabbing headlines like egregious acts of data falsification, fabrication, and plagiarism, they are nonetheless just as pernicious (8). I hope that the policy changes we are implementing at the *Journal* will be welcomed by the scientific community and help us continue *JCI's* reputation of publishing the most robust science.

As Mr. Jaggars famously said to Pip in Charles Dickens's novel *Great Expectations*: "Take nothing on its looks; take everything on evidence. There's no better rule."

### Howard A. Rockman, Editor in Chief

1. Spier R. The history of the peer-review process. *Trends Biotechnol.* 2002;20(8):357–358.
2. Savla U. Reflecting on 80 years of excellence. *J Clin Invest.* 2004;114(8):1006–1016.
3. Wilson JD. The Journal of Clinical Investigation 1974. *J Clin Invest.* 1974;54(4):xv–xvii.
4. Rockman HA. Tradition, tradition. *J Clin Invest.* 2012;122(3):785–786.
5. Birukou A, et al. Alternatives to peer review: novel approaches for research evaluation. *Front Comput Neurosci.* 2011;5:56.
6. Altman DG. Poor-quality medical research: what can journals do? *JAMA.* 2002;287(21):2765–2767.
7. Drummond GB, Vowler SL. Show the data, don't conceal them. *J Physiol.* 2011;589(pt 8):1861–1863.
8. Martinson BC, Anderson MS, de Vries R. Scientists behaving badly. *Nature.* 2005;435(7043):737–738.



**Figure 1**

Data set of 12 observations, displayed as a dot plot alongside the mean and SEM (left) and as a plunger plot with SEM (right). The dot plot clearly reveals the distribution of the data, whereas the dynamite plunger obscures the skewness of the data.