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Targeted Protein Degradation by Novel PROTACs and Molecular Glues 2020: a landscape analysis of companies, technologies, targets, investors and partners from an industry perspective

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Abstracts

Targeted Protein Degradation by Novel PROTACs and Molecular Glues 2020: a landscape analysis of companies, technologies, targets, investors and partners from an industry perspective

This report provides you with a landscape description and analysis of Targeted Protein Degradation (TPD) technologies and of discovery and development of TPD drug candidates from an industry perspective as of May 2020.

The report brings you up-to-date with information about and analysis of

Approaches of Targeted Protein Degradation with heterobifunctional PROteolysis

TArgeting Chimeras (PROTACs) and monovalent molecular glue compounds;

Stakeholders in the field: technology and major pharmaceutical companies and investors;

Technologies of Targeted Protein Degradation;

Targets and therapeutic area selected for PROTAC and molecular glue drug discovery;

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PROTAC Optimization: target identification, novel E3 ligases, ligase binders, linkers; ternary complex analysis

New Approaches: lysosomal degradation, bio-PROTACs

Preclinical and clinical experience with selected PROTACs and molecular glues;

Financing situation of technology companies and key investors in the field

Partnering deals with financial terms;

Major pharmaceutical companies: in-house technologies, R&D, collaborations and equity purchase.

More than US$ 1.7 bln have been raised so far by TPD technology companies in financing rounds and from partnering deals. At the same time, nearly all major pharmaceutical companies have some kind of stake in the field of targeted protein degradation, with many of them pursuing in-house TPD technology development and TPD drug discovery.

This huge amount of money and the active role of major pharmaceutical companies highlight the tremendous interest from investors and major pharmaceutical companies and the opportunities they recognize in these new approaches to address previously considered undruggable targets with TPD small molecules.

The human proteome accounts for more than 30,000 proteins that have multiple biological functions in the human body. However, more than >80% of proteins are still out of reach and remain undruggable targets. Targeted protein degradation has recently emerged as a novel pharmacological modality that promises to overcome small molecule limitations whilst retainding their key advantages.

The PROTAC technology takes advantage of the ubiquitin–proteasome system to selectively degrade a protein of interest (POI). In brief, a PROTAC is a bifunctional heterodimer that binds simultaneously to a POI and to an ubiquitin E3 ligase, the two ends being linked together by a chemical tether. The close vicinity of the POI and the E3 ligase caused by the PROTAC triggers its ubiquitination. The tagged POI is then recognized and decomposed by the proteasome 26S, therefore freeing the PROTAC for further iterative cycles of degradation. Thus, only sub-stoichiometric amounts are

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needed for potent activity. In comparison with a small-molecule inhibitor that requires high systemic exposure to sustain a pharmacological effect, the catalytic nature of PROTACs gives them the advantage to act effectively with a low systemic exposure, which is translated into reduced off-target problems and toxic side effects.

This report evaluates the industry landscape of targeted protein degradation with novel PROTAC and molecular glue technologies and compounds. The report is based on the identification and description of 20 major biopharmaceutical and 24 technology-focused companies with targeted protein degradation technologies and research and development activities.

For each company, a profile has been elaborated providing information about the company background/history, the financial situation, relevant technology, partnering deals and target and pipeline overview. Company profiles are presented in separate chapters for major pharmaceutical companies and technology-focused companies.

Provided that sufficiently detailed information was available, eight different targeted protein degradation technologies were described in more detail and their profiles are provided in the Chapter „Technology Profiles“.

Eventually, this report has profiled ten drug candidates in preclinical and clinical stages of development. The descriptions can be found in the chapter „Drug Candidate Profiles“ in alphabetical order by the drug code or generic name.

All information in the four chapters of Company Profiles, Technology Profiles and Drug Candidate Profiles are fully referenced with 78 scientific references, in many cases with hyperlinks leading to the source of information (abstracts, Posters, papers). Non-scientific references, such as press releases, annual reports or company presentations, are disclosed within the text with an embedded hyperlink leading to the online source of information.

Details about the collaboration and licensing agreements, acquisition terms as well as substantial financing rounds are described in the profiles of the TPD technology companies. The findings described in the four profile sections (Companies, Technologies, Drug Candidates) are summarized and analyzed in the chapter “Description and Analysis”.

What will you find in the report?

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Profiles of Targeted Protein Degrader (TPD technology companies active in the field;

Description of Big Pharma's role in the field (in-house R&D, partnering and investing);

Comprehensive description and analysis of emerging PROTAC and molecular glue technologies;

Pharmacologic profiles of Targeted Protein Degraders (TPD);

TPD Technology selection and preferences of major pharma;

Key characteristics of technologies;

Target selection and competition of drug candidates;

Description and analysis of financing rounds (capital raised, investors);

Economic terms of collaboration and licensing deals;

Sources of financing.

Who will benefit from the report?

Venture capital, private equity and investment managers;

Managers of Big Pharma venture capital firms;

Financial analysts;

Business development and licensing (BDL) specialists;

CEO, COO and managing directors;

Corporate strategy analysts and managers;

Chief Technology Officer;

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R&D Portfolio, Technology and Strategy Management;

Clinical and preclinical development specialists.

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COMPANIES MENTIONED IN THE REPORT

AbbVie
Amgen
Amphista Therapeutics
Arvinas
AstraZeneca
Bayer
Biogen
BiotheryX
Boehringer Ingelheim
Bristol-Myers Squibb (& Celgene)
C4 Therapeutics
Calico Life Sciences
Captor Therapeutics
Cedilla Therapeutics
Cullgen

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Kymera Therapeutics
LEO Pharma
Lycia Therapeutics
Merck
Monte Rosa Therapeutics
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