

Screening of small molecule activators for efficient orthodontic tooth treatment

歯科矯正治療への応用をめざした歯牙移動促進剤のスクリーニング

【Keywords】

orthodontics

small compounds
screening

ROCK inhibitors

Abstract

□ In recent years, number of adult patients of orthodontics is increasing...

→ **The treatment period of adult patients tends to become prolonged because their teeth don't move very well compared to children.**

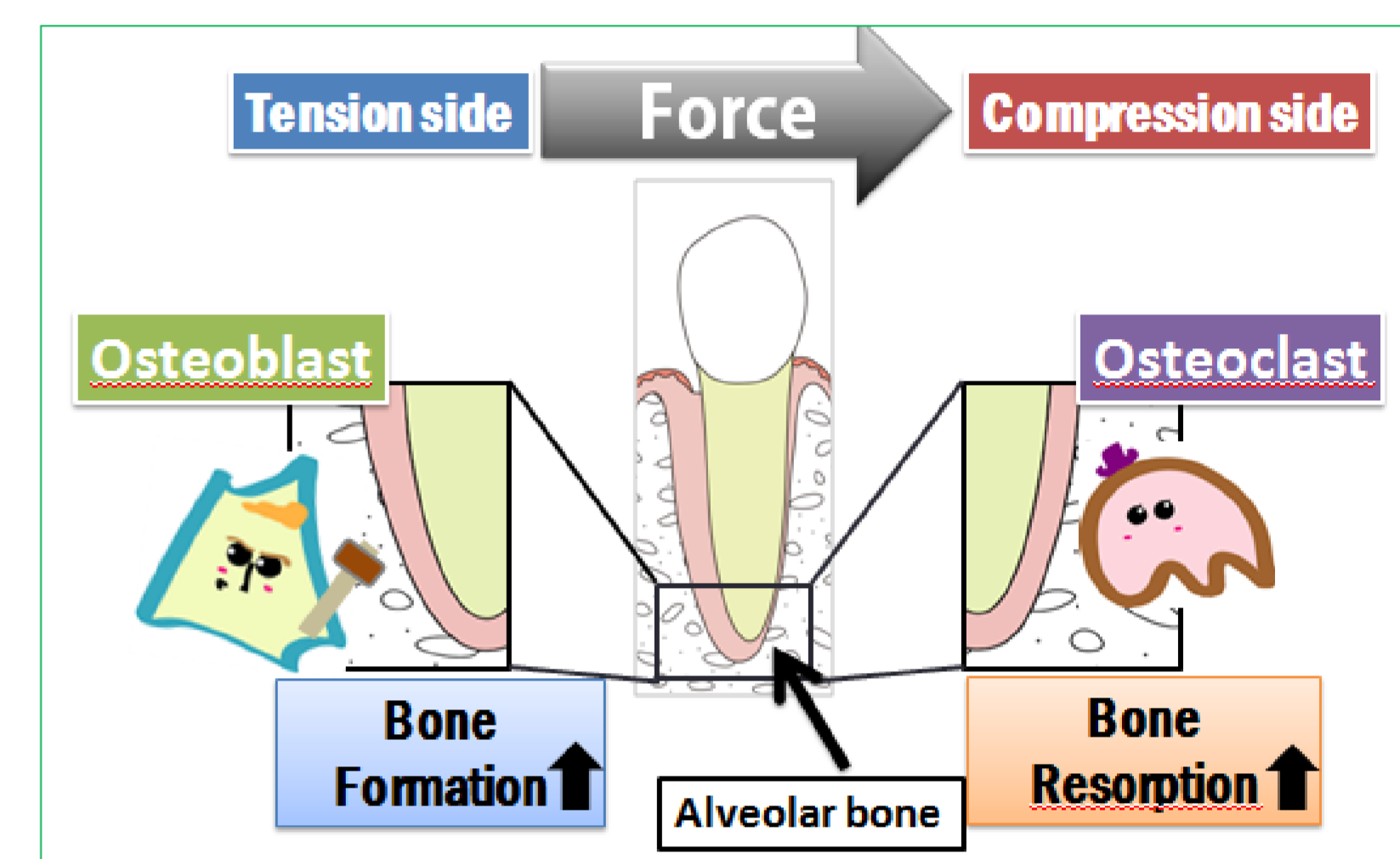
【Why?】

→ Alveolar bone metabolism is low in adult patients because of aging.

【Solutions】

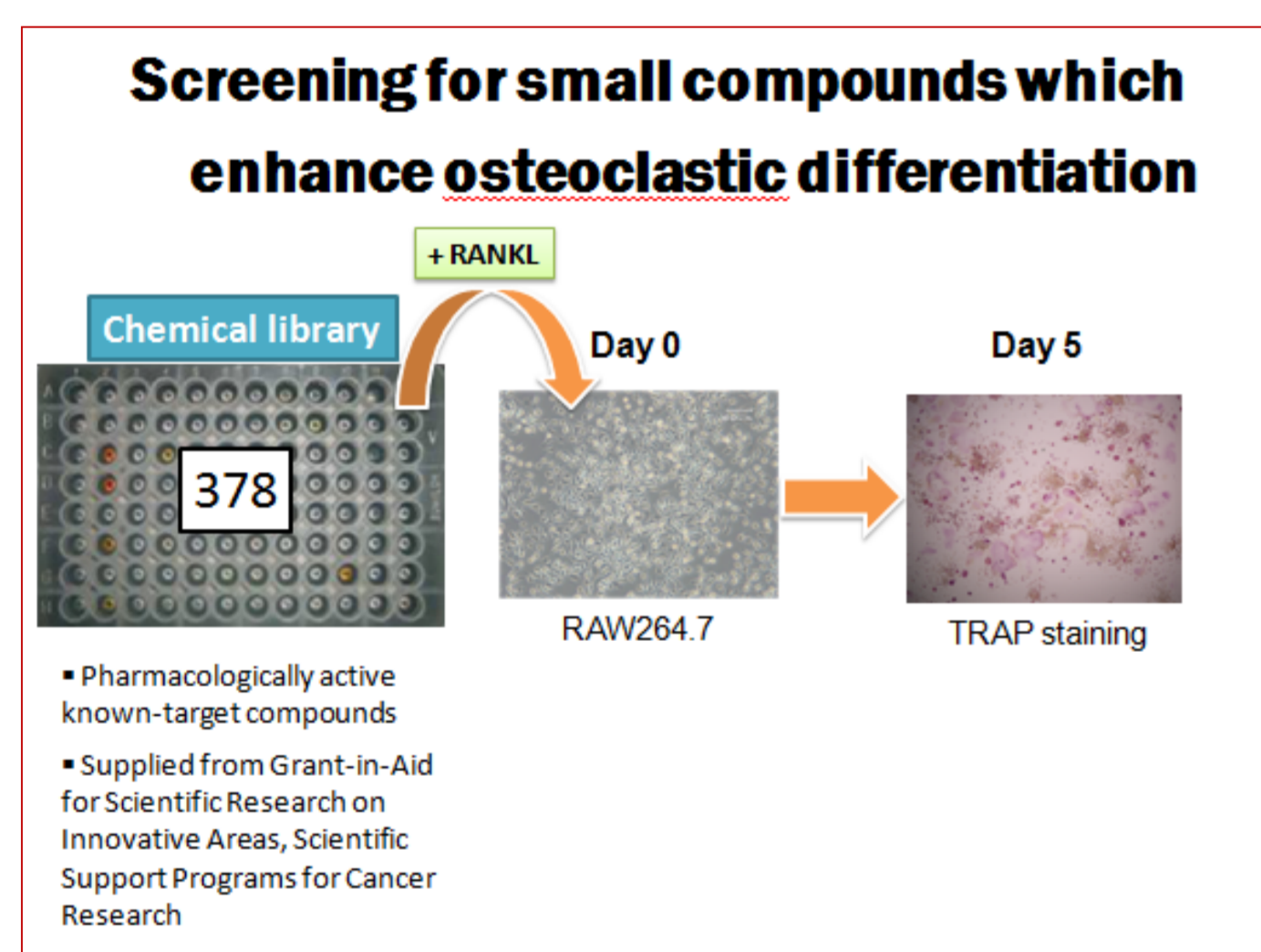
→ We sought a drug which activates alveolar bone remodeling.

→ Then, we apply the identified drug for orthodontic tooth movement.



Results

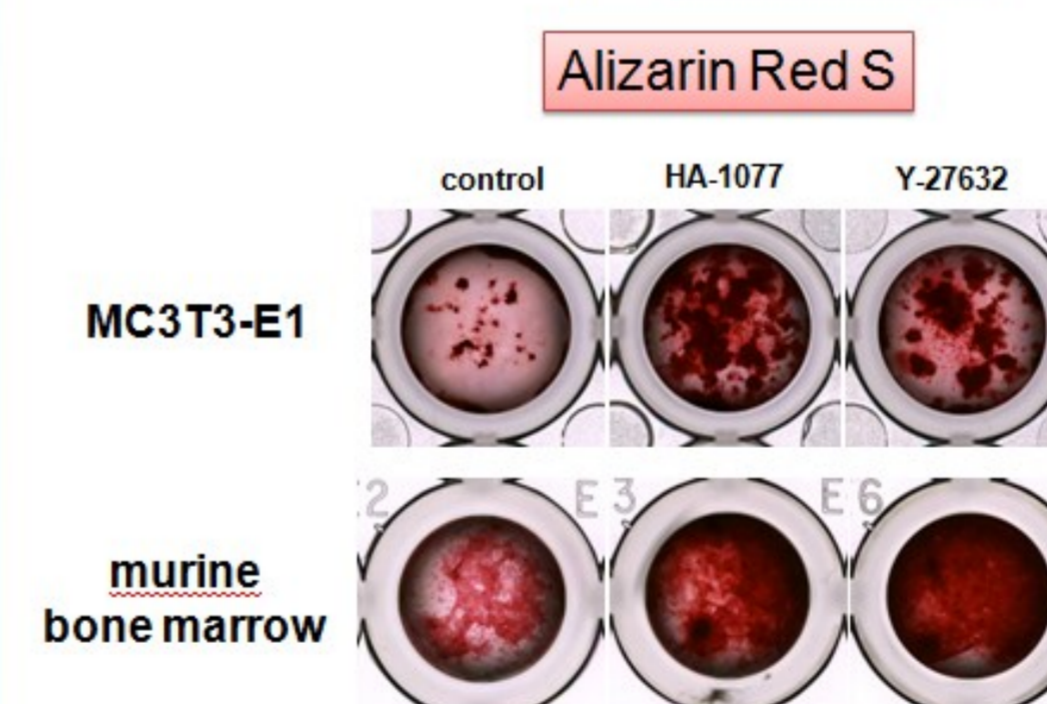
□ We identified **ROCK inhibitors** by the chemical library screening, and determined that they **accelerated orthodontic tooth movement** in animal model.



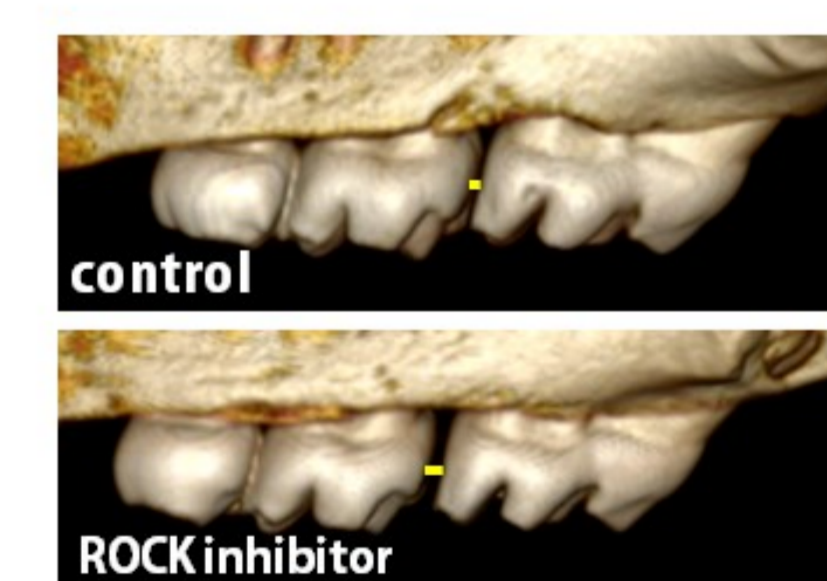
Identified activators for osteoclastogenesis by the screening

Compounds	Targets	Fold changes
Kenpaulone	GSK, CDK	2.4
1-Azakenpaulone	GSK	2.1
HA-1077	ROCK	1.9
Y-27632	ROCK	1.3
Olomoucine	CDK	1.3
DMAT	CK	1.9
H-7	PKC, PKA	1.8
IWR-1-endo	Wnt	1.5

ROCK inhibitor enhances the calcification activity of osteoblasts



ROCK inhibitors accelerate the orthodontic tooth movement



Possible applications

□ It could be possible to apply for a treatment of alveolar bone destruction caused by periodontal disease or occlusal trauma.

❖ We are looking for collaborators who are interested in our approach and application of ROCK inhibitors for clinical research.