CYCLIC-DI-GMP

Nippon's mission is to build bridges between Japanese and European research life science markets to increase the availability of the most recent life science tools which leads to more efficient and specific drug development which can save lives and contribute to a more sustainable health economy.

Cyclic-di-GMP

Cyclic-di-GMP is a substance which regulates the synthesis of cellulose. In recent days it is thought to control the formation of biofilm. Biofilm is the colony of microorganisms such as Yersinia pestis, Salmonella enteric and Staphylococcus aureus and resistant bacteria such as MRSA and PRSP. These pathogenic microbes form the biofilm to raise their drug resistance ability and infectivity. Therefore cyclic-di-GMP is now at the center of attention as a new candidate for medicines. Cyclic-di-GMP is also known to relate to activate the production of CD4 which works as a growth inhibitor of cancer.

Problem 1:

Cyclic-di-GMP is harvested from natural organic compounds, but is associated with low quantities due to the low amount of cyclic-di-GMP present inside the natural organic compounds. Synthesizing cyclic-di-GMP enzymatically or chemically has been tried, but no effective synthesis pathway has been developed yet.

Problem 2:

The low amount of cyclic-di-GMP that is harvested from natural organic compounds, causes high pricing on cyclic-di-GMP.

A chemical method to synthesize cyclic-di-GMP

A new chemical method is developed to synthesize cyclic-di-GMP. The new chemical method can produce cyclic-di-GMP at gram-scale, which leads to larger amounts of cyclic-di-GMP produced per batch than is harvested from natural organic compounds.

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