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Squillions of bytes in one cup of DNA I/O is rubbish, but DNA will be around once the LTO standard is dust

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It's not the first time that digital data has been encoded on DNA, but new research published today in *Nature* brings bio-storage a significant step closer to reality.

Scientists have previously demonstrated that DNA is viable as a digital storage medium – for example, Stanford University [demonstrated](#) last year that a bit written onto DNA could survive cell reproduction.

Both reading and writing DNA are error-prone, particularly if a DNA 'letter' repeats in the string, and it's only possible to manufacture short strings of DNA at the moment. It's these problems the researchers have worked to address.

In their [paper](#), the researchers describe a technique to encode manufactured DNA to avoid code repetition.

As co-author Ewan Birney [explains](#):

“We knew we needed to make a code using only short strings of DNA, and to do it in such a way that creating a run of the same letter would be impossible. So we figured, let's break up the code into lots of overlapping fragments going in both directions, with indexing information showing where each fragment belongs in the overall code, and make a coding scheme that doesn't allow repeats. That way, you would have to have the same error on four different fragments for it to fail – and that would be very rare.”

In his demonstration, Birney and fellow-researcher Nick Goldman, both of the EMBL-European Bioinformatics Institute, called on Agilent Technologies to help them encode a variety of content onto manufactured DNA: a jpg photo of the EMBL-EBI, a PDF of the Watson and Crick paper that first described DNA, a txt file containing all of Shakespeare's sonnets, and an mp3 of Martin Luther King's "I Have a Dream" speech.

All of this went onto manufactured DNA strings "as big as a speck of dust", Agilent's Emily Leproust said – meaning that a cupful of DNA would hold "a hundred million hours of high-definition video".

While you won't see DNA replacing the RAM in your computer, the researchers say its density and longevity – it can be decoded from creatures long-dead such as woolly mammoths – make it an ideal archival medium. @

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