

A DNA microarray chip for discrimination of complex microbial communities

김병찬, 박지현, 구만복*
광주과학기술원 환경공학과
(mbgu@env.kjist.ac.kr*)

A DNA microarray chip platform technology for discrimination of bacterial species in the complex communities such as activated sludge system was developed using unsequenced random genomic DNA probes. Genomic DNAs of each pure cultured bacterium were fragmented and these fragmented were ligated with library vector. Using T3/T7 primer, random specific probes for each bacterium (Total 11) were produced. For the reference signals, all genomic DNAs involved chip fabrication are primed with cy5-dCTP and each detected genomic DNA samples are primed with cy3-dCTP. Scanning result and statistic analysis shows that this system can identify presence of specific strains in terms of genomic DNAs.

We showed that this tool could be useful to monitor the specific bacterial abundance in the complex bacterial communities such as activated sludge and offer pre-information of population abundances. Even though, unsequenced random genomic DNAs, we could clearly discriminated specific genomic DNAs within different genus levels. This method offers the fast and reliable sensing schemes as searching or identifying mixed bacterial communities using DNA microarray platform technology.