OPEN ACCESS Freely available online

Journal of Developing Drugs

ISSN: 2329-6631

Perspective

Drug Repurposing Accelerating Therapeutic Innovation Through Existing Medicines

Natalie Parker*

Department of Pharmacy, University of Otago, Dunedin, New Zealand,

DESCRIPTION

Drug repurposing, sometimes referred to as drug repositioning, involves identifying new therapeutic uses for approved, discontinued, or investigational drugs whose pharmacological characteristics have already been partially or completely established. Since these medicines have undergone extensive preclinical testing and in many cases, human clinical evaluation, substantial information regarding their pharmacokinetics, toxicity and safety is already available. This existing knowledge considerably reduces scientific uncertainty and enables researchers to focus primarily on evaluating therapeutic effectiveness in new disease settings. One of the principal advantages of drug repurposing is the significant reduction in development time. Traditional drug discovery requires target identification, compound screening, optimisation, toxicological assessment, multiple phases of clinical trials and regulatory review. Repurposed medicines can often bypass several early developmental stages because critical safety information has already been established. Consequently, patients suffering from serious or life threatening diseases may gain access to promising therapies much sooner than would be possible through conventional pharmaceutical development. Economic considerations further strengthen the importance of drug repurposing. The financial burden associated with bringing an entirely new medicine to market continues to increase because of rising research costs and stringent regulatory requirements. Repurposing existing compounds allows pharmaceutical companies, academic institutions and public health organisations to maximise the value of previous research investments while reducing development expenditure. This approach is particularly attractive for rare diseases and neglected tropical diseases, where limited commercial incentives often discourage traditional drug discovery programmes.

Advances in molecular biology have transformed the scientific foundation of drug repurposing. Many diseases previously considered unrelated are now recognised to share common molecular pathways, signalling networks, or genetic abnormalities. Consequently, medicines originally developed for one condition may demonstrate therapeutic activity in another through shared biological mechanisms. Modern genomic, transcriptomic, proteomic and metabolomic technologies provide unprecedented opportunities to identify these overlapping disease processes and reveal unexpected therapeutic possibilities. Systems biology further enhances this understanding by analysing complex interactions among genes, proteins, metabolites and cellular pathways rather than focusing on isolated molecular targets. Artificial intelligence and computational modelling have become powerful tools for accelerating drug repurposing. Machine learning algorithms can analyse enormous volumes of biomedical literature, electronic health records, molecular databases and clinical trial results to identify hidden associations between drugs and diseases. Network pharmacology approaches examine relationships among biological pathways, drug targets and disease mechanisms, enabling researchers to generate hypotheses that would be extremely difficult to identify through conventional experimental methods alone. These computational technologies substantially improve research efficiency while reducing the costs associated with large scale laboratory screening.

The global response to emerging infectious diseases highlighted the practical value of drug repurposing. During periods of urgent public health need, researchers rapidly evaluated existing antiviral, anti inflammatory and immunomodulatory medicines for potential therapeutic benefits. Although not every candidate demonstrated clinical success, these efforts illustrated how repurposing strategies can rapidly mobilise available pharmaceutical resources while novel therapies are being developed. This experience reinforced the importance of maintaining comprehensive databases of approved medicines and strengthening collaborative international research networks capable of responding quickly to future health emergencies. Drug repurposing is also contributing significantly to oncology. Cancer is characterised by complex molecular diversity and many therapeutic agents interact with multiple biological pathways beyond their originally intended targets. Investigators are increasingly examining approved non cancer medications for potential anticancer activity by exploiting their previously unrecognised effects on tumour growth, angiogenesis, immune regulation, or cellular metabolism. Similar strategies are being

Correspondence to: Natalie Parker, Department of Pharmacy, University of Otago, Dunedin, New Zealand, E-mail: natalie.parker@gmail.com

Received: 05-Jan-2026, Manuscript No. EOED-26-43966; **Editor assigned:** 07-Jan-2026, PreQC No. EOED-26-43966 (PQ); **Reviewed:** 21-Jan-2026, QC No. EOED-26-43966; **Revised:** 28-Jan-2026, Manuscript No. EOED-26-43966 (R); **Published:** 04-Feb-2026, DOI: 10.35841/2329-6631.26.15.260

Citation: Parker N (2026). Drug Repurposing Accelerating Therapeutic Innovation Through Existing Medicines. J Develop Drugs. 15:260.

Copyright: © Parker N. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

explored in neurodegenerative diseases, cardiovascular disorders, autoimmune conditions, metabolic diseases and chronic inflammatory illnesses, expanding the therapeutic potential of numerous established medicines. Demonstrating effectiveness for a new indication still requires carefully designed clinical trials capable of providing robust evidence of benefit.