



# MegaPlex PCR - Massively Multiplexed PCR

Megaplex PCR has been developed to overcome the above limitations by combining surface-phase and solution-phase reactions.



*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-moleculardiagnostics-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

