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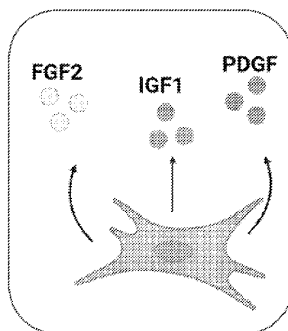
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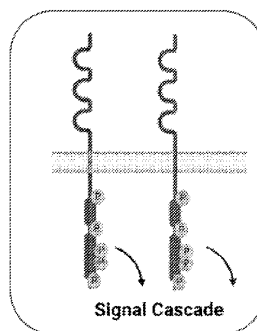
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(54) Title: ENGINEERING CELL LINES CAPABLE OF PROLIFERATION IN GROWTH FACTOR FREE MEDIA FORMULATIONS

1. Overexpress growth factors in cells



2. Overexpress active downstream targets



3. Overexpress both growth factor protein and downstream targets

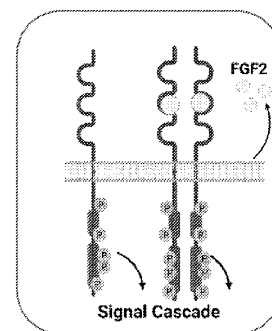


FIG. 1

(57) Abstract: Provided herein are methods of engineering a cell line for reduced dependence on exogenous growth factor(s). In some embodiments, the method includes introducing into a cell one or more of: a polynucleotide comprising a coding sequence of a growth factor ligand; a polynucleotide comprising a coding sequence of a growth factor receptor; or a polynucleotide comprising a coding sequence of an activated downstream growth factor target and culturing the cells in a cultivation infrastructure.

[Continued on next page]

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