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(54) Title: IN VITRO MUTAGENESIS, PHENOTYPING, AND GENE MAPPING

(57) Abstract: Cellular libraries useful for *in vitro* phenotyping and gene mapping. In a representative approach, a method for preparing a homozygous cellular library includes the steps of providing a heterozygous cellular library comprising a plurality of isolated parent cells; including site-specific mitotic recombination in the plurality of isolated parent cells; culturing the plurality of isolated parent cells, whereby a population of daughter cells is produced; and selecting daughter cells comprising a homozygous genetic modification, whereby a homozygous cellular library is prepared.

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