

Disrupting the liquid dispensing landscape: dragonfly® discovery

As early drug discovery shifts away from traditional HTS in favour of more disease relevant screens that are inherently complex, varied and highly miniaturised, the shortcomings of commonly used liquid dispensers have become more apparent.

In response to this 'data integrity over speed' shift, we began developing a new innovative positive displacement solution to circumvent the reliability and accuracy limitations of legacy technologies. Our vision was to deliver a flexible, agile dispenser that addresses the challenges of novel assay development without being mind-blowingly difficult to operate.

It should deliver robust data from miniaturised assays and facilitate the seamless transition of assays between disciplines (from assay development into HTS, or Hit to lead Optimisation), in order to eliminate workflow bottlenecks and reduce drug discovery timescales. Our vision is now a reality.

dragonfly® discovery is a low volume, positive displacement, non-contact dispenser. Positive displacement enables highly reliable and accurate dispensing across a broad dynamic range (200 nL - 4 mL), irrespective of liquid viscosity or surface tension, using the same software settings. As such, it delivers the flexibility to address and miniaturise a wide range of phenotypic, biochemical and functional genomics applications. It ensures accessibility for all (not just robotic programming experts) and there is nothing to wash, maintain, check or calibrate prior to a run for walk-up convenience.

During its development, the reagent handling requirements of more physiologically relevant screening approaches were carefully considered. Their reagents can be limited in supply, temperature or sheer force sensitive. Dispense reagents for low throughput experiments (< 5 plate), are therefore, supplied from single use liquid reservoirs with dead volumes as low as 30 µL. Temperature sensitive reagents may be kept cold prior to dispensing using a new reservoir cooling block.

For higher throughput screens, new auto-feed reservoir modules (AFR) provide bulk reagent additions. Here reagent source containers can be kept dark, warm, cold, shaken or stirred. The most enabling AFR application is undeniably cell dispensing. The dragonfly discovery alleviates the cell health, uneven cell distribution and large dead volume concerns that surrounding the use of peristaltic dispensers, making it possible to dispense specialised, or fragile cells using an automated approach.

The instrument is available in three

configurations that differ by the number of dispense heads (3, 6, 10) or channels. Channels can be combined for fast bulk reagent dispensing, or, used independently to dispense any volume of any liquid class into any well at any time.

The 10-head dragonfly discovery has been readily adopted by assay development groups optimising assay, media or reaction conditions in multifactorial assays. Recently, a collaboration between SPT Labtech and Synthace saw the integration of dragonfly with Antha software. This powerful integrated solution for automated Design of Experiments execution and data aggregation provides significant time, tip and reagent savings.

SPT Labtech and Biosero (workflow automation software) also collaborated, coupling dragonfly discovery with a fast plate stacker to deliver a standalone screening or plating system for small batches of plates. Sitting between manually fed workflows and the complexities of a fully integrated robotic workstation, this solution overcomes a general dispensing bottleneck within assay validation and hit to lead optimisation.

With 6- and 3-head configurations now available the cross discipline spread of dragonfly discovery from assay development into HTS and Hit to Lead Optimisation has begun in earnest. This step also marks the completion of SPT our vision to develop an industry enabling dispense technology that delivers high integrity data, the ability to readily switch from one complex assay type to another and seamless transfer assays between one discipline and another.

Visit sptlabtech.com/dragonflydiscovery for more info.



auto-feed reservoir modules (AFR)