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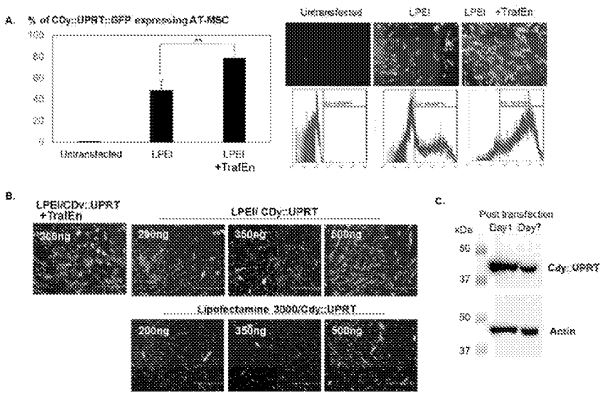


FIG. 1

(57) Abstract: Described herein are methods for transfecting mesenchymal stem cells (MSCs) with a nucleic acid construct using a cationic polymer, a first reagent capable of redirecting endocytosed nucleic acids from intracellular acidic compartments, and a second agent capable of stabilizing a microtubular network of the MSCs. The methods are free of virus-based transfection vehicle materials and the transfected MSCs have substantially unchanged multipotent phenotype. In certain embodiments, the transfected MSCs express functional genes comprising suicide gene, such as cytosine deaminase or uracil phosphoribosyltransferase. Also described are methods for the treatment of diseases, such as cancer, using such transfected cells in combination with 5FC, 5FU, GCV, as well as kits and composition relating thereof.

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