Editorial

Independent or codependent?—industry, academics, and the publication of medical research

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Collaboration between professionals employed by biomedical companies and academic scientists can be mutually beneficial. Academics provide expertise in the conduct of clinical trials and the ability to recruit patients, while industry provides expertise in converting scientific findings to viable business products. Academics focus on the science, and industry focuses on applying the results. Joint conduction of a clinical trial helps both parties better understand disease mechanisms and improve hypothesis generation. In an ideal situation, this relationship results in academic driven scientific research first, then commercial applications second. With no preconceived commercial agenda, academic integrity remains intact. A sustainable academic-industry collaboration model requires both academic freedom and viable commercial applications (1). Optimal collaboration occurs when the noblest goals of medicine drive the science, and solid industrial support enables these scientific discoveries to be commercially viable and widely available.

A recent article in the *BMJ* examined the relationship between academics and industry in clinical trials and found that these relationships compromised academic integrity with regularity (2). The authors performed an observational study that identified the 200 most recent phase III and phase IV trials of vaccines, drugs, and devices. They exclusively examined trials that were fully funded by industry and had at least one academic author. Only trials published by one of the top seven high impact general medicine journals were included: the *New England Journal of Medicine*, *Lancet*, *JAMA*, *BMJ*, *Annals of Internal Medicine*, *JAMA Internal medicine*, and *PLoS Medicine*. A follow-up survey of the academic authors involved in these studies was also conducted to assess their experience participating in the industry funded research.

The study found strong evidence of an unhealthy relationship between academic and industry collaborations. Not only did industry fund the research, industry was involved in the study design in 92% of publications, 87% of the journal articles noted industry co-authors, and industry funders were involved in the data analysis of 73% of trials. Interesting to note is that a greater percentage of studies had data analysis by the funders (73%) than by the academic authors (40%). Contract research organizations (CROs) were involved in 62% of publications.

The second part of this study consisted of a survey of the lead academic authors of the 200 industry sponsored research studies examined. Only 80 authors (40%) responded. Of these 80 authors, only a third stated that academics had the final say on the design, although most found that the collaboration with industry was a positive experience.

The authors concluded that in the most recent 200 industry funded studies published in the top seven high impact general medicine research journals, industry funders were usually involved in every step of the trial. Notably, data analysis is often conducted without any academic involvement. Ghost authorship was common, even though it is well known that such practices can lead to the dissemination of misleading and even false information (3). The authors found evidence of ghost

authorship in 17 out of 80 trials (21%), which likely was an underestimate as some lead academic authors had only a small role in the analysis and reporting of the trial. Because of this limited role, ghost authorship could occur without the academic authors' knowledge.

This study raises several important questions, primarily, is the relationship between academics, industry, and medical journals one of equal partners, or an unhealthy codependency that promotes pseudoscience? Unfortunately, industry influence upon academics and medical publishing appears to be strong and thriving. The foundational building blocks of a clinical trial are study design and data analysis (4). This study of recent clinical trials published in top medical journals found that less than half (40%) of academic authors were involved in data analysis, whereas the industry funder was involved nearly twice as often (73%). Just how can academic authors be truly independent if they are not even involved in the data analysis? When academic referees no longer analyze the fundamental research data, there is a high risk that science will transform into a pseudoscience utilized primarily for marketing purposes.

The authors also found that CROs were involved in the majority of publications (62%). CROs have been utilized by the healthcare industry for decades to assist with medical research. Industry can outsource marketing, medical writing, data analysis, and study design. CROs can also play an important role in ensuring the research complies with all legal rules and regulations. They can reduce research costs by economies of scale and by subcontracting work to poorer nations.

However, CROs are corporations that are profit-driven, which creates a fundamental conflict of interest. Their business, like all businesses, relies on pleasing the customer. In the case of CROs, the customer is typically a for-profit health care company that makes money by selling a pharmaceutical or a medical device. Thus, CROs have a financial incentive to put the best spin on a research study in order to make the drug or device look as good as possible (5). However, there also is the possibility that CROs will improve the independence of medical researchers. An alliance between industry and CROs potentially could decrease conflicts of interest between industry and academics. It is possible that the true value of a CRO is its independence, and that CROs improve their financial bottom line by emphasizing this independence. At this point in time, however, we do not have enough evidence to definitively say how independent CROs are. We only know that they are being used more and more by industry and are here to stay (6).

Finally, this research study would not have been possible if study authors were not required to disclose their affiliations and their conflicts of interest. Transparency and honesty regarding conflicts of interest is required for ethical research (7). But is disclosure of conflicts enough? Transparency is good, but it doesn't remove the conflict. Full disclosure does not appear to always reduce harm from the conflict of interest, it simply makes the conflict transparent. Our goal is accuracy and objectivity, not just a disclosure of in-objectivity (8).

We know how to reduce conflicts of interests among academic researchers. Academic-industrial collaborations can yield fruitful research. While consulting with or accepting grants from industry is not prohibited, a stronger clarification of roles is necessary (9). Having academic researchers be intimately involved with study design and data analysis in 100% of clinical trials would be a good start. We aren't there yet.

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Footnote

Conflict of Interest: The authors have no conflicts of interest to declare.

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