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(54) Title: SELECTION BY ESSENTIAL-GENE KNOCK-IN

(57) Abstract: Strategies, systems, compositions, and methods for efficient production of knock-in cellular clones without reporter genes. An essential gene is targeted using a knock-in cassette that comprises an exogenous coding sequence for a gene product of interest (or "cargo sequence") in frame with and downstream (3') of an exogenous coding sequence or partial coding sequence of the essential gene. Undesired targeting events create a non-functional version of the essential gene, in essence a knock-out, which is "rescued" by correct integration of the knock-in cassette, which restores the essential gene coding region so that a functional gene product is produced and positions the cargo sequence in frame with and downstream of the essential gene coding sequence.



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