

Spring 1-1-2016

Temporal Trends of Corporate Sponsorship in Medical Research

Elijah Bodey
ebodey@bgsu.edu

Follow this and additional works at: <https://scholarworks.bgsu.edu/honorsprojects>

 Part of the [Laboratory and Basic Science Research Commons](#), [Medical Pharmacology Commons](#), and the [Other Medicine and Health Sciences Commons](#)

Repository Citation

Bodey, Elijah, "Temporal Trends of Corporate Sponsorship in Medical Research" (2016). *Honors Projects*. 310.
<https://scholarworks.bgsu.edu/honorsprojects/310>

This work is brought to you for free and open access by the Honors College at ScholarWorks@BGSU. It has been accepted for inclusion in Honors Projects by an authorized administrator of ScholarWorks@BGSU.

Temporal Trends of Corporate Sponsorship in Medical Research

Elijah Bodey

HONORS PROJECT

Submitted to the University Honors Program

at Bowling Green State University in partial

fulfillment of the requirements for graduation with

UNIVERSITY HONORS

5/2/2016

Dr. Juan Bouzat Biology Department

Dr. M. Neil Browne, Economics Department

Abstract

Data was collected from medical journals to assess changes in the nature and prevalence of corporate sponsorship. The journals that reviewed were the Journal of the American Medical Association (JAMA), the New England Journal of Medicine (NEJM), the British Medical Journal (BMJ), and the Lancet. These journals were chosen because of their high impact on medical research representing both American and British Medical editorials. It has been shown that corporate sponsorship has been associated with bias results (Kjaergard et al 2002). Changes in the nature of corporate sponsorship would be linked to changes in economic climate and changes in the policies regarding how research is done and published. Data collected from the four journals was used to determine several things: Significant changes in corporate sponsorship, differences between European and American editorials, and a potential association between subject and corporate sponsorship.

The consequences of temporal trends have a bearing on social policy because a bias in medical research affects many large decisions, such as allocation of research funds, what medicines to use on a personal level, and what research should be done in the future.

Similarities and differences were found in this study. American and British Periodicals both showed an increase in For-profit sponsorship of Articles. The percentage of corporate sponsorship has increased significantly more for the American periodicals. While American Periodicals have roughly equal percentages of Private and Public coauthor affiliations, British Periodicals show a stark difference. While American Periodicals are more likely to endorse a project, the difference is only around 10 percent.

The Problem

There have been many allegations that corporate sponsorship has biased all fields of research through funding. Gathering data on temporal trends in reported medical research could add another dimension to the discussion of corporate sponsorship. If corporate sponsorship has taken on a major role only recently, then an analysis of changes in policy could be done to see what led to this change in funding. If recent changes in policies have led to a bias of research, then perhaps those policies should be reevaluated.

This study aimed to make note of major temporal trends in the corporate sponsorship of American and European editorials.

Background to the Problem

Questions about the link between the corporate funding of research and a potential bias started with suspicions regarding studies funded by the tobacco industry (Turner and Spilich et al 1997). Questions about a potential conflict of interest then began to be raised about other subjects. Some of the first conversations regarding the need for financial disclosures and the role of potential bias came when scandals occurred at noted medical journals such as the NEMJ (Angell and Kassirer 1996) and the BMJ (Smith 1998).

In the following years many papers have been conducted which investigate the potential role of corporate sponsorship and bias. Epidemiological studies of randomized clinical trials published in various medical journals have shown that there is a distinct correlation between competing interests and authors' conclusions (Kjaergard et al 2002). Studies have also been done to determine if there is a difference between the methodology of tests funded by pharmaceutical

companies and those who list no competing interests. Articles were picked by well-defined medical article database searches (Lexchin and Bero et al 2003).

Many papers have been written that investigate the relationship between pharmaceutical companies and research. A paper by Resnik and Elliot identified five factors to determine whether financial relationships are likely to enhance, undermine, or have no impact on the credibility of research (Resnik and Elliot et al 2013). A paper by Wand and Murad offered possible suggestions by which industry can potentially exert effects and propose new directions for the future (Wand and Murad et al 2010).

The study I suggest would add to the collection of studies done by looking at a much larger timespan, compare and contrast American and European editorials, and gathering more variables than previous studies which may offer additional insights.

Research Design

The journals that have been chosen for this study were selected based on their high impact on medical research. Two journals are American medical journals and two are British medical journals. This selection allows for a comparison between American and European editorials.

From these journals a sampling of each publication year selected will be taken. Two issues from a publication year will be selected – the first issue of the year and the first issue in July. From these issues, the articles selected for review will be of the following categories: original contributions, brief reports, reporting of cases, and laboratory technique notes. Articles that will be excluded from the study include: editorials, book reviews, special communications, corrections, letters, medical news, or any article that is not the result of data collection.

A rubric has been designed for this study that will gather the following data: number of coauthors, if the article is international, the lead author, the lead author's institute, the lead authors type of Institute (Hospital, University, Lab), whether the institute is public or private; the last author, the last author's Institute, type of Institute (Hospital, University, Lab, or Government Organization), whether the institute is public or private, coauthors collective affiliations; study design (Clinical Study, Data Review, Drug Review, Equipment Review, Questionnaire, Report of Case) , origin of funding (Public or Private), how funding was described (Grant, Chemicals, or Equipment), and study subject, and if the study was in support of the product (Negative, Neutral, or Positive).

Layout of the Rubric described above

Issue	International	Number of Coauthors	First Author	Lead Author's Institute	Institute Type	Public or Private

Last author	Last Author's Institute	Institute Type	Public or Private	Coauthors Affiliations

Study Design	Funding	How was Funding Defined	Study Subject	Is Subject Marketable	Endorsement of Product

Results

Figures 1-9 were generated from the data gathered using the rubric and collected in tables 1,2,3, and 4 in the appendix. Figures 1-3 focused on the funding of articles. The figures went from most general to more specific. Figures 4-6 focused on coauthors affiliations to a public or private institute. Yet again the figures go from most general to most specific. Figures 7-9 focused on the endorsement or non-endorsement of marketable subjects. The figures went from their most general form to most specific. Figures 10 and 11 show the endorsement or lack of endorsement of marketable subjects based on type of funding.

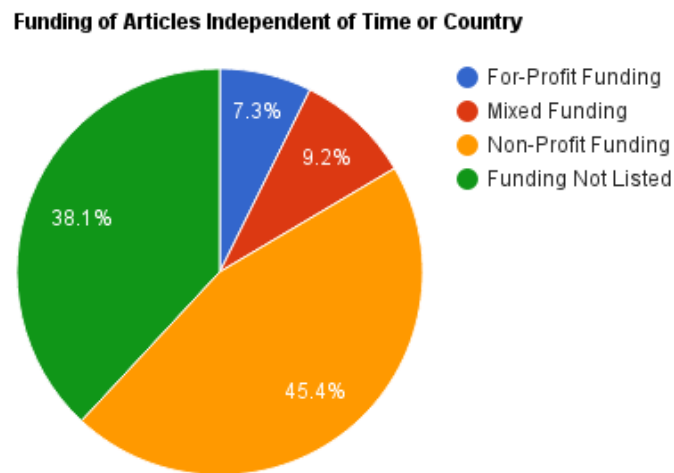


Figure 1. Pie chart representing the funding of articles from the year 1960-2015. This Pie chart is independent of Time or distinction of periodical's country.

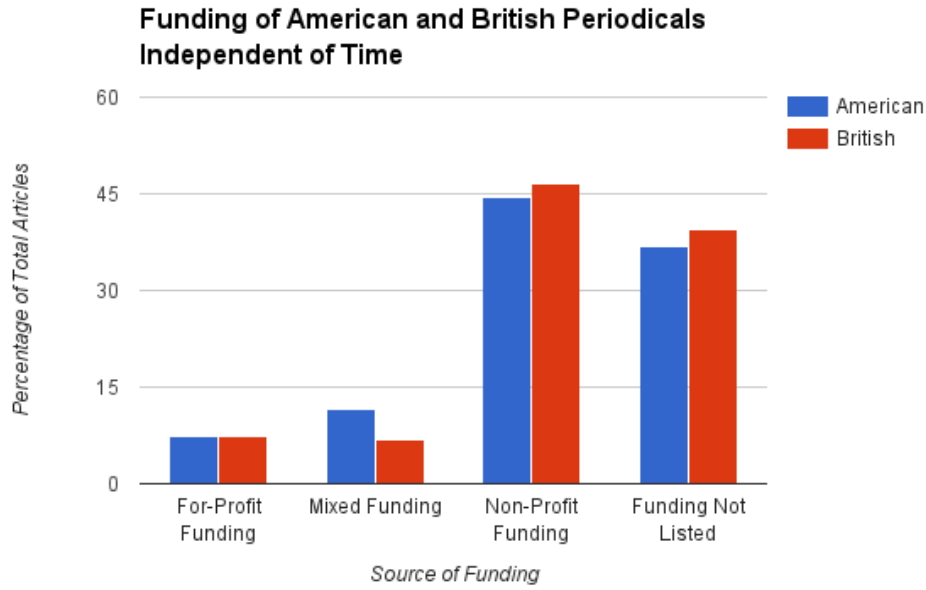


Figure 2. Percentage of Articles which have any source of Corporate Sponsorship Independent of Time.

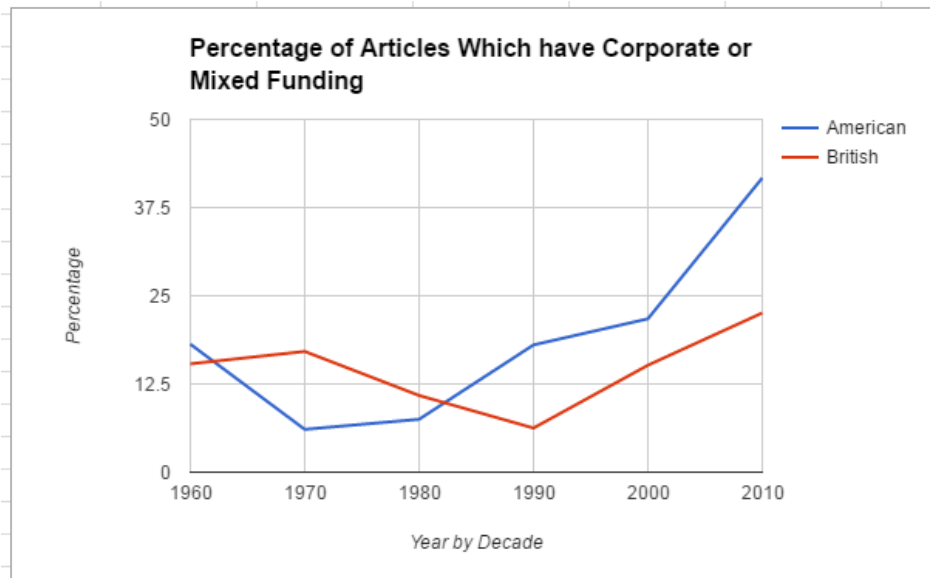


Figure 3. Percentage of Articles which have any source of Corporate Sponsorship

Coauthors Affiliations Independent of Time

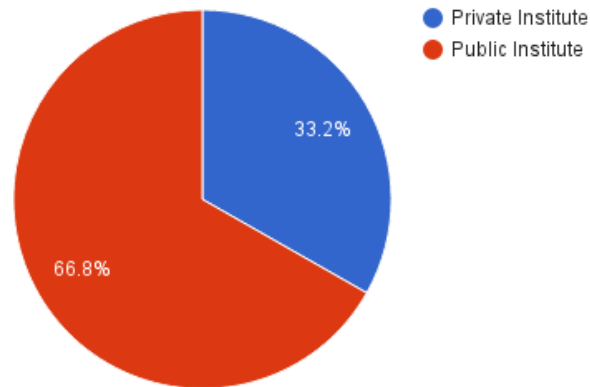


Figure 4. Percentage of Coauthors belonging to a Private or Public Institute from 1960-2015.

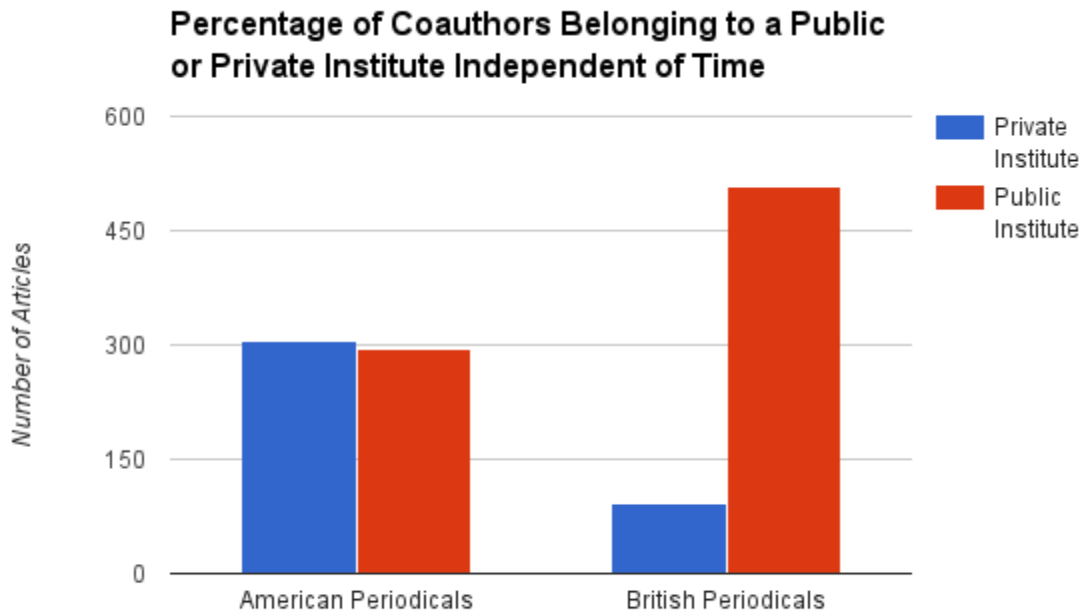


Figure 5. Percentage of Coauthors belonging to a Private or Public Institute Independent of Time

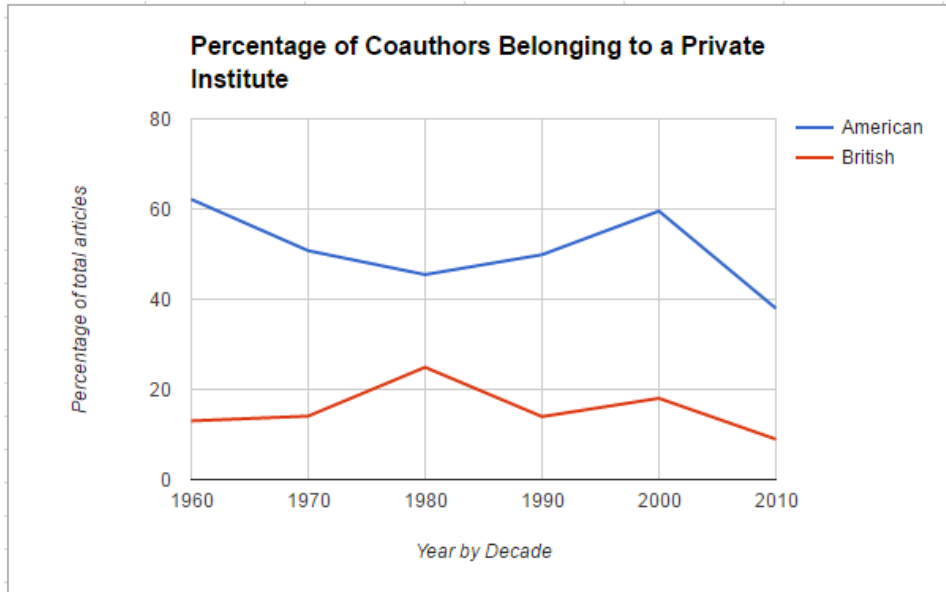


Figure 6. Percentage of Coauthor Affiliations which were Private or a mix of Private and Public.

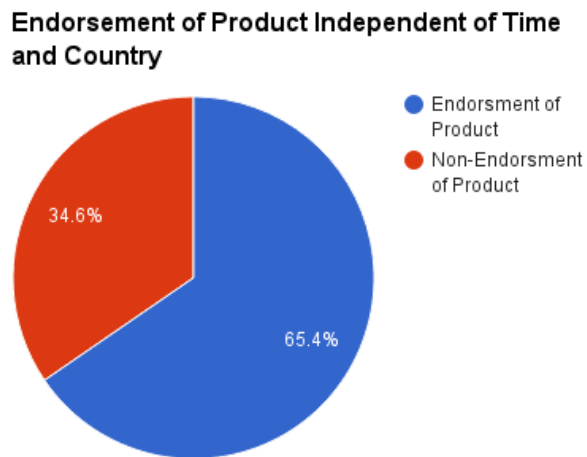


Figure 7. Percentage of marketable subjects that received or didn't receive Endorsement independent of Time or County

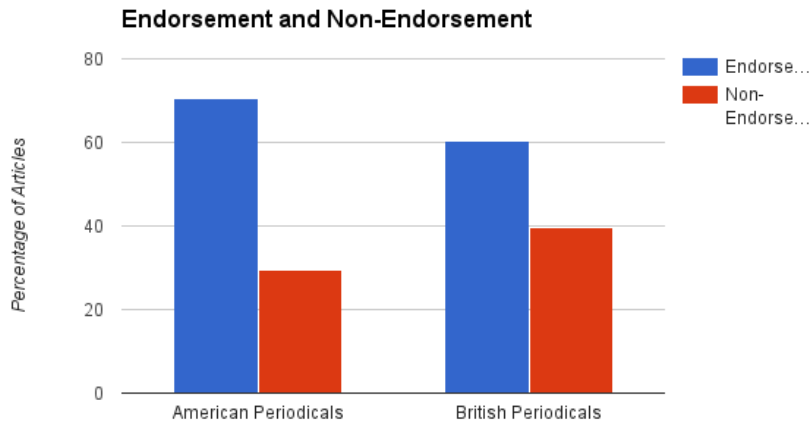


Figure 8. Percentage of marketable subjects that received or didn't receive Endorsement independent of Time

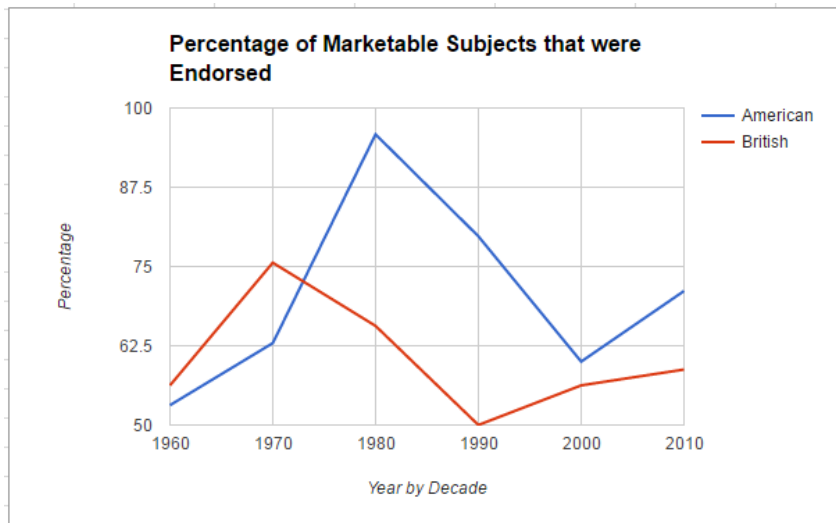


Figure 9. Percentage of marketable subjects that received or didn't receive Endorsement by the study reviewing them.

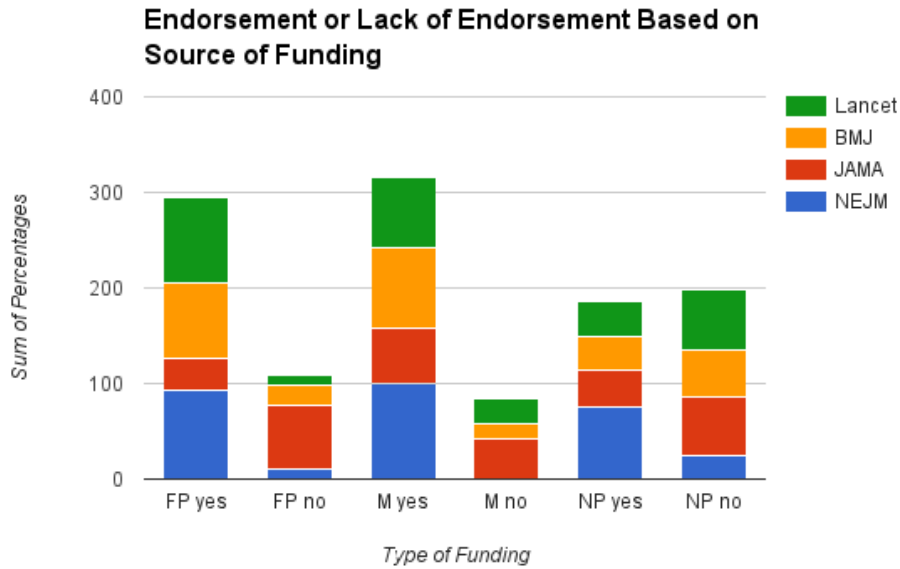


Figure 10. Sum of the endorsement or lack of endorsement of marketable subjects based on type of funding for all four periodicals independent of time.

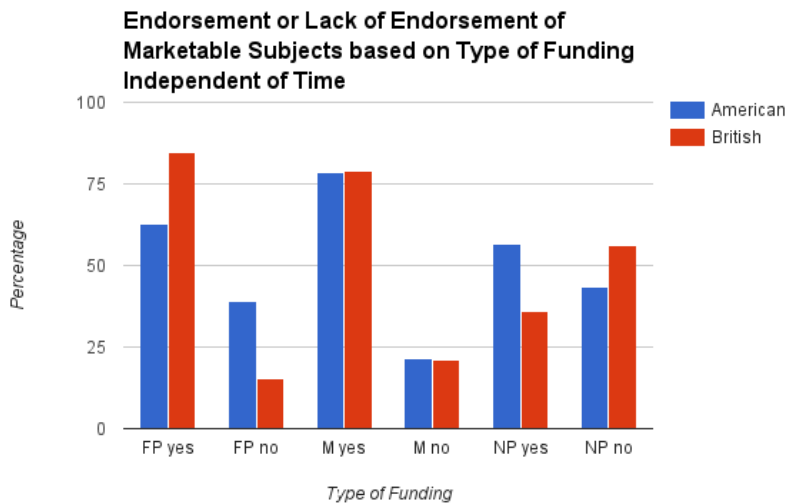


Figure 11. Endorsement or Lack of Endorsement of Marketable Subjects based on Type of Funding Independent of Time

Discussion and Conclusion

As can be seen in Figure 3 two patterns are noticeable. The first trend is that the Percentage of Articles which have any source of corporate sponsorship has increased for both the British and American periodicals. The second trend is that the increase in the percentage of corporate sponsorship has increased significantly more for the American periodicals. Figure 2 shows that the types of Funding in American and British Articles were very similar. In fact for For-Profit funding, independent of time, the rate was the same.

Figure 4 shows that while American Periodicals have roughly equal percentages of Private and Public coauthor affiliations, British Periodicals show a stark difference. This pattern is expected as a majority of British universities and hospitals are publically funded. As can be seen in Figure 6 the British Periodical does not show a change over the decades in percentage of coauthor affiliations which were Private or a mix of Private and Public. Interestingly the American Periodicals show a steady decrease, with the exception of the decade of the 2000s, in the percentage of coauthor affiliations which were Private or a mix of Private and Public.

Figure 7 shows that a marketable subject which has an article written about it has a 65.4 percent chance to be endorsed. Figure 8 shows that while American Periodicals are more likely to endorse a project, the difference is only around 10 percent. Figure 9 shows that American Periodicals are more likely to endorse a marketable product which is being reviewed. The reason for this difference in percentage could be due to a number of factors such as: higher rates of corporate sponsorship, differences in selection of marketable subjects to review, or differences in concluding if a subject was successful or not.

Figures 10 and 11 are the strongest evidence of the biasing role of corporate sponsorship. It is clearly shown that any article funded by corporate sponsorship is likely to endorse a marketable subject. Additionally Figure 11 shows that American periodicals are more likely to have an endorsement of marketable subjects based on if they have a corporate sponsor.

Annotated Bibliography

- Angell M, Kassirer JP. Editorials and conflicts of interest. *N Engl J Med* 1996; 335:1055–1056
 - Lays out the NEJM financial conflict disclosure policies, their necessity, and their origin. This article is in response to a scandal.
- Bekelman JE, Li Y, Gross CP. Scope and impact of financial conflicts of interest in biomedical research: a systematic review. *JAMA* 2003;289:454- 65.
 - Financial relationships among industry, scientific investigators, and academic institutions are widespread. Conflicts of interest arising from these ties can influence biomedical research in important ways.
- Boser, Ulrich. "Who Foots Those Bills?" *U.S. News & World Report* 136, no. 12 (2004): 50.
 - Discusses the growth of corporate funding of academic research. Experience of biology professor Tyrone Haynes, who was paid by Ecorisk to study the effect of a herbicide on African frogs; Ecorisk's refusal to let Hayes publish his findings; Criticism that scientists are entering into agreements that foster conflicts of interest and secrecy; Willingness of companies to fund scientific research; Advantages of private-sector grants; Controversy that can accompany corporate-sponsored research; Influence of corporations on research publication.
- Cho MK1, Shohara R, Schissel A, Rennie D. Policies on faculty conflicts of interest at US universities. *JAMA*. 2000 Nov 1;284(17):2203-8.
 - Despite federal regulations on faculty conflicts of interest in federally funded research, academic-industry ties are common, and evidence exists that financial considerations bias the research record. Public scrutiny of these ties is increasing, especially in cases where researchers have financial interests in the corporate sponsors of their clinical research. Most policies on conflict of interest in our sample of major research institutions in the United States lack specificity about the kinds of relationships with industry that are permitted or prohibited. Wide variation in management of conflicts of interest among institutions may cause unnecessary confusion among potential industrial partners or competition among universities for corporate sponsorship that could erode academic standards. It is in the long-term interest of institutions to develop widely agreed-on, clear, specific, and credible policies on conflicts of interest.
- Deyo RA. Marketing, Media, Wishful Thinking, and Conflicts of Interest: Inflating the Value of New Medical Technology. *The Permanente Journal*. 2009;13(2):71-76.
 - article asserts that new treatments, while assessed for being effective, are not compared to previous treatments in studies enough
- Dorman PJ, Counsell C, Sandercock P. Reports of randomized trials in acute stroke, 1955 to 1995: what proportions were commercially sponsored? *Stroke* 1999;30:1995-8.

- There was a substantial increase in the number of acute stroke trials published per year between 1955 and 1995. The description of pharmaceutical industry involvement in each trial report was poor. Only a minority of supported trials made explicit statements about the role of the sponsoring company. The proportion of trials apparently supported by the pharmaceutical industry has increased substantially.
- Huss A, Egger M, Hug K, Huwiler-Müntener K, Rööfli M. Source of Funding and Results of Studies of Health Effects of Mobile Phone Use: Systematic Review of Experimental Studies. *Environmental Health Perspectives* [serial online]. January 2007;115(1):1-4.
 - There is concern regarding the possible health effects of cellular telephone use. We examined whether the source of funding of studies of the effects of low-level radiofrequency radiation is associated with the results of studies. We conducted a systematic review of studies of controlled exposure to radiofrequency radiation with health-related outcomes (electroencephalogram, cognitive or cardiovascular function, hormone levels, symptoms, and subjective well-being).
- **Kyvik Changing trends in publishing behaviour among university faculty, 1980–2000** *Scientometrics*, 58 (2003), pp. 35–48.
 - This article analyses changes in publication patterns over a twenty-year period at Norwegian universities. Based on three surveys among academic staff; in 1982, 1992 and 2001, covering all kinds of publications, the following general conclusions are drawn: (a) co-authorship has become more common, (b) the extent of publishing directed towards an international audience has increased, (c) the scientific article in an international journal has enhanced its position as the dominating type of publication, and (d) the number of publications per academic staff member has increased. The largest changes have taken place within the social sciences, which to an increasing extent approaches the publication pattern in the natural sciences. On the other hand, the large productivity differences between individual researchers have remained remarkably stable over the two decades in all fields of learning.
- Kjaergard LL, Als-Nielsen B. (2002) Association between competing interests and authors' conclusions: epidemiological study of randomized clinical trials published in the BMJ. *BMJ*. 325:249.
 - This article asserts that there is an association between competing interests and author's conclusions. Article develops a Scale used to grade authors' conclusions
- Lewis S, Baird P, Evans R, Ghali WA, Wright CJ. Dancing with the porcupine: rules for governing the university-industry relationship. *CMAJ*2001; **165**:783–5
 - In this commentary we examine the logic and behavior of the pharmaceutical industry in pursuit of its interests and propose rules to govern university–industry partnerships that reflect the public interest

- Lexchin Joel, Bero Lisa A, Djulbegovic Benjamin, Clark Otavio. Pharmaceutical industry sponsorship and research outcome and quality: systematic review BMJ 2003; 326 :1167
 - To investigate whether funding of drug studies by the pharmaceutical industry is associated with outcomes that are favorable to the funder and whether the methods of trials funded by pharmaceutical companies differ from the methods in trials with other sources of support.
- RESNIK, DB; ELLIOTT, KC. Taking Financial Relationships into Account When Assessing Research. *Accountability in Research: Policies & Quality Assurance*. 20, 3, 184-205, May 4, 2013. ISSN: 08989621.
 - At least five factors can be examined to determine whether financial relationships are likely to enhance, undermine, or have no impact on the credibility of research. These include as follows: whether sponsors, institutions, or researchers have a significant financial stake in the outcome of a study; whether the financial interests of the sponsors, institutions, or researchers coincide with the goal of conducting research that is objective and reliable; whether the sponsor, institution, or researchers have a history of biasing research in order to promote their financial goals; how easy it is to manipulate the research in order to achieve financial goals; and whether oversight mechanisms are in place which are designed to minimize bias.
- Smith R. Beyond conflict of interest. Transparency is the key. *BMJ* 1998; 317:291–292.
 - An article questioning what medical journals should do regarding financial disclosures.
- Thompson DF. Understanding financial conflicts of interest. *N Engl J Med* 1993; 329:573–576
 - article by the NEJM outlining what financial conflicts are and why they are a problem.
- Turner C, Spilich G. Research into smoking or nicotine and human cognitive performance: does the source of funding make a difference?. *Addiction* [serial online]. November 1997;92(11):1423-1426.
 - To establish whether there is a relationship between tobacco industry support of basic research and the conclusions drawn by the authors of that research. Starts to assert that author's conclusions are due to a bias
- Wang AT1, Montori VM, Murad MH. Financial conflicts of interest in biomedical research: the need to improve the system. *Drug News Perspect*. 2010 Nov;23(9):607-12
 - Fifty years ago, the issue of conflict of interest in biomedical research appeared in the national spotlight and has remained in a state of constant evolution. Government legislation caused a boom in collaborations between physicians, researchers, academic institutions and industry. These relationships continue to advance medical science and make meaningful progress, yet they may threaten the integrity of physicians and researchers and the public's trust in medicine. This article will highlight the evolution of industry relationships and conflict of interest over time,

discuss methods by which industry can potentially exert effects and propose new directions for the future.