

Abstract Submitted  
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**Modeling of DNA zipper reaction rates** PRESTON LANDON, CASEY SANCHEZ, ALEXANDER MO, RATNESH LAL, University of California, San Diego — DNA zippers are a thermodynamically driven system consisting of three DNA oligonucleotides. Two of the strands are designed to create a small helix the third is designed to invade and separated the helix. A zipper system consisting of a normal strand (N), a weak strand (W), and an opening strand (O). N is made up of normal DNA bases, while W is engineered with inosine bases substituted for guanine. Inosine forms one less hydrogen bond with cytosine than guanine. By varying the number and order of inosine, W is engineered to provide less than natural bonding affinities to N in forming the [N:W] helix. When O is introduced (a natural complement of N), it competitively displaces W from [N:W] and forms [N:O]. DNA zippers have been used to create new DNA devices such as springs and tweezers and to create functionalized DNA origami structures. Currently, The basic principles and interactions of DNA zippers are not well understood. Here we will report the results on an investigation of several different DNA zipper constructs designed to aid in the creation of a mathematical prediction of the reaction rate for DNA zippers.

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