Agilent Technologies

MassCode PCR Technology: Multiplex PCR with Mass Spectrometric Detection

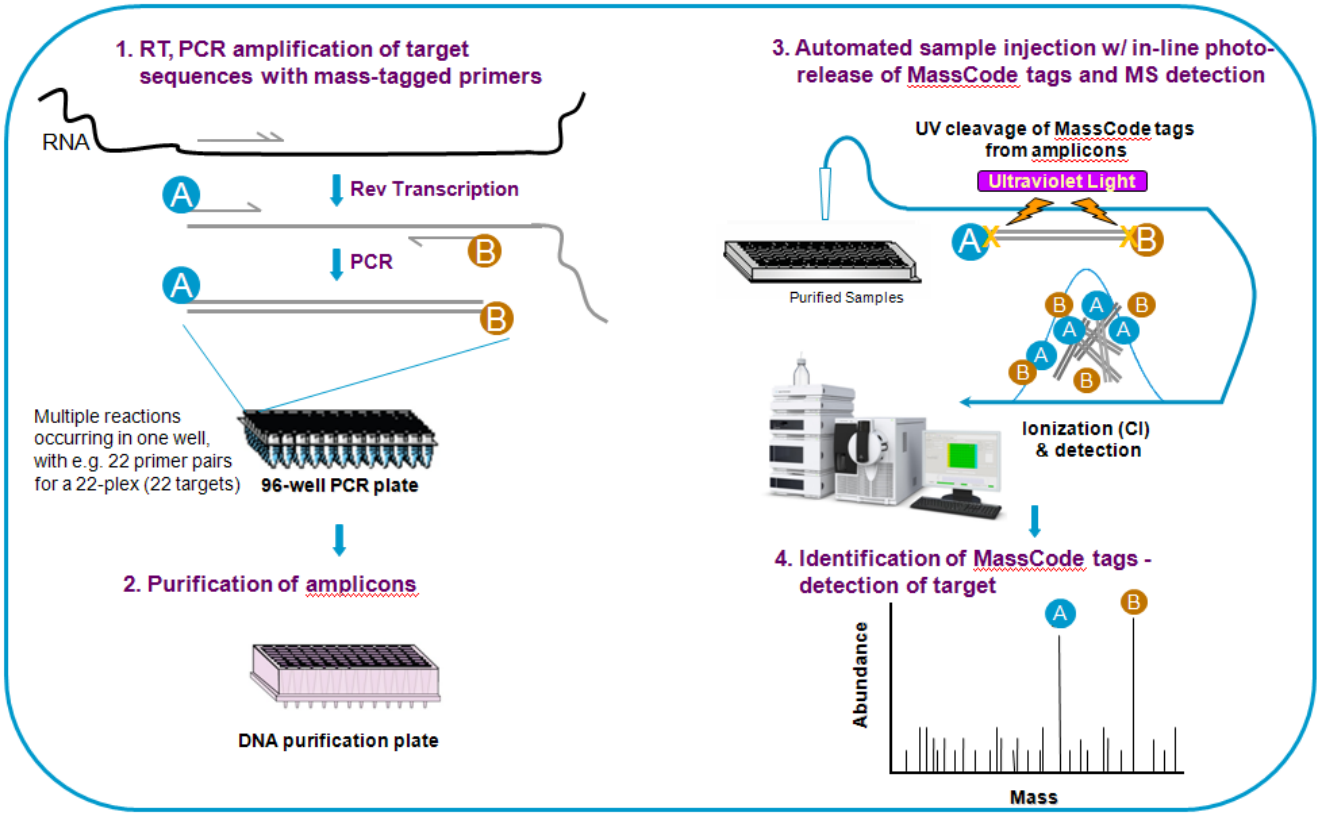
Overview

MassCode Polymerase Chain Reaction (PCR) technology is suitable for any research application that requires detection of a set of nucleic acid sequences through design of consensus primers, and is ideal for high-throughput detection of 10-30 target sequences simultaneously. MassCode PCR technology leverages Agilent's reliable high-performance LC/MS instrumentation and expertise in polymerase enzyme engineering and PCR reagent development to provide a novel amplification and detection solution.

Workflow

After extraction of nucleic acids from samples of interest, the MassCode PCR workflow starts with Reverse Transcription PCR (RT-PCR) on the source material in 96-well plate format. PCR primers for each target are designed to minimize primer-dimer formation and to be specific for a set of inclusive sequences, e.g. multiple viral nucleic acid targets, while being exclusive for non-desired sequences, such as all other targets in the reaction and potential contaminating sequences. Each forward and reverse primer is conjugated with a small molecule tag of a specific mass to provide a dual signal for a given target sequence. After RT-PCR, the reaction is subjected to selective depletion of excess primers and unwanted side reactions. The entire 96-well plate is then loaded into the LC autosampler for automated processing through a UV unit which cleaves the small molecule tags from the amplified target. Subsequent flow injection into the single quadrupole mass spectrometer equipped with an Atmospheric Pressure Chemical Ionization (APCI) source enables detection of the respective tags. MassCode PCR Application Software automatically analyses the data and reports results for each target of interest.

MassCode PCR Schematic



Benefits

MassCode PCR is the most cost effective means of mid-level multiplex nucleic acid detection (e.g. 10-30 targets) in a large number of samples.

- Mid-level multiplexing
- Dual Tagged Primers
- Low operational costs
- Rapid method
- Flexible assay design
- Reliable and consistent results

Bibliography

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