



## Technical Note

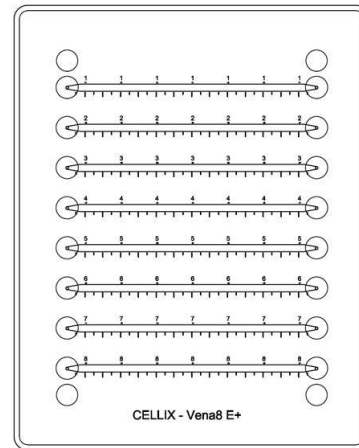
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### Vena8 Endothelial+™ Biochips

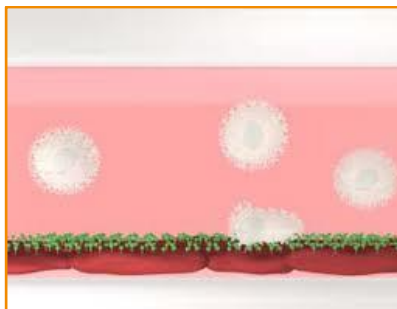
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## Vena8 Endothelial+ Biochip: for cell-primary endothelial cell studies and mimicking physiological flow

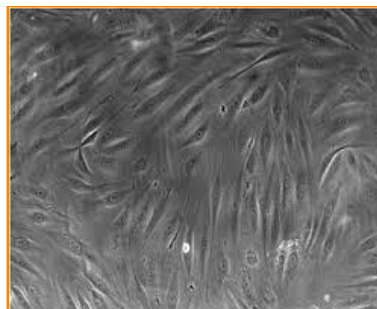
Vena8 Endothelial+ biochips contain 8 parallel enclosed microcapillaries for culturing primary endothelial cells and continuous flow cell-based assays. Primary endothelial cells are cultured, and cell suspensions may then be injected using Cellix’s microfluidic pumps which supports a range of shear stresses / shear flow rates for dynamic flow-based assays. Vena8 Endothelial+ biochips are supplied in packs of 10, facilitating 80 experiments per pack.



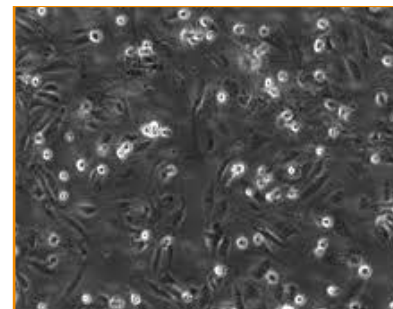
*Vena8 Endothelial+ biochip*



*Illustration close-up: cell-cell adhesion inside Vena8 Endothelial+ biochip*



*Example: primary HUVECs cultured in Vena8 Endothelial+ biochip*



*Example: adhesion of THP-1 monocytes at a shear stress of 0.5 dyne/cm<sup>2</sup> to primary cultured in channel*

**Vena8 Endothelial+ Features:**

- 20x, 40x, 60x, 100x short working distance magnification microscopy; 60x, 100x oil-immersion microscopy.
- Wider channels for easy seeding of cells.
- Primary endothelial cell monolayer obtained in 3 hours.
- Compatible with brightfield / phase contrast / fluorescent / confocal microscopy.
- Suitable for culturing wide range of primary endothelial cells.
- Suitable for whole blood and blood cells analysis (e.g. leukocytes, platelets)
- Biochip plastic is optically clear permitting detailed microscopy studies.
- 0.05–200 dyne/cm<sup>2</sup> shear stresses / shear flow rates easily obtained and controlled by the Mirus Evo nanopump, ExiGo, UniGo and 4U microfluidic pumps.
- Shear stress / shear flow rate may be pre-set to be incrementally increased during an assay.
- Real time imaging under flow conditions.

**Performance and Technical Specifications:**

Performance specifications	
Range of proteins	Fibronectin, VCAM, ICAM, gelatin, etc.
Range of primary cells	HUVEC, HUAEC, HCAEC, etc.
Cell types for suspension assay	T-cells: primary & cell lines, e.g. HUT 78
	Monocytes: primary and cell lines; e.g. THP-1
	Eosinophils
	Neutrophils
	Platelets
	PBMCs, whole blood, etc.
Minimum sample volume	~12 µL
Maximum sample volume	100 µL (Vena8 Endothelial+ microwells)
Shear stress precision	<0.5% CV
Shear stress range for cell suspension	0.05–10 dyne/cm <sup>2</sup> ; steps of 0.05 dyne/cm <sup>2</sup> (100 µL syringe)
Shear stress range for whole blood*	2.25–200 dyne/cm <sup>2</sup> (1 mL syringe)
Volumetric flow rates**	100 nL/min–20 µL/min (100 µL syringe); 5 µL/min–1 mL/min (5 mL syringe)
Sample volume aspiration accuracy	±1%
Shear stress accuracy	±0.5%

\*Considering human whole blood with a viscosity of 4.5 cP.

\*\*Given for the flow of distilled water in a microcapillary with dimensions: 400 µm (W) x 100 µm (D) x 28 mm (L).

Technical specifications	
Material	Topas
Number of channels per biochip	8
Volume of each channel	2.69 $\mu$ L
Dimensions of each channel	800 $\mu$ m (W) x 120 $\mu$ m (D) x 28 mm (L)
Dead volume at input port	0.1 $\mu$ L
Thickness of bottom substrate	0.17 mm

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