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(54) Title: A METHOD OF ALTERING A DIFFERENTIATION STATUS OF A CELL

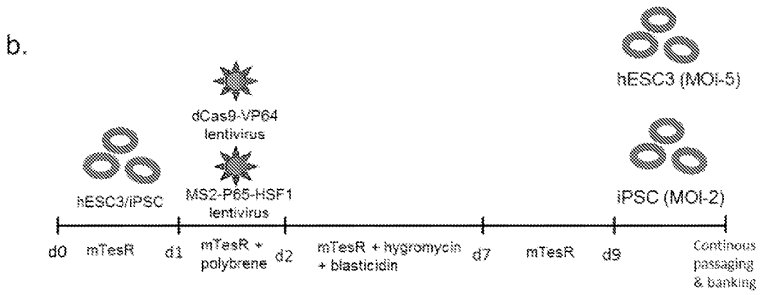


Fig. 1

(57) Abstract: The invention relates to a method of altering a differentiation status of a stem cell by modulating the expression of one or more differentiation factors with a nuclease-deactivated Cas9 (dCas9) fusion protein comprising dCas9 and a transcriptional activator. The method may further include a guide RNA (gRNA) and an activator module comprising RNA-binding protein binding capable of binding to the gRNA. In one embodiment, the dCas9 fusion protein comprises dCas9 and VP64 while the activator module comprises MS2 coat protein and p65. The one or more differentiation factors may comprise PAX6, MITF and OTX2 for differentiation of pluripotent stem cell into retinal pigment epithelium (RPE). Also disclosed are cells comprising the dCas9 fusion protein, gRNA, kits, and method of treating a disease thereof.

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