

Devolved drug discovery and the virtual research centre



The author explains why the concept of the virtual research centre is becoming a reality

Pharmaceutical R&D has been a frequent target for recent reorganization. Commercially attractive therapeutic targets are a greater challenge than ever, and as a result, R&D is increasingly difficult and expensive. Failure of projects at an advanced stage is commonplace, and the effects on share prices in the present climate are a matter for concern and are often dramatic. It is well known that the process of taking a new drug from the chemist's bench to pharmacist's shelf is ferociously complex and difficult, and therefore it is no surprise that this process should come under the spotlight. Hitherto, it has been common practice for large multinational companies to undertake much, if not all, of these activities in-house.

The opportunity for outsourcing of pharmaceutical development has been evident for some time. Contract research organizations (CROs) have traditionally offered an important resource with respect to services such as toxicology and clinical testing. But the scope for outsourcing of work has extended dramatically in recent times. This is partly because CROs themselves have been anxious to broaden their range of services; partly because universities and other academic institutions have been intent on furthering their collaborative efforts with industry; and partly because of the reorganization within industrial pharmaceutical research, which has spawned a huge number of small start-up ventures.

As well as an increase in variety of sources for external work, the work itself has broadened. Whereas contract pharmaceutical development has often been conducted out of house, research has not. This is now changing. Universities are looking for industrial partners at ever earlier stages. CROs are offering research pharmacology, and small biotechnology companies are offering the tools of new technology to large pharmaceutical company clients who need to adapt to the increased pace of change in biomedical research.

The motivation for this development may be said to derive partly from increased emphasis on risk-aversion by large multinationals. They also see greatest scientific creativity coming from

small groups whose entrepreneurial basis ensures that their tenuous existence is dependent upon hard work and innovation. However, the benefits are not wholly to be found within the corridors of the multinationals. It is now possible to conduct an entire pharmaceutical research project with only skeletal in-house facilities. The concept of the virtual research centre is becoming a reality. The coordinators of such programmes need to possess a broad multidisciplinary understanding, but it is nevertheless feasible. This model offers possibilities hitherto unconsidered; for small companies to embark on a research programme without the time lag associated with an in-house setup.

Another enabling factor is the increasing facility for instantaneous worldwide communication. In the future, we may look forward to further breakdown of geographical barriers through electronic conferencing and video telecommunication.

Pharmaceutical research carried out across a large number of sites with links to each other, as well as to a central coordination centre – like a spider's web, has several advantages. It is flexible, allowing component activities to be used on an as-needed basis. It can cope with bottlenecks and surges in activity. It is efficient, insofar as the specialist expertise sought in a partner may also be offered by that partner to other clients. And it can be operated on a small scale where individual scientists are fully motivated and can feel their personal contribution is significant. There are certain core activities that are more difficult than others to contract out. In instances where an inventive contribution is sought, a versatile and flexible relationship is paramount. This makes the use of contracted-out discovery chemistry a challenging problem; but for devolved drug discovery to be successful, a two-way interchange of ideas is essential.

We at Napp have been in the forefront of this development in pharmaceutical research, and are currently bringing a phosphodiesterase (PDE-4)-inhibitor for asthma towards clinical evaluation, without in-house biological resources. In this project, we have called upon over a dozen laboratories in Europe and North America. Their disciplines have ranged from discovery chemistry to chemical development, from *in vitro* screening to state-of-the-art *in vivo* animal pharmacology. There have been collaborative projects with world-class academic laboratories, as well as contract-based work with small specialist industrial research organizations.

This model has application to other research projects too. As large company pharmaceutical research is broken up, perhaps devolved drug discovery is the glue that will allow the component parts to function in an integrated fashion in the future.

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