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Does industry participation in research retard progress?

Recently, we have witnessed a swirl of reports about research data suppression and delay—among them, Boots Pharmaceuticals' obsessive and lead-footed attempt to suppress equivocal data about its hypothyroidism drug, Synthroid (see p. 490), and a survey indicating procrastination on the part of some of the best and brightest life science researchers in publishing their data (see p. 504). Such reports reinforce the stereotype that the introduction of industry into anything automatically stifles creativity and slows progress. They also insinuate that industry involvement in research automatically leads to misconduct—or worse.

These preconceptions rest, in part, on an idealized view of a bygone scientific Atlantis, where money was no object, and everyone shared research for the good of scientific and biomedical progress, and where there were no self-anointed scientific leaders. Unfortunately, we no longer possess the exact coordinates of this lost land.

There certainly was a time when the only road to recognition and reward in science was frequent, rapid research publication. Disclosure of data through publishing led (and still does) to better, perhaps even tenured, jobs; bigger grants; and awards, perhaps even a fancy dinner in Stockholm. But now there is another lucrative route to data disclosure—intellectual property ownership and patents. If the purpose of patents is to encourage the dissemination of information (see p. 586) and the purpose of publishing is to disseminate information, where does the problem of delayed disclosure lie? Has industry funding introduced delay beyond that which academic researchers might introduce themselves to protect their own new interests? And if so, what effect has that had on the development of drugs and on patient care?

Scientific research is entering the domain of the human; it is reluctantly giving up the facade that it is more altruistic than any other enterprise, unsullied by desire and ambition. This is not to say that it should not hold itself to the highest possible standards of personal and community integrity. Individual researchers have a responsibility to read the all fine print when signing deals with industry. Corporate sponsors must remember that they are buying research, not propaganda.

What is needed is a solid analysis of whether industry—out of concern for its financial investments—has become a hinderance to scientific progress and in doing so is thwarting its own agenda. Until then, the extent to which informal and formal scientific discourse has changed cannot be determined. If indeed it has changed, we need to know to what measurable effect.

As a journal publishing original research, we depend, not only legal agreements and contractual arrangements, but on the personal and corporate integrity of the participants in the publishing process. Given the extent of industry's involvement in research at the current time, we are struck by how few active attempts to strong-arm, subvert, or stifle the flow of work we encounter. But it certainly would be better to have some facts instead of anecdotal evidence to base our impressions on.

Empirical antisense

A cause for apprehension in the field of antisense therapeutics is that, despite reported promising results, little is known about the underlying molecular mechanisms. At our recent antisense conference (p. 519), this disparity was evident in discussions on nucleic acid chemistry, oligonucleotide delivery, and antisense site selection. What are the rules? Although strides forward have been made in determining the molecular mechanisms of many antisense effects—the nature of RNase H activity, for example—the development of antisense drugs (like that of most small molecule drugs) is an empirical science. Can and should we develop drugs without an in-depth understanding of their mode of action?

The pharmaceutical industry has done just that for the past half century. And there seems to be no need to change the rules for oligonucleotides, as results from Ed Southern's group on targeting antisense oligonucleotides indicate (p. 537). Their advanced oligonucleotide array technology allows the screening of virtually every possible antisense oligonucleotide to a 122 base RNA. A surprisingly small number of oligonucleotides were found that bind the target sequence with high efficiency—molecules that could not have been predicted on the basis of current knowledge. However, the power of combinatorial chemistry makes an exhaustive screen of individual therapeutic targets feasible.

As scientists, we probably will never be fully satisfied until we understand the molecular mechanisms. But if the goal of biotechnology is to bring the science out of the laboratory and into the marketplace, perhaps we can take some satisfaction in knowing that, despite our ignorance, we can still be clever enough to do that.

Collective unconsciousness

Does biotechnology have a collective noun? How about the "group?" That was the term that analysts from the investment bankers Hambrecht & Quist used repeatedly at the recent "Investing in Biotechnology" conference held in London in May. It applied, apparently, both to the 30 or so companies that presented at the conference and to biotechnology companies as a whole. "The prospects for this group in 1998 are. . .," "The defining events over the next few months for this group will be. . .," "The business models for this group. . ." This kind of generalizing must have been galling for the company chief executives who—before the H&Q round up—had each just spent a half hour strenuously impressing to the audience of potential investors the distinct identity of their company.

The "group" just will not do as a way of describing all the corporate activities that shelter under biotechnology's umbrella. Nor will many other terms. The "biotechnology sector" is far too neat and geometrical a description for a somewhat disparate and wide ranging activity. The "biotechnology industry" is inappropriately exclusive, wrongheadedly refusing to acknowledge the underpinning research and development that goes on outside companies. The "biotechnology enterprise?" Probably too "Captain Kirk" for the serious minded.

Collective nouns for biotechnology and companies using them are the retreat of the lazy or the scurrilous. One can use "biotechnology industry" as shorthand to imply "those companies that might become as big as Amgen." The collective noun approach disguises the very differences that wring success or failure from an enterprise. The collective noun merges, misrepresents, and misinforms. The person who seeks to understand biotechnology must define, differentiate, and distinguish.