

Round Table Science and Integrity How do I know a scientific paper isn't junk?

Note: 4th in a series on **Integrity in Science and Medicine**. Future presentations are planned to include an annotated bibliography on clinical trials looking at fungal colonization of nasal passages and sinuses; phagocytic cells such as eosinophils; eosinophilic major basic protein and TGF beta-1.

The science strongly suggests that there is no basis to treat someone for months with anti-fungals for fungi that are supposed to be doing bad things because they were found in the nose. In a nutshell: They aren't. *Read why in the next essay.*

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The subject of this report is the recent proliferation of online science journals that aggressively market publication to targeted authors for a fee. These new journals will publish papers quickly though usually without much scrutiny, providing free online access to the public to new information.

The following are issues for which the scientific community needs to review and set standards:

1. If there are problems in the methods of a study, how does that affect the reader's ideas of what is worthwhile science versus junk science?
2. How about lab testing?
3. How can the interested reader know what claims are junk and which aren't?
4. Who and how competent are reviewers?

Don't forget that this is the era of fast publication, and when costs of \$5000 for a quick citation used to promote a product are just an advertising cost of doing business. The public might unknowingly be duped by lack of scientific integrity. Some routinely observed problems with on-line journals include sloppy peer review; absence of acceptable or aberrant methods; rampant speculation; no restriction on generalization; uncontrolled and unfounded assumptions; and invariably (among others), an inadequate or biased reference base. Finally, the desultory treatment of control populations, often the most difficult aspect of clinical trials, is almost universal in journals that sell authorship of bundled papers (Beware the "Ides of Special Editions"!) to special interest groups.

How can you recognize junk science easily?

1. **Look for three things: Methods, methods, methods.** If what was done doesn't make sense, don't even read the conclusions.
2. **Look for decent control groups.** If the patient is his own control for an intervention study, that approach works. But if you see someone looking at cases to make a suggestion for

testing (money, money, money), and no control group is presented throw the study away and don't buy the product.

3. *If the study is full of unsupported speculation or uses dubious authorities* (Just imagine reading, "According to the Mitochondrial Society of Pocomoke." That unreferenced citation won't cut it), toss it.

4. *If the paper doesn't use a prospective study design, it cannot possibly determine causation.* And if the prospective design ignores reasonable variables, junk it is.

5. *Conflicts of Interest.* Oh my, this one is so obvious, how can concealment ever be permitted? And then see a co-author who was also an editor of the same paper!

6. *Biased populations.* Don't tell me about a universal cure when the only participants are men or women of one age group.

7. *Absence of delineation of the methods* used to validate antibody testing in ELISA (*see attached opinion on unreliable ELISA testing*).

8. *Claims for treatment benefit* without documentation of before and after data. This one seems so blatant; it usually is some sort of opinion piece in which the author is building a case for their approach but we never see what happens with any intervention.

9. *Ethics review.* If one is going to write about human research, someone better have overview from an IRB. Sure IRBs are expensive and who wants to fill out all the forms? But IRBs, like the IRS, can grind exceedingly fine. Don't cheat the public by not having a licensed group review methods and ethics, especially if one is selling something, either directly or indirectly.

10. *Thorough references.* When anyone is referencing publications to make a point in one's own favor, omitting opposing points of reference is just plain academic fraud.