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Enhancing drug discovery efficiency: Paradigm shifts

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rug discovery is a risky business given the high cost, the lengthy duration and the high attrition rate facing drugs during their journey from early discovery to market. To address the alarming low efficiency of drug discovery and development multiple efforts have been made in the last decade to steer the direction towards enhanced efficiency. Innovative processes or tools have been advocated for or implemented at every stage of the drug discovery and development process shifting paradigms to enhance efficiency and boost benefit versus cost in the pharmaceutical industry. Analysis has shown that paradigm shifts in the pharmaceutical industry were able to some extent to enhance efficiency of drug discovery. These paradigm shifts include implementation of the phenotypic drug discovery as compared to the classical target/hypothesis drug discovery approach leading to enhanced approval of first in class drugs. Other paradigm shifts include the adaptation of the model-based approach with computation and data mining processes as well as the reverse translation approach benefiting multiple stages in drug discovery spanning early discovery and advanced developmental clinical stages. Precision medicine ensuring delivering the right intervention for the right patient at the right time constitutes a new paradigm shift challenging the classical modality of blockbuster drugs of one fits all modality and that potentially may lead to higher efficiency in drug discovery. Finally, improving efficiency through expedited approval processes by regulators which is currently practiced approving drugs for serious/rare diseases is another way of enhancing drug development. New processes are slowly being embraced by multiple stakeholders in the pharmaceutical industry to bring new drugs to the market efficiently; however, the need for transformational tools and processes through collaborative innovation is imperative to ensure sustainability of drug discovery in the pharmaceutical industry.

Biography

Nesrine El-Bizri is an Associate Principal Scientist at Merck Research Laboratories (MRL) in South San Francisco, USA. She has more than 20 years of combined PhD, Postdoctoral and biotechnology experience in the field of cardiovascular research with core expertise in *in vitro*, *in situ* and *in vivo* models of disease. She has a PhD in Cell Biology from the University of Sherbrooke, Quebec, Canada and has completed a Postdoctoral Fellowship in Pulmonary Arterial Hypertension at Stanford School of Medicine. She then joined Gilead in 2007 and extensively contributed to preclinical discovery research teams with focus on target validation, lead optimization and preclinical efficacy and safety research supporting the development of a molecule into phase 2/3 clinical trials in three different indications. In 2017, she joined MRL in early discovery cardiovascular group in the Department of Cardio-Renal Metabolic & Ophthalmic Discovery Biology where she is studying heart failure.

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