1078-92-184 **Daniel J. Catanese**, **Jonathan M. Fogg**, **Milenka Arevalo-Soliz**, **Erol Bakkalbasi**, **Truston J. Bodine**, **Donald E. Schrock**, **Brian E. Gilbert** and **Lynn Zechiedrich*** (elz@bcm.edu), Molecular Virology & Microbiology, One Baylor Plaza, Mail-stop: BCM-280, Houston, TX 77025. *Advances in using Supercoiled Minivector DNA for Gene Therapy.* Preliminary report.

Gene therapy requires delivering nucleic acids to diseased organs and cells. We have developed nonviral gene therapy vectors called Minivectors. Using a site-specific intramolecular recombination reaction allows for milligram production of closed circular, supercoiled DNAs as small as 250 bp. We have published that Minivectors (i) transfect human cells; (ii) express genes, shRNAs, or miRNAs; and (iii) resist shear forces associated with vector delivery and human serum nucleases.

To track Minivectors in cells or live animals, we developed a protocol for site-specific labeling of supercoiled Minivectors. We attach any chemical moiety (e.g., fluorescent dyes) to a specific nucleotide within a given sequence. To evaluate the potential of intravenous delivery of Minivectors into humans, we subjected supercoiled DNAs of varying lengths to human serum. DNA degradation strongly correlated with DNA length and was independent of DNA sequence.

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