Bioorganic studies on marine natural products --diverse chemical structures and bioactivities

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The discovery of new molecules contributes to the development of basic scientific concepts, leads to valuable drug-oriented compounds, and suggests possible new pharmacological reagents. Newly discovered substances can even be responsible for the creation of new scientific fields. Due to the radically different habitats of marine organisms, several notable examples of secondary metabolites have been isolated from them. Two of the most remarkable properties of these compounds are their structural and physiological diversities. These bioactive compounds are candidates for drugs or biological probes for physiological studies. Thus, we have investigated unique marine natural products from marine organisms.

Recently, we successfully isolated a super-carbon-chain compound with a molecular weight of 2,859 from the dinoflagellate *Symbiodinium* sp., and named it symbiodinolide. Notably, symbiodinolide showed Ca^{2+} channel-opening activity. From the dinoflagellate *Durinskia* sp. isolated from the sea slug *Chelidonura fulvipunctata*, we isolated a new super-carbon-chain compound, named durinskiol A. Durinskiol A inhibited the growth of zebrafish and characteristically creates edema around its heart. Furthermore, we have been trying to identify the compounds which enable coral larvae to metamorphose into a mature coral. We found that 11-deoxyfistularin-3 is unambiguously involved in the settlement and metamorphosis of the scleractinian coral *Pseudosiderastrea tayamai*. Interestingly, several kinds of carotenoids were revealed to have synergistic effects or act as enhancers.

As mentioned above, we are seeking to acquire a deeper understanding of biological phenomena correlated with marine natural products. I will introduce here up-to-date topics of our major work.