DNA folding takes a fresh direction

Interlocking grids guide the production of two- and three-dimensional structures.

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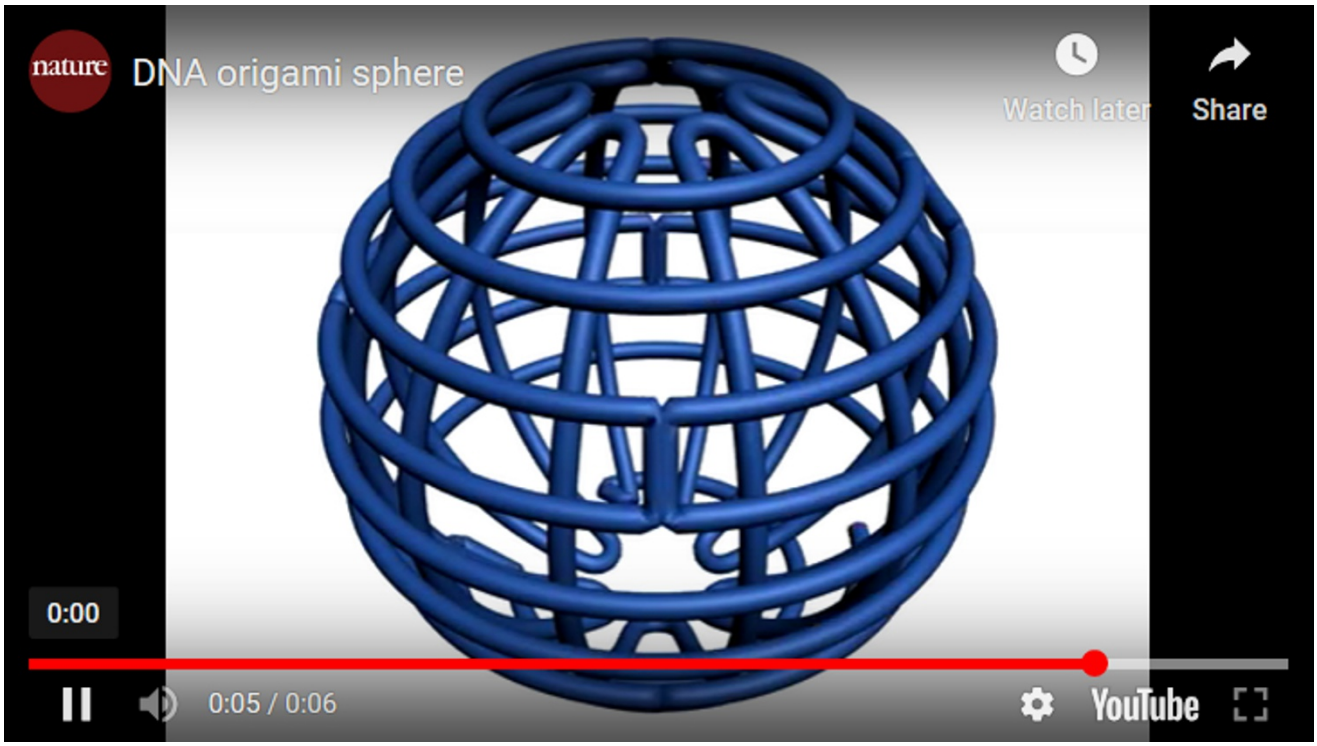

The intricate art of DNA origami has been given a fresh twist. Researchers at Arizona State University in Tempe have managed to coerce a single strand of DNA to fold back on itself to form an array of two- and three-dimensional nanostructures (see video above).

DNA origami involves using scaffolding to guide a single strand of DNA as it folds up to form a shape. The Arizona team, led by Hao Yan, managed to create more intricate shapes than have been possible so far, by using scaffolding made up of cross-like structures of two DNA strands nearly at right angles to each other.

Similar cross-shaped structures, called Holliday junctions, are not new. But it had been thought impossible to link them together to make a stable scaffold because the charge of the DNA molecules was always mismatched.

Yan and his team overcame this problem by tweaking the way they assembled their scaffold so that the junctions became slightly 'twisted'. The result was that junctions could link together to form a waffle-like gridiron structure that is "surprisingly very stable", Yan says.

Using this, the team was able to guide the formation of not only two-dimensional DNA structures but also three-dimensional spheres and screw-like shapes. The scaffold and the various structures it can produce are published in *Science* today[1].

Yan hopes that DNA origami can now become more useful, perhaps building three-dimensional 'cages' to hold drugs and so deliver them to the specific place they are needed in the body.

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References

1. Han, D. *et al*. *Science* **339**, 1412–1415 (2013).