

Micro Algae Cyanidiophyceae that enable to deliver drugs

~ The Oral Delivery of Useful Proteins to the Intestinal Tract ~

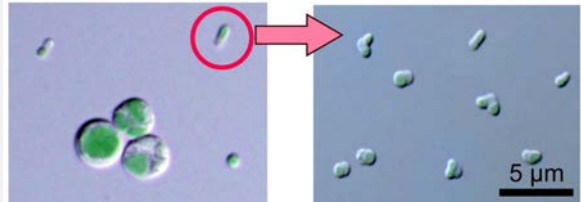
KEY INVENTION

- The haploids of the unicellular Cyanidiophyceae which live under acid environments and have no strong cell wall are stable under mild to high acid environments. However, the cells rupture under neutral to alkaline environments to release the contents of the cells.
- In combination of the gene editing technologies for the haploids of Cyanidiophyceae with the abovementioned behaviors, the system to be stable to stomach acids and release the useful proteins stored in the algae cells when the cells reach the intestinal tract has been discovered.

APPLICATION expected


- Oral biopharmaceuticals for humans and animals (Oral Vaccines, Oral Insulin Formulations, etc.)

SUMMARY of INVENTION



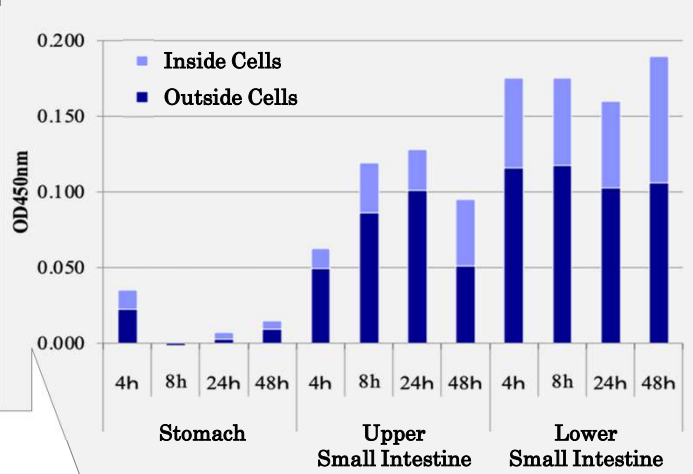
Cyanidium (Diploid) Cyanidium (Haploid)

The haploids that have no cell wall were successfully prepared.



Cell Outline Chloroplast Autofluorescence Immunofluorescence Staining by Anti-HA Antibody

The useful proteins were enabled to be stored in chloroplast.



The stomach, upper small intestine and lower small intestine were corrected over time, and the amount of GFP released outside the cells was measured by ELISA.

Algae cells was observed to release useful proteins in the intestine.

COMPARISON with and ADVANTAGE over CURRENT TECHNOLOGIES

[Advantage]

- Available to orally be administered
- Available to genetically modified
- Genes are stable for a long time even at room temperature.

	Haploids of Cyanidiophyceae	Animal Cells	Bacillus Coli	Tobacco	Farm Crops	Phytoplankton (Euglenophyceae, etc.)
Oral Administration	○	×	×	×	○	○
Infectious Agents for Humans	○	×	×	○	○	○
Productivity	○	○	○	×	×	○
Cell Walls	○	○	○	×	×	×

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Licensable Patents [Title of Invention - Registration No. (JP)/International Publication No. (WO)]

- Novel Micro Algae and Uses thereof - JP6852190
- Drug Delivery Composition - WO2020203816

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