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Lynn Zechiedrich* (e1z@bcm.edu), One Baylor Plaza, Mail-stop BCM-280, Houston, TX 77030, and **Jonathan M. Fogg, Daniel J. Catanese, Jr., Donald Schrock, Brian Gilbert, Nianxi Zhao** and **Youli Zu**. *Supercoiled DNA minicircles*.

To study DNA supercoiling and DNA topoisomerases, we created a way to make milligram quantities of minicircle DNAs of a few hundred base pairs. These DNAs have been extremely useful for this purpose. I will present data showing that supercoiled minicircles are useful for studying DNA structure and are superior vectors for delivering DNA into human cell types that no other DNA vector has been previously able to penetrate. In cells, DNA sequence is transcribed from these minicircles into small RNAs that regulate gene expression. Even small genes can be expressed from supercoiled minicircles. Supercoiled minicircles resist shear forces associated with gene therapy delivery and are significantly less susceptible to the nucleases in human serum than normal plasmid DNA vectors of a few thousand base pairs. (Received February 02, 2010)