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Intermittent compressive force regulates cell proliferation and osteogenic differentiation of mouse induced pluripotent stem cells

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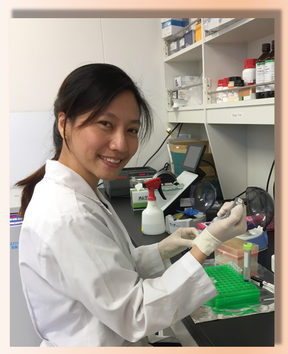


Introduction

Induced pluripotent stem cells (iPSCs) have been proposed as an excellent cell source for regenerative medicine. Mechanical force significantly contributes in the control of cell homeostasis, repair and regeneration. These specific regulations are influences by many factors, including force, cell, and environmental factors. Among various types of force, compressive force is of interest. It has been reported that compressive force significantly increase bone mass in mouse tibia, indicate the anabolic role of compressive force on bone tissues. However, the role of compressive force on induced pluripotent stem cells remained unclear. Leading to the objective of this study is to investigate the role of intermittent compressive force on mouse induced pluripotent stem cell (iPSC) behavior.

Figure 1 Force induced cell cycle and proliferation in iPSCs

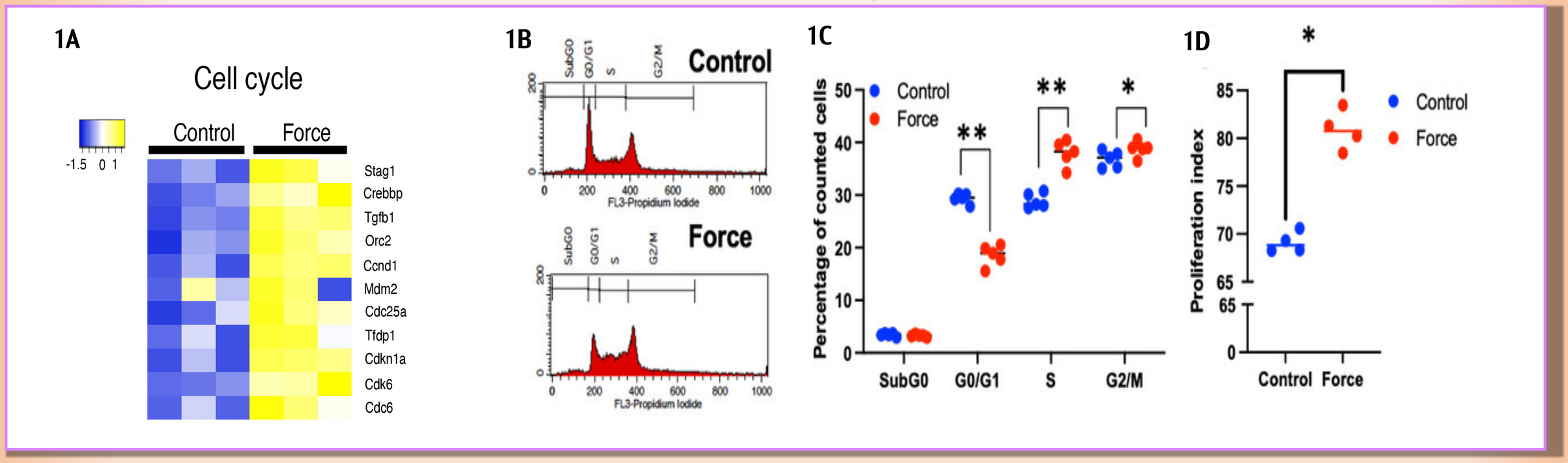


Figure 2 Force induced cell cycle and proliferation in iPSCs

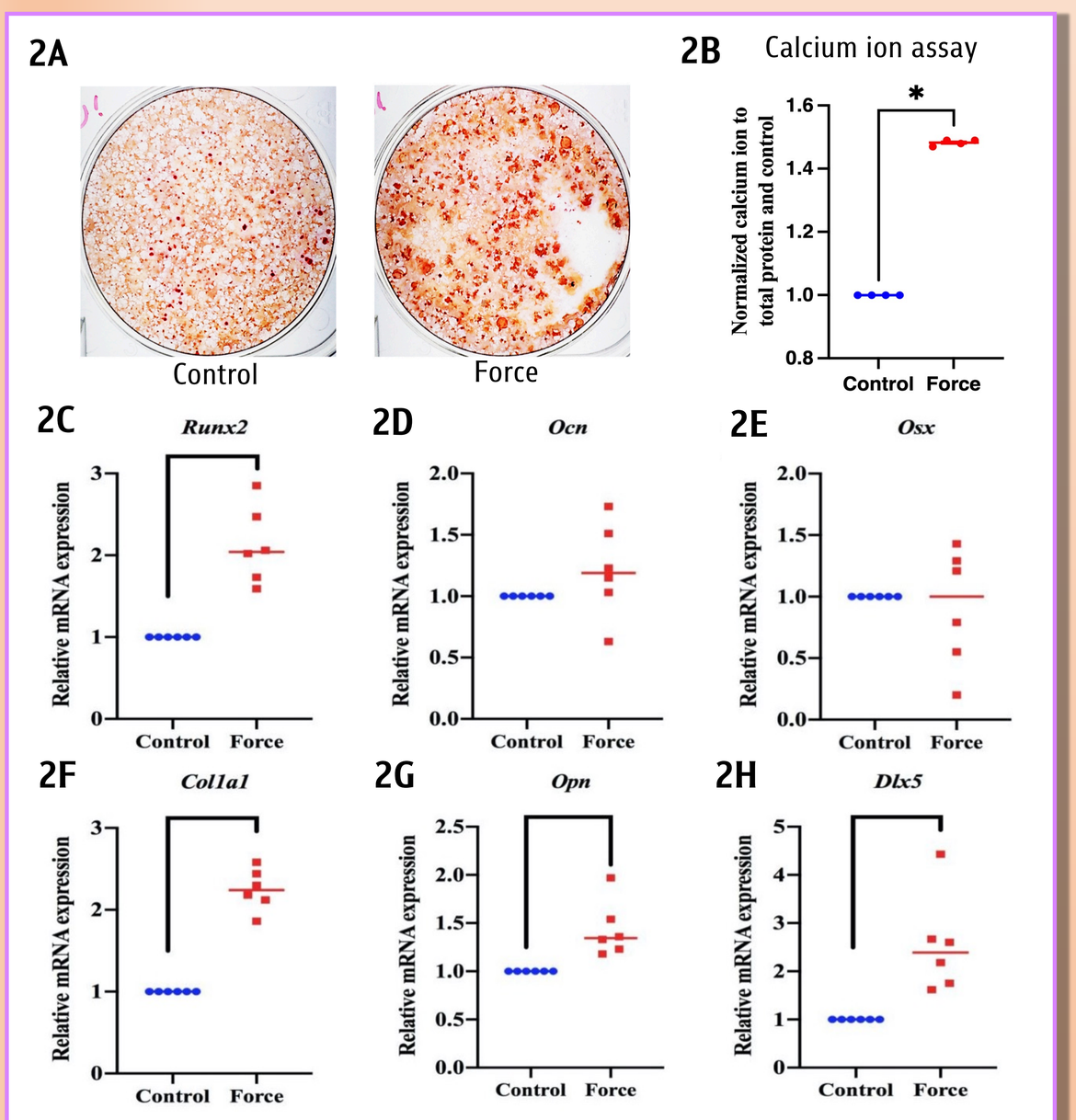
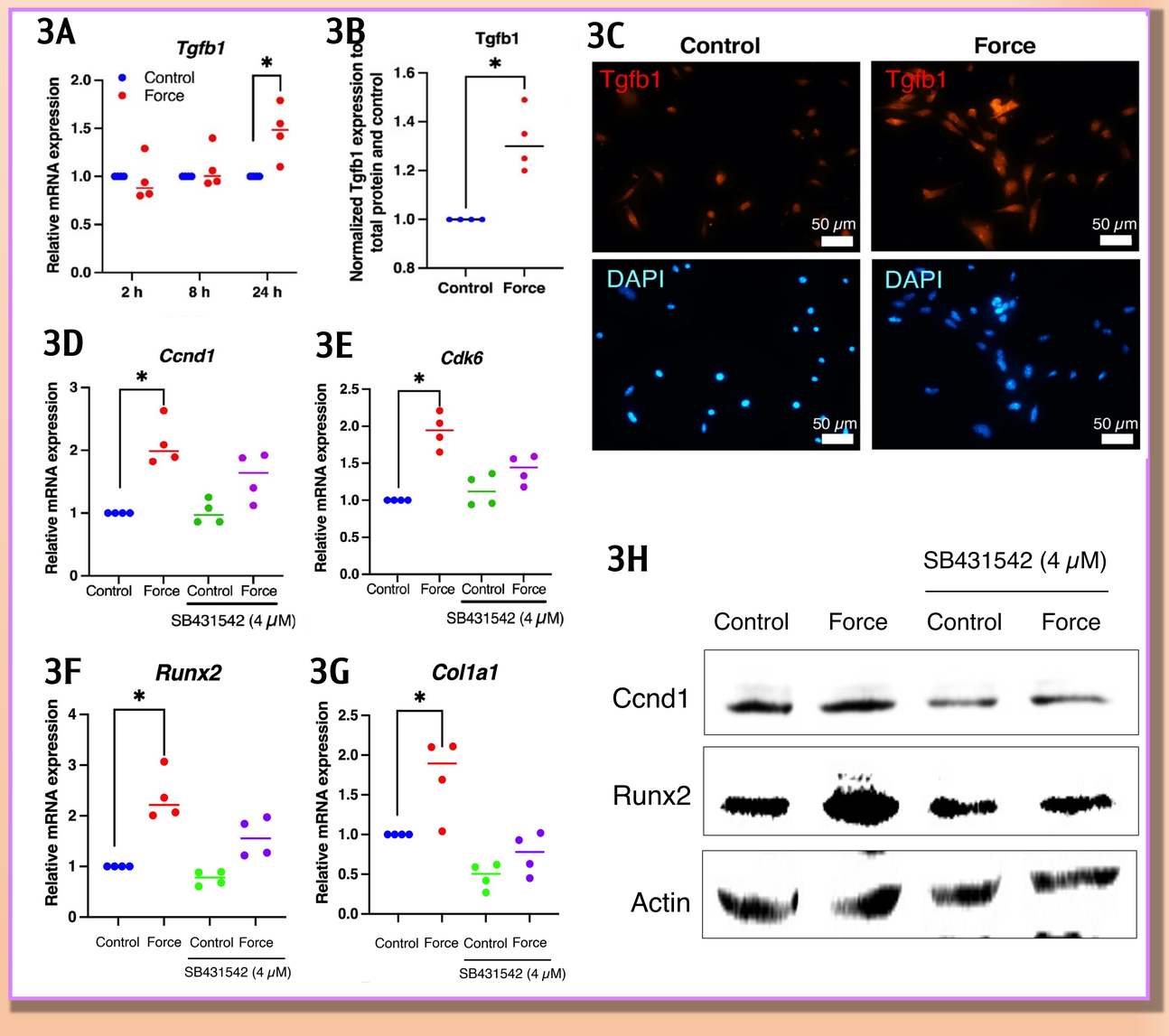
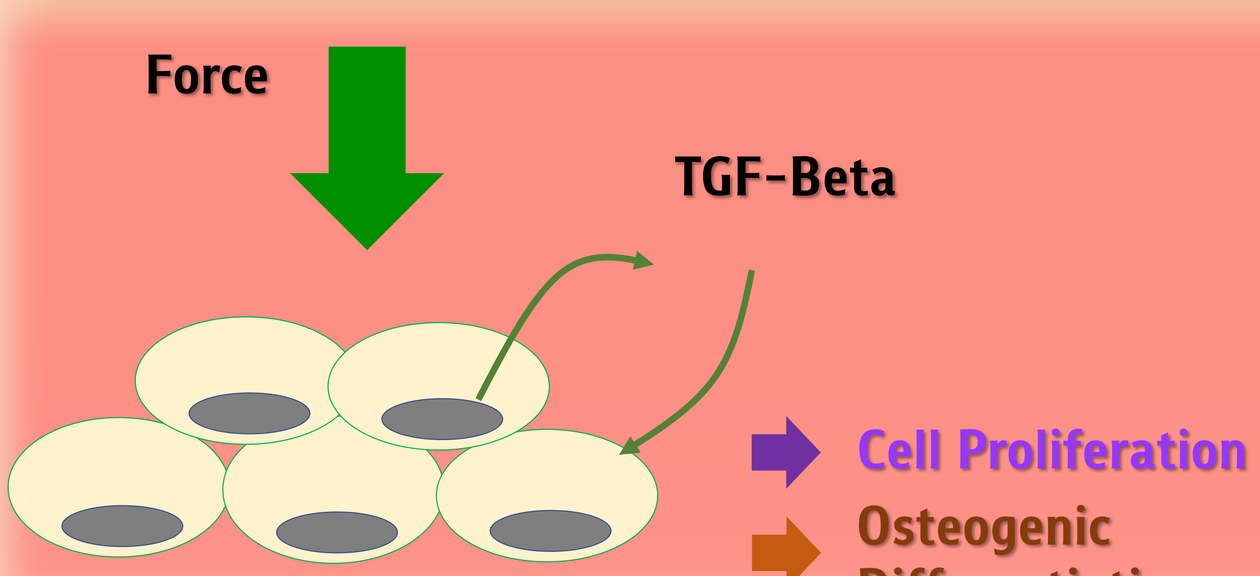


Figure 3 TGF-b signaling participated in force regulated proliferation and osteogenic differentiation in mouse iPSCs





Conclusion

Intermittent compressive force promoted proliferation and osteogenic differentiation in iPSCs probably occurred via TGF-b signaling. This knowledge would be beneficial in manipulate iPSCs for regenerative medicine.

Acknowledgement

- The Japan Society for the Promotion of Science under JSPS-RONPAKU Fellowship FY(2018)
- Chulalongkorn University