

DNA AS DATA STORAGE



Data production around the globe will soon surpass the capacity of our currently available storage methods

DNA Data Storage could be a viable solution to meet the data burden

Digital information would be stored in synthetic DNA molecules using chemical technology

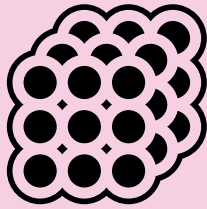
HOW TO STORE DATA IN DNA

Encoding	DNA synthesis	DNA storage	Retrieving and reading data	Decoding
Unique combinations of DNA nucleotides are assigned to specific binary bits	DNA is constructed combining nucleotides in a sequence that corresponds to the encoded data	Suitable storage conditions protect DNA from degradation and error in its code	The DNA is amplified in order to determine the order of the nucleotides	Sequenced DNA is converted into binary code of the original data

ENABLERS



Global demand for increased data storage



Storing lots of data in a small volume



Long-term stability for data preservation



Strong investment from many institutions

BARRIERS



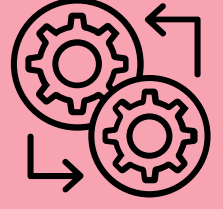
Slow and costly storage and retrieval process



Potential for errors during stages of data storage



Specialist skill is required for storing data on DNA



A lack of automated, integrated systems

QUESTIONS

Could the DNA that is storing data be considered 'personal data'?

How secure is the data stored within the DNA?

Should existing historical data be stored?

Would uneven access to the technology bias the historical record?



With investment, DNA data storage could become routine within the next 20 years, maybe sooner if the challenges of high costs and slow data read/write speeds can be overcome

Where could DNA digital data storage be feasible for use in healthcare?

When could it be considered affordable for use across health systems?

Will error rates in storing and retrieving data be low enough for healthcare use?

THE USE OF DNA DATA STORAGE TO PRESERVE HEALTH RECORDS OR DATASETS RAISES SPECIFIC ISSUES FOR INVESTIGATION