ICR The Institute of Cancer Research

Innovation in cancer drug discovery and development

Position statement from

The Institute of Cancer Research, London

Summary

The pharmaceutical industry can sometimes be unwilling to take risks by tackling the most challenging drug targets, which are often the most novel and exciting. The research ecosystem needs to incentivise companies to develop innovative and effective cancer medicines with different mechanisms of action to those already on the market, which can be used alone or in combination to overcome the major challenge of drug resistance. The ICR believes that innovation needs to be embedded in every stage of a drug's path to market, including in assessing whether drugs should be made available for healthcare systems. We need, in particular, to incentivise the creation of treatments in areas of high unmet need or in rare diseases, such as childhood cancers, where it can be hard to make a profit, while also offering treatments at a reasonable price to ensure broad uptake. Companies need to know that when they do develop innovative and effective medicines, those treatments will be made available for patients. That requires appraisal bodies like NICE to take into account a drug's degree of innovation when evaluating whether it should be made available on the NHS. We also need to find ways of sharing risk between Government, academic institutions, charities, the NHS and industry, and to find ways of making new drugs affordable by pricing according to the evidence of benefit.

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Background information

One of the biggest barriers to making further strides against cancer is the shortage of new innovative medicines coming through to the clinic. Advances in technology have driven huge leaps in our understanding of the biology and genetics of cancers, but we're not yet seeing matching progress in the discovery and development of new drugs. Approved drugs are available for well under 10 per cent of the 500 or so cancer-causing gene products, and despite recent advances in targeted therapies and immuno-oncology, only a relatively small proportion of the new medicines being licensed have novel mechanisms of action.

Novel cancer drugs, attacking cancer in new ways, are extremely costly to develop and take to the market. As a consequence, these new medicines tend to be very expensive, and there is concern that innovation is coming to be seen as unaffordable for healthcare systems. There is a risk that new treatments will be so expensive that healthcare systems will not make them available for patients. Drug companies require incentives to develop novel cancer treatments, because newer, targeted treatments often work in smaller patient populations than the blockbusters of the past, and so potentially offer less return on investment.

Traditional pharmaceutical companies have become unwilling to fund innovative early-stage, proof-of-concept studies and early-phase clinical trials because they are concerned about the substantial risk of a project failing. Instead, the whole market is geared up to support 'me-too' drugs coming to market with 'safer bets' on targets we already know are viable. These drugs may have small benefits compared with those already available but they won't allow us to make the big breakthroughs we need if we are going to make step-change improvements in cancer outcomes.

An innovation gap or 'valley of death' has opened up between advances in scientific understanding and the clinical and commercial development of new treatments. Academic researchers have historically been able to take on high-risk, early-stage work on target validation and drug discovery, and as companies have moved away from this area, academia has increasingly been filling this gap. There is growing interest in finding new models of sharing risk through collaborations between Government, academia, charities and industry. Funding cancer drug discovery is a complex ecosystem including big pharma, venture capital and grants from charitable and government sources, all of which have a role to play in supporting the development of future innovative treatments.

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Key ICR positions on innovation in cancer drug discovery and development

- We need to create a global ecosystem for biomedical research and drug development that encourages the high-risk, high-reward research that is required for true innovation. Only truly innovative research working on challenging new targets using completely new mechanisms of action can deliver step-change improvements in outcomes for patients. Innovative new medicines are needed which attack cancers in brand new ways, alone or in combination, to overcome the major clinical challenge of drug resistance. We have seen innovative targeted drugs and immunotherapies reaching patients, but until we can fix the current system, where companies often see the risks of innovation as too high and the potential benefits too low, we will not see the number of really exciting, novel treatments that patients need and deserve.

- The ICR believes that we need to incentivise companies to develop innovative, effective cancer drugs so that they are more likely to take on the risk. This is particularly important in areas of unmet need, where there are no existing effective treatments, or in rare diseases like childhood cancers, where the small patient populations can make it particularly expensive and unprofitable to develop drugs. Incentives such as extra protection of market exclusivity or R&D tax credits may help in encouraging companies to develop drugs in unprofitable areas.

- The Government should play a stronger role in encouraging innovative research on high-risk targets by developing hybrid funding models and risk-sharing initiatives, and by funding projects through ‘proof of concept’ to a stage where businesses are willing to invest. Funding should also cover state-of-the-art infrastructure and equipment that is needed to exploit rapidly advancing technology. Academic organisations like the ICR, with expertise in this area, can help bridge the innovation gap by taking on more early-stage drug discovery and development, as part of risk-sharing partnerships with industry, governments and charities.

- A long-term funding strategy for science is essential to ensure we have a flow of discoveries to form the basis of the innovative treatments of the future. Fundamental scientific research is the key driver of knowledge exchange and research commercialisation. A gradual decline in the UK’s science spending risks slowing scientific progress and damaging the UK’s ambition to be internationally competitive in scientific and technological innovation.

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- The concept of innovation needs to be embedded at every stage in creating a drug and taking it to the market, including during the evaluation of new medicines. The key to driving faster progress in cancer treatment is building confidence among companies that health systems will pay for the most innovative and effective cancer treatments to encourage them to work on these high-risk projects. Evaluation bodies such as NICE need to properly take into account how innovative a treatment is alongside the other parameters they use in deciding whether or not a drug should be made available for patients.

- We need to incentivise the development of new cancer drugs as components of combination therapies to improve outcomes for patients. Many drugs in development have the potential to significantly increase the effectiveness of curative treatments such as radiotherapy as well as having synergistic effects with existing drugs, including generics where the patent has expired. Research into curative combination therapies could lead to significant improvements in patient survival while potentially reducing costs through shorter, more effective treatment regimens.