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'DNA slingshot' targets drug delivery

Molecular machines built with synthetic DNA and antibodies could have applications in medicine

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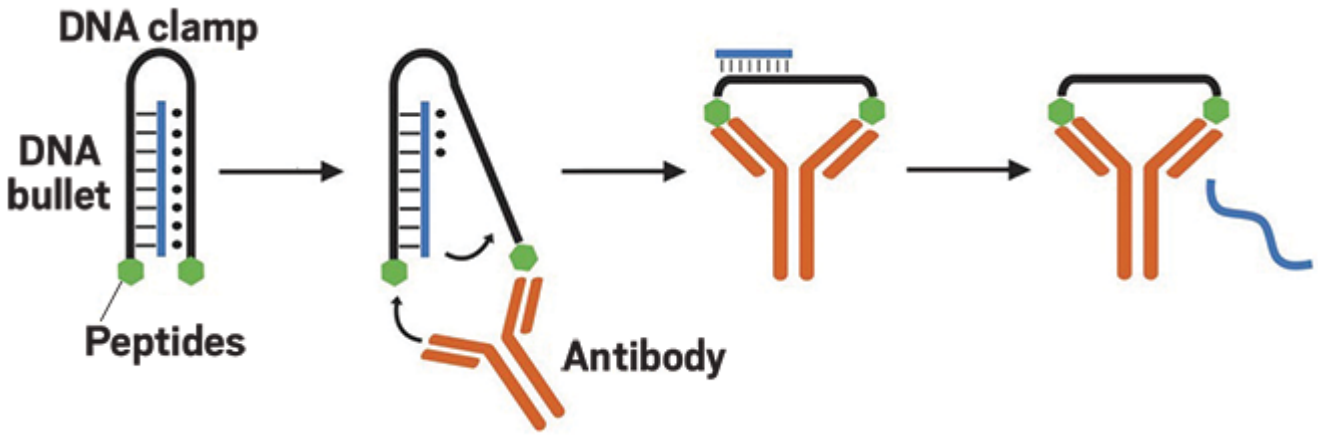
Gene therapy and personalized medicine are probably the first things that come to mind when people think about DNA and health care. But a growing number of researchers are viewing DNA as a functional and flexible material to build nanomachines with potential in medical diagnostics and drug delivery applications. The latest example is a "DNA slingshot" designed by researchers at the University of Montreal and the University of Rome Tor Vergata. Led by Rome's **Francesco Ricci <http://www.francescoriccilab.com/>** , the researchers first created a DNA clamp from two synthetic DNA strands to encapsulate a third strand. The team conjugated antigenic peptides to the ends of the clamp strands, meaning every clamp is equipped to recognize specific antibodies. When two peptides find their target, the clamp strands elongate to span the familiar Y-shaped



Peptides anchored to a DNA clamp bind with an antibody, unfolding the assembly into a slingshot that releases a DNA "bullet." Dots and lines represent different base pairing motifs present in the nanomachine.

Credit: *Nat. Commun.*

arms of the antibody. When the DNA clamp loosens, the interior strand is released like a wet noodle from a slingshot (*Nat. Commun.* 2017, DOI: **10.1038/ncomms15150 <http://sci-hub.cc/10.1038/ncomms15150>**). This DNA-based platform is inexpensive and is readily adaptable to accommodate peptides to recognize biomarkers specific to certain diseases, Ricci says. Although the slingshot shoots DNA currently, the team is working to load it with other molecules, including cancer therapeutics.

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