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Summary

Backgrounds

- Aquatic organisms have tremendously various strategy for keeping their lives
- Proteins and enzymes are indispensable for their various strategies for protection of themselves.
- These proteins are still with their unique activities outside the lives. They may influence the properties of other components, such as foods and environments.

Purpose

- We investigate apply these properties of enzymes from aquatic organisms, and aim to apply these knowledges to food and environmental science.

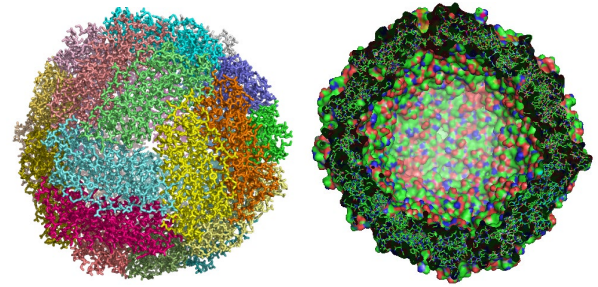
Major achievements

- We have revealed the structures and functions of metal binding proteins which affect food deterioration and self defense from aquatic organisms.
- We have identified the main source of mellanization in crustaceans and revealed the mechanism on the food browning or mellanization in important food species.

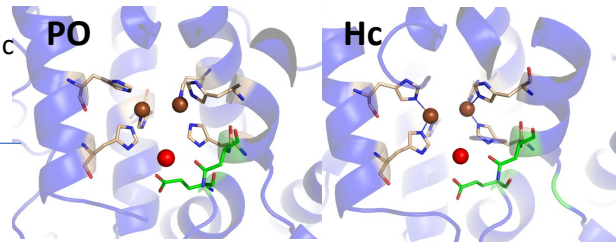
Prospects of collaboration

【Collaboration with agriculture, fisheries, livestock, and food industries】 Recovery of trace amounts of metals from aquatic environments. And, development of safe strategy for food preservation.

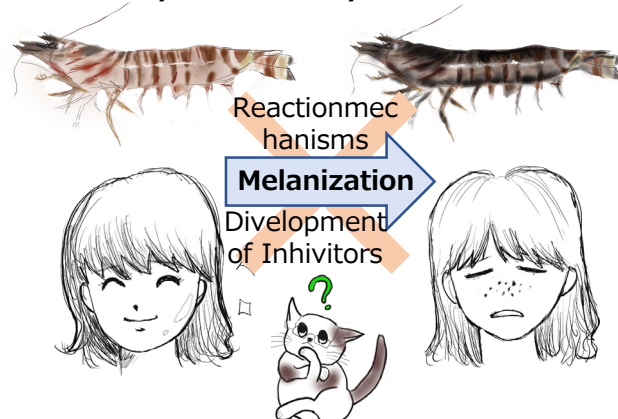
【Collaboration with Medicine, Pharmacology, Nursing, and Engineering】 Developing a strategy for inhibiting melanization reactions can apply for many industrial fields, including cosmetic, medical and food industries.



Structure of ferritin (left) and section structure (right). Is it capable of accumulating metals, other than iron?



Reaction centers of Phenoloxidase from crustacean (left) and Hemocyanin (right). Really resembles each other, don't they? But, only PO has enzymatic activity.



Application on development of inhibition



Selling point

We are investigating the interesting aspects of aquatic organisms from the structural and functional level of proteins and enzymes. The reaction machinery that is created by nature is beautiful and functional.