

# Global health needs demand new approach to drug discovery

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Pharmaceutical research and development (R&D) is one of the best examples of human ingenuity. It attracts vast amounts of funding, employs brilliant minds, and deploys the most advanced technologies.

Over the past century, it has enabled unprecedented advances for human health.

Yet the pharmaceutical R&D system is struggling to keep up with society's medical needs. High failure rates and prolonged research timelines for candidate drugs constitute a human tragedy, and have dramatically increased the cost of [drug discovery](#) over the last decades.

More and better medicines are desperately needed at a time of global ageing and expanding populations, with new challenges such as antibiotic resistance on the horizon and many tropical infectious diseases still in need of adequate pharmaceutical solutions. To meet these challenges it is imperative that we rethink [drug discovery](#).

In a new study, 'A New Pharmaceutical Commons: Transforming Drug Discovery', I and my colleagues, Dr Wen Hwa Lee, and Dr Javier Lezaun, call for 'open science' approaches to drug discovery and offer ways forward that would transform how the medical challenges of this century could be addressed more efficiently.

Our research highlights the limits of traditional R&D models focussed on secrecy and the protection of Intellectual Property (IP) rights, and offers a set of recommendations for strengthening pre-competitive and [open source](#) practices that can accelerate the race for cures to the world's most harmful diseases.

The pharmaceutical industry has made enormous strides in the production of potential therapies and medicines. But even today, close to 90% of candidate drugs that enter Phase 1 trials fail to make it to the market place. This is a system beset by duplication of effort and hence wastage of resources. No one lab or institution can do this on its own. We must urgently pool resources and expertise, minimise duplication, explore new drug targets, biomarkers, and technologies in order to

generate new, effective, and more affordable drugs for patients more quickly.

The new paper calls for the adoption of 'open science' principles that would allow for a less restrictive approach to the sharing of pharmaceutical tools and data, and would re-define the role of IP in pharmaceutical R&D. It also gives examples of where this is already working successfully.

There has been a great deal of successful experimentation with the application of pre-competitive and open source approaches to drug discovery, not least here at Oxford with the Structural Genomics Consortium, which has shown how corporate pharmaceutical resources can be pooled and used to produce IP-free science.

Our study identified a number of ways in which the world of drug discovery can be enlarged and strengthened, including:

- tax incentives for pre-competitive and open source research, for example by introducing a lower tax rate on profits obtained from IP-free innovations, or to facilitate the placing of patented innovations in free-access platforms.
- the introduction by regulatory agencies of specific designation for products developed through open science collaborations, with reduced fees and fast-tracked review of technical data.
- the development of new evaluative metrics by pharmaceutical companies to better capture the value of open science research, and create schemes that allow researchers to contribute a percentage of their time to open science drug discovery initiatives.
- a shift away from patent- and intellectual property-centric measures of

performance within academia.

- increased investment in open science drug discovery initiatives by research funding bodies, to develop specific funding programmes to kick-start these efforts and place the supporting infrastructures on more sustainable footing.

Although there is no simple one-size-fits-all solution to the challenges of the drug discovery process, open source R&D has the potential to have a significant impact.

The full paper, '[A New Pharmaceutical Commons: Transforming Drug Discovery](#)', can be read on the Oxford Martin School website.

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