

# Gene Circuit Therapeutics Market Set to Reach \$4.11 Billion by 2029

*The Business Research Company's Gene Circuit Therapeutics Global Market Report 2025 – Market Size, Trends, And Global Forecast 2025-2034*

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Gene Circuit Therapeutics Global Market Report 2025

What Is The Expected Cagr For The [Gene Circuit Therapeutics Market](#) Through 2025?

The market for gene circuit therapeutics has seen rapid expansion in recent years, surging from \$1.50 billion in 2024 to \$1.84 billion in 2025, equating to a

compound annual growth rate (CAGR) of 22.5%. This impressive growth during the historical period can be associated with factors such as the growing exploration of gene circuits based on quorum sensing, increased usage of epigenetic regulatory modules, advancements in bio-computational therapeutic frameworks, rising adoption of optogenetic control systems and a growing fascination with non-coding RNA-mediated circuit designs.

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The market for gene circuit therapeutics is projected to

experience substantial expansion in the coming years, with its valuation predicted to rise to \$4.12 billion by 2029, maintaining a compound annual growth rate (CAGR) of 22.3%. This projected boom during the prediction period is linked to factors such as growing acceptance of cell-based therapies, an uptick in investment towards synthetic biology research, increasing demand for personalized healthcare, enhanced government support for the development of gene therapies, and breakthroughs in gene editing technologies. Key trends anticipated during this period involve progress in programmable gene network treatments, advanced modulation of cell-specific gene circuits, innovations in the design of synthetic feedback loops, introduction of computational modelling for circuit optimisation, and advances in controlling therapeutic gene switches.

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### What Are The Key Factors Driving Growth In The Gene Circuit Therapeutics Market?

The gene circuit therapeutics market is predicted to expand due to the increasing interest in personalized medicine. Tailored to match the unique characteristics of each patient, often determined by genetic, biomarker, or molecular profiling, personalized medicine is a rapidly growing field. It's driven by advancements in genomics and synthetic biology, which allows for more accurate disease targeting and enhanced treatment outcomes. Personalized medicine relies significantly on gene circuit therapeutics, which enable cells and microbes with programmable logic to detect, process, and react to specific disease conditions, therefore facilitating safer, more efficient, and patient-specific treatments. For example, NHS England's Genomics Statistical Commentary, a UK governmental authority, reported that the total number of personalized genomic tests rose to 65,884 in 2024, a 14% increase from 2023, indicating the rising demand for personalized medicine. As a result, the gene circuit therapeutics market has been significantly driven by the escalating demand for personalized medicine.

### What Are The Top Players Operating In The Gene Circuit Therapeutics Market?

Major players in the Gene Circuit Therapeutics Global Market Report 2025 include:

- GenScript Biotech
- Agilent Technologies
- Cellectis S.A.
- CRISPR Therapeutics
- Beam Therapeutics
- Twist Bioscience
- Ginkgo Bioworks
- Sangamo Therapeutics
- Senti Biosciences
- Editas Medicine

### What Are The Top Trends In The [Gene Circuit Therapeutics Industry](#)?

Key businesses in the gene circuit therapeutics market, such as Synlogic, Inc., are concentrating on the advancement of programmable gene circuits. The aim is to enhance disease targeting, therapeutic responses, and overall safety. These programmable circuits, composed of DNA, RNA, and regulatory proteins, are engineered genetic networks that simulate logical processes within cells. As a result, cells can sense biological inputs, process them accordingly, and produce specific outputs. Synlogic, Inc., a US-based clinical-stage biotechnology firm, shared new findings on SYN1353, a Synthetic Biotic drug candidate for homocystinuria (HCU), at the Synthetic Biology: Engineering, Evolution & Design (SEED) Conference in May 2023. The SYN1353 utilises genetically programmed probiotic bacteria equipped with metabolic gene circuits designed to intake methionine and lower harmful levels of homocysteine. This case demonstrates the versatility of programmable circuits in treating conditions beyond cancer, such as rare metabolic

disorders, underscoring their potential in creating precise, lasting, and patient-centric treatments.

### Comprehensive Segment-Wise Insights Into The Gene Circuit Therapeutics Market

The gene circuit therapeutics market covered in this report is segmented as

- 1) By Product Type: Synthetic Gene Circuits, Programmable Cell Therapies, Gene Editing Tools, Other Product Types
- 2) By Technology: Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR), Transcription Activator-Like Effector Nuclease (TALEN), Zinc Finger Nucleases, Other Technologies
- 3) By Application: Oncology, Rare Diseases, Infectious Diseases, Regenerative Medicine, Other Applications
- 4) By End-User: Pharmaceutical And Biotechnology Companies, Academic And Research Institutes, Hospitals And Clinics, Other End-Users

### Subsegments:

- 1) Synthetic Gene Circuits: Switch-based Circuits, Logic Gate Circuits, Oscillatory Circuits, Memory Circuits
- 2) Programmable Cell Therapies: CAR-T Cell Therapy, TCR-T Cell Therapy, NK Cell Therapy, Stem Cell-Based Therapies
- 3) Gene Editing Tools: CRISPR-Cas Systems, TALENs, Zinc Finger Nucleases (ZFNs), Meganucleases
- 4) Others: RNA-Based Therapeutics, Antisense Oligonucleotides, Epigenome Editing Tools

View the full gene circuit therapeutics market report:

<https://www.thebusinessresearchcompany.com/report/gene-circuit-therapeutics-global-market-report>

### Global Gene Circuit Therapeutics Market - Regional Insights

In the 2024 Gene Circuit Therapeutics Global Market Report, North America emerged as the leading region. However, Asia-Pacific is predicted to display the quickest growth in the upcoming forecast period. This comprehensive report includes details pertaining to multiple regions such as Asia-Pacific, Western Europe, Eastern Europe, North America, South America, Middle East, and Africa.

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