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Eric J Rawdon* (ejrawdon@stthomas.edu). *Unknotting and unlinking DNA via Topoisomerase IV.*

Type II topoisomerases have been shown to be 10 to 100 times more effective than random crossing changes in unknotting and unlinking DNA. The exact mechanism for such efficiency is a problem of modern curiosity. Buck and Zechiedrich proposed that type II topoisomerases might perform strand passages preferably at hooked juxtapositions. Simulations have shown that strand passages at such hooked juxtapositions on random knot configurations do preferably simplify knotting. Furthermore, Witz et al. showed that supercoiling induces a tightening of the knotted regions during simulations. In our work, we show how supercoiling creates special geometrical attributes in simulated knotted and linked DNA that could be identified by Topoisomerase IV, a bacterial type II topoisomerase. This is joint work with Julien Drier, Dusan Racko, Kenneth Millett, and Andrzej Stasiak. (Received December 16, 2016)