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Precision biotherapeutics molecules at futuristic regimens: PROTAC & Undruggable Drug Targets

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APAC is home to over 60% of the world's population and the economical benefits of having a biopharma industry in the region are significant. The region is opening up to innovative pharma companies following new therapeutic targets and treatments which are the need of the hour to diagnose and curb many diseases and their comorbidities. APAC region has rich innovation resources and also intense medical needs, leading to both opportunities and uncertainties for the industry. The region accounts for 30% of all global pharma spending, and national healthcare expenditure is expected to increase threefold to over $2 trillion by 2030.

Governments in APAC are collaborating with stakeholders to develop innovative remedies for rare diseases, cancers, immune and inflammatory disorders. APAC market is also influenced by local governing regulations, clinical trials, market access framework, hospital networks, and therapeutic area of competitiveness.

With the booming biopharma R&D and research ventures, PROTAC, and Undruggable Drug Targets are recently becoming popular endeavors of APAC biopharma companies. Drug design space is expanding into the 'undruggable' and PROTACs (Proteolysis Targeting Chimeras) space for the treatment of cancer and rare diseases through the usage of an innovative platform in order to accelerate drug design and discovery.

Many diseases, in humans, are driven by the dysfunction or dysregulation of proteins. However, up to 80 percent of proteins do not possess binding sites suitable for direct binding of small-molecule drugs, making them ‘hard-to-drug’ or ‘undruggable’ protein targets. In fact, only 2 percent of human proteins interact with currently approved collective drugs on the market. This highlights the inability of most drug discovery practices to target disease-causing proteins effectively.

Hence, the biopharmaceutical industry and drug development firms have been focusing on developing precision biotherapeutics molecules capable of directly binding to specific structures of proteins for an assured diagnosis. Among many proteins involved in causing diseases, certain molecular targets are now being more carefully interrogated using several small molecules and antibodies to improve treatment outcomes. Many APAC Biopharma companies like SyntheX, Hummingbird Bioscience are focusing on developing precision therapies against hard-to-drug targets via a unique data-driven systems biology approach.

Similarly, PROTACs (Proteolysis Targeting Chimeras) is offering a new option to APAC biopharmaceuticals markets. This is a novel approach to target protein degradation with heterobifunctional PROTACs and monovalent molecular glue compounds. Small-molecule-induced protein degradation has been demonstrated to possess the potential to drug a broader range of proteinaceous biological targets. It involves the selective recruitment of the body’s inherent protein degradation pathways, to eliminate disease-causing / associated proteins, using bifunctional small molecule drugs. PROTACs can simultaneously bind a target protein and an E3-ubiquitin ligase, and thereby, facilitate the selective ubiquitination and eventual proteasome-mediated degradation of the target protein.

The targeted protein degradation enabling technologies market, featuring a healthy pipeline of novel therapeutics, is anticipated to be worth over USD 3.3 billion by 2030. The sector has emerged as a revolutionary pharmacological concept that presents both viable and versatile drug development opportunities and is anticipated to introduce a new paradigm in APAC modern healthcare.

Hithaishi C Bhaskar