

Molecular detection and identification of microbial infections: methods and kits

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Detection and identification of microbial agents is important step for accurate diagnosis of infectious diseases for treatment or prevention from spread to the society. Classical methods like culture, subculture, biochemical, immunological or other typing process are very time consuming, labor intensive, expensive and results are presented very late for the physician or the patient. There have been tremendous efforts to develop new rapid detection methods for microbial agents specially by indirectly analyzing antibodies to the agents or directly detection specific antigens by serological methods. But with advances in Molecular understanding of microbial molecules specially DNA, RNA and proteins and more importantly having rapid genome sequence of infectious agents it has been great progress in developing new fast detection and identification methods. Molecular Methods like PCR and its derivatives like nested PCR, Real time PCR, RFLP, AFLP, next generation sequencing and development of isothermal PCR, micro fluidic DNA amplification methods, hybridization techniques, Microarray, DNA chips, Protein Chips, lab on a chips and rapid immunological kits (lateral flow) on the base of monoclonal antibodies for rapid screening of field and environmental samples are few examples of these technologies.

There are numerous instruments and kit based methods developed for this purpose even personal detection systems, mobile labs and central reference laboratories are looking for rapid and even ultra rapid detection methods.

Even there are remote sensing detectors in military to detect presence of microbial agents from far distances this is applicable in biodefense and national security.

In this presentation I will introduce latest development in the field of simple, rapid and ultra Rapid detection and Identification methods for microbial pathogens in the world of infectious diseases.