introduction

All those involved in drug discovery continue to be excited by the potential for the development of truly innovative and useful new medicines in the wake of the discoveries made in the human genome project and ongoing advances in genomics, proteomics, informatics and other related disciplines which we have been reviewing in ***Drug Discovery World***. We have, however, attempted to temper this enthusiasm with some realism since new drugs will not flow automatically from all this new knowledge. Statistics show that over the past few years the annual numbers of innovative products launched have not increased significantly – the floodgates are not yet open!

An enormous amount of work is in progress to capitalise on recent discoveries and all those involved in drug discovery, development, commercialisation, regulation and application are giving a great deal of thought as to how they can best deal with the new types of medicines which will appear in the coming decades.

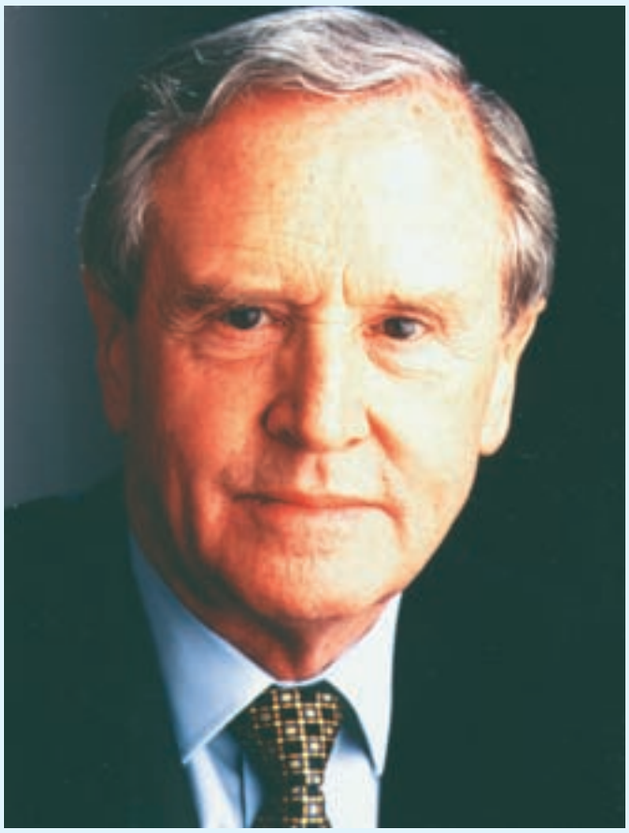
We include two articles dealing with the role of regulatory authorities in the post-genomic era. Drs Steve Arlington, Tim Peakman et al point out that several new molecules deriving from genomics are already in Phase 2b clinical trials so that, if new regulations need to be formulated to deal with their registration, time is getting short. It is clear from the article by Dr Tim Hudson from the Medicines Control Agency that regulators are alert to this need for 'regulations to evolve with evolutions in science'. Regulators share the hope that the so-called genomics revolution will translate ultimately into significant improvements in public health.

The drug development process will also have to be modified to meet these new challenges. One change is that activities traditionally carried out in series may now be done in parallel. Professor Peter Dunnill points out that process evaluation has tended, in the past, to be carried out after other aspects of the evaluation of drug candidates have been largely completed. Time, costs and risks can be reduced if the manufacturing problems associated with complex biopharmaceuticals are identified and, if possible solved, early in the development process.

We have included articles in earlier numbers of ***DDW*** on such subjects as combinatorial chemistry and high-throughput screening which enable very large numbers of chemical compounds to be made and tested for a wide range of biological activities. Advances in automation and miniaturisation have facilitated these processes but there are limits to what can be achieved. The next developments will probably involve chip-based solutions and this has lead to the concept of the 'lab on a chip' which is discussed in this edition by Drs Simon Cowen and Coulton Legge. They point out that microchip technology in chemistry and biochemistry is increasingly widely used in the pharmaceutical industry and, although there are still issues to be resolved the 'biochip' is likely to be here to stay.

The amount of data being generated in drug discovery laboratories is now enormous and analytical methods used in the past cannot cope with these very large data bases. Bioinformatics is playing an increasingly important role in the drug discovery process and here we follow articles on that subject in earlier editions with one by Drs Robert Small and Herbert Edelstein on a relatively new method – data mining. The authors define this as 'a process that uses a variety of analysis and modelling techniques to find patterns and relationships in data'. They believe that integration of the large and diverse data bases in pharmaceutical companies into a form suitable for mining will enable these companies to stand a better chance of realising the benefits of new technologies

Dr Mark Murcko and his colleagues, in their article on chemogenomics, also make the point that there is likely to be a limit to the increase in efficiency of the drug discovery process created by automation. They advocate the reuse of chemical and biological information



and know-how to produce intellectual property which may be transferable among related targets, ie those in the same gene family. The jury is still out on whether such an approach is more efficient than more traditional ones but experience to date from the authors' laboratory lends support to the view that it may well be.

One of the great hopes of all working in drug discovery is that new developments in this post-genomics era will produce significant advances in areas of continuing medical need. We plan, in these pages, to review current developments in such areas. Here Dr Ray Hill and his colleagues discuss new developments in analgesia, noting that increased understanding of the physiology of pain perception have not, as yet, been accompanied by corresponding advances in therapy for pain. The challenge ahead lies in identifying those gene products which are the most promising drug discovery targets in this area.

In order that we can reap the benefits of new scientific discoveries and new technologies as effectively and expeditiously as possible it is, of course, important that the right sort of people should be involved. Scientific and technical expertise is essential but there is also a need for those with entrepreneurial skills. We include an article by Dr Jeffrey Kiplinger who challenges the rather conventional view that there is no place for entrepreneurs in large companies. He supports what is happening in many large companies where attempts are being made to create small innovative groups which, as he says 'can yield spin-offs instead of lay-offs'.

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