



MegaPlex PCR - Massively Multiplexed PCR

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Header image provided by the University of Leicester.

IP Status

Patented

Seeking

Licensing

About **University of Leicester**

The University of Leicester works hand in hand with industry to generate business growth and find real applications for its leading innovation and research.

Background

- Genetic analysis often requires the amplification of multiple specific regions from small amounts of DNA, but existing technologies are inefficient, non-uniform and have a limited target scope.
- Ideally a multiplexed PCR method would be simple, inexpensive, automatable, generate no false products and have uniform efficiency across a wide range of targets.
- Solution-phase approaches are challenged by high reagent cost, non-uniform target amplification, high artifact levels, and a limited target scope per assay design.
- Standard surface-based approaches provide a number of advantages, but suffer from extreme inefficiency.
- Droplet-based approaches require expensive specialized instruments, and suffer from poor efficiency and postamplification purification challenges.

Tech Overview

Megaplex PCR has been developed to overcome the above limitations by combining surface-phase and solution-phase reactions (**Figure 1**). It is:

Simple and inexpensive: minimal requirement for specialist equipment.

Automatable: incorporates a seeding step via a unique low cost, highly-effective, surface-based reaction with the uniformity and efficiency of a solution-phase reaction to mass amplify the desired product.

Clean and efficient: wide and diverse target range, diverse target scope, minimal artifacts and simply purified final product.

- The method therefore combines the strengths of solution and surface phase methods and avoids the unnecessary complexities of droplet based approaches.
- Overall efficiency and specificity per target equates to that of single-plex PCR.
- The reaction principle is fully compatible with automation systems that use micro-titer plates incorporating planar micro-arrays or immobilized bead arrays of pairs of oligonucleotide primers.

Applications

The main application for the MegaPlex technology is in medium scale genomic analysis (such as targeted Next Generation Sequencing, high-plex genotyping, and sample identification/fingerprinting) in areas such as biomedical research, clinical diagnostics, agricultural/livestock quality control, and environmental monitoring. These are all large markets, for example the in vitro diagnostics market is expected to reach \$16.38Bn globally, with rapid growth between 2013 to 2023 (<http://www.reportlinker.com/p0578540/In-Vitro-Diagnostics-World-Market-Outlook-2013-2023.html>), with molecular diagnostics already representing 18% of the >\$10Bn IVD market in

Europe alone in 2014 (<http://www.prlog.org/10944132-moleculardiagnosics-is-the-fastest-growing-segment-in-the-in-vitrodia...>).

Opportunity

Available for exclusive and non-exclusive licensing.

Patents

- The patent is granted in Europe and the US and is derived from PCT/GB2008/002273.

Appendix 1

Figure 1

MegaPlex PCR: Simple Massively Multiplexed PCR, designed for low cost and automation

