

Commentary

The benefits and threats of research partnerships with industry

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During the past two decades, the involvement of non-academic sponsors of biomedical research, particularly clinical trial research, has increased exponentially. It is estimated that between 1980 and 2003 the overall research and development expenditure by US pharmaceutical companies increased from \$2 billion to \$33 billion [1]. The sources of funding for biomedical research have also shifted significantly towards industry. By 2002, 70% of funding for clinical trials came from industry [2]. The involvement of industry partners in research has undoubted benefits. Drug development is extraordinarily expensive, and government and other non-commercial sources of research funding have generally not been able to or willing to underwrite the enormous sums necessary to develop and test the medications and devices that have made remarkable improvements in the lives of so many.

But partnership with industrial sponsors of research also carries potential threats both to human subject protection and to research integrity. Because such research may result in financial or other rewards for researchers and institutions, commercially sponsored research may taint individual or institutional judgment concerning important aspects of the conduct of research. To the extent that researchers have a financial interest in the success of the research, such as an equity interest in the sponsor, or if the researcher has come to rely upon the sponsor for research funding or for personal income, the researcher has financial interests that substantially align with those of the sponsor; that is, for a successful project with adequate recruitment and positive results. In an increasingly entrepreneurial environment, researchers and and/or institutions may own shares, options, or other interests in biotechnology companies formed for the purpose of exploiting research findings. Such interests may cause the investigator, perhaps unwittingly, to recruit subjects inappropriately, to downplay risks or exaggerate benefits, to cut corners on inclusion/exclusion criteria, or to under-report adverse events. Institutions that have come to rely on industry-sponsored research for overhead payments

and other amounts that support the broader research enterprise may fail to provide adequate oversight to ensure appropriate research practices. While the existence of a financial or non-financial conflict does not itself show improper behavior, maintaining public trust in the integrity of scientific investigation and the protection of human subjects requires that conflicts be carefully managed.

Particular precautions are necessary in critical care to ensure that appropriate research standards are met. For research in the intensive care unit there is frequently limited time available to secure consent, which is often obtained from family members, and in some emergency research may not be able to be obtained at all. Even those patients that appear capable of consenting may have no recollection of their intensive care unit stay, and family members may be overwhelmed when asked to make decisions for a patient with acute or life-threatening illness.

Industrial sponsors of research tend to focus drug and device development on products for which a market exists or can be created, not necessarily on products for which there is the greatest need or social value. Industry-sponsored clinical trials can be of significant financial benefit to research institutions and researchers. Institutions' over-reliance on industry-funded research may therefore skew the institutional research agenda by focusing resources, and the talents of institutional researchers, on studies with commercial applications and away from other important research avenues.

Institutions and investigators should also be aware of potential threats to the integrity of industry-sponsored research. Researchers with ties to industry have been shown to be more likely to report favorable results than researchers without such ties [3-5]. In clinical trials, sponsors have a clear interest in designing a trial that will have the greatest likelihood of demonstrating a positive result for their product. Sadly, sponsoring companies have in the past used a variety of methods to influence aspects of trial design in order to

make it more likely that research yields the desired results [6]. Surrogate endpoints are measured that may at best be weak predictors of a relevant health outcome – or particularly sensitive endpoints, most probably to show a positive response, may be chosen [7,8]. Inappropriate measurement scales [9] and a range of other techniques may also be employed to skew research results in a positive way [10].

Furthermore, data are commonly retained by the sponsor in multicenter trials, who oversees their analysis and interpretation. In the analysis of data, a number of techniques may be employed to give the misleading appearance that the sponsor's product is superior to others. Calculations may be based on unrealistically large effect sizes that make data more likely to show a statistically significant result [11], or conclusions may be based on statistically insignificant differences [10] or inappropriate generalizations from findings [12]. Researchers should be wary also of the bias that may be introduced in industry's reporting of findings. Selective or misleading reports of findings, or conclusions that may not accord fully with the study data, are not uncommon [13].

Researchers should also ensure that research findings are not suppressed. Withholding research findings is a violation of the fundamental goal of medical research, to advance scientific knowledge in order to cure illness and relieve suffering [14]. In a 1997 survey, Blumenthal and colleagues found that 19.8% of academic life scientists had delayed publication of findings for longer than 6 months at the request of the sponsor [15]. In an analysis of 30 studies of drug-related research, Lexchin and colleagues demonstrated that research funded by drug companies is less likely to be published than other studies [16].

While research partnerships with industry may bring significant benefits to researchers and institutions, potential conflicts must be carefully monitored. Sometimes the protection and respectful treatment of subjects and the integrity of research require that some research opportunities be foregone, or are carried out by independent investigators elsewhere.

Competing interests

The author(s) declare that they have no competing interests.

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