

Betonicine, a New Quorum Sensing Signaling Molecule

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Quorum-sensing (QS) is involved in various cellular events such as cell density control, biofilm formation, and virulence. Bacteria usually produce and secrete quorum sensing signaling compounds (called autoinducers), one example of which is N-acyl homoserine lactone (AHL). We have been studying red algae for screening quorum sensing inhibitors. The attempt has been made based on a sensitive detection method for AHLs and their analogues using recombinant *Agrobacterium tumefaciens* NTL4 (pCF218) (pCF372) as the reporter strain. In one red algal species, the fraction containing betonicine together with floridoside and isethionic acid was observed to have antagonistic effect on AHL function. However, when tested alone, betonicine had a dose-dependent stimulative effect like AHL in the concentration ranged from 10^{-3} M to 10^{-6} M. Although the sensitivity of betonicine as an inducer molecule is much lower than that of octanoyl homoserine lactone in the present assay system, it is important that betonicine has a totally different chemical structure from AHL. We expect that a series of new QS stimulators/inhibitors which are structurally not related to AHL can be developed in the near future