

S006 Miniaturised PCR systems for cancer diagnosis

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The polymerase chain reaction (PCR) retains a pivotal role in making accessible marker nucleic acid sequences for analysis in cancer diagnosis. For certain cancers such as acute lymphoblastic leukaemia, the application of quantitative procedures to assess and subsequently direct therapy has given rise to the field of minimal residual disease management. While excellent protocols exist for performing these analyses, akin to all PCR procedures the limit of detection can vary markedly between laboratories. This summary is an overview of a talk that describes how the analytical field relating to miniaturisation is likely to facilitate a link that integrates sample processing with downstream PCR, analysis and eventual therapy. Miniaturised devices are suited to the multi-parallelised handling of defined numbers of cells, and PCR-based microfluidic procedures are becoming reasonably established. The integration of the sample processing and PCR in microfluidic devices is beginning to offer reproducible data that relates the number of biomarker nucleic acids to the defined analysed cell or cells for meaningful clinical assessment. The application of minimal residual disease may, through integrated miniaturised PCR, become more reliable and routine with additional applications in defining disease threshold levels for other cancer types. These enabling integrated platforms may facilitate biomarker measurements to predict response and outcome which are also of current interest for personalised medical care.