TECH SCAN

GENE EDITING & BIOTECHNOLOGY

BAZAAR®

WHERE MIND MEETS MARKET

Genetic engineering in biotechnology enables the direct alteration of organismal DNA, transforming biological systems for medical, agricultural, and industrial applications. Manipulating the code of life carries profound moral and safety responsibilities, guiding a technology that has rapidly transitioned from laboratory concepts into high-impact global applications. Today, these systems are actively deployed to synthesize life-saving therapeutics, engineer climate-resilient crops, and correct genetic disorders at the molecular level.

The historical trajectory of biotechnology is defined by intense global competition, with patent frameworks determining the control and commercialization of genomic innovations from the 1970s recombinant DNA revolution to the current CRISPR era. These legal structures have become central to securing intellectual property for advanced gene-editing capabilities, effectively turning molecular tools into highly protected commercial assets.

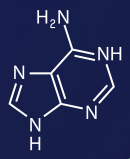
India is positioning itself in this biotechnology landscape by transitioning toward indigenous precision medicine, supported by national research institutions and bio-incubators. While foundational tool discovery is globally consolidated, Indian entities are accelerating innovation through patenting localized diagnostic kits, climate-adaptive agricultural strains, and affordable bioprocessing workflows. This focus on scalable design and low manufacturing costs aims to make next-generation genetic advancements globally accessible.

INNOVATION TIMELINE

PATENTABLE COMPONENTS

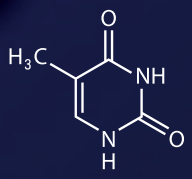
cDNA (Complementary DNA)
It is a synthetic molecule. The non-coding regions (introns) are artificially removed in a lab to match the continuous coding sequence of mRNA.

Recombinant DNA (rDNA) Constructs, Plasmids, and Expression Vectors
Joining DNA fragments from different biological sources to create a functional molecular delivery tool.

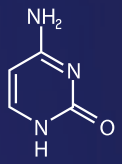


Genetically Modified Microorganisms (Bacteria, Yeast, and Fungi)
Artificially engineered cellular factories used for brewing drugs or processing chemicals.

Synthetic Nucleases and Guide RNA (gRNA) Sequences
Engineered gene-editing machinery-such as modified Cas9 enzymes, codon-optimized nucleases, and custom-designed target-specific guide RNAs-are artificial laboratory constructs created for precise sequence targeting.



Chemically Modified mRNA (Messenger RNA)
mRNA that has been chemically altered in a lab (e.g., nucleoside modifications to enhance stability or evade immune rejection).



Recombinant and Structurally Modified Proteins/Polypeptides
Proteins manufactured via an engineered host cell or altered amino acid chains that show superior therapeutic efficacy, are fully eligible.

Synthetic Oligonucleotides, Primers, and DNA Markers
Artificial, laboratory-synthesized short DNA or RNA strands designed to serve as specific primers for diagnostic testing or molecular markers.

Bioprocessing, Synthesizing, and Gene-Editing Laboratory Methods
The technical, step-by-step methodologies used to edit cells ex vivo, manufacture recombinant therapeutics, or synthesize complex genetic sequences.

Synthetic/Hybrid Cell Lines and Diagnostic Kits
Highly manipulated cellular cultures (such as engineered CAR-T cells modified for cancer therapy) and downstream consumer products like CRISPR-based viral testing kits.

PATENT STATISTICS

PATENT LANDSCAPE

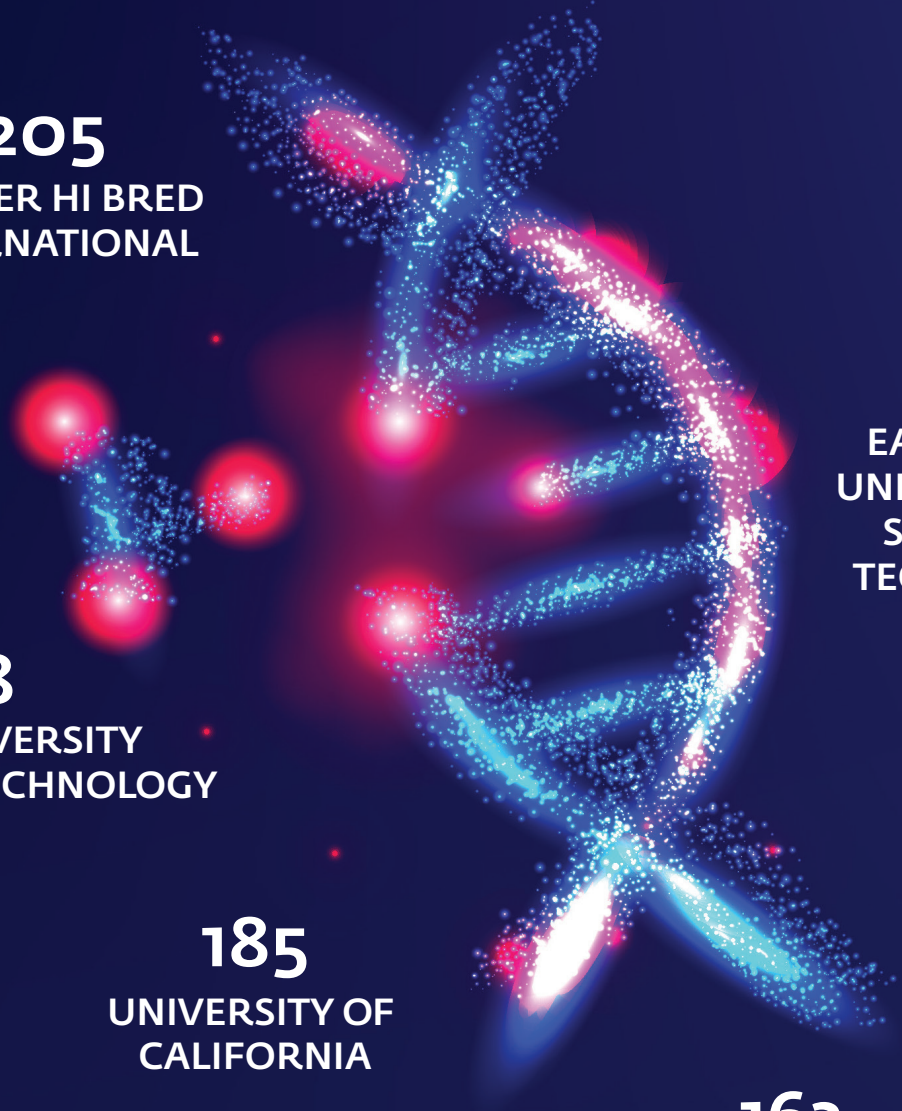
Database: Questel Orbit
Data Range: 01/01/2021 - 23/06/2026

TOP APPLICANTS

530
JIANGNAN UNIVERSITY

280
ZHEJIANG UNIVERSITY OF TECHNOLOGY

260
TIANJIN INSTITUTE OF INDUSTRIAL BIOTECHNOLOGY - CHINESE ACADEMY OF SCIENCES



205
PIONEER HI BRED INTERNATIONAL

168
EAST CHINA UNIVERSITY OF SCIENCE & TECHNOLOGY

188
TIANJIN UNIVERSITY OF SCIENCE & TECHNOLOGY

185
UNIVERSITY OF CALIFORNIA

163
BROAD INSTITUTE OF MIT & HARVARD

156
CHINA AGRICULTURAL UNIVERSITY

155
CJ CHEILJEDANG

Database: Questel Orbit
Data Range: 01/01/2021 - 23/06/2026

NOTABLE INNOVATIONS

Patent Application	Priority date	Title	Assignee
EP0093619	1982-05-05	Human tissue plasminogen activator, pharmaceutical compositions containing it, processes for making it, and DNA and transformed cell intermediates therefor	GENENTECH
US5278297	1988-11-21	Gene encoding a novel protein H capable of binding to IgG	SUMITOMO PHARMACEUTICALS
US20040018489	1991-09-09	Detection of RNA	THIRD WAVE TECHNOLOGIES
US20020173640	1999-05-27	ADAM polynucleotides, polypeptides, and antibodies	HUMAN GENOME SCIENCES
US20050037439	2002-10-29	Differentially expressed genes involved in cancer, the polypeptides encoded thereby, and methods of using the same	PHARMACIA
US9650642	2008-02-08	Genetically modified cyanobacteria for the production of ethanol	ALGENOL BIOTECH
US8697359	2012-12-12	CRISPR-Cas systems and methods for altering expression of gene products	BROAD INSTITUTE OF MIT & HARVARD
CN109485721	2018-11-23	Method for obtaining tumor specific T cell receptor	DU XUEMING
CN112266411	2020-09-25	Novel coronavirus vaccine and application thereof	BEIJING NORTHLAND BIOTECH
CN122168649	2026-04-09	Preparation method of neutrophil gelatinase related lipocalin and antibody	GUILIN IMMUNETECH

WHITESPACES

Non-Invasive, Directed in Vivo Delivery Vectors

Epigenetic Editing Systems

Diagnostic Biocomputing Logic Gates

Synthetic Xenotransplantation Genetic Cleaners

Cell-Free Protein Synthesis (CFPS) Platforms

Next-Generation High-Fidelity Editing Enzymes

If you would like to learn more about any of these areas or have specific questions, we're here to provide further information and insights. Our team is dedicated to driving progress and staying at the forefront of Gene Editing & Biotechnology.

About IP Bazzaar

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Where Mind Meets Market

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