

Dublin City University Licensing Opportunity

LIFE SCIENCES

Semi-Automated, Low-Cost Liquid Handling Solutions

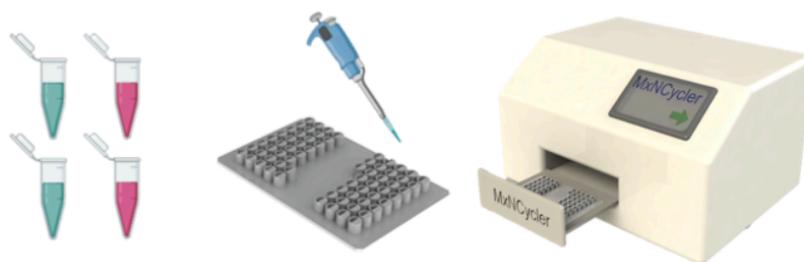
INTRODUCTION

- MxN Chip is a disposable, microfluidic, micro-titre plate style cartridge.
- 12x12 MxN chip creates 144 assays by cross mixing 12 samples (M) with 12 reagents (N) of 10µl in just 90 seconds.
- The unique, centrifuge instrument is programmed to create various spin profiles which cross-mix the on-board samples to create the large array of assays.
- Low cost cartridge uses clever, microfluidic design to eliminate the need for valving to allow for on-board mixing; reducing overall cost of device.
- Semi-automated.
- Can offer up to 94% saving in liquid handling operations

BACKGROUND

Molecular biology labs conducting biological testing studies use liquid-handling to mix target samples “M” with “N” probes/primers. This sample preparation process is conducted in thousands of laboratories across academic research, pharmaceutical, diagnostic, agricultural biotechnology, animal and plant genetics. MxN mixing is the laboratory-step that immediately precedes the screening analysis the MxN liquid handling and mixing process is implemented either manually or on costly liquid handling robots.

TECHNOLOGY DESCRIPTION



1
Sample Preparation

2
Pipette samples into
cartridge

3
Place cartridge into
instrument for mixing



LOW COST



PRECISE



RAPID TESTING



ARRAYING



EASY TO USE

In low-throughput scenarios, where M and N are typically less than 8, MxN mixing is by manual pipetting. This is labour intensive and error prone, resulting in high cost, high variability and poor-quality outputs. In medium throughput laboratories, where M and N can range between 8-30, a liquid handling robot costing up to €40k is typically required with extensive servicing costs.

MxN Technology delivers a microfluidically-enabled disposable cartridge (MxNChip) with a supportive, centrifuge-style instrument (MxNArm). MxNArm uses clever system design to allow for cross mixing of M samples with N reagents. The loading of the chip requires M + N pipetting steps from the user to create M*N assays. Our 12x12 chips is capable of creating 144 10µl volume assays with just 24 pipetting steps, saving over 80% in manual pipetting from user.

Importantly, The MxNChip will have the same format/shape as microtitre plates and so will maintain compatibility with existing laboratory equipment such as plate-handlers, readers and plate sealers. MxNChip is fully compatible with manual loading (pipetting) with the test time complete is just 90 seconds. The internal architecture of the cartridge contains metering and aliquoting reservoirs, thus improving the accuracy of each individual assay. Removal of human error have been transferred from the lab technician and integrated into the MxNChip consumable. This improves assay outcomes and increases the repeatability and reliability of each data point. The semi-automated test also reduces consumable and reagent waste, reducing the overall cost of each assay. The MxNChip is a fully sealed micro-fluidic chip means that decontamination/cleaning of liquid handling robotics is no longer required. MxN Technology also realises the potential to create a 24x24 MxNChip which will offer even more effective parallelisation and automated arraying of liquids for high-throughput scenarios.

MxN Technology has potential applications in small/medium labs in DNA genotyping, combinatorial indexing, drug and compound screening and rare cell testing.

OPPORTUNITY

MxN Technology has a unique position in the market, where the technology can be offered to small/medium sized labs. Our technology is cheaper whilst still offering highly precise, rapid liquid handling solutions. The liquid displacement is determined by clever microfluidic design in the chip rather than relying on a highly expensive robotic pipetting system. This allows us to undercut the competition with reduced system costs, passing on the saving to the laboratory.

RESEARCH AND IP STATUS

Pending in US and Europe (US 16/464,982 and EP 17821797.2). Title: "A fluidic device for aliquoting and combinatorial mixing of liquids"

TYPE OF BUSINESS SOUGHT

We are interested to talk to companies interested in collaborations and strategic partnerships.

CONTACT

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