Environmental Bioscience

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Major research fields

Microbiology, Enzymology, Fermentation Technology

Microorganisms are very tiny one-celled organisms, viruses, fungi, and bacteria, and are found everywhere in the world. They can live in the air, on land, and in fresh or salt water environments. An extremophile is a unique microorganism that thrives in physically or geochemically extreme conditions that are detrimental to most life on earth. Enzymes from extremophiles are expected to fill the gap between biological and chemical processes due to their unusual properties. Especially enzymes from hyperthermophiles that can grow at above 90 °C were devoted owing to its extraordinary thermostability and denaturant tolerance. One of the most successful uses of thermostable enzymes was DNA polymerase in the polymerase chain reaction (PCR). Besides PCR, thermostable enzymes are used in the chemical, food, pharmaceutical, paper and textile industries. Hyperthermophiles are very attractive microorganisms because they are sources of thermostable enzymes and because they are some of the most primitive microorganism on earth. In our laboratory, we focus on adaptation mechanisms of hyperthemophiles to various stress environments and study them in a molecular level. In addition, trials to develop novel technologies by “extremozyme” are attempted.

Reference:

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