

Life-Metal project: investigating the correlation between microbial usage and environmental content of heavy metals.

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The proteins including metal(s) are called metalloprotein. Most of reactions related to energy metabolisms are catalyzed by these metalloproteins. But, metals involved in metalloprotein differ between each energy metabolisms. For example, hydrogenotrophs such as methanogens have many of nickel containing protein in their hydrogen-oxidizing pathway. Therefore, we have hypothesized that quantity and variety of metals involved in total proteins from a cell determine the energy metabolisms of the cell. And also we have hypothesized that quantity and variety of metals in the environment prescribe the variation of energy metabolisms.

In this project, we will determine if there are the correlations between heavy metal content in microorganisms and that in environment. To investigate that hypothesis, we will analyze metal-usages for total proteins from a cell by using ICP-MS and so on. To analyze each energy metabolisms, we will collate the usage of metals from both a cell and environment. If this hypothesis is approved, this approach will be a tool for estimating energy metabolisms occupying environments which include deep-subsurface and the primitive earth.