nature medicine

A marriage of convenience

Translational research that takes place in academic settings is increasingly being funded by private-public partnerships. As these partnerships become more prevalent, scientists need to strike a balance between the benefits from this welcome funding source and the protection of their academic freedom.

Over the past few years, the direction of research at academic institutions has been shaped by a shift in the priorities of funding agencies in favor of translational science; the US National Institutes of Health (NIH) Roadmap for Medical Research is a well-known example of this shift. As a result, the number of discoveries with translational potential being made by academics can be expected to increase.

At the same time, the pipelines of many large pharmaceutical companies are drying up. Insufficient internal innovation, an increasingly tough regulatory environment and the expiration of key patents are prompting companies to economize by closing research programs and reducing their head counts.

Historically, small biotech companies created by academic researchers and funded by venture capital have bridged the translational gap between academia and industry, but the number of successful startups seems to be on the wane. Most venture funds are simply not interested in the early-stage research that comes out of academic labs, as the time to obtain a return on investment is too long and the risks are too high.

So, the engine that drives drug discovery is not in balance—academic institutions make early-stage discoveries of translational potential, but investors have little appetite for funding biotech firms built around these discoveries, and pharma is running out of drugs to take to the market.

Several mechanisms have emerged to correct this imbalance, for example, the NIH's National Center for Advancing Translational Science. But another strategy that is increasingly gaining traction is the formation of public-private partnerships (PPPs)—deals in which the involved parties (often academic institutions and pharmaceutical companies) have an active role in the work that is aimed at the development of a new therapy. Importantly, these relationships are not mere licensing agreements or unrestricted grants to academic labs, formulas that always have been part of the dialogue between industry and academia, but true joint ventures.

A recent comprehensive analysis of worldwide PPP activity during 2011 (*SciBX* **5**, 1–4, 2012) found that deals of this type are beginning to eclipse venture investment in early-stage projects, at least in monetary terms. For example, whereas the top four venture deals of the past year were on the order of $50 million apiece, each of the top four PPPs were worth $100 million.

What does the increasing weight of PPPs mean for academia, venture investment and industry? On 1 March, at a small meeting organized by *Nature Medicine* and *Nature Biotechnology* in San Francisco, members of these three communities got together to explore this issue.

The discussion focused on three broad questions. First, is there a relationship between cutbacks in research conducted within pharmaceutical companies and the increased PPP activity? Second, is the relationship between venture capital investment and PPPs competitive or complementary? And last, how do PPPs influence the focus of new and ongoing research projects at academic institutions?

The meeting participants were enthusiastic about the potential of PPPs and did not see substantial drawbacks to them. Industry representatives felt that it is not a question of sacrificing internal in favor of external innovation but rather a question of having access to more innovative ideas, regardless of the source.

Academic scientists, for their part, felt that the substantial income from a PPP does not affect the direction of their research. Instead, these partnerships allow them to do studies they cannot afford—toxicology, lead optimization and other steps of the translational process for which there are no public funds—and give them access to industrial expertise not commonly available in academia.

Venture funds, in turn, see themselves as small players in the field compared to the investment from public and industry sources. Moreover, depending on whom you ask, in the US there are as few as five venture funds that remain interested in early-stage translational research. And even though these funds may well be interested in early-stage ventures, the stark reality is that they turn down over 99.5% of the proposals they see. So, most translational research is quite unlikely to ever attract startup funds from venture capital.

Despite the positive views expressed at the meeting, the reality might be more nuanced. For example, pharmaceutical

companies keep on closing research departments, and some senior executives of large companies privately (and sometimes publicly) say that the money they have spent in internal research programs has been largely a waste, leading them to turn to academia for innovation, which they see as a much cheaper alternative.

There is also little question that academics will follow the money in setting up their research programs. For example, the number of scientists working on autism has markedly increased ever since generous funding started flowing from private sources. Yet, as a senior science policymaker hinted recently, it is astonishing how many of these autism researchers have never met an autistic child. If the substantial money from PPPs is perceived to be a good opportunity to keep a lab running, there will not be a shortage of researchers willing to adapt their research program to increase their chances of obtaining those funds.

Given this state of affairs, what will the new equilibrium of translational research look like? Companies and venture funds will surely find ways to navigate these turbulent waters. They will form alliances to minimize the risks inherent to drug development and will think of academia as simply another asset to diversify their investment portfolio.

But for academics, if the funds from PPPs start to account for a larger proportion of the research-related income of a university, this might begin to clash with the concept of academic freedom and lead to an uncomfortable 'researchers for hire' situation, particularly in a climate in which federal funds for investigator-driven research are increasingly hard to come by.

The pressure on academics to become more 'translational' to attract funding—whether from public or private sources—is not likely to abate. But academic scientists need to protect their autonomy, which is arguably needed for the type of innovative thinking that would attract industry sponsorship in the first place.

If the public funders' emphasis on translational research has been a trigger for scientists to become more translational, then it may be time for academics to remind their funding bodies that, although the push for translational research is welcome and necessary for the development of new therapies, it should never come at the expense of academic freedom.