Visit to our Alma Mater: Kanagawa Prefectural Atsugi High School

[Overview]

Visit location: Kanagawa Prefectural Atsugi High School
Day of visit: 27th of August of 2016 (Saturday)
Visitors: Kengo Nakahara, Maoko Takenoshita
Target people: 12 students belonging to the SS Lab. (1 Guidance teacher)

[Objective]

In a previous visit to our Alma Mater, when we asked what image did the students had about *E. coli*, they answered "yogurt" or with names of bacteria completely unrelated. There, by giving a lecture about the specific mechanisms of gene recombination, as well as a lecture about *E. coli,* we intended to enhance high school students' interest and attention to *E. coli.*

By performing a lesson in the overview of the iGEM, synthetic biology and gene recombination, we intended to deepen the high-school student's understanding in biology and the experimental technics and let it be a trigger for them to get interested in this topics.

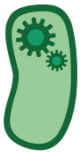
Also, we presented our project, Snow White, and a card game which we designed, and asked for their opinions.

[Flow of the class]

Presentation and explanation of the lesson's purpose
↓
Pre-lesson Mini test and survey
↓
Explanation of synthetic biology and gene recombination
↓
Explanation of iGEM and our project
↓
Experience of the Card Game
↓
Post-lesson Mini test and questionnaire and summary

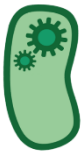
[Mini test and survey]

Before and after the lesson we carried out a mini test and a survey to examine the level of understanding on the basics of genetic engineering and the change of consciousness.



E. Coli Mini test / Gene recombination awareness survey

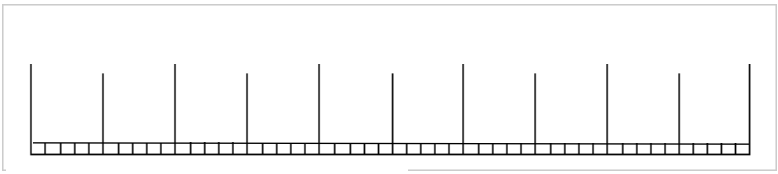
Pre-lesson examination



E. coli mini test

Circle the alternative you think is correct

I. How big do you think E. coli is? What unit is used to represent an E. coli?



(a) ⟺ nm (10^{-9}m)

(b) ⟺ μm (10^{-6}m)

(c) ⟺ mm (10^{-3}m)

II. Apart from the intestines, where else do E. coli inhabit generally?

(a) Flowers

(b) Rivers

(c) Cormorant, Oysters

III. What is the name of E. coli in English?

(a) A.coli

(b) C.coli

(c) E.coli

Gene recombination awareness survey

Circle the option closest to your own opinion

I. What kind of image do you have on gene recombination?

(Good · Normal · Bad · I don't really know)

II. Do you want to use a product (food, medicament, etc.) which has been genetically modified?

(Strongly agree · Agree · Slightly disagree · Disagree)

E. Coli Mini test / Gene recombination awareness survey

Post-lesson examination

E. coli mini test

Circle the alternative you think is correct

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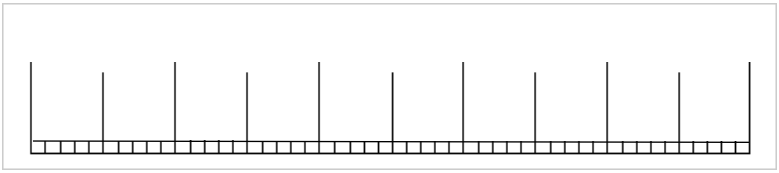

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III. What is the name of E. coli in English?

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IV. Is E. coli a prokaryote or a Eukaryote?

(a) Prokaryote

(b) Eukaryote

V. Fill the blank in the following sentence

Generally, in order to perform a gene recombination,

instead of the genome DNA(left picture), a ( ) DNA(right picture), is needed

VI. Fill the blank in the following sentence

The field which artificially creates creatures with new mechanisms by applying the genetic modification technics is called ( )

Gene recombination awareness survey

Circle the option closest to your own opinion

I. What kind of image do you have on gene recombination?

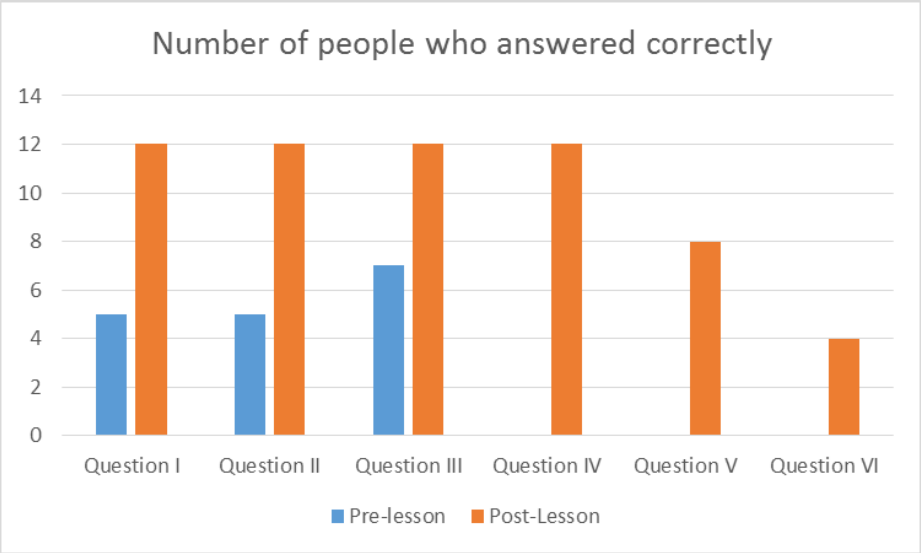
(Good · Normal · Bad · I don't really know)

II. Do you want to use a product (food, medicament, etc.) which has been genetically modified?

(Strongly agree · Agree · Slightly disagree · Disagree)

[Mini test results]

	Question I	Question II	Question III	Question IV	Question V	Question VI
Pre-lesson	5	5	7			
Post-Lesson	12	12	12	12	8	4



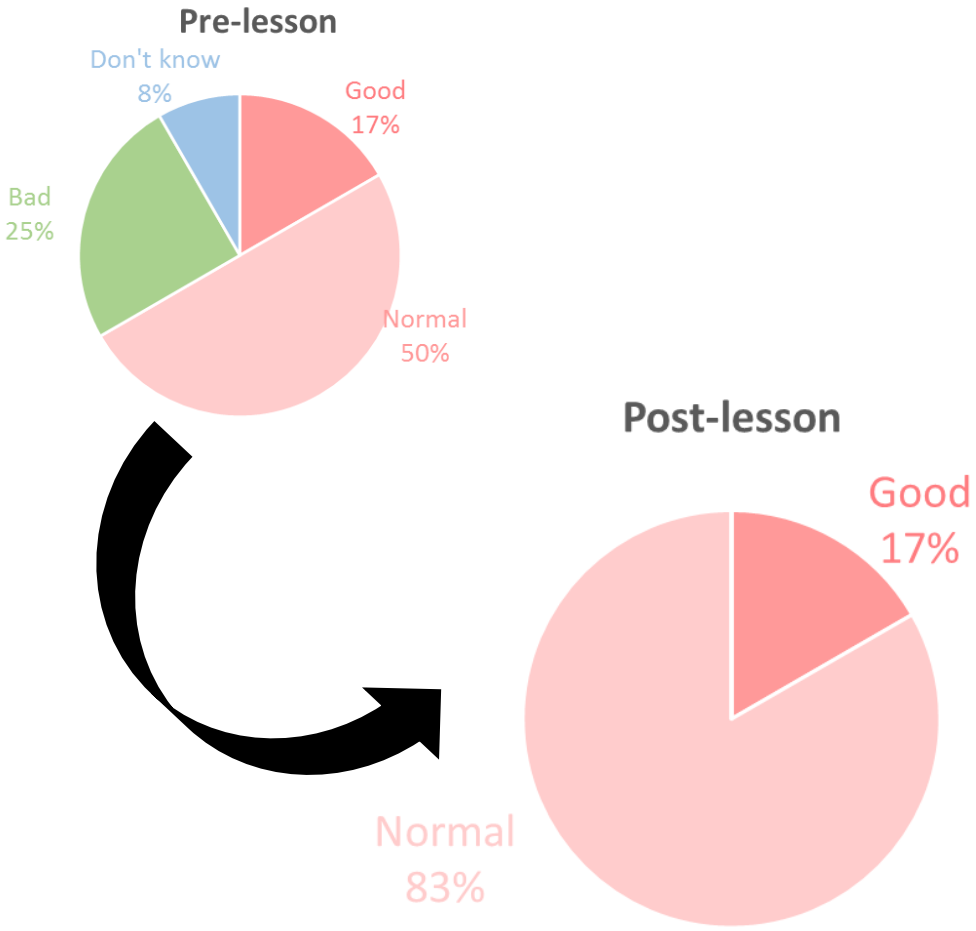
Post-lesson Question VI

Wrong answer examples: Bioengineering, synthetic genetics, genetic engineering (5 people)

[Awareness survey results]

1. What kind of image do you have on gene recombination?

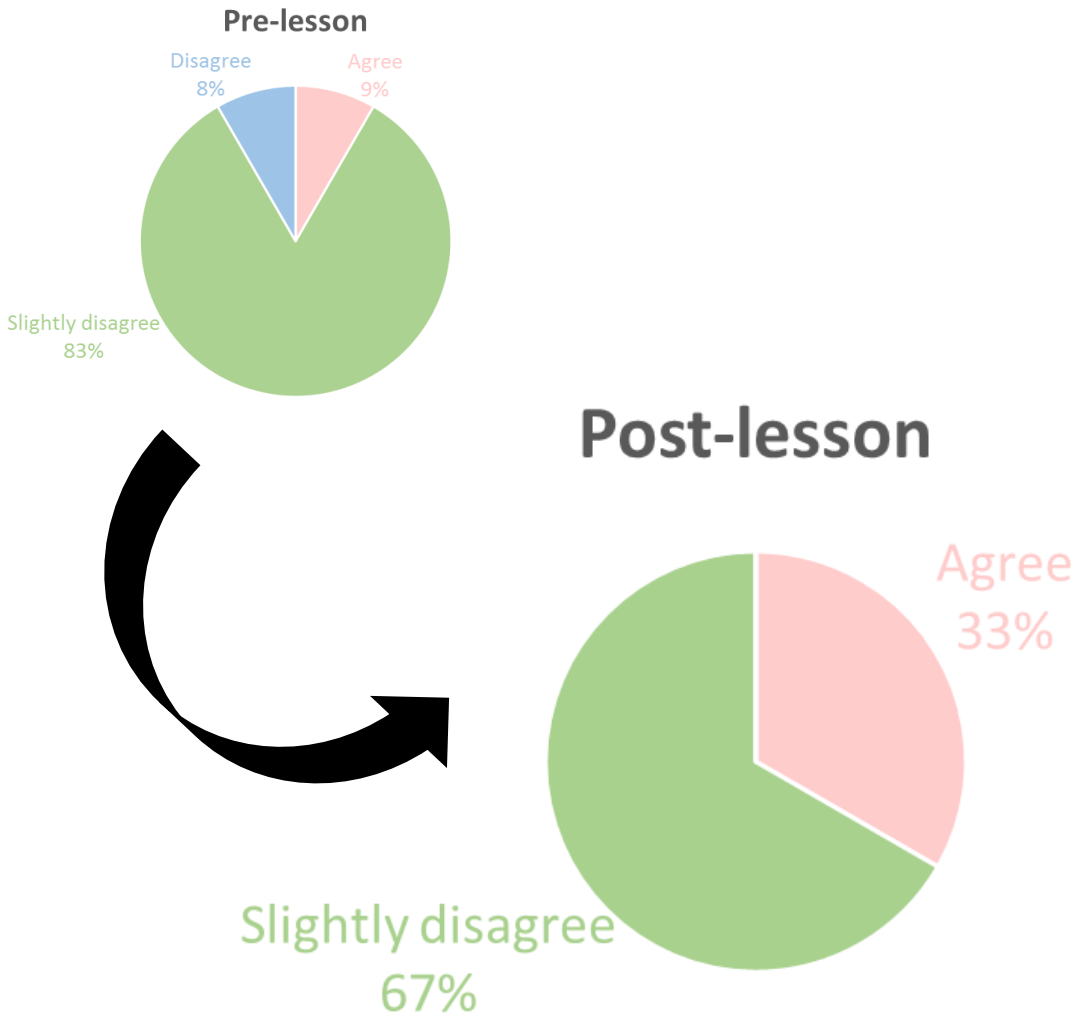
	Good	Normal	Bad	Don't know
Pre-lesson	2	6	3	1
Post-lesson	2	10	0	0



What kind of image do you have on gene

2. **Do you want to use a product (food, medicament, etc.) which has been genetically modified?**

	Strongly agree	Agree	Slightly disagree	Disagree
Pre-lesson	0	1	10	1
Post-lesson	0	4	8	0



Do you want to use a product (food, medicament, etc.)

[Mini test / awareness survey summary]

- In the graph we can see that compared to the pre-lesson mini test results', the post-lesson mini test results' accuracy rate is overwhelmingly high. This means that the students understood the contents of the class. So we can assume that our first objective of deepening the high-school student's understanding in biology and the experimental technics and let it be a trigger for them to get interested in this topics was achieved.
- The percentage that was able to correctly answer synthetic biology to the last question was only a 33.3%. Regarding this point, we can say that it's still an unresolved problem in order to spread the idea of synthetic biology.
- Since, after the lesson, the people that had a bad image on gene recombination disappeared, we can say that the gene recombination image improved. However, we think that if we give an explanation even easier to understand its image can change even more.
- The people that would like to use genetically recombined products increased slightly. However, we think that we can improve the image of gene recombination even more.

[Summary of the card game]

- It's interesting and the rules are easy to understand
- Students were able to understand that the AHL prompts the activation of the promoter when it reaches a fixed concentration by stablishing that when 3 AHL get together it prompts the activation of the promoter.
- We were able to make them understand the characteristics of toxins and antitoxins through the game.
- By separating the AHL by color students learned the specifics of the promoters.