

# A protocol to improve pluripotent stem cell differentiation

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## Abstract

We describe a method to help overcome restrictions on the differentiation propensities of human pluripotent stem cells. Culturing pluripotent stem cells in dimethylsulfoxide (DMSO) activates the retinoblastoma protein, increases the proportion of cells in the early G1 phase of the cell cycle and, in more than 25 embryonic and induced pluripotent stem cell lines, improves directed differentiation into multiple lineages. DMSO treatment also improves differentiation into terminal cell types in several cell lines.

## Procedure

Prior to the onset of directed differentiation, pluripotent stem cells are cultured in maintenance medium with 1% or 2% DMSO for 24-48h. Proceed with desired differentiation protocol after this treatment.

## Troubleshooting

Please see the supplementary note included in our publication (PMID: 23584186) for additional suggestions on optimization.

## Anticipated Results

Treatment with DMSO activates the retinoblastoma (Rb) protein and improves efficiencies of differentiation into a desired lineage from any pluripotent stem cell line. Most importantly, this treatment improves the capacity for terminal differentiation into functional cell types both in vitro and in vivo.

## A simple tool to improve pluripotent stem cell differentiation

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