

crystallographers favourite liquid handlers



 **sptlabtech**

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mosquito[®] for protein crystallography

The automation of protein crystallography screening has made a significant contribution to the rapid expansion of crystallography-based structural biology. Automated liquid handlers such as mosquito[®] crystal and mosquito[®] LCP improve the accuracy, reproducibility and throughput of protein crystallography screens, reducing labour intensive plate preparation for screening, optimisation and scale up as well as eliminating manual pipetting errors. All our mosquito systems offer:

- **range of low volumes** - robust performance from microlitres to nanolitres
- **accurate and precise** - using positive-displacement pipetting technology in the 25 nL – 1,200 nL volume range
- **cost savings** from optimised sample use and reduced waste
- **zero cross contamination** - using disposable pipette tips
- **minimal dead volumes** - optimising reagent use
- **more than just dispensing** - our instruments are true pipettors, able to aspirate multiple components, dispense and even mix without splashing or split drops
- **ease-of-use** - intuitive set-up and software proven in multiple-user labs; just walk up and use it
- **fast** - no slow wash steps or system fluids



mosquito[®] crystal



mosquito[®] LCP

protein crystallisation screening

mosquito[®] crystal is the protein crystallographer's favourite liquid handler. It makes protein crystallography screening faster, more cost-effective and quite simply easier than ever before. It brings together speed, accuracy and high precision pipetting of nanolitre volumes with zero cross-contamination from a disposable tip.

- **flexible automation** – rapid automated plate set-up for all standard crystallisation techniques: sitting drop, hanging drop, microbatch, bicelles, microseeding and additive screening
- **reproducibility** - unrivalled reproducibility down to 25 nL
- **no configuration changes for different experiments** - eliminates the need for instrument configuration changes when changing techniques or liquid viscosities
- **multiple aspiration** before a single dispense and microseeding, which is essential for automating additive screening
- **unrivalled drop precision** - perfectly positioned drops for downstream imaging by placing protein and screen drops with the same head
- **robust day-to-day performance**, even in heavy use. Proven reliability with no blocking or clogging

automating LCP set-up

mosquito[®] LCP is the ultimate tool for membrane protein crystallisation with all the functionality of mosquito[®] crystal. It allows you to fully automate LCP set-ups accurately and repeatedly. mosquito[®] LCP allows you to dispense lipidic cubic phase (LCP) volumes as low as 25 nL, while automated calibration of syringe and pipette positioning ensures precise drop-on-drop placement to facilitate automated imaging.

- **automation of membrane protein crystallisation screening**, optimisation and scale-up using techniques such as LCP and bicelles
- **versatility** - ability to set up both LCP and all traditional protein crystallisation experiments with just one instrument using commercially available SBS-format plates
- **flexibility of sample type** - precise pipetting across a wide range of liquid viscosities with no format change required
- **speed of set up** – rapid tip changing and no washing
- **active humidity control** – mosquito's active humidity chamber reduces experimental inconsistencies caused by variation in the humidity in the environment



dragonfly® crystal

screen optimisation optimised

dragonfly® crystal enhances protein crystal screen optimisation. dragonfly® crystal is the ideal system to complement SPT Labtech's mosquito® in the protein crystallisation workflow. Once the initial crystal 'hits' are identified, dragonfly crystal produces a set of optimised conditions to grow better diffracting crystals.

- **no liquid classification** - making set-up quick and easy
- **flexible automation** - dispense any volume from 0.5 µL upwards to 4 mL, into any well, from any syringe. Independent control of each channel
- **fast** - rapid completion of plate irrespective of viscosity variation in stocks (5-8 mins)
- **negligible evaporation** of the dispensed reagents due to minimal set-up time
- **stock integrity** - positive displacement technology preserves stock integrity, even for volatiles
- **free unlimited screen designer software** - interactive, highly intuitive, powerful and simple set-up on multiple instruments anywhere, anytime



accessories

LCP mixer

The LCP mixer has been designed to automatically mix protein and monoolein (MO), or other lipids, into a lipidic cubic phase (LCP) from two coupled syringes.

- accepts any combination of 100 µL and 50 µL Hamilton syringes
- accepts any sample volume
- simple and robust design
- glove friendly touch screen display
- on-the-fly adjustment of mix cycles
- compact unit to save bench space
- no adjustment or calibration required

active humidity chamber

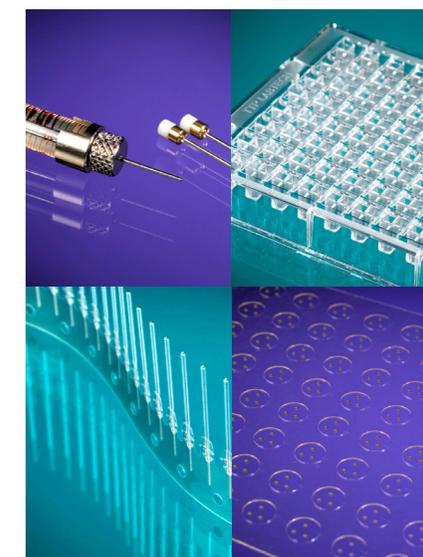
mosquito's active humidity chamber reduces experimental inconsistencies caused by variation in the humidity in the environment, by allowing users to accurately control the relative humidity (RH) of each experiment.

- enables up to a 90% reduction in drop evaporation
- it takes only a few minutes to reach high levels of humidity (80-90% RH)
- precisely controlled from within mosquito software (version permitting)
- allows 'per protocol' control to suit multi-user labs

MXone in-well mixer

MXone is the perfect companion to dragonfly crystal to mix any liquid in small wells. The MXone keeps the plate stationary, allowing for extremely fast mixing of even the most viscous solutions with no risk of spillage using high-speed oscillation of a disposable pin.

- fast and efficient
- zero cross-contamination
- range of viscosities mixed in one plate
- avoid spillage as seen with orbital shakers



consumables

SPT Labtech consumables are developed and manufactured to the same high standard of design and engineering as our instruments – quality we also demand from our suppliers. The combination of cutting-edge innovation and precision manufacturing ensures accurate results in the lab, every time.

positive displacement pipetting:



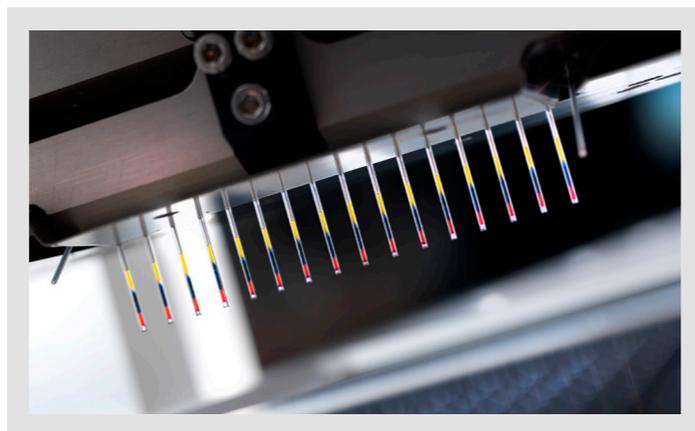
the accurate way to handle liquids

As a protein crystallographer you want to be safe in the knowledge that the wide range of viscosities regularly encountered is handled and dispensed accurately and repeatably every time without liquid classification.

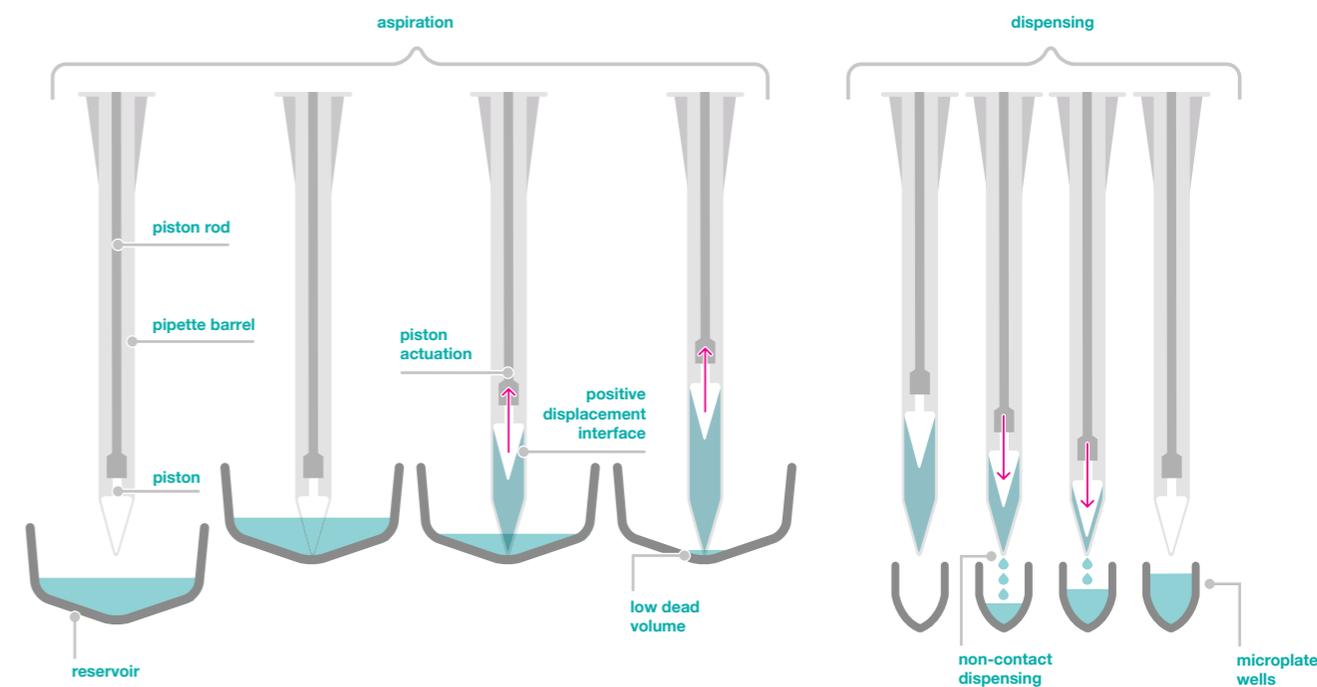
The difficulties of pipetting accurately at low volumes are well known, as are issues associated with handling viscous liquids. Our innovative technology development team have overcome these with the novel use of positive displacement dispensing from disposable tips in all of our liquid handling products. Positive displacement pipetting is defined by the fact that the piston moving the liquid in and out of the tip for aspiration and dispensing comes into direct contact with the liquid that is being moved. This piston based pipetting action results in highly accurate liquid handling across a very broad volume and viscosity range.

dragonfly uses much larger (4 mL) positive displacement, disposable tips to aspirate from reservoirs and dispense non-contact to wells within plates. It is therefore ideal for combination and bulk reagent dispensing as well as accurate handling of difficult liquid classes.

mosquito uses positive displacement, disposable micropipettes to handle low volumes (25 nL - 5 uL) of liquid in plate to plate, or intra plate, transfers using contact dispensing - thus it's ideal for traditional pipetting tasks that users would like to miniaturise.



true positive displacement pipetting of an optimisation gradient with dragonfly - how it works



simple

Intuitive and logical operation simplifies user experience and reduces set up time and training requirements

productive

No air gaps or system liquids mean accurate displacement of liquids, irrespective of liquid class

reliable

Disposable tips and a piston based pipetting mechanism with no pressure system or valves results in robust and reliable performance

versatile

More than just dispensing - our instruments are true pipettors, able to aspirate, dispense and even mix

economical

Direct sample aspiration by the tip ensures minimal sample dead volumes

innovative

Motor driven pistons reliably eject liquid from the tips directly, providing extremely repeatable dispensing

specifications

	mosquito® crystal	mosquito® LCP	dragonfly® crystal
pipetting range	25 nL – 1.2 µL	25 nL – 1.2 µL	0.5 µL – 4 mL
applications	protein crystallography set-ups e.g. additive screening, microseeding, microbatch, bicelles	lipidic cubic phase (LCP) screening plus all the functionality of mosquito crystal	protein crystal optimisation and assay development without contamination or liquid classification
primary SBS plate format	48, 96, 384	48, 96, 384	15, 24, 48, 96, (384)
dead volume	< 0.3 µL	< 0.3 µL	< 0.5 mL
optional extras	active humidity chamber	active humidity chamber, LCP mixer	MXone automated in-well mixer
throughput	< 2 mins/ 96-well plate, 4 mins/ 288 drops	2 mins/ 96 drop plate for vapour diffusion 5 mins/ 96 drop LCP plate	4–6 ingredient, 96-well plate in 4–8 mins, irrespective of viscosity

get in touch

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