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Rapid Detection of Microorganisms–State of Art and Future Directions

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For the last several decades, nutrient-based culture growth methods have been accepted as the standard for microorganism detection and identification. However, since the discovery of nucleic acids and molecular breakthrough technologies such as restriction enzymes and polymerase chain reactions, the detection and identification of microorganisms have advanced to culture-independent methods that fall under the category of rapid microbial detections. Here, we present an overview of major rapid microbial detection technologies. These technologies will include both amplification and non-amplification based methods for the detection and identification of target microorganisms. The technologies described can be applied to detecting a wide variety of microorganisms, including bacteria, viruses, mycoplasma, and fungi and have the potential sensitivity to detect a single microorganism. Also in this presentation, we will present examples of real-life applications as well as future challenges for the advancement of the field of rapid microbiology.