BioFluidica LiquidScan™ STARlet

Instrument Description

Enrich your cell and exosome populations for precision medicine.

Summary

BioFluidica LiquidScan is specifically designed for automated biomarker enrichment from liquid biopsy. All three major biomarkers can be enriched: rare cells, cfDNA, and exosomes (EV). Applications include the enrichment of circulating tumor cells (CTCs) and fetal cells from untreated whole blood from a standard blood draw and the enrichment of specific populations of exosomes (EVs) from plasma. LiquidScan is an affinity catch-and-release methodology using a unique microfluidic chip architecture. The channels of the microfluidic chip are surfaced with an antibody targeted to a biomarker of specific cells. Blood, for example, is passed through the chip, and the cells of interest are captured by affinity binding. Once bound, background cells are washed away, and the cells are released and subsequently collected ready for downstream molecular analysis e.g., NGS, RNA-Seq, qPCR, MassArray, etc.

LiquidScan microfluidic chips can be surfaced with any antigen or antibody for which there is a complimentary biomarker of interest in a biological liquid. LiquidScan is used as the instrument of choice as a prelude to Multiomics analysis; an antigen can be used to "catch" immune cells and, antibodies and aptamers can be used to "catch" cells or antigens.

Captured biomarkers are specifically released from the microfluidic chip by enzymatic or photocleavable clipping of the linker that tethers the antibody/antigen/aptamer to the chip. Once the linker has been released, the affinity-caught entity is automatically collected for downstream analysis.

LiquidScan Components

LiquidScan consists of the LiquidScan microfluidic chip processing module (MCPM) which is housed on a Hamilton Microlab® STARlet™ (or STAR) liquid handling robot.

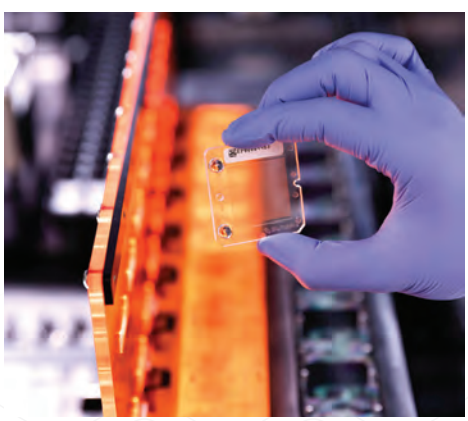
The Microlab STARlet liquid handling robot is configured for LiquidScan biomarker enrichment applications. The STARlet should be configured for either 8-channel autoloading (AL8) or 16-channel autoloading (AL16)

All LiquidScan components are manufactured by BioFluidica, Inc, San Diego CA, and distributed worldwide.

Components include:

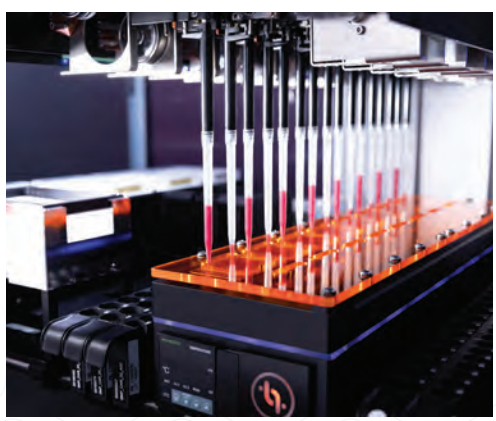
- ✔ Microfluidic Chip Processing Module (MCPM)
- ✔ Microfluidic chips (sinusoidal for rare cell catch-and-release; pillar for exosome catch-and-release)
- ✔ LiquidScan Blood Collection Tube
- ✔ LiquidScan Reagent Plate

There are two types of microfluidic chips, sinusoidal architecture for the capture of rare cells and the other, pillar architecture, for the capture of exosomes (EVs) and cfDNA. Two types of linker chemistry are used to tether the antibody to the chip. Different chemistries are used to enable cleavage from the chip to release the captured biomarker for elution and subsequent collection. One type of linker uses a heat-activated enzyme to cleave the linker, the other incorporates a photocleavable linkage.



Microfluidic Chip Processing Module (MCPM)

Microfluidic Chips



LiquidScan Blood Collection Tube
LiquidScan Reagent Plate

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LiquidScan Workflow

1 Load

Flow whole blood over capture chip

2 Capture

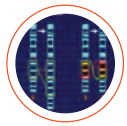
Capture rare cells or exo-somes

3 Wash

Wash to eliminate background

4 Elute

Elute rare cells or exosomes



5 Analyze

The LiquidScan automated process is the same for the enrichment of rare cells or exosomes via antibody affinity capture. For example, rare circulating tumor cells (CTCs) are captured using a microfluidic chip with sinusoidal architecture. This architecture helps maintain cell viability while presenting a maximal capture area per time of sample loading. The chips are pre-surfaced with the appropriate antibody, or multiple antibodies, for the cells to be captured and loaded onto the microfluidic chip processing module (MCPM), which is housed on the STARlet liquid handling robot. The user then chooses a standard protocol from the LiquidScan Software or can customize a workflow. The LiquidScan User Manual will guide regarding load volume and load rate, as well as the number of washes prior to linker-cleavage and elution and collection of biomarkers (antigen, cells, or exosomes).

The LiquidScan process is completely automated running on a STARlet liquid handling robot, controlled by LiquidScan Software integrated with Hamilton VENUS software.

Hamilton Microlab STARlet Automated Liquid Handling Platform

The STARlet liquid handling robot incorporates pipetting technology that achieves high accuracy, precision, and repeatability from sub-microliter to large volumes.

- ✔ Modular and flexible Microlab STARlet liquid handling robot for life science and diagnostic labs accommodates tip sizes from 10 µL to 5000 µL
- ✔ Compact model provides smooth interplay between software, mechatronics, and intuitive user interface
- ✔ Simplified workflow with VENUS Software and designed for easy integration of modules and devices

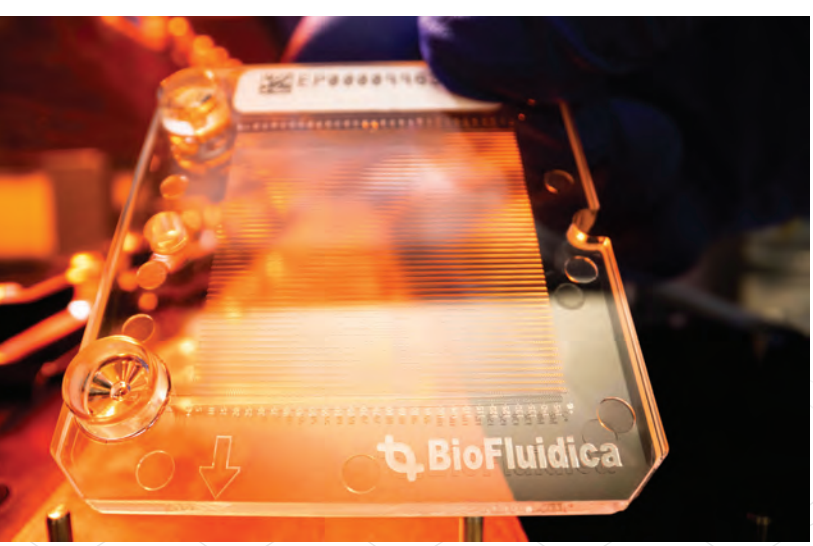
Type: Automated Pipettor

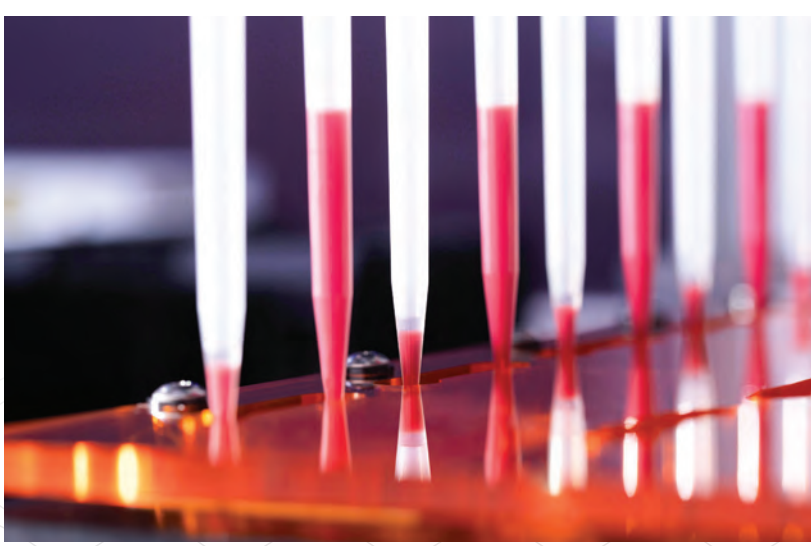
Model: Hamilton Microlab STARlet

Configuration: Multi-Channel

Deck Capacity: 30 tracks (T) / 45 SLAS ANSI positions

Unit of Measure: EA





BioFluidica

Table of LiquidScan Components

Part No.	Product			Qty
1000201	**BioFluidica LiquidScan STARlet AL16***	Includes all parts below except where noted		**1**
1000208	**BioFluidica LiquidScan STARlet AL8†**	Includes all parts below except where noted		**1**
	Hamilton Microlab STARlet			
		173021	STARlet Auto Load	1
		173050	Modular Arm for 4/8/12/16 Channels	1
	* Order this Part No. for AL16	173083	16 Channels with 1000 ul Pipetting Heads	1
	or			
	† Order this Part No. for AL8	173081	8 Channels with 1000 ul Pipetting Heads	1
		182136	Teaching Needle Set of 8, 1 ml	1
		911264-USB	VENUS FOURV4.4 Base Package	1
		63251-02	System Controller for Windows 10	1
	LiquidScan Configuration			
		182085	Framed Tip Rack (FTR) Landscape Carrier	1
		173400	Carrier for 24 Tubes - (sold as set of 4)	1
		173410	Carrier for 32 Tubes - (sold as set of 3)	1
		96822-01	Molded Tube Carrier Insert w/spring, Set of 32	1
	Reagent Plate Holder			
		188039	MFX Landscape Carrier Base	1
		188313	96-Deep Well Plate Holder	1
INSSTR35	Engineering & Services	INSSTR35	MicroLab STAR Installation	1
62964-01		62964-01	Field Verification Kit II - Consumable Kit 1	1
199030		199030	Field Verification Kit II - Solutions Kit	1
METH-PROG-TRNG		Method	Method Development Service	2
1000202	LiquidScan Module Kit			1
		2006070	LS Module Assembly	1
		2006080	LS Module Power Cable Assembly	1
		2006090	Front module power cable	1
		2006010	LS Module control box	1
		2006020	Power adapter	1
		2006030	Power adapter cable	1
6000102	LiquidScan Software			1
5000100	LiquidScan Installation & Training			