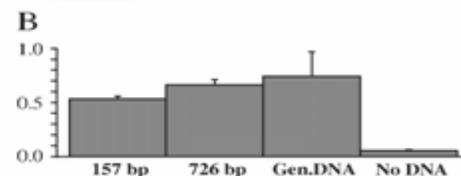
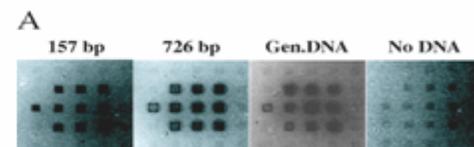


Bacterial Pathogen Detection with Multiplex Microarray-Enhanced PCR

Sergei Bavykin, Alexander Pemov

Using solution-phase PCR for multi-target analysis is constrained by the requirement of a secondary method for size separation or sequence verification and uncontrollable primer-primer interactions. An attractive solution is spatial separation of different primer pairs. Microarrays appear to be ideally suited for this task. However, several attempts to perform PCR on a solid support revealed unacceptably low amplification efficiency. Multiplex Microarray-Enhanced PCR (MME-PCR) technology unifies the sensitivity of PCR and the multiplexed capacity of microarrays in a homogenous assay, where multiplex PCR on the surface is enhanced by pseudo-monoplex PCR with one universal pair in solution and works in concert with 3-dimensional gel element supports that provide high enzymatic activity. In 60 independent amplification reactions performed simultaneously in single 8-microliter reaction chamber, 1,000 copies of *B. subtilis* DNA were detected with fluorescent label demonstrating 1,000,000-fold amplification after 50 cycles. Further development for increasing of reaction efficiency is in progress. MME-PCR was also tested for identification of *S. aureus* and *E. coli* toxin genes.



MME-PCR with template DNA of different complexity and sizes

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