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# Drug Discovery Tomorrow: How to Catapult Ourselves into the Future

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The changes in our industry are as exciting as they are challenging. The changing roles of pharma, biotech, the service sector and charities combine with patient and payer pressures to create the need for higher value, precision medicines. In the future a more complex mixture of agile companies will be working in partnership to generate targeted medicines, founded on real world patient data, accessing stratified patients at an earlier stage and using more complex biomarkers and diagnostics to measure their impact. However, this will not happen by itself. It will need energy, expertise, collaboration and a long term view.

The Medicines Discovery Catapult has been created to support the community on the journey to that future. Its facility at Alderley Park, Cheshire, provides a fragmented sector with a place to work together, access to scarce assets and to de-risk their new prototypes and services. Its strategic initiatives link the industry with national stakeholders to provide new foundation processes, and its collaborative projects with industry and academia establish proven new techniques and technologies. As its name implies, it is a store of energy, and a resource the sector can use to propel prototypes and products towards commercialisation.

## High Value Precision Products Needed

The recent debate over the cost of bringing new medicines to market highlights three main issues. First is the impact of failure: which sends the unit cost of any new marketed drug spiralling from $700M to over $2bn [1]. The second is time: the 10+ years that it currently takes to get medicines to market soaks up capital and often causes projects to be shelved due to changes in big pharma business strategies. Finally, even the $700M cost for a new medicine is becoming insupportably high, particularly for more targeted, niche medicines: a commercial point seismically made by incoming GSK CEO, Emma Warmsley [2].

These truths demonstrate the need for high value products. These are products that real patients want, combined with the measurement of their impact to those who pay. Just as changes in industries such as automotive, engineering - and even retail - have required more precision approaches to deliver high value - so too for medicine.

We need to put the patient at the beginning, become more predictive in pre-clinical testing and develop means by which to safely access stratified patient cohorts at an earlier stage. This will reduce large scale clinical trial failures that cost the money and take the time, which the sector can no longer bear [3].

## Putting the Patient at the Beginning

Whether one looks at the world from an ‘experience of disease’ or takes a biomolecular view, one thing is true: the answer is in the patient. The work done by groups such as Faster Cures in the USA and the Association of Medical Research Charities (AMRC) in the UK are part of a movement to put the patient first.

It is still the case that product profiles new medicines exist behind the walls of big corporations and may only reflect one manifestation of any disease. There is best practice shown from organisations such as the Medicines for Malaria Venture (MMV) where desired product profiles are refined by experts and published on behalf of the community. Charities can be helped to provide more of patient-centred profiles, which will allow innovators to produce new products not just for the primary disease, but also those elements that are often overlooked. For example, in Alzheimer’s disease a product profile can be developed for a range of symptoms including agitation, which is a key element of a patient’s experience of disease, but is not reflected in worldwide R&D pipelines.