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Gene Switch / Molecular Switch Market - Distribution by Application Area (Management of Treatment Related Toxicity, Regulation of Gene Expression and Other Applications), Type of Target Therapy (CAR T Cell Therapy, Gene Therapy and Other Therapies), Type of Payment Model Employed (Upfront Payments and Milestone Payments), and Key Geographical Regions (North America, Europe, Asia-Pacific and Rest of the World): Industry Trends and Global Forecasts, 2023-2035

https://marketpublishers.com/r/G31D6E703BBCEN.html
Date: April 2023
Pages: 210
Price: US$ 4,799.00 (Single User License)
ID: G31D6E703BBCEN

Abstracts

The global gene switch / molecular switch market is expected to reach USD 670 million in 2023 anticipated to grow at a CAGR of 11.5% during the forecast period 2023-2035.

In recent years, the field of adoptive cell therapy has experienced substantial advancements, notably through innovative treatments such as CAR T cell therapy, TCR therapy, TIL, and natural killer cell therapy. These approaches have shown promising clinical outcomes, spurring significant interest within the pharmaceutical industry. Notably, the US FDA has approved nearly 30 cell and gene therapy products, while more than 1,200 cell therapies are undergoing evaluation across various clinical development stages. The approval of over five CAR T cell therapies has particularly intensified focus on advancing cellular therapies.

Despite their potential, these therapies come with limitations. Adverse events, including neurotoxicity, cytokine release syndrome (CRS), on-target/off-tumor toxicity, and graft-

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versus-host disease (GVHD), pose significant challenges. Consequently, the industry is actively exploring tools and methods to address these issues. Attention has centered on safety switches, molecular switches, gene switches, or suicide switch systems. These mechanisms involve regulatory sites within genes capable of controlling the transcription and translation processes, promising enhanced safety profiles for genetically modified cell products in vivo while preserving the host's immune response.

Moreover, extensive analysis of ongoing developments and trends in the gene switch or molecular switch market has been conducted to project the global market opportunity. The growth of this market is expected to closely align with the expansion of the adoptive cell therapy market throughout the forecast period.

Report Coverage

An executive summary of the key insights captured in our report. It offers a high-level view on the likely evolution of the gene switch market in the short to mid-term, and long term.

A general overview of gene switch, highlighting details on its basic components and mechanism of action. Further, it presents detailed information on applications of gene switch. Additionally, it features a discussion on the future prospects within this domain.

An elaborate analysis of gene switch platforms based on several relevant parameters, such as type of target gene switch, switch activation, type of activator / repressor, application area, target therapies, highest phase of development and target therapeutic area.

A product competitiveness analysis of the gene switch platforms, based on supplier power (in terms of the experience of the developer) and product competitiveness (in terms of application area, target therapy, highest phase of development and target indication).

Detailed profiles of the prominent gene switch developers (shortlisted based on proprietary scoring criteria). Each company profile features a brief overview of the company, details related to its gene switch platform portfolio, recent developments and an informed future outlook.

An analysis of the various collaborations and partnerships inked between

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stakeholders engaged in this domain, since 2018. Further, the partnership activity in this domain has been analyzed based on various parameters, such as year of partnership, type of partnership, application area, type of target therapy, type of partner (industry and non-industry), most active players (in terms of number of partnerships inked) and regional distribution (continent and country-wise) of partnership activity.

Details on the various investments and grants that have been awarded to players focused on gene switch development. It includes a detailed analysis of the funding instances that have taken place during the period 2019 to 2023 (till January), highlighting the growing interest of venture capital (VC) community and other strategic investors in this domain.

A detailed review of peer-reviewed, scientific articles related to research on gene switch on the basis of several relevant parameters, such as year of publication, type of article, most active publisher, emerging focus areas, active affiliated institutes and geography. The chapter also highlights the top journals (in terms of number of articles published and impact factor).

An insightful analysis of the patents that have been filed / granted related to gene switch, since 2019, taking into consideration several relevant parameters, such as type of patent, publication year, application year, patent jurisdiction, CPC symbols, type of applicant, patent age and leading players (in terms of number of patents filed / granted). It also features a patent benchmarking analysis and a detailed patent characteristics and patent valuation analysis.

A business model analysis to understand the operational model adopted by the firms developing gene switch platforms, including service centric model and product centric model.

A comprehensive market forecast analysis, highlighting the likely growth of the gene switch market, till 2035. We have segregated the current and future opportunity based on as application area (management of treatment related toxicity, regulation of gene expression and other applications), type of target therapy (CAR-T cell therapies, gene therapies and other therapies), type of payment model employed (upfront payments and milestone payments), and key geographical regions (North America, Europe, Asia-Pacific and Rest of the World).

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Key Market Companies

- aceRNA Technologies
- Autolus Therapeutics
- Bellicum Pharmaceuticals
- Cellectis
- Kiromic BioPharma
- panCELLa
- Precigen
- Sana Biotechnology
- Sangamo Therapeutics

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