Applications of Bacterial Quorum Sensing

이진태*
영남대학교, 디스플레이화학공학부
(jtlee@ynu.ac.kr*)

Bacteria have developed intercellular signaling to adapt and survive in natural communities. Many bacteria communicate with each other using small diffusible compounds in cell population dependent manner, which is called quorum sensing (QS). QS controls many bacterial phenotypes, such as bioluminescence, pathogenesis, biofilm formation, and competence. This talk will present several major results in the field of QS research. An important application of QS is to discover anti-virulence compounds that, unlike antibiotics, decrease bacterial pathogenesis, but do not affect bacterial growth so that there is a less chance for drug resistance. Additionally, indole as one of new signaling molecule (a possible quorum sensing molecule) will be introduced. To date, 85 bacterial species produce a large quantity of indole that controls diverse aspects of bacterial physiology, such as spore formation, plasmid stability, drug resistance, biofilm formation, and virulence in indole-producing bacteria. In contrast, many non-indole-producing bacteria, plants, and animals produce diverse oxygenases which may interfere indole signaling. It appears indole plays an important role in bacterial physiology, ecological balance, and possibly human health.