

Biotechnologies towards Sustainable Development in Malaysia

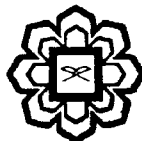
Zarina Zainuddin

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Zarina Zainuddin



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Chapter 5

Genetic manipulation for better bioremediation processes

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Introduction

Majority of bioremediation studies are focused on identification of bio-agents that can be utilized for the degradation of particular pollutants and also optimization of methods to enhance the degradation activities. The natural limitation possesses by living organisms such as bacteria, fungi and plants that are involved in degradation of pollutant chemicals has directed a new dimension in bioremediation studies. The genetic manipulation for novel metabolic routes offers a new potential of utilizing organisms especially bacteria towards degradation process of pollutant chemicals.

Anthropological activities have been recognized as major contribution to environmental pollution. The release of chemicals that never or rarely presence in the biosphere before (xenobiotics) with large quantity lead to difficulties for bioremediation agents such as microorganisms to function effectively in the cleanup process. Environmental issues rose with the increase of global population due to industrial development needed for sustainable socio-economic growth. With the vast amount of genomic data generated by molecular biologist around the world especially for microorganisms isolated from environment, it is the high time for environmental biotechnologist and environmental engineers to harness these genomic data for the development of more effective bioremediation process.