A Panel of Different Whole Cell Genotoxicity Biosensors using Recombinant Bioluminescent Bacteria for Detection and Classification of Genotoxicity

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A panel of different biosensing cells using promoters responsive to different levels of genotoxicity was used for detecting and classifying genotoxicity. Five recombinant bioluminescent bacteria responsive to different levels of genotoxicity have been newly developed in this study. The responses of these recombinant bioluminescent bacterial strains were successfully characterized and classified by using MMC, MNNG, NDA and 4-NQO. The responses obtained from these cells were compared with the recombinant bioluminescent bacteria containing a promoter of either recA or gltA fused to luxCDABE genes and the differential effects among the strains in response to different types of genotoxic agents have been successfully characterized. This result suggests that the use of these different bioluminescent bacteria could elucidate and classify the possible impacts of genotoxicity by different samples. Therefore, these genotoxic biosensors are believed to be utilized in the area of pre-screening steps of new drugs, unknown or newly synthesized chemicals.