

# BDR SEMINAR via Zoom

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**Wednesday, August 9, 2023**

12:30-13:30

Meeting URL will be announced on the event day by e-mail.

※This seminar is open only to BDR members.

## Kleptoprotein: sequestering functional protein from prey for bioluminescence

### Summary

The process of an organism acquiring a new function is predominantly understood to be the result of accumulated mutations. Specifically, novel changes in the genome lead to the acquisition of genes with new functions. An exceptional case to this rule is the phenomenon of organisms acquiring functions from their prey, as seen in "klepto(=stealing)plasty," where sea slugs obtain chloroplasts from algae and carry out photosynthesis.

In my study to identify fish luciferase (bioluminescent protein), I occasionally discovered protein sequestering and named it as "kleptoprotein". The fish, *Parapriacanthus ransonneti*, has luciferase which is identical to that of the crustacean *Cypridina noctiluca*. The luciferase is obtained by ingested crustacean but not genetically encoded in the fish genome. It is a rare occurrence for an ingested protein, which would usually be digested and broken down, to be stored in a specific organ and maintain its function for an extended period. The use of kleptoprotein is the alternative manner for novel trait evolution. So far, no other instances apart from *P. ransonneti* have been reported.



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