Asst. Prof.
NEMOTO Michiko

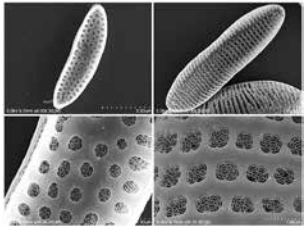
Understanding of molecular mechanisms of biomineralization

Biominerals are minerals formed by organisms. They possess various superior material properties derived from their structure and composition. Understanding biomineralization could contribute to the development of material science and nanotechnology. We are studying biomineralization using omics technologies.

Magnetite biomineralization in chitons

The denticle caps of chiton radular teeth consist of magnetite. The elucidation of magnetite biomineralization mechanisms in chitons could pave the way for developing novel environmentally benign processes for the production of iron oxide materials. To clarify the molecular mechanisms of magnetite biomineralization, we constructed de novo assembled transcriptome data from radular tissue of chitons for the first time. Furthermore, we identified the proteins that were specifically expressed in the mineralized teeth. Characterization of these proteins using genetic engineering techniques are ongoing.

Silica biomineralization in diatoms



The beautiful geometric design of diatom silica cell walls have attracted many people over the years. Recently, it has been shown that diatom silica cell walls are not only beautiful but also useful in the nanotechnology field because of their many exceptional material properties. We are studying silica biomineralization in consideration of future nanotechnological applications.