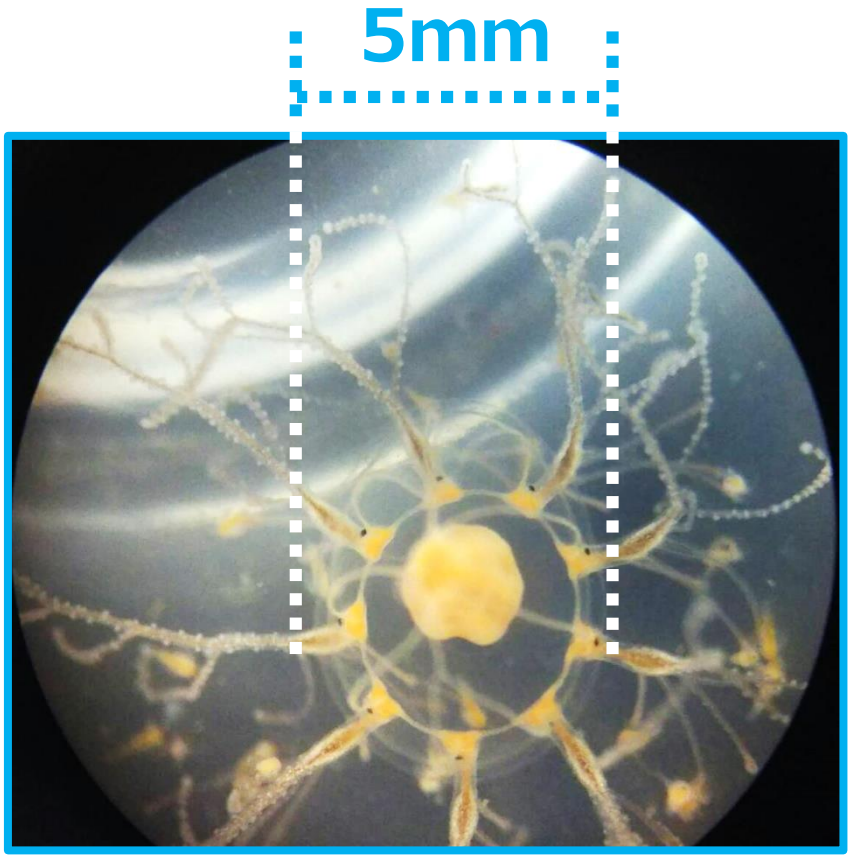
加古川東
課題研究

# “ Experiments for triggering regeneration of *Cladonema pacificum* ”

# *Cladonema pacificum*

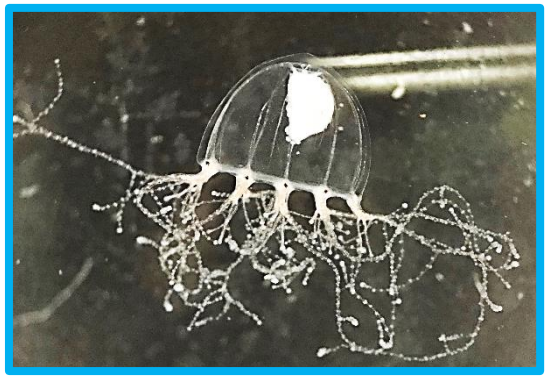
the protagonist in experiments

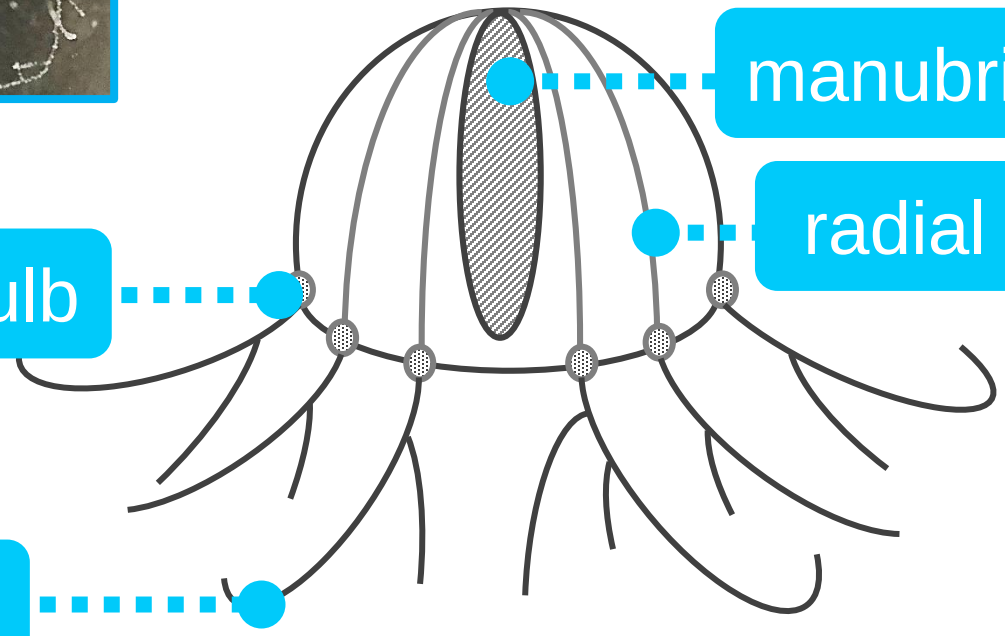



《 seen from the **UNDERNEATH** 》

# *Cladonema pacificum*

name of each organ





manubrium “stomach”

radial canal “canal”

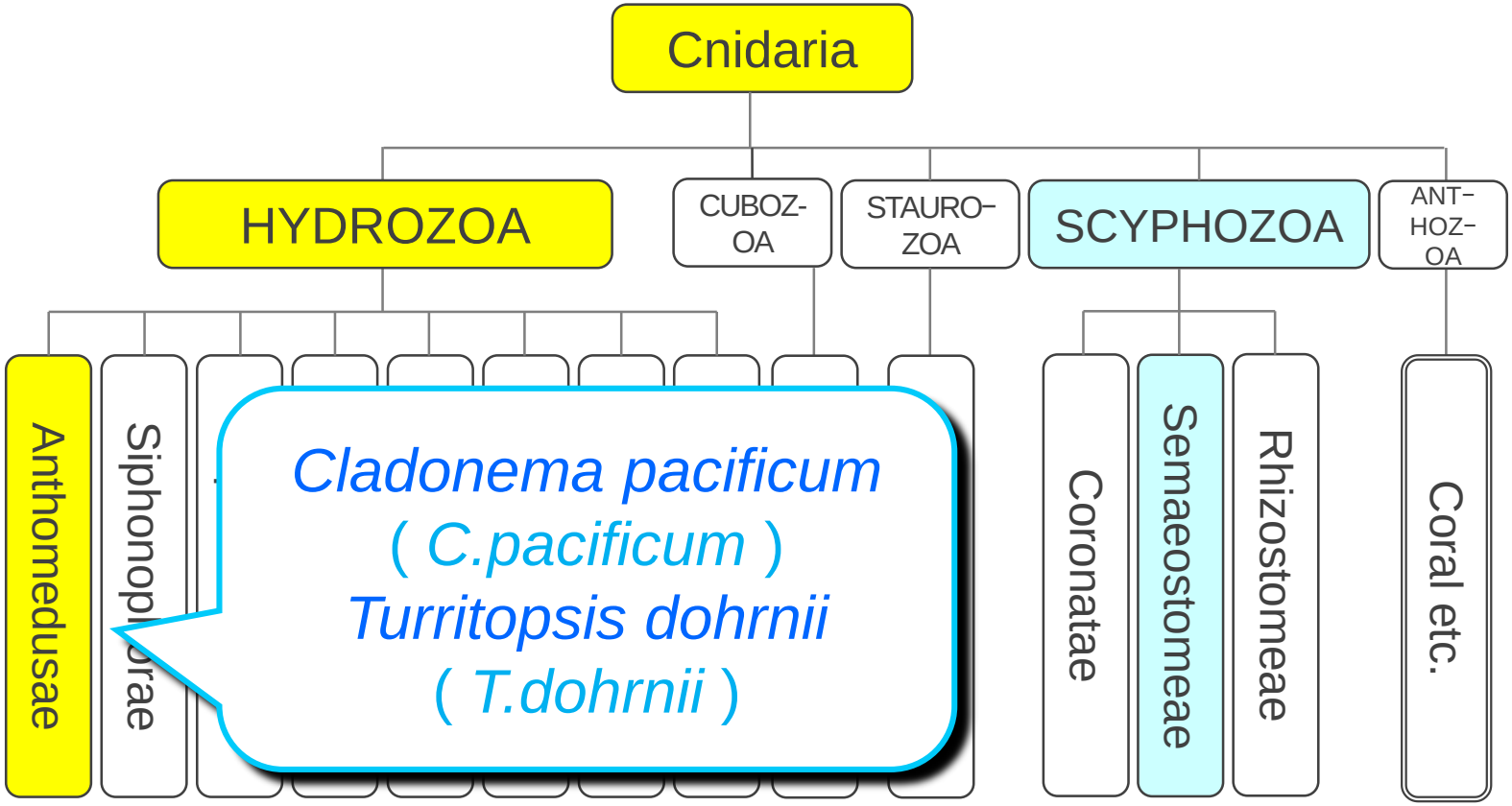
“bulb”

tentacle bulb

tentacle

《 seen from the **SIDE** 》

# Family Tree ~ Cnidaria



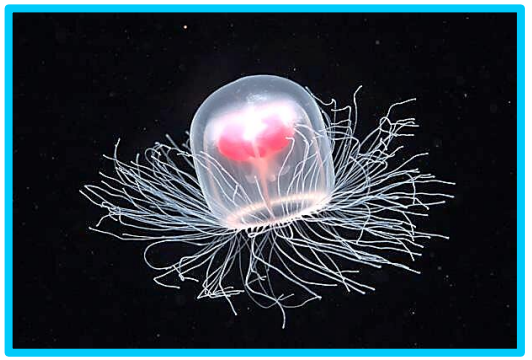
# Nature's Mystery !

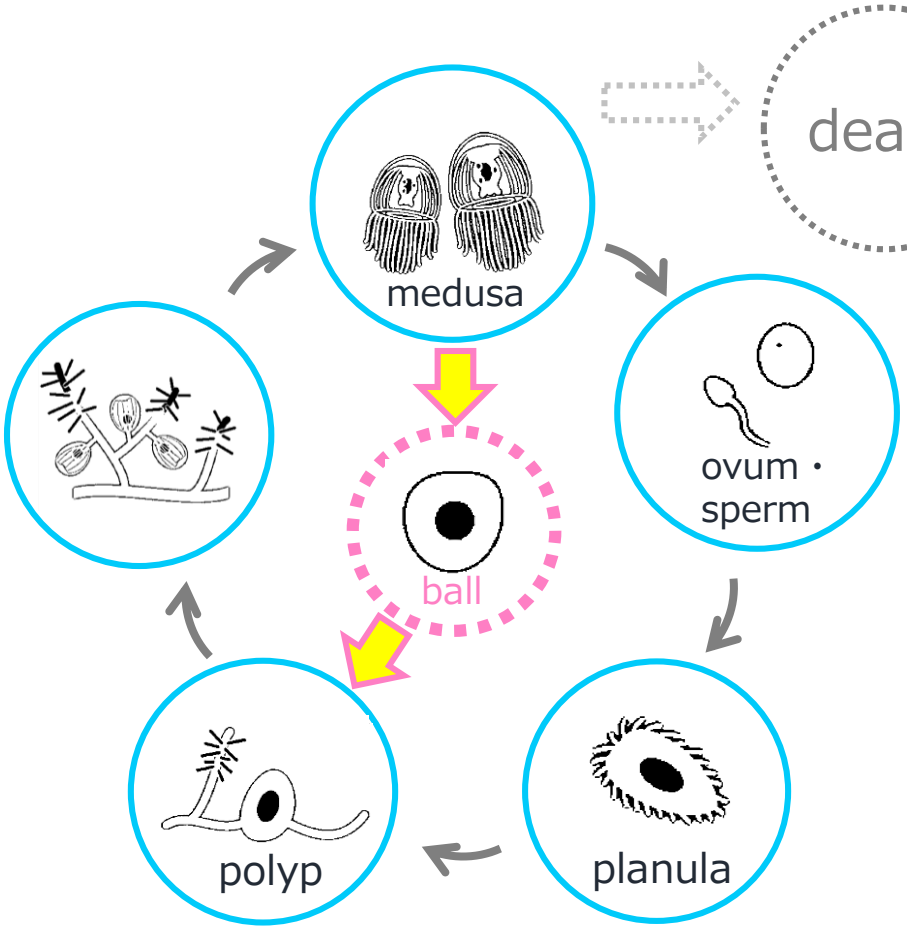
"Turritopsis dohrnii"

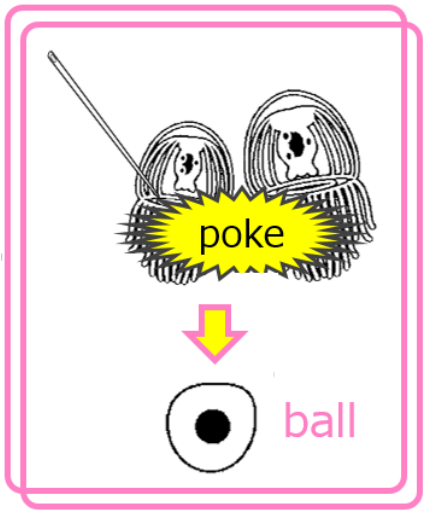
Jellyfish "Rejuvenation"

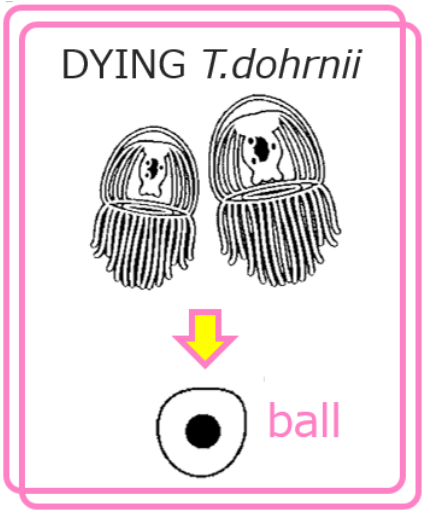
# Eternal Life
## *Turritopsis dohrnii*

life history “going back”





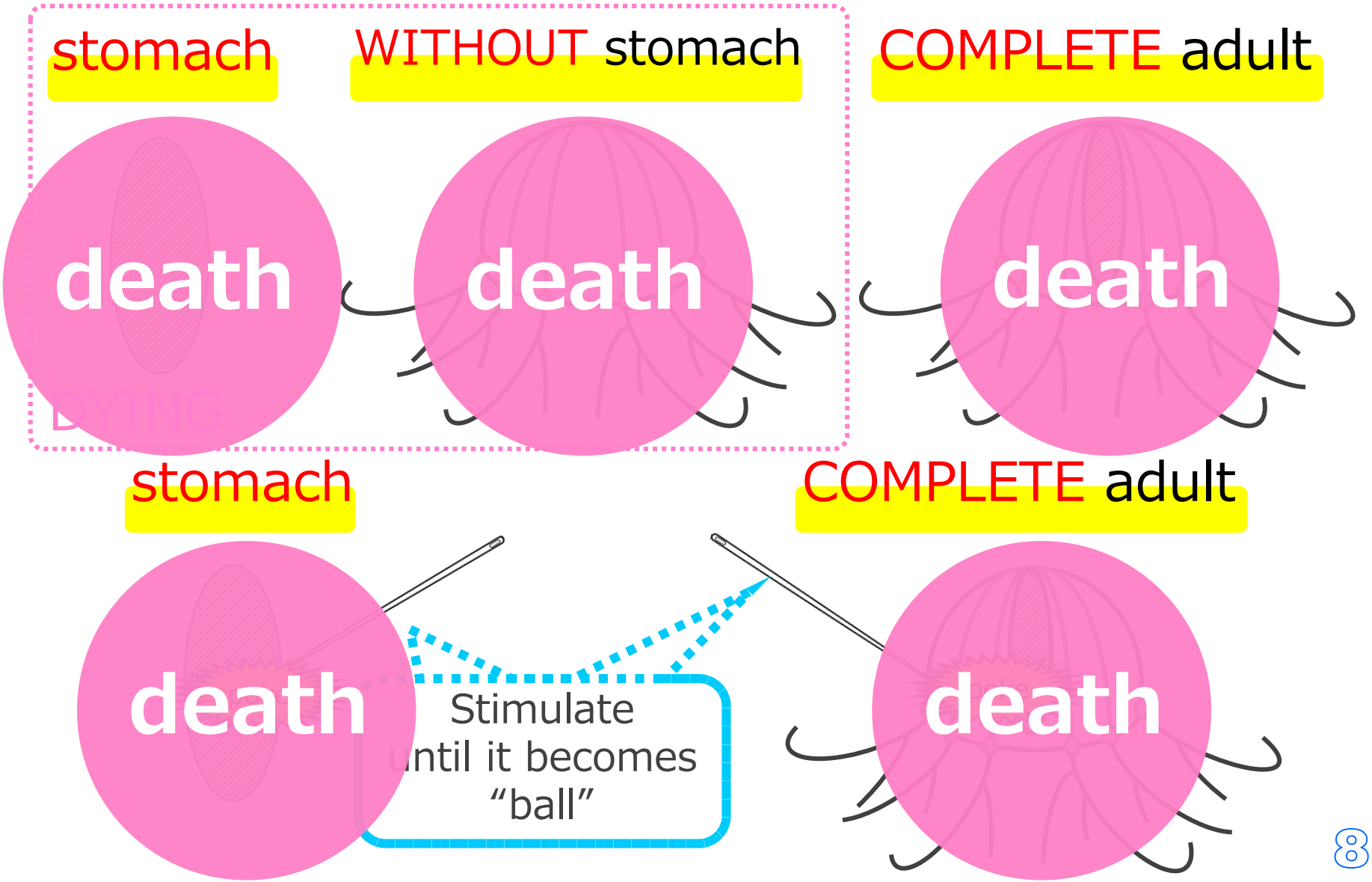

Source : WAO Science Park “The method of rejuvenation can be found from here ! ”

# EXPERIMENT 1

**Rejuvenation** induction experiment

# Experiment 1

observation of DYING *C.pacificum* ・poke them



# CONCLUSION

**RESULT :**

***C.pacificum* NEVER underwent the cycle of rejuvenation.**

**⇒ *C.pacificum* do NOT have rejuvenation ability.**

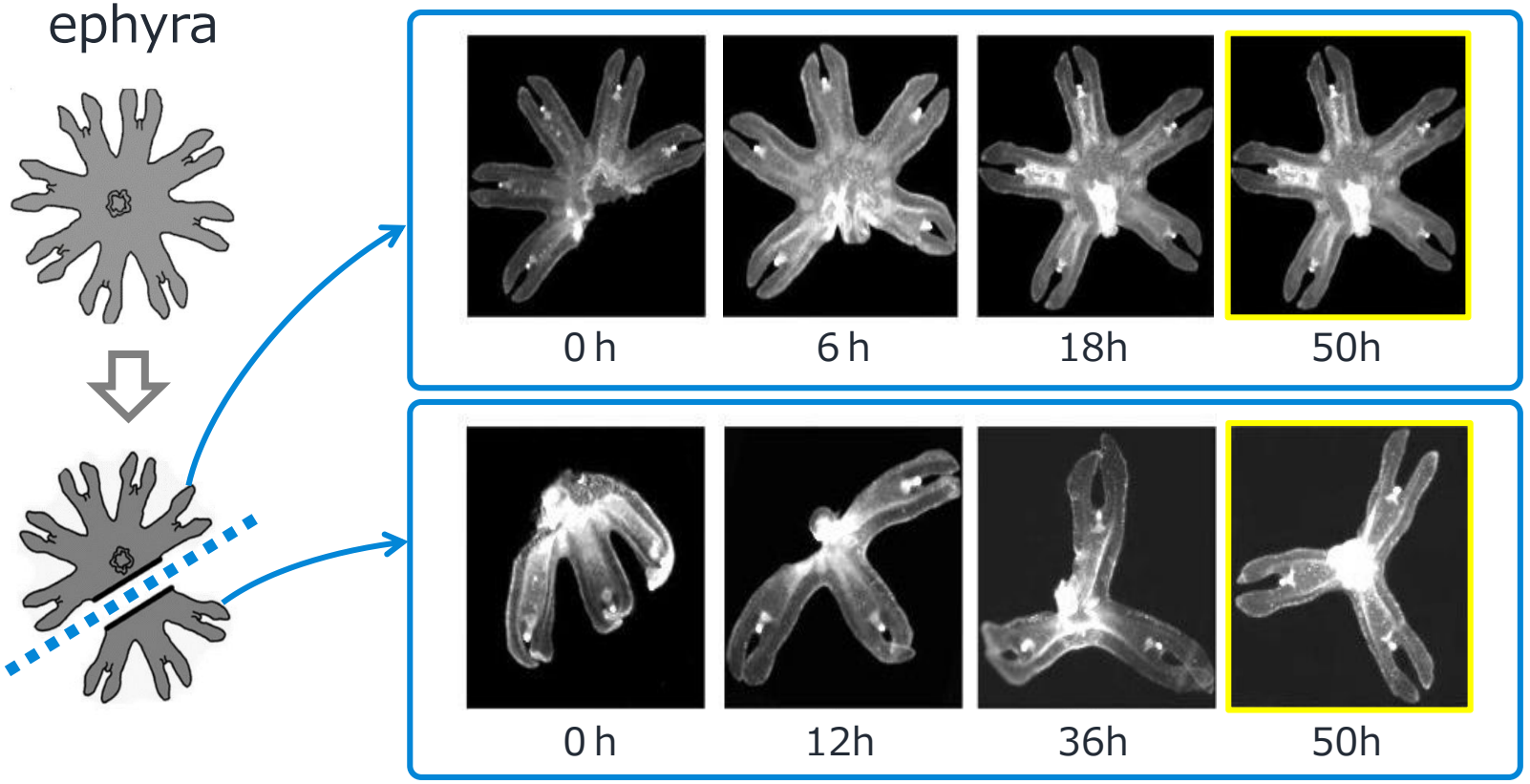
**⇒ Rejuvenation ability is special to *T.dohrnii*.**

# EXPERIMENT 2

**Self-repairing** experiment

# Previous research on Moon Jellyfish (*Aurelia aurita*)

not regeneration but rearrangement

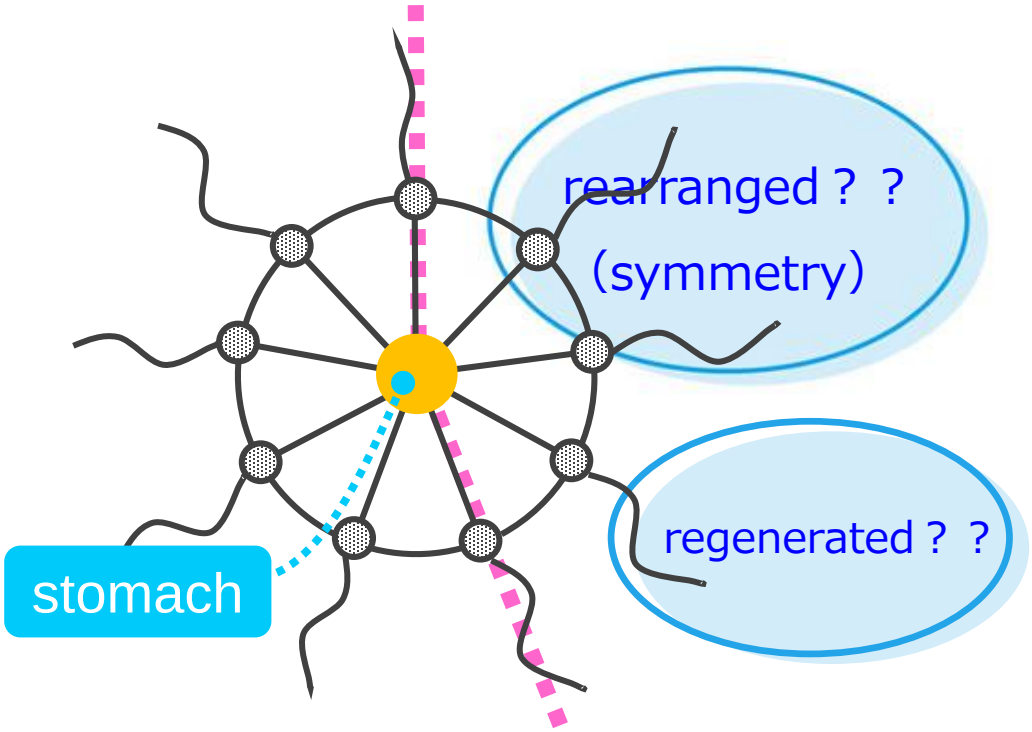


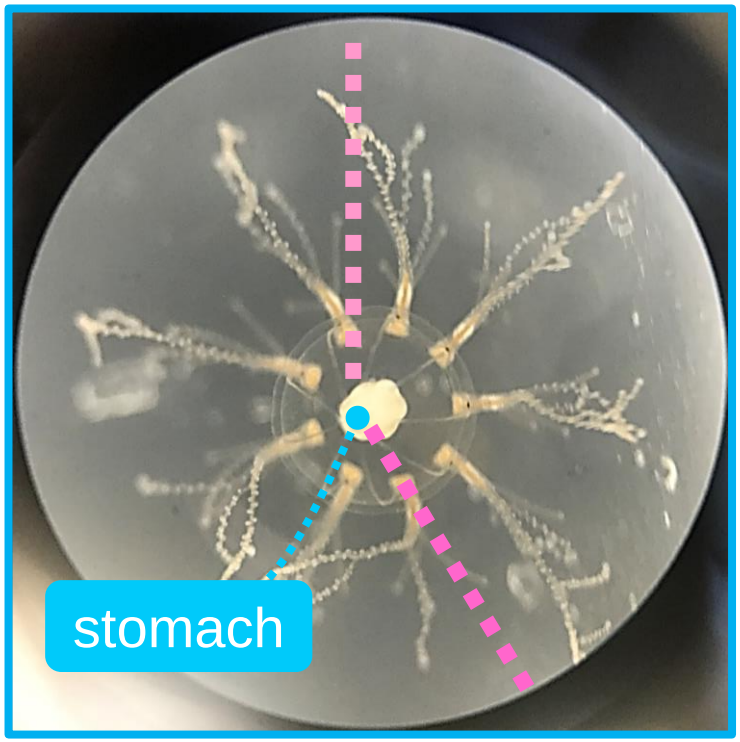

Source : Self-repairing symmetry in jellyfish through mechanically driven reorganization
Michael J. Abrams, Ty Basinger, William Yuan, Chin-Lin Guo, and Lea Goentoro 2015

# Experiment 2

our experimental methods

Along ▪▪▪▪, we cut “umbrella”, “bulbs”,and “tentacle”



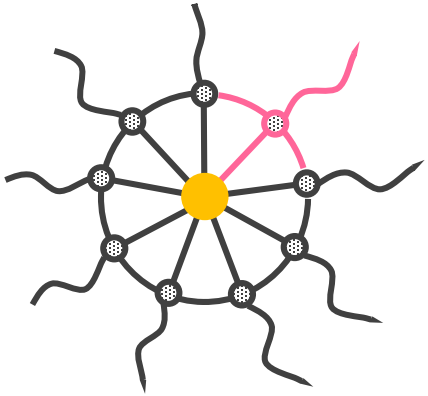

《 seen from the **TOP** 》

# Experiment 2

our experimental methods ⇒ results

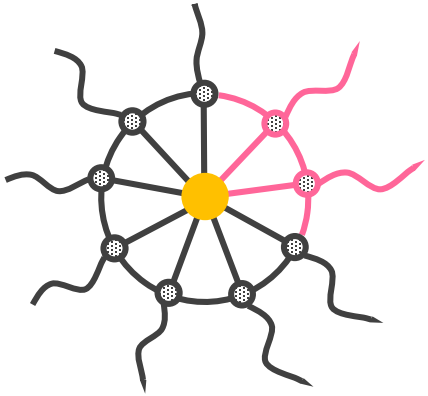
1 individual

1 tube



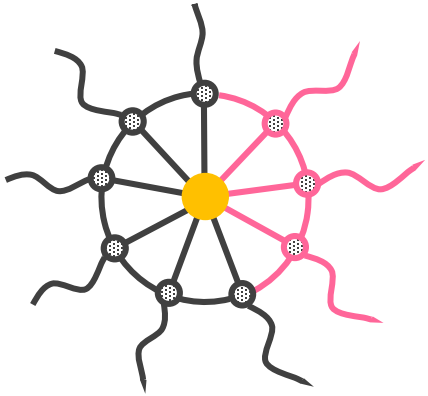
1 individual

2 tubes



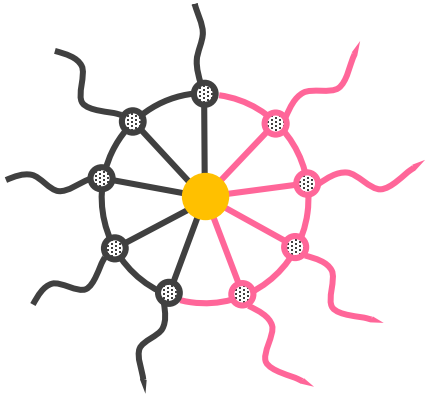
1 individual

3 tubes



1 individual

4 tubes



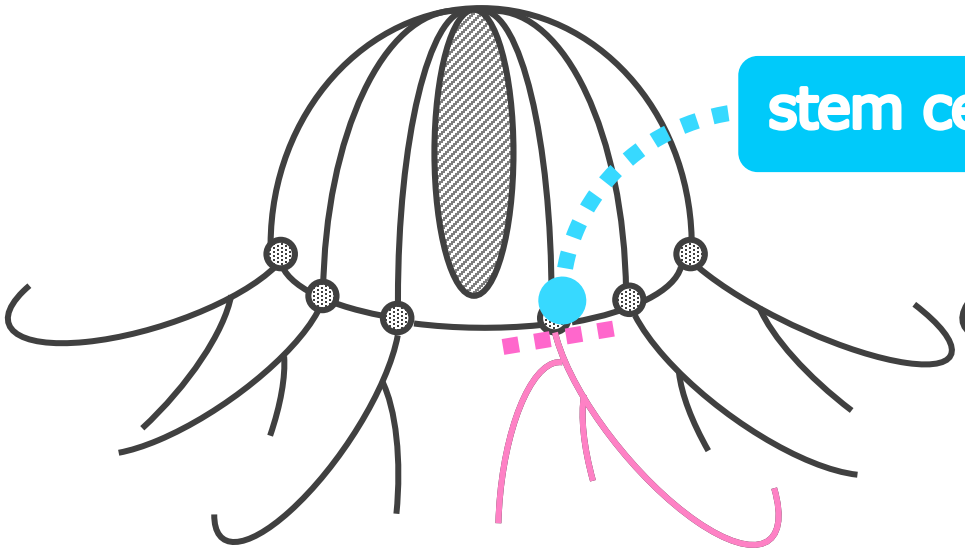
rearranged (symmetry)

**Completely Regenerated !**

# Result 1

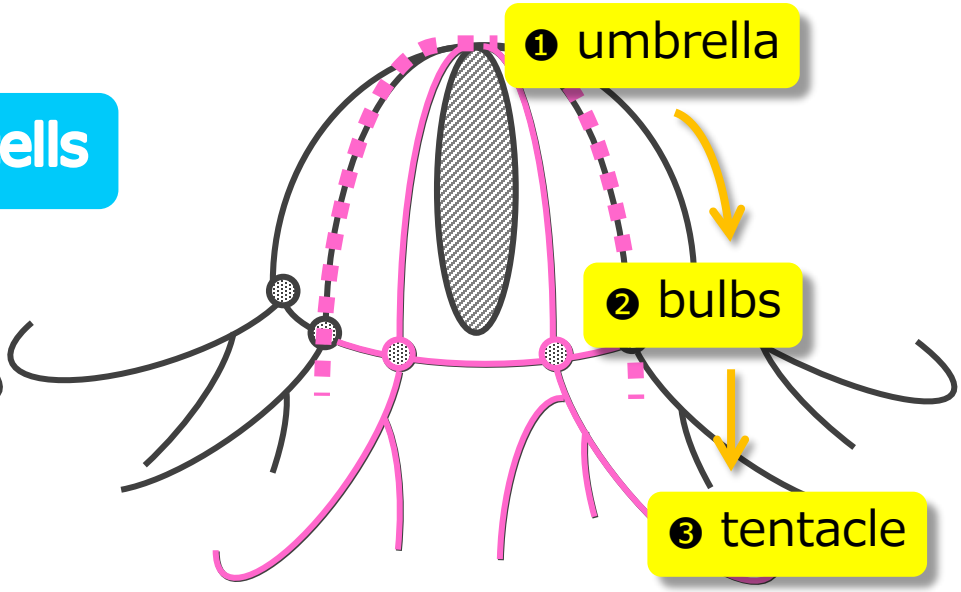
stem cell：it can cause regeneration.

previous research




Tentacles can be regenerated
⇒ bulbs = stem cell

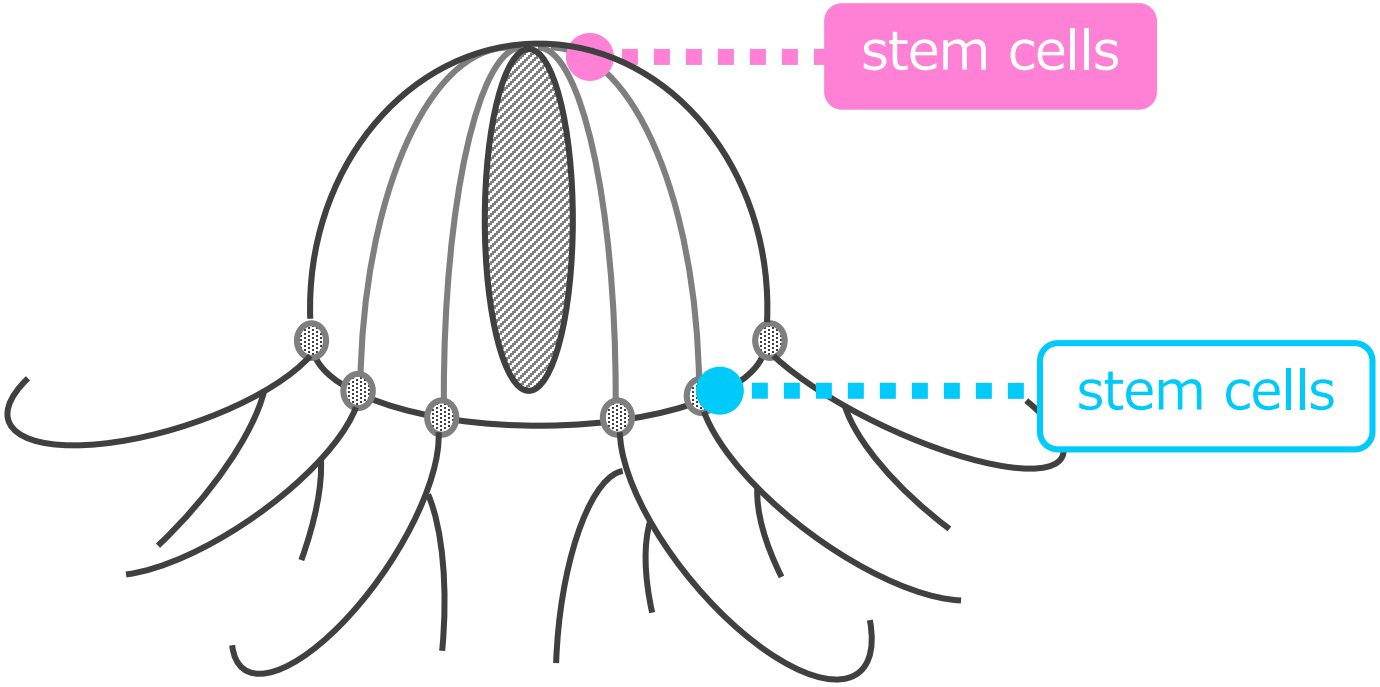
our result




We cut umbrella・bulbs・tentacle
⇔ **ALL organs were regenerated**

# Discussion I

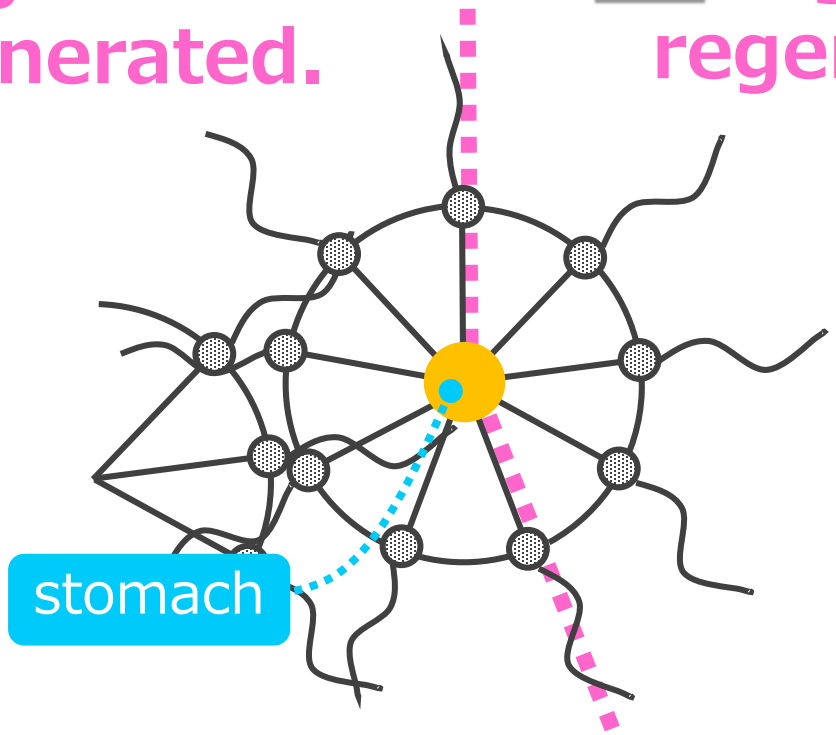
*C.pacificum* also have stem cells in the apical part of the umbrella.



# Result Ⅱ

**All organs were regenerated.**

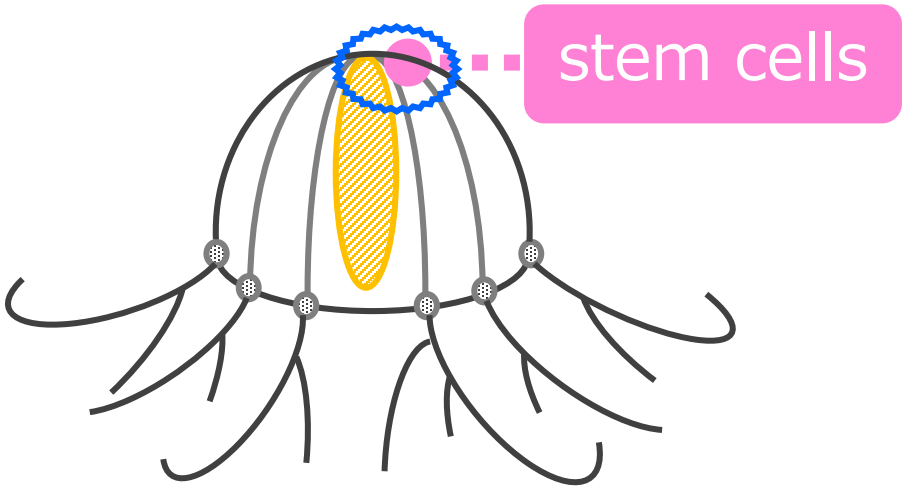
**No organs were regenerated.**



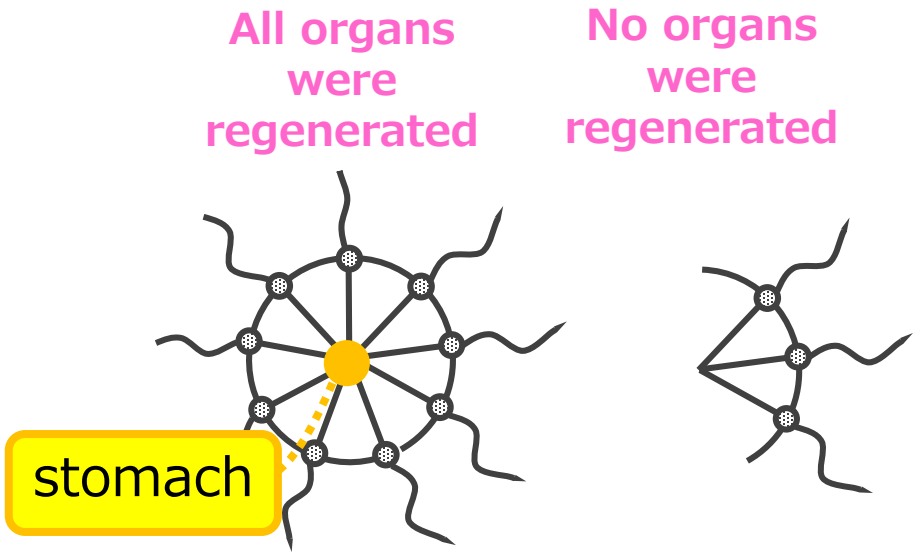
# Discussion Ⅱ

stomach induces regeneration in stem cells of the umbrella

Ⅰ



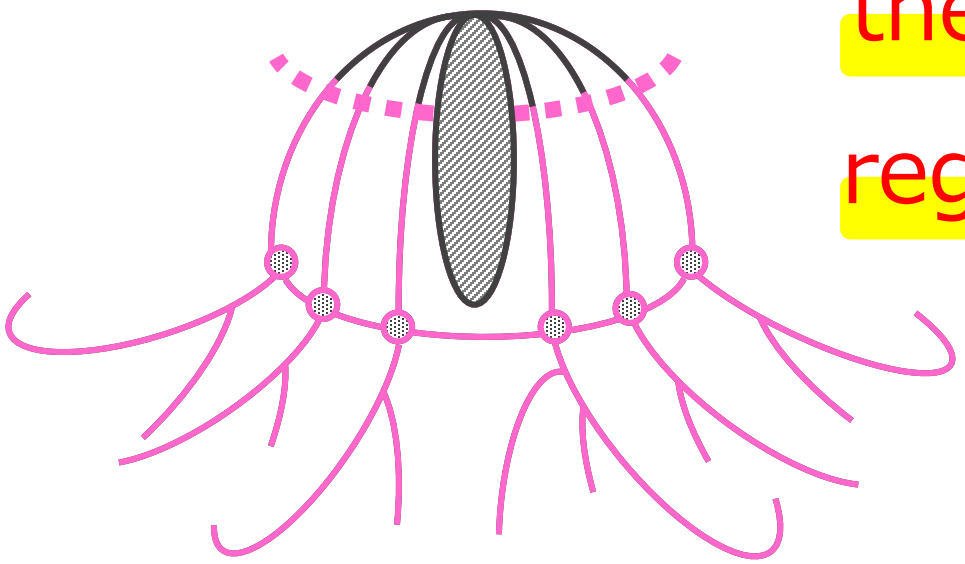

Ⅱ




“the stomach-inducing-regeneration-theory”

# Future Plan

Investigation of our discussion



“the stomach-inducing-regeneration-theory”

# Works Cited

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〈2〉WEB site : WAO Science Park “The method of rejuvenation can be found from here ! ”

〈3〉Paper : Induction of “rejuvenation” phenomenon of *Turritopsis* sp.（Jan.20,2018）
KUBOTA Shin

〈4〉Paper : COMING CAUTION IN PHYSICAL INDUCTION OF REJUVENATION EXPERIMENTS USING *Turritopsis* sp.
BY THE GENERAL RUN OF PEOPLE （Mar.12,2016）KUBOTA Shin

〈5〉Paper : Self-repairing symmetry in jellyfish through mechanically driven reorganization （June.15,2015）Michael J. Abrams, Ty Basinger, William Yuan, Chin-Lin Guo, and Lea Goentoro

〈6〉Paper : Methods for Collecting and Breeding the Hydrozoan Jellyfish *Cladonema pacificum* （Sep.30,2007）DEGUCHI Ryusaku

# Works Cited-2

〈7〉Paper : Hisological and autoradiographical studies on the hydranth regeneration of *cladonema uchidai* SATOKO Sadano etc.

〈8〉Paper : Strange fate of degenerated medusa of *Turritopsis nutricula* from northern Japan KUBOTA Shin etc.

〈9〉paper : Biological notes on *Ocenia armata* in japan KUBOTA Shin etc.

〈10〉paper : Forefront of regenerative medicine KANEMARU Shin-ichi

〈11〉paper : AN INCOMPLETE REJUVENATION OF *Cytaeis sp*. KUBOTA Shin

〈12〉paper : List of Medusozoa and Ctenophora in Tanabe bay KUBOTA Shin

〈13〉Paper : Occurrese of many medusa of *Turritopsis nutricula* in Kagoshima bay with some observation on rejuvenation KUBOTA Shin

〈14〉Paper : 166 DAYS GROWTH AND AGING OF *Pandeopsis ikarii* (Uchida) (Cnidaria, Hydrozoa, Anthomedusae) APPEARED IN THE TANK AND NEW POSSIBILITY OF THE DISTRIBUTION KUBOTA Shin etc.

# Works Cited-3

〈15〉Paper : The first observation of rejuvenation and subsequent polyp colony growth in the medusa *Turritopsis nutricula* (Cnidaria, Hydrozoa, Anthomedusae) in Japan　KUBOTA Shin etc.

〈16〉https://www.nikkei.com/article/DGXMZO33397560V20C18A7I00000/

〈17〉https://www.sankei.com/column/news/181213/clm1812130004-n1.html

〈18〉https://www.kazusa.or.jp/news/re_info-2016-0819/

〈19〉http://www.kyoto-u.ac.jp/static/ja/news_data/h/h1/news7/2010/documents/110212_3/01.pdf

# Acknowledgements

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KUBOTA Shin


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