UNIVERSITY OF WYOMING
RESEARCH PRODUCTS CENTER

Improved Artificial DNA for Data Storage Applications

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Patent Status:
Patent Pending

Description of Technology

Artificial DNA is considered to be the new revolutionary data storage method, with potential to store vast amounts of digital data *in vivo* or *in vitro* within a very dense and stable medium. However, as with any computer code, DNA coding is susceptible to errors during code construction, storage, and read-out. Thus it is critical that DNA used for data storage have dependable and precise error-correcting or detecting features.

University of Wyoming researchers have composed an algorithm derived from coding theory and cryptography that seamlessly combines with existing DNA storage applications to provide greater protection and precision. The proposed algorithm is also designed to ensure authenticity and correctness throughout any series of data by generating a certificate that confirms that the obtained data is exactly like the original data. The two main ingredients for the success of these new methods are randomization and secure data integrity. These new methods compare favorably with existing approaches in terms of ease of implementation and message expansion.

Applications

The presented solutions have the potential to significantly improve the use of artificial data as a data storage medium. The algorithm is also relevant and applicable for faster DNA sequence alignment techniques, DNA steganography, and fast identification of correct reads of next generation sequencing. The new methods can apply to both *in vitro* and *in vivo* approaches.

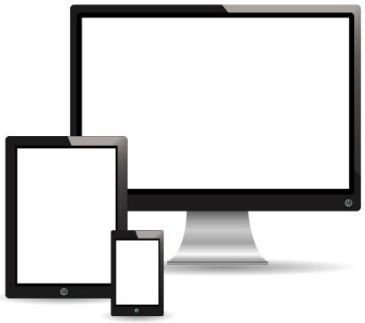
Features & Benefits

- Improved protection and precision for DNA storage methods
- Capable of being used with existing data storage methods
- Easy implementation
- Can be applied to both *in vitro* and *in vivo* methods
- Applicable to other areas of DNA research

Market Opportunity

Storing digital data on DNA has incredible potential for future global use. Researchers at Harvard's Wyss Institute have successfully stored around 700 terabytes of data in a single gram of DNA. Biological storage could be used across the world for everyday purposes and could significantly improve our data storage capabilities. Hence, a method to improve the precision and dependability of DNA storage application is necessary to further develop this technology.

[1] Anthony, Sebastian (2012). *Harvard Cracks DNA Storage, Crams 700 Terabytes of Data into Single Gram.* Extreme Tech. Retrieved from http://www.extremetech.com/extreme/134672-harvard-cracks-dna-storage-crams-700-terabytes-of-data-into-a-single-gram



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