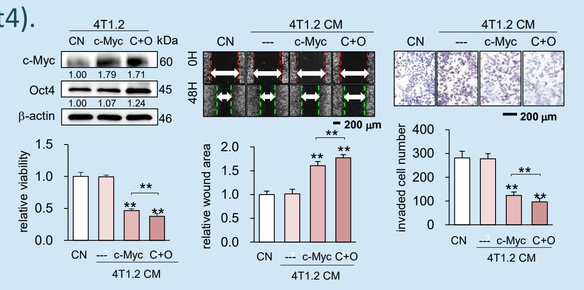
YOKOTA Skeletal Research Group

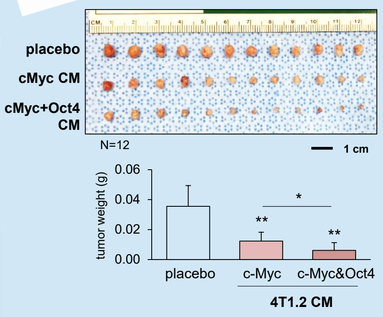
Principal Investigator
Dr. Hiroki Yokota

Develop iTSC technology.

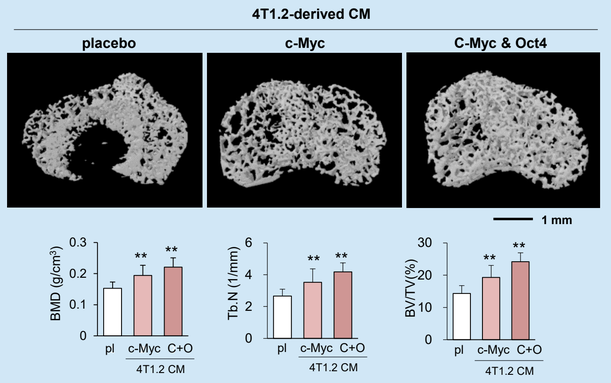
Activation of Wnt signaling, PI3K signaling, etc. converts tumor/non-tumor cells into iTSCs (induced tumor-suppressing cells), and iTSC-derived conditioned medium (CM) presents strong anti-tumor capabilities. iTSCs can also be generated by overexpressing two of the Yamanaka iPS factors (c-Myc and Oct4).



Suppression of scratch-based motility and Transwell invasion.



Suppression of mammary tumor growth by cMyc CM and cMyc & Oct4 CM



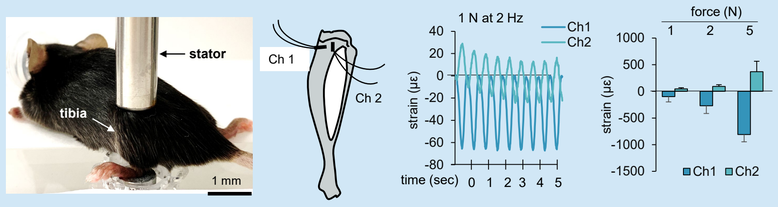
Prevention of bone loss by cMyc CM and cMyc & Oct4 CM

	Gene names	Mol [kDa]	EO_ β-cat	EO_ BML	EO_ CN
1	Hspa8	70.90			
2	Hsp90ab1	83.28			
3	Ubc	17.23			
4	Actg1	41.79			
5	Hist2h4	11.37			
6	Calm1	16.84			
7	Ppia	17.97			
8	Eno1	47.14			
9	Flna	280.47			
10	Vim	53.69			
11	Ncl	76.86			
12	Hist1h2bj	13.58			
13	Aldoa	39.36			
14	Pgam1	28.83			
15	Eef1a1	50.11			
16	Lmna	74.24			
17	Ldha	36.50			
18	Msn	67.74			
19	Nme2	30.20			
20	Arhgdia	23.41			
21	Pkm	57.84			
22	Cfl1	18.56			
23	Eef2	95.26			
24	Ywhaz	27.77			
25	Tuba1b	50.15			

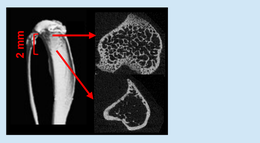
A list of atypical tumor suppressing proteins, which are enriched in CM.

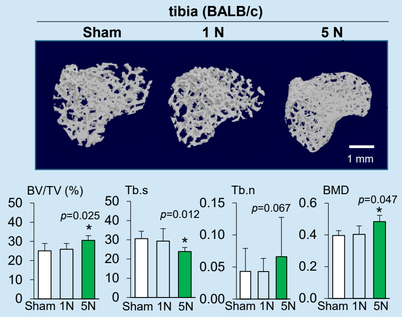
Make bone metastasis curable.

In a mouse model, breast/prostate cancer-driven bone loss can be inhibited by mechanical loading (tibia loading & knee loading), as well as iTSC CM.

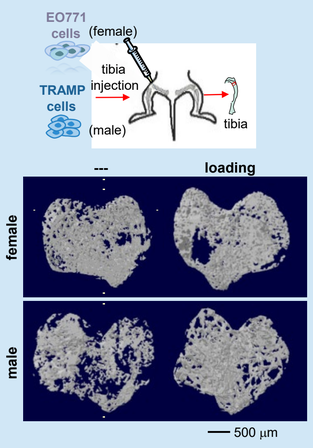


Application of tibia loading and 2-dimensional induced strain.





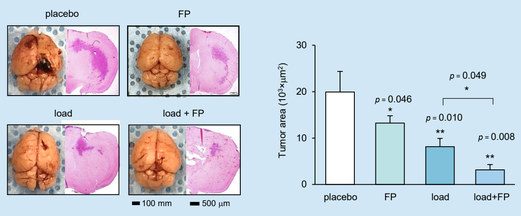
Loading-driven bone formation (no tumor control).



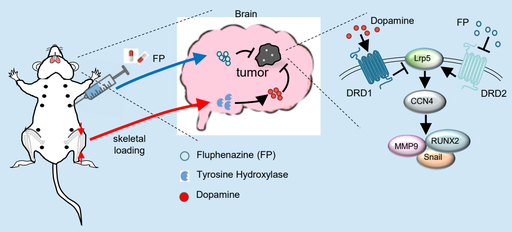
Prevention of tumor-induced bone loss using mammary & prostate tumor cells.

Make brain metastasis curable.

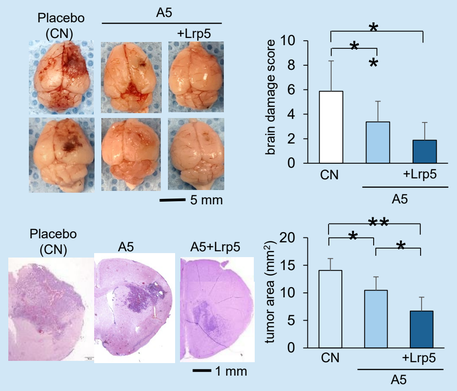
In a mouse model, the progression of breast cancer-associated brain tumors can be inhibited by mechanical loading-driven elevation of dopamine, and the administration of osteocyte/MSC-derived iTSC CM.



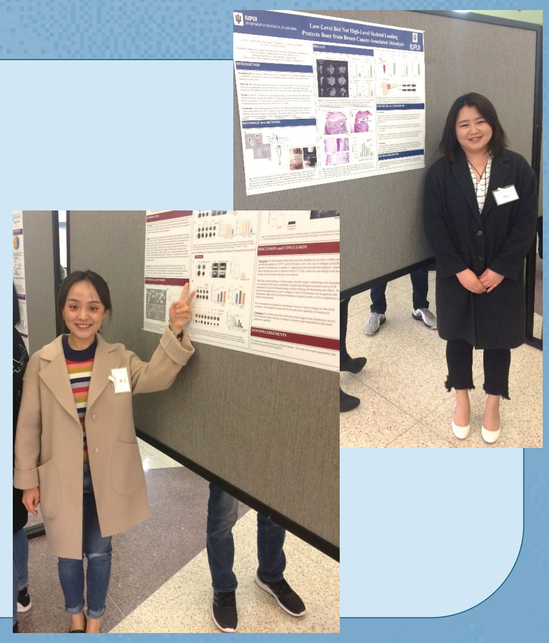
Suppression of the growth of brain tumor by tibia loading and administration of dopamine modulator.



Proposed regulatory mechanism of the suppression of brain tumors in response to tibia loading and a dopamine modulator.



Suppression of the growth of brain tumor by the administration of Lrp5-overexpressing osteocyte-derived conditioned medium.



International collaborations:
Harbin Medical University
Mie University
Osaka University

Appreciation: 100 Voices of Hope

Interested in research opportunities?

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