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Global PROTAC Targeted Protein Degraders Market Opportunity & Clinical Trials Insight 2027

https://marketpublishers.com/r/G9AA1DBBB235EN.html
Date: October 2024
Pages: 180
Price: US$ 4,200.00 (Single User License)
ID: G9AA1DBBB235EN

Abstracts

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Global PROTAC Targeted Protein Degraders Market Opportunity & Clinical Trials Insight 2027 Report Finding & Inclusions:

- First PROTAC Drug Approval Expected By 2027
- Global & Regional PROTAC Drug Market Trends Insight
- First 12 Months & First 5 Years Market Size Estimates Since Approval
- Global PROTAC Drugs Clinical Trials Insight By Company, Country, Indication & Phase: > 90 Drugs
- FDA Fast Track & Orphan Drug Status Insight By Company & Indication
- Comprehensive Insight On PROTAC Technology Platforms: 10 Platforms
- Global PROTAC Drug Market Trends By Indications
- Competitive Landscape

First conceptualized in the early 2000s, proteolysis-targeting chimeras (PROTACs) are emerging as a transformative approach in targeted therapies. By harnessing the body's natural ubiquitin-proteasome system, PROTACs selectively eliminate specific proteins

implicated in various diseases, particularly those that have been historically deemed undruggable. This innovative therapeutic modality is gaining traction in both academic and industrial settings, with a focus on addressing significant gaps in treatment options for patients with complex diseases.

PROTACs function through a unique mechanism that comprises three essential components: a targeting ligand, an E3 ligase ligand, and a linker. The targeting ligand binds specifically to the protein of interest (POI), which often plays a crucial role in disease pathology. This can include proteins associated with cancer or neurodegenerative disorders. The E3 ligase ligand links the PROTAC to an E3 ligase, an enzyme that facilitates the attachment of ubiquitin molecules to proteins. Once the PROTAC simultaneously binds to the POI and the E3 ligase, it catalyzes the transfer of ubiquitin, marking the target for degradation by the proteasome. This mechanism allows for a more effective and precise intervention in disease processes compared to traditional small molecule inhibitors, which often only inhibit protein function without promoting degradation.

The most prominent application of PROTACs is in cancer treatment. Cancer involves a complex interplay of proteins that contribute to tumor growth, progression, metastasis, and resistance to existing therapies. PROTACs are being developed to target and degrade a variety of key proteins, including KRAS, BRAF, cyclin-dependent kinases, and hormone receptors like estrogen and androgen receptors. Among the candidates in clinical trials, Vepdegestrant (ARV-471), an estrogen receptor degrader developed by Arvinas, stands out. As of October 2024, Vepdegestrant is undergoing phase 3 clinical trials for the treatment of estrogen receptor-positive, human epidermal growth factor receptor 2-negative (ER+/HER2-) breast cancer. This makes it the most advanced PROTAC candidate in the global pipeline, potentially paving the way to become the first PROTAC on the market by the end of this decade.

In addition to Vepdegestrant, Arvinas is also conducting a Phase 1/2 clinical trial for Bavdegalutamide (ARV-110), a PROTAC targeting the androgen receptor in patients with metastatic castration-resistant prostate cancer. This dual approach highlights the potential of PROTACs to address multiple facets of cancer biology effectively.

Beyond oncology, the application of PROTACs is expanding into the realm of autoimmune and inflammatory disorders. Researchers are exploring their potential to degrade key proteins involved in inflammatory signaling pathways. Notably, proteins from the IRAK family, especially IRAK4, and BTK kinase are being targeted for PROTAC development in these areas. While most candidates in this category are still in

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early phases, with few like HSK-40118 and KT-474 currently in clinical trials, ongoing research promises to uncover more viable options in the future.

The commercial landscape for PROTACs is burgeoning, characterized by strategic collaborations aimed at accelerating the discovery and development of new PROTAC-based therapies. In January 2024, Galapagos and BridGene Biosciences announced a strategic partnership to develop novel precision medicines targeting clinically validated oncology targets. This collaboration aims to leverage both companies' expertise to enhance the development pipeline of PROTACs. In August 2024, they expanded their agreement to include efforts on developing a selective oral SMARCA2 PROTAC in precision oncology, underscoring the collaborative spirit in this emerging field.

The market for PROTACs is anticipated to grow significantly, driven by advancements in research and increasing investments in drug development. The unique mechanism of action and the ability to target previously undruggable proteins position PROTACs as a promising addition to the therapeutic arsenal against complex diseases.

As the PROTAC field continues to evolve, its clinical and commercial prospects look bright. The promising early results from clinical trials and the strategic partnerships being formed indicate that PROTACs could soon revolutionize treatment paradigms for various diseases, particularly cancer and autoimmune disorders. With ongoing research and development, PROTACs are set to become a cornerstone of targeted therapy, offering new hope to patients and filling critical gaps in treatment. As we move toward the latter half of this decade, the landscape of drug development is likely to be significantly reshaped by the success of PROTAC technology.

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