

P1-9 Treatment with hydrogen peroxide photolysis inhibits tooth demineralization caused by *Streptococcus mutans* biofilm.

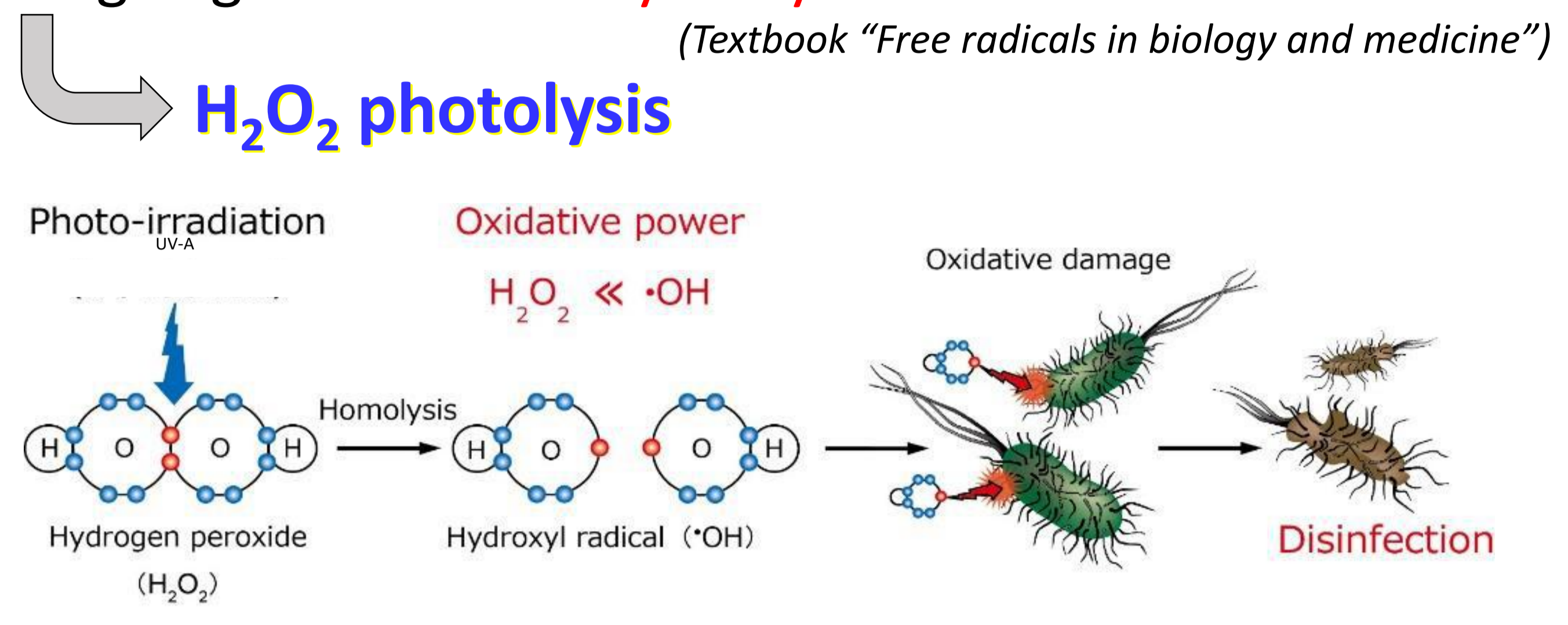


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Background

- Hydrogen peroxide (H₂O₂) is photolyzed by UV-A light, resulting in generation of **hydroxyl radicals**.

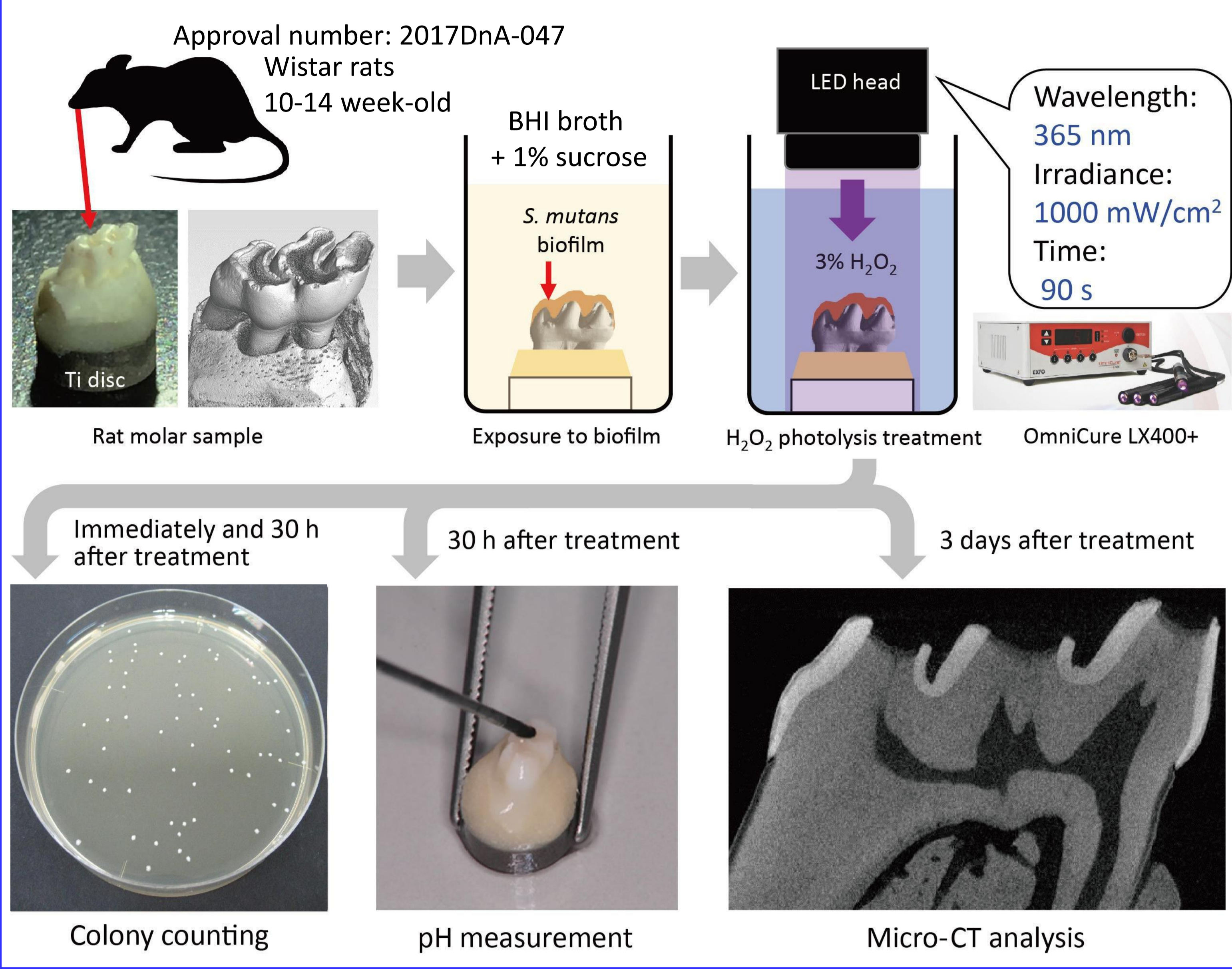


- Hydroxyl radicals exert bactericidal activity. (Shirato et al. 2012)
- Hydroxyl radicals can kill cariogenic bacteria embedded in biofilm. (Nakamura et al. 2016, Shirato et al. 2017)

Purpose

To evaluate the effect of H₂O₂ photolysis on demineralization of rat teeth caused by *Streptococcus mutans* biofilm.

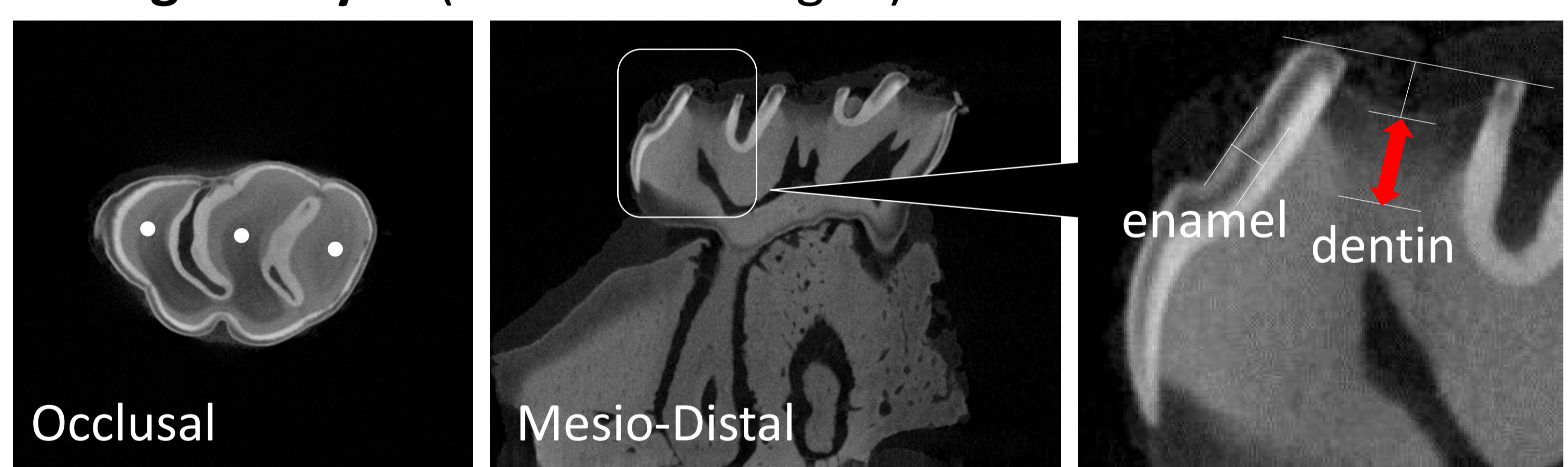
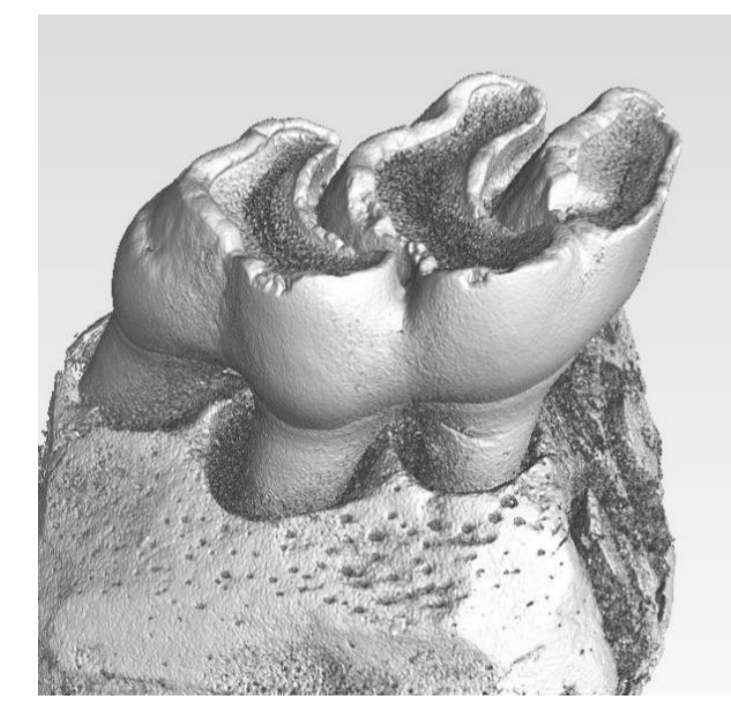
Study design



Micro CT analysis

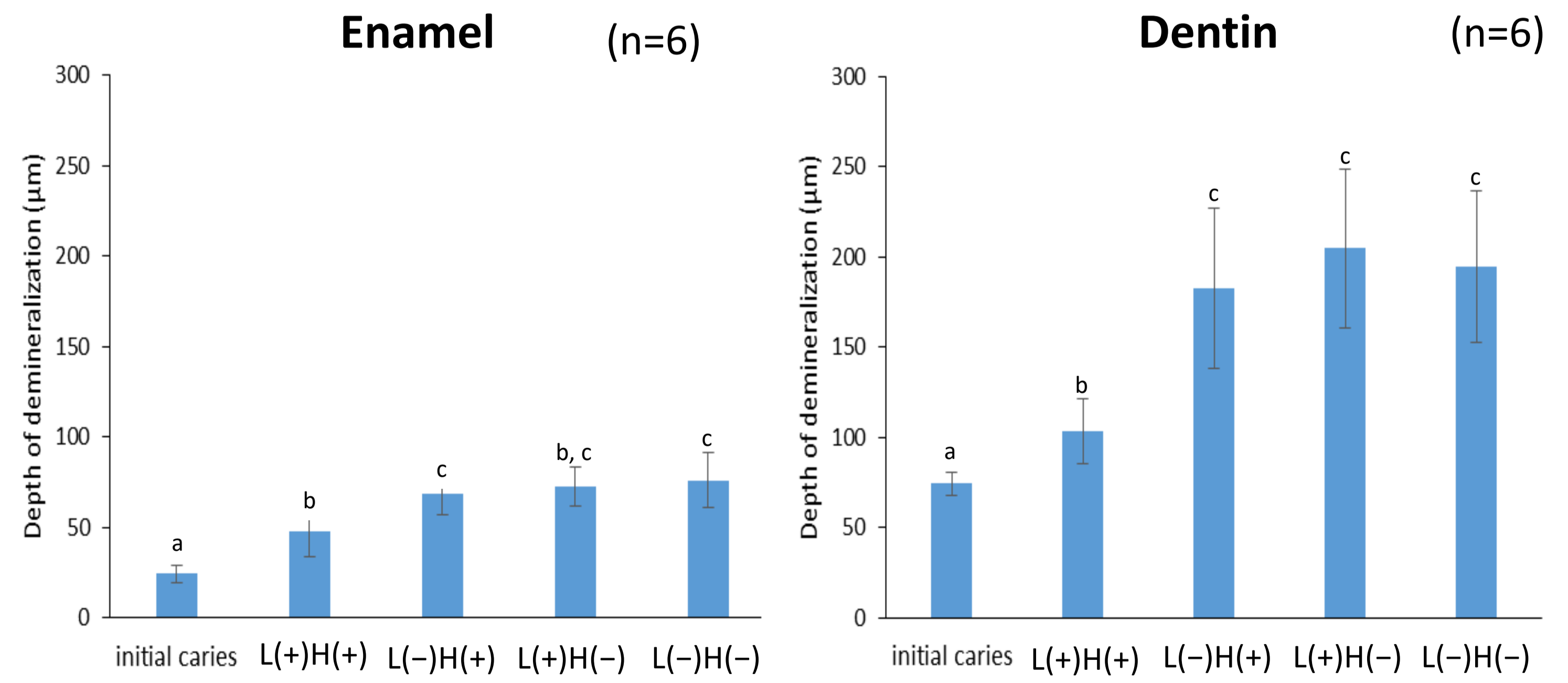
Micro CT: ScanXmate-D225RSS270 (Comscantecno, Japan)

Measuring method: Cone-beam scanning
Voltage: 120 kV, Current: 80 μA
Resolution: 6.023 μm



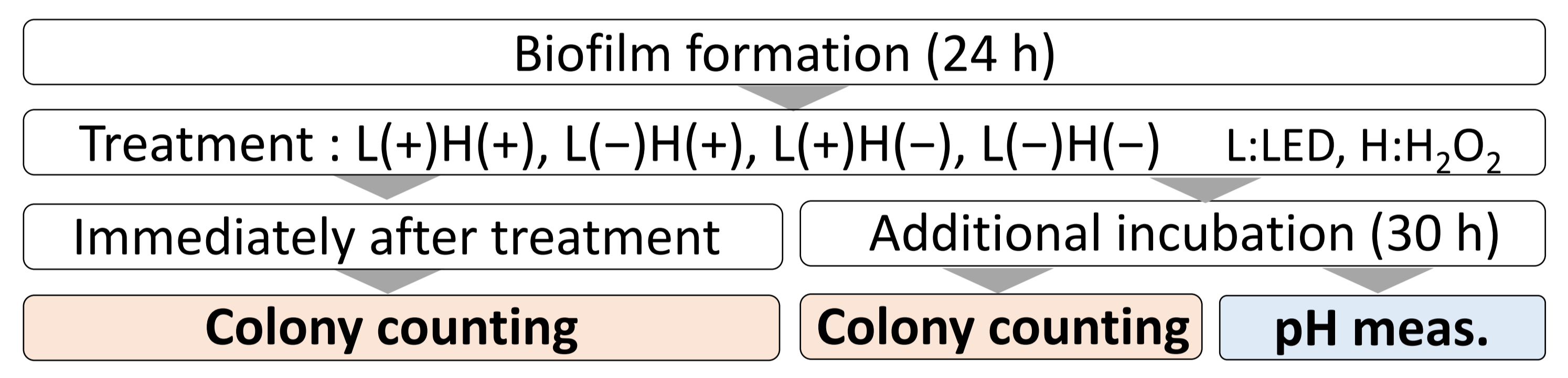
Depth of radiolucent layer was measured at central part of each cusp.

Results

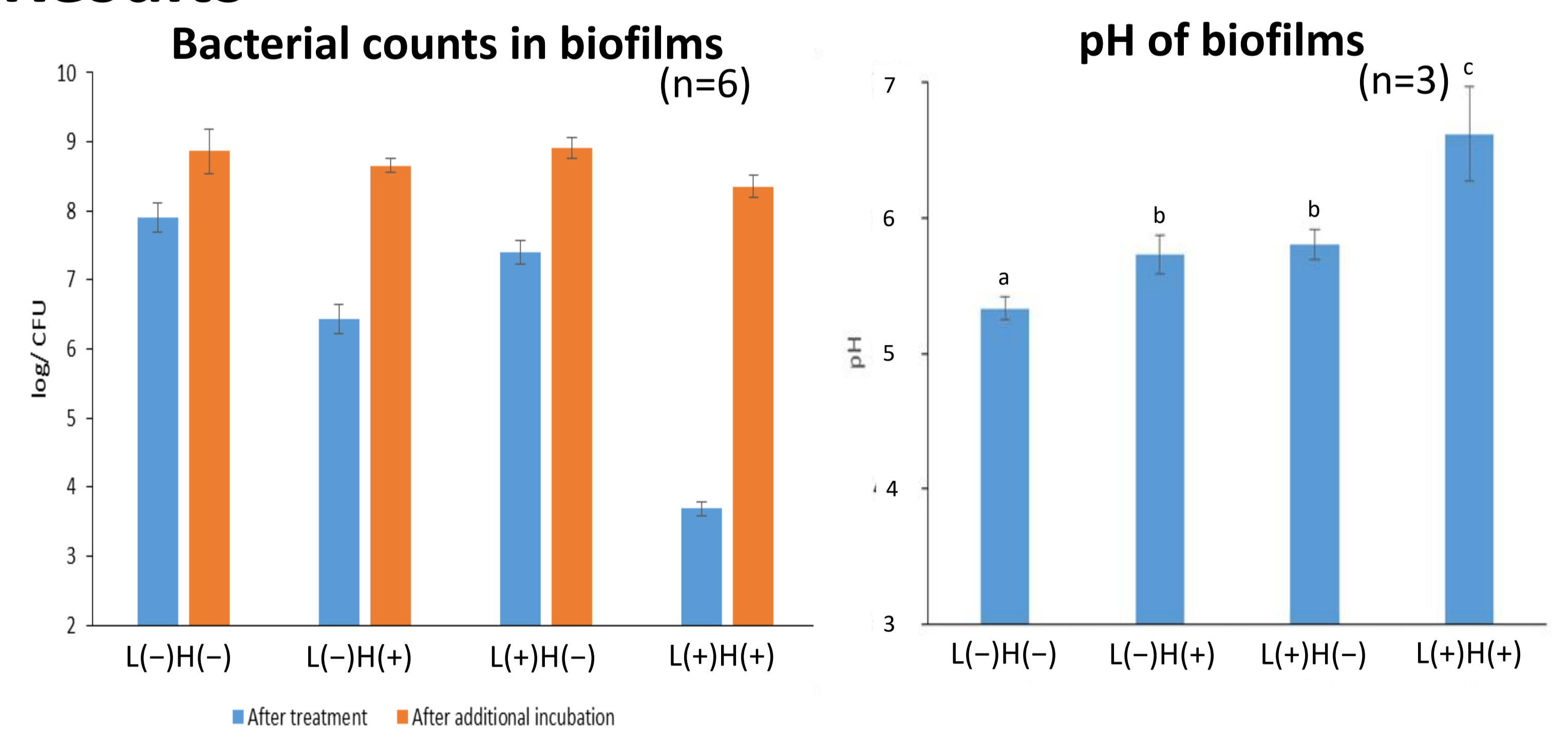


- In enamel, there were not significant differences between the treatment groups.
- In dentin, H₂O₂ photolysis resulted in shallower depth of demineralization layer than the other treatment groups.

Colony counting & pH measurement



Results

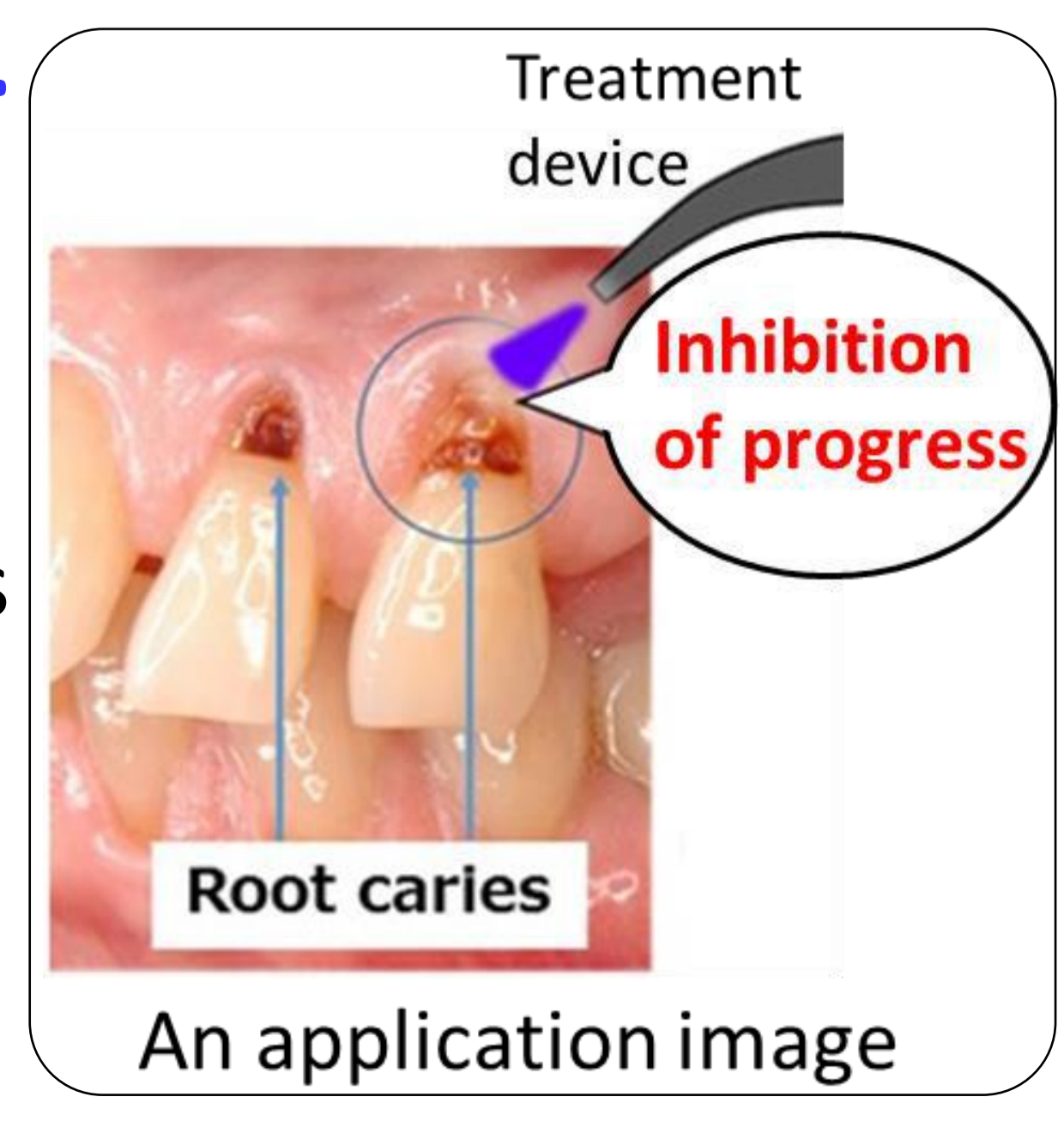


- L(+)+H(+) group (H₂O₂ photolysis) showed strong bactericidal effect against *S. mutans* biofilms on rat tooth.
- L(+)+H(+) group showed less pronounced acidogenicity than other treatment groups even after re-establishing the biofilm.

Summary

These results suggest that treatment with H₂O₂ photolysis can inhibit tooth demineralization.

By treatment with H₂O₂ photolysis...
Acidogenicity was less pronounced.
→ Inactivation of the biofilms
Demineralization depth in dentin was shallower.
→ The anti-demineralization effect



It could be applicable as a new caries treatment.

Acknowledgement

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