

## **The past, present and the future of cardiovascular translational medicine research"**

In preparing this presentation on the nature, scope and development of cardiovascular translational medicine ( TM) , it has been rather difficult to focus on those current aspects of TM that are likely to contribute to improvements in cardiovascular health in the future. The difficulty arises from the considerable span of TM, depending upon the context within which the clinical scientist researcher is working.

The question naturally arises as to which disease, if any, is likely to benefit from TM in the foreseeable future. One might ask: does the concept of TM really work in practice, and how might it be further improved? Most scientific leaders in this field recognise the need for major changes, both in attitudes and structures, in order for interdisciplinary teams to be truly effective.

The potential benefit of making this complex process effective includes:

1) Improving disease understanding 2) Improving confidence in human drug targets 3) Understanding the therapeutic index in humans 4) Enhancing cost-effective decision making.

In essence, we have to move from our current research philosophy, which is dominated by a reductionist approach, illustrated by our current major focus on genes, proteins and pathways, with far less emphasis on organs and organisms. Another way of looking at this problem is to capture in more detail the complex relationships between biological systems at the molecular level and the complex integrated systems

Whilst this concept is exciting, I believe there are significant hurdles to be overcome before the new paradigm for innovative discoveries is implemented. The main hurdles are firstly cultural, and secondly intellectual. Cultural hurdles include what I term sub-discipline introspection. By this I mean: can a TM team composed of bioengineers, mathematicians, biologists and clinicians really sustain long-term effective collaboration? The intellectual hurdles which I anticipate include that abandoning a predominantly reductionist research philosophy may prove very difficult;

So in looking to the future of cardiovascular TM , we firstly must keep in mind the salutary advice that the great Nobel physicist, Richard Feynman, stated: "for a successful technology, reality must take precedence over public relations, for nature cannot be fooled".