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Short Communication

Molecular Techniques for Detection and Identification of Microorganisms

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DESCRIPTION

Rapid detection and identification of microorganisms is a challenging and important feature in industries ranging from manufacturing to medicine. Standard methods are notorious for being time-consuming and labour-intensive (e.g., culture media and biochemical tests). In contrast, screening techniques necessitate a quick and low-cost grouping of bacterial and fungal isolates, while current analysis necessitates broad reports of microorganisms involving the use of molecular techniques for detection and identification of microorganisms, as well as discussions of their benefits and limitations. Secondary metabolites, also known as "natural products," are produced by a variety of organisms, including bacteria, fungi, and plants [1]. Natural products have been a prolific source of and inspiration for numerous medical agents with widely disparate chemical structures and biological activities, such as antimicrobial, immunosuppressive, anticancer, and anti-inflammatory activities, many of which have been developed as treatments or have potential therapeutic applications for human diseases. Aside from natural products, the recent advancement of recombinant DNA technology has sparked the development of a diverse range of biopharmaceutical products, such as recombinant proteins, which offer significant advances in the treatment of a wide range of medical illnesses and conditions [2].

Natural products and biological activities

Natural products have a wide range of biological activities that are relevant to human health, such as antibiotic, antifungal, anticancer, immunosuppressive, anti-inflammatory, and biofilm inhibitory properties [3]. This section will concentrate on the biological activities of natural products, which can be classified into several groups. By attempting to cover all types of microorganisms involved in the degradation of various pollutants, the biological activities of recombinant microbial proteins are attempted [4]. Furthermore, while we recognise that the term "biodegradation" is frequently used in ecology, waste management, biomedicine, and the natural environment (bioremediation) and is now commonly associated with environmentally friendly products, we primarily focus on biodegradation in relation to bioremediation by describing processes (natural attenuation, bio stimulation, and bioaugmentation) that use the degradation abilities of microorganisms can be genetically modified for a variety of purposes [5]. Electrochemical biosensors are further classified into amperometric, impedimetric, potentiometric, and conductometric types based on the measurement of changes in current, impedance, voltage, and conductance caused by antigen-bioreceptor interactions, respectively. One such application is the efficient degradation of pollutants, the importance of some Genetically Engineered Microorganisms (GEM) in this process, and the challenges that must be overcome before GEM can provide an effective clean-up process at a lower cost.

CONCLUSION

Foodborne pathogen detection using immunological methods is based on antibody-antigen interactions, in which a specific antibody binds to its specific antigen. The sensitivity and specificity of immunological-based methods are determined by the binding strength of a specific antibody to its antigen. There have been numerous studies on the degradation of environmental pollutants by various bacteria. Several bacteria have been found to feed solely on hydrocarbons. Hydrocarbon-degrading bacteria are bacteria that can degrade hydrocarbons. The nitrate-reducing bacterial strains *Pseudomonas sp.* and *Brevibacillus sp.* isolated from petroleum-contaminated soil biodegraded hydrocarbons under aerobic and anaerobic conditions; the anaerobic biodegradation may be far more important. The following ten genera of hydrocarbon-degrading bacteria were isolated from the marine environment: Bacillus was the best hydrocarbon-degrading bacteria, followed by *Corynebacterium, Staphylococcus, Streptococcus, Shigella, Alcaligenes, Acinetobacter, Escherichia, Klebsiella,* and *Enterobacter.*

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