Development of multiplex and quantitative microRNA analysis technology based on isothermal exponential amplification with CE-SSCP

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Expression profiling of microRNAs (miRNAs) provides not only valuable information for understanding the biological processes but also potential diagnostic markers by detecting alterations in miRNAs' expression level in complex diseases. Because multiple miRNAs are generally related to the specific biological processes, it is necessary to develop a method quantifying the multiplexed miRNAs. Isothermal exponential amplification reaction (EXPAR) has attracted as a miRNA assay with high amplification efficiency. This method, however, has limitation in broad application due to the complexity of probe design and lack of proper detection method for multiplex analysis. Here, we developed a multiplex miRNA profiling method by a modified isothermal EXPAR and a high-resolution capillary electrophoresis-based single-strand conformation polymorphism (CE-SSCP). 6 miRNAs related to development of C. elegans and two references were analyzed and their expression pattern was found to be almost identical to the previous studies. And the method also allows multiplex quantification tool for miRNA expression levels.