### 超音波顕微鏡を用いた

#### ヒト皮膚線維芽細胞からのコラーゲン分泌の動的可視化

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日本超音波医学会COI開示:筆頭著者・共著者、全ての者が利益相反状態に該当しません

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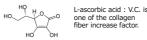
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#### **Background**

#### Extracellular matrix is important for cellular scaffold.



The molecules of extracellular matrix are released from cells and distribute around them.



 Extracellular collagen plays important roles to cell adhesion, proliferation, differentiation, and mechanical strength and flexibility, however, its dynamics of release is unknown.

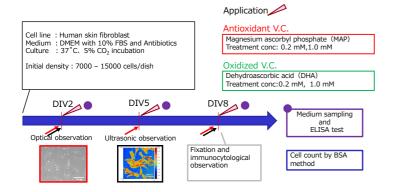
#### **Purpose**

Dynamic visualization of the collagen fiber secretion with the ascorbic acid dosage

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#### **Materials and Methods**

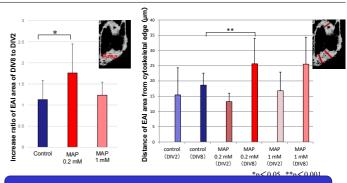


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# Acoustic impedance image of cultured human fibroblast (DIV8) Acoustic impedance image of cultured human fibroblast (DIV8)

<sub>国立大学法人</sub> 豊橋技術科学大学

## TOYOHASHI Result 3 Dynamic AI change during culture



MAP 0.2 mM treatment increased extracellular impedance dynamically.

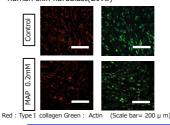
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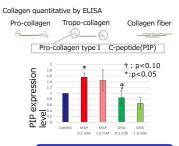
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# Result 4 Immunocytochemical staining and Collagen quantitative by ELISA

Confocal microscope image of cultured human skin fibroblast(DIV8)



Intracellular Collagen can be visualized, whereas extracellular collagen not.

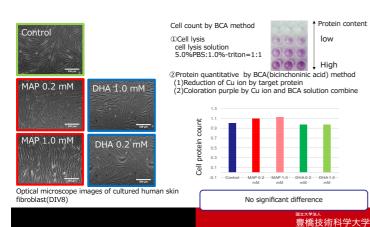


MAP 0.2 mM treatment increases collagen in medium significantly.

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Discussion and conclusion

# TTOYOHASHI Result 1 Cell proliferation potential



# Extracellular Elastic fiber Fibronectin Laminin etc Collagen fibril

The detection of the extracellular high fluid ingredient release

Ultrasonic microscope

No- significant difference of proliferation by the treatment

→Treatment ascorbic acid has effect to improve collagen produce

Using the ultrasonic microscope, different acoustic impedance area has be observed outside of cell. Treatment of MAP 0.2 mM has tendency to increase that area, similar to the result of ELISA.

→Effect of MAP treatment for collagen synthesis →Dynamic visualization of the living cell observation using ultrasonic microscope