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(54) **Title:** NON-VIRAL MODIFICATION OF MESENCHYMAL STEM CELLS

(57) **Abstract:** Described herein are methods for transfecting mesenchymal stem cells with a nucleic acid construct from which one or more functional genes are expressed, which are non-viral and which in certain embodiments may provide high transfection efficiency, high copy number per cell, high cell viability, transient expression for extended duration, and/or a substantially unchanged multipotent phenotype. In certain embodiments, such methods may be scalable and/or suitable for large scale clinical production of modified mesenchymal stem cells. Also described in detail herein are transfected mesenchymal stem cells and populations of mesenchymal stem cells, uses thereof, methods for the treatment of diseases or disorders such as cancer using such transfected mesenchymal stem cells, and kits and compositions relating thereto.