

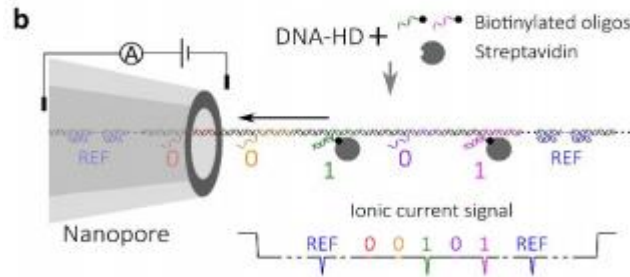
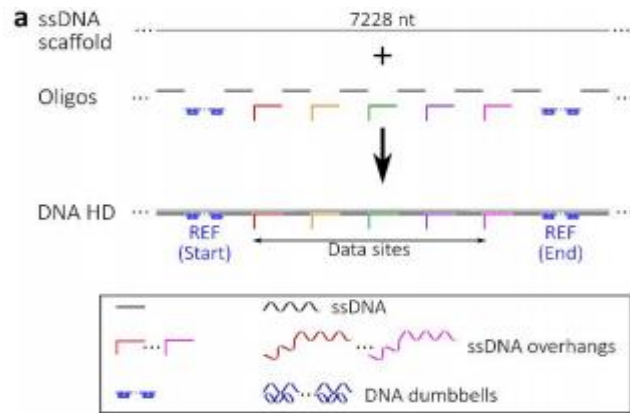
15/04/20

# Science news

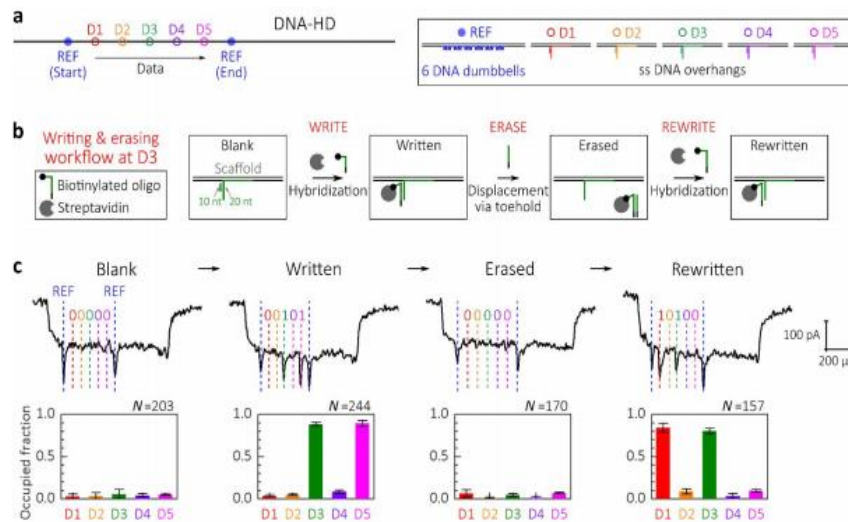
A.Galkevich

# Запись и чтение информации с помощью ДНК

## система ДНК-жесткий диск (DNA-HD)



Nanopores are powerful single-molecule tools for label-free sensing of nanoscale molecules including DNA that can be used for building designed nanostructures and performing computations. Here, DNA hard drives (DNA-HDs) are introduced based on DNA nanotechnology and nanopore sensing as a rewritable molecular memory system, allowing for storing, operating, and reading data in the changeable three-dimensional structure of DNA. Writing and erasing data are significantly improved compared to previous molecular storage systems by employing controllable attachment and removal of molecules on a long double-stranded DNA. Data reading is achieved by detecting the single molecules at the millisecond time scale using nanopores. The DNA-HD also ensures secure data storage where the data can only be read after providing the correct physical molecular keys. Our approach allows for easy-writing and easy-reading, rewritable, and secure data storage toward a promising miniature scale integration for molecular data storage and computation.



<https://doi.org/10.1021/acs.nanolett.0c00755>



# Дофаминирование хроматина

## More than a normal neurotransmitter

The molecular mechanisms underlying the persistence of addiction remain largely unclear. Lepack *et al.* found that, with cocaine exposure, there is an intracellular accumulation of dopamine in neurons of a brain region called the ventral tegmental area (see the Perspective by Girault). Dopamine associates with chromatin to initiate a previously unknown form of epigenetic regulation called dopaminylation. This modification has an impact on ventral tegmental area function and, consequently, on dopaminergic action potentials. The result is aberrant dopamine signaling in the ventral striatum during periods of drug seeking.

*Science*, this issue p. 197; see also p. 134



<https://doi.org/10.1126/science.aaw8806>;

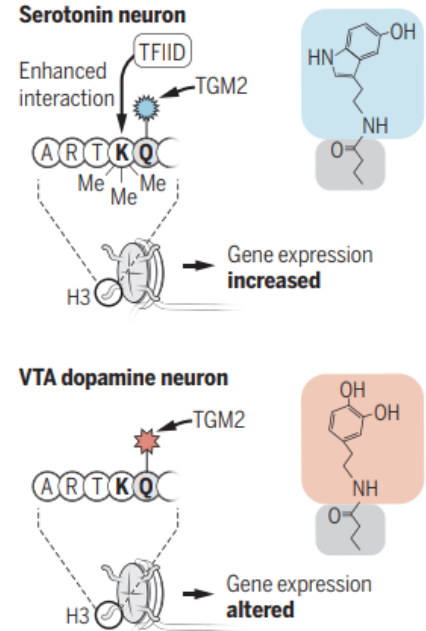
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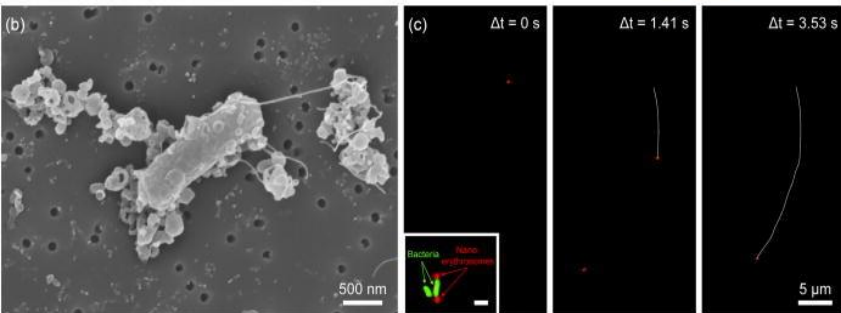
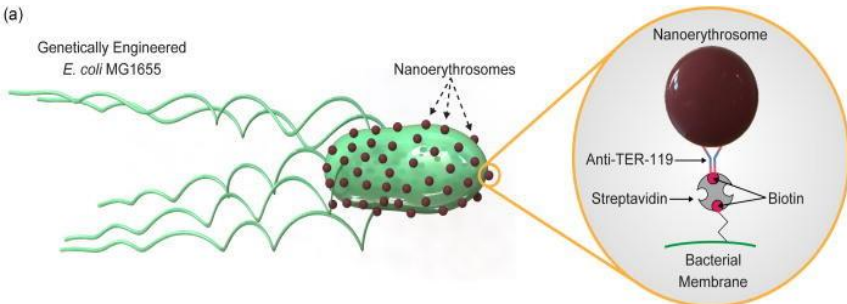
## Monoamination of histone H3

Serotonylated glutamine (Q) 5 in histone H3 during serotonergic neuron differentiation is catalyzed by transglutaminase 2 (TGM2) and associated with trimethylation of lysine 4 (K4me3). Seronylation enhances general transcription factor IID (TFIID) binding to K4me3 and facilitates transcription.

Dopaminylated Q5 in histone H3 is initially decreased during cocaine withdrawal and then increased. This facilitates withdrawal-induced gene expression alteration in ventral tegmental area (VTA) neurons and enhances dopaminergic neuron excitability and drug-seeking behavior in rats. A, alanine; R, arginine; T, threonine.

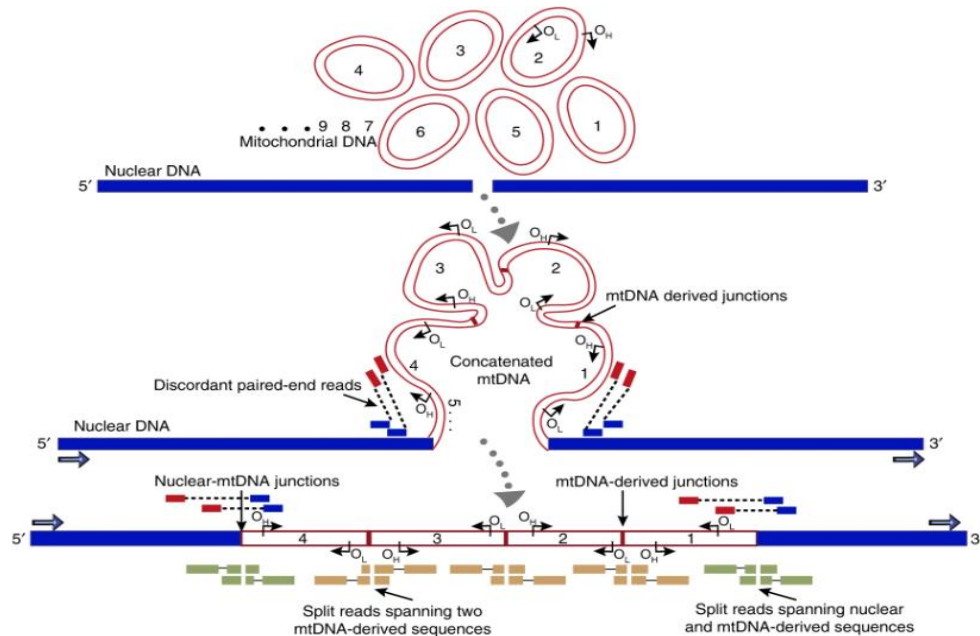


# Наносвиммеры



Унаследованная от отцов мт-ДНК оказалась ядерной

mega-NUMTs (NUclear MiTOchondrial DNA)



<https://aip.scitation.org/doi/abs/10.1063/1.5130670>



<https://www.nature.com/articles/s41467-020-15336-3>

