

Chemically defined methods to differentiate stem cells for disease modeling and other applications

To generate your favorite cell types from ESCs, iPSCs, or other types of stem cells? Recent studies have provided defined and more efficient methods to differentiate pluripotent stem cells (ESC and iPSC) or adult stem cells into functional tissue-specific cell types, offering unique opportunity to study embryonic development and model human diseases.

- **Directed neural differentiation of ESC or iPSC¹:** Dual SMAD inhibition by TGFbeta pathway inhibitor ([SB431542](#)) and BMP pathway inhibitor ([LDN-193189](#)).
- **Dopaminergic or motor neuron differentiation²:** For mimicking ventralizing sonic hedgehog signaling, [Hh-Ag1.5](#) is the most potent and selective Hh pathway agonist available.
- **Endothelial cells³:** TGF-beta inhibitors ([SB431542](#) or [A83-01](#)) are useful for expanding endothelial cells differentiated from hESC/iPSC.
- **Hematopoietic stem cells⁴:** HSCs differentiated from hESC/iPSC can be expanded by [StemRegenin 1 \(SR1\)](#).
- **Cardiovascular stem cells⁵:** Cardiovascular stem cells derived from hESC/iPSC can be expanded by GSK3 inhibitor - [CHIR99021](#).
- **Pancreatic cell differentiation⁶:** Hedgehog pathway inhibition (by [LDE225](#) or [Cyclopamine](#)) promotes pancreatic cell differentiation from hESC/iPSC derived definitive endoderm cells.

References:

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