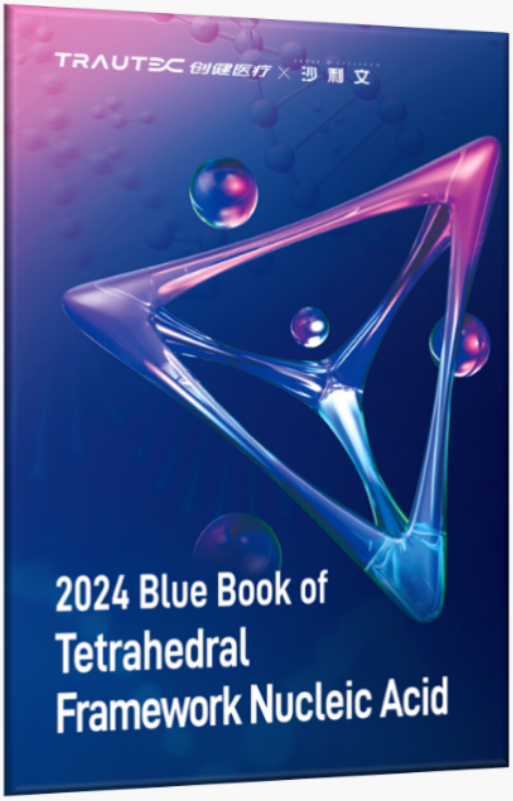
Frost & Sullivan co-published 2024 Blue Book of Tetrahedral Framework Nucleic Acid with Trautec



SHANGHAI, CHINA, November 12, 2024 / EINPresswire.com/ -- Frost & Sullivan and Trautec have conducted extensive investigation across the nucleic acid and tetrahedral framework nucleic acid (tFNA) industry and co-published the "2024 Blue Book of Tetrahedral Framework Nucleic Acid", which aims to analyze the latest research progress, production technology, application fields, and prospects of tFNAs. (To read the 2024 Blue Book of Tetrahedral Framework Nucleic Acid, go here https://hub.frost.com/tetrahedral-framework-nucleic-acid-a-promising-nanomaterial-with-significant-potential-in-biomedical-and-cosmetic-applications/.)

Nucleic acids, fundamental building blocks of life, hold a central position in biology and medicine. With technological advancements, nucleic acids have transcended their role as carriers of genetic information to become crucial raw materials for designing and constructing nanomaterials. Among these, tetrahedral framework nucleic acids (tFNAs) have emerged as a promising nanomaterial, demonstrating significant potential in biomedical and cosmetic applications.

tFNAs have multiple advantages including high mechanical strength, stability, editability, and excellent biocompatibility and safety profiles, which can be applied to skin and soft tissue repair, bone tissue regeneration, neuroprotection, immune system modulation, and antimicrobial therapy. This report will help readers understand the importance and broad application prospects of tFNAs, provide valuable references for tFNA research and applications, and offer insights and inspiration for researchers and practitioners in related fields. As research deepens and technology advances, tFNAs will play an increasingly important role in future biomedical and personal care fields, not only driving technological innovation but also making significant contributions to enhancing human health and quality of life. Furthermore, developing tFNAs will provide valuable experience and reference for the industrialization of other emerging

nanomaterials.

Trautec Co., Ltd. (Changzhou, Jiangsu, China) actively explored innovative biosynthetic methods for synthesizing oligonucleotides required for tetrahedral framework nucleic acids (tFNA). Through synthetic biology, they cleverly utilized the DNA replication and repair mechanisms in the body to achieve large-scale, efficient, and direct synthesis of the required DNA sequences in vivo. The advantages of this method are significant. Preliminary studies have shown that biosynthetic methods are expected to reduce the production cost of oligonucleotides to about 1/3 of traditional chemical synthesis methods. This significant cost reduction not only makes the production of tFNA more economical and feasible, but also paves the way for its application in a wider range of fields. In particular, this method significantly reduces the cost of obtaining nucleic acids, making it possible to use tFNA in the cosmetics field.

Trautec Co., Ltd. is also actively exploring the industrialization and application of tFNA in the field of cosmetics. By reducing costs, tFNA is expected to become a high-tech raw material that most cosmetic brands can afford. This not only brings innovative functional raw materials to the cosmetics industry, but also opens up a new market for the large-scale application of tFNA.

"2024 Blue Book of Tetrahedral Framework Nucleic Acid" highlights the following:
* Types, historical context, nomenclature, molecular structures, and functions of nucleic acids, including DNA, RNA, and synthetic nucleic acids.
* Evolution of DNA nanotechnology, from early DNA ligation techniques to modern DNA origami and dynamic DNA nanostructures.
* The unique structural properties of tFNAs, including their high mechanical strength, stability, editability, and excellent biocompatibility and safety profiles
* tFNAs' advantages in skin and soft tissue repair, bone tissue regeneration, neuroprotection, immune system modulation, and antimicrobial therapy.
* tFNAs' multiple applications from structure-based regulation of cell biology to drug carriers. For their core applications in cosmetics, tFNA is applicable in wound healing promotion, skin aging alleviation, skin whitening, photodamage repair, hair loss prevention, etc.
* Perspectives on the future potential of tFNAs in research and applications, discussing possible challenges and opportunities.
* Case Studies of tFNA Company —— Trautec Medical

Key Topics Covered:
1. Overview of Nucleic Acids
a. Definition and Structure of Nucleic Acids
b. History of Nucleic Acid Discovery and Applications
c. Nomenclature of Nucleic Acids
d. Types of Nucleic Acids
e. Molecular Composition and Size
f. Topology of Nucleic Acids

2. DNA Nanotechnology
a. Nanoscale Structure Manufacturing Method
b. History of DNA Nanotechnology
c. Early DNA Ligation Techniques
d. DNA Origami
e. Three-Dimensional DNA Structure
f. Dynamic DNA Nanostructures
g. Supramolecular DNA Assembly

3. Tetrahedral Framework Nucleic Acids (tFNAs)
a. Structural Advantages of tFNAs
b. High Mechanical Strength
c. High Stability
d. Editability
e. Good Biocompatibility and Safety
f. Ease Cell Penetration

4. Application Value of tFNA
a. First-Generation tFNA
b. Second-Generation tFNA as Carriers
c. Applications on Skin and Soft Tissue
d. Applications in Bone Tissue Regeneration
e. Applications in the Nervous System
f. Applications in Immune System
g. Applications in Antibacterial Treatment

5. Typical Applications of tFNA in Skin
a. Promote Scar-free Healing of Skin Wound
b. Relieve Skin Aging
c. Skin Whitening
d. Repair Photosensitive Damage
e. Anti-Hair Loss
f. Carrying Medicine for Skin Diseases

6. Biosynthesis of tFNA and Its Application in Cosmetics
a. Synthesis of tFNA Oligonucleotides
b. Safety Testing of tFNA as Cosmetic Ingredients
c. Efficacy of tFNA as Cosmetic Raw Material
d. Prospects of tFNA

About Frost & Sullivan
Frost & Sullivan, the Growth Partnership Company, works in collaboration with clients to leverage visionary innovation that addresses the global challenges and related growth opportunities that

will make or break today's market participants. For more than 60 years, Frost & Sullivan has been developing growth strategies for the global 1000, emerging businesses, the public sector and the investment community.

About Trautec
Jiangsu Trautec Medical Technology Co., Ltd. ("Trautec") is a synthetic bioscience and technology company focusing on the research and development, production, and sales of new biomaterials and innovative protein / nucleic acid drugs with nearly 40 years of experience in the medical device industry. Anchored in its vision of building an intelligent platform for synthetic biology, Trautec aims to create a healthier future by bringing technology closer to life.

From 2022 to 2023, Trautec Medical successfully secured two consecutive rounds of financing, amassing nearly 400 million yuan. These funding rounds were respectively led by Shiseido's Ziyue Fund and LVMH's L Catterton's inaugural RMB fund.

Media Contact
Trautec
Shengwei Fu
fushengwei@trautec.com.cn
https://www.trautec.us/

Website: http://www.frostchina.com

Qian Li
Frost & Sullivan
email us here