

# Collapsing process of planarians organism

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Team 04

## 1. Introduction

< Planarian >

- Live in a good quality environment
- Highly advanced ability to regenerate

→ Individual differences

After splitting, they can grow back the missing parts such as head and feet

- No gender
- Asexual reproduction



Fig.1 Planarian

From the previous research, Planarians collapse due to stimulation by wasabi and heat.

### 【Definition of death】

Apparently, the outline of individual becomes dispersed.

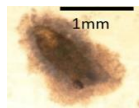


Fig.2 Organism collapsed planarian

## 2. Purpose

- ① Investigate the collapse of planarian through experiments
- ② Expose why Planarians become dispersed

## 3. Hypothesis

The cause of the collapse  
...leaving **Cadherin** (cell adhesion molecule)

We wanted to see Cadherin  
→but it is inactive stain solution

**Cadherin is bounded to actin filaments**  
(Actin filaments can be dyed.)

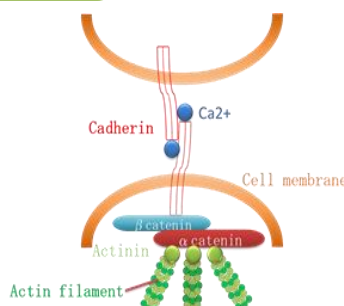


Fig. 3

## 4. Materials & Methods

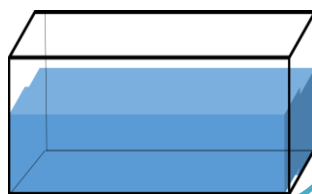
- Planarians → living in the Koya River
- Fluorescence microscope
- Artificial water
- Formalin (5%)
- Phalloidin → dyeing Actin filament green
- Glycerin → decolorizing planarian's body color

1. Put planarian in the hot water that has a temperature of 40 degrees (1~10 minutes)
2. Preserve planarian in formalin
3. Dilute phalloidin with artificial water
4. Each planarian was put into phalloidin and artificial water
5. Decolorized planarian's body color by glycerin
6. Observe it with a Fluorescence microscope

※ Phalloidin dyes actin filaments green

40-degree water

Fig.4



## 5. Results and Discussion

Result from previous research <sup>1)</sup>

Pictures of epidermal cells taken by microscope.

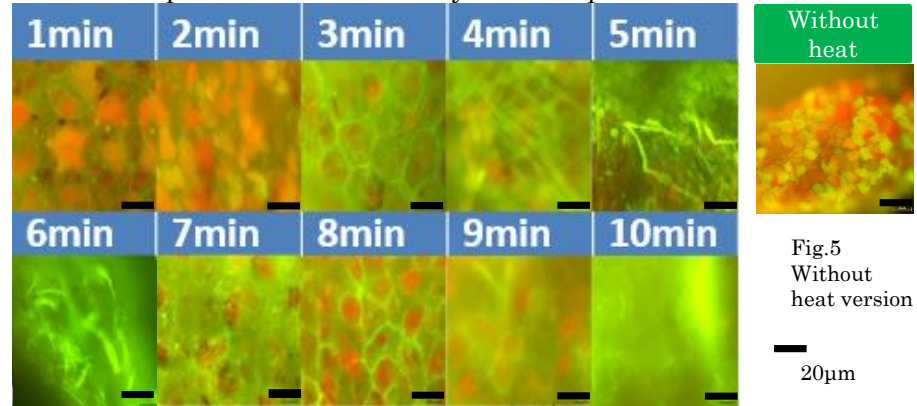


Fig.6 With heat version

Fig.5 Without heat version

20µm

### Results & Thinking

①

The Actin filament's form becomes loose from 1 to 10 minutes

The change of Actin filament's form has some relationship with the process of organism's collapse

[Previous] The relationship between heating time and organism collapse

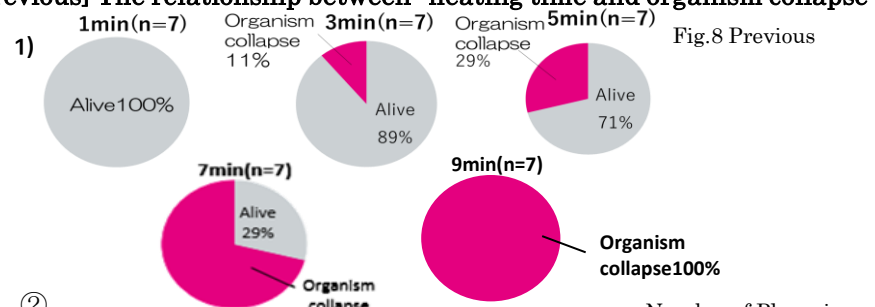


Fig.8 Previous

②

Difficulty in observing the change of some points

According to previous and our research, organism collapse happened from 5 to 7 minutes remarkably.

↓  
It is likely to happen at the same time between the change of Actin filament's form and the organism collapse.

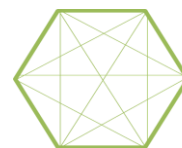


Fig.7 Actin filament

## 6. Summary

This time we observed the process of planarian organism collapse from heat stress.

We found Actin filament's shape gradually broke over 10 minutes.

## 7. Future work

To research the planarians which were given pungent ingredient stress.

## Reference

1) The boundary between life and death of planarians H29 Sendai daisan high school Miharu Ashitate and so on

2) The relationship between planarians stress acceptance and collapse H30 Sendai daisan high school Masumi Otsutomo and so on