RuFus

Cell Unroofing

Plasma Membrane Isolation

Cell Unroofing is a technique to isolate the cell plasma membrane with its associated protein complexes like clathrin pits, caveolae, actin, etc for microscopic imaging. It requires precision application of mechanical force to remove the unadherent portion of the cell while retaining the adhered membrane and its subtrate.

RuFus, our unroofing system, utilizes a liquid jet flow controlled by an air pressure regulator and the pulse timer which streams onto a sample with adjustable X, Y, and Z position control. It is perfect for unroofing cells even on the most delicate subtrates like cryoEM grids.

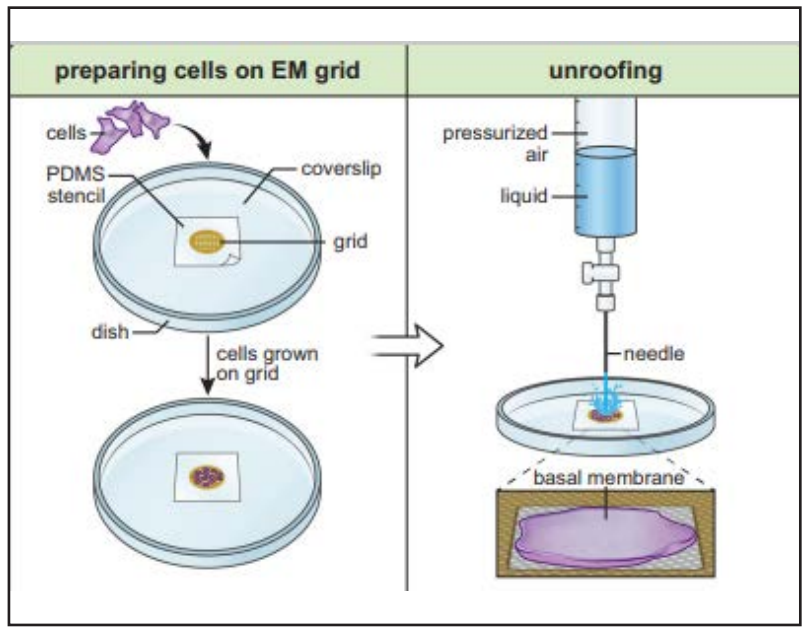
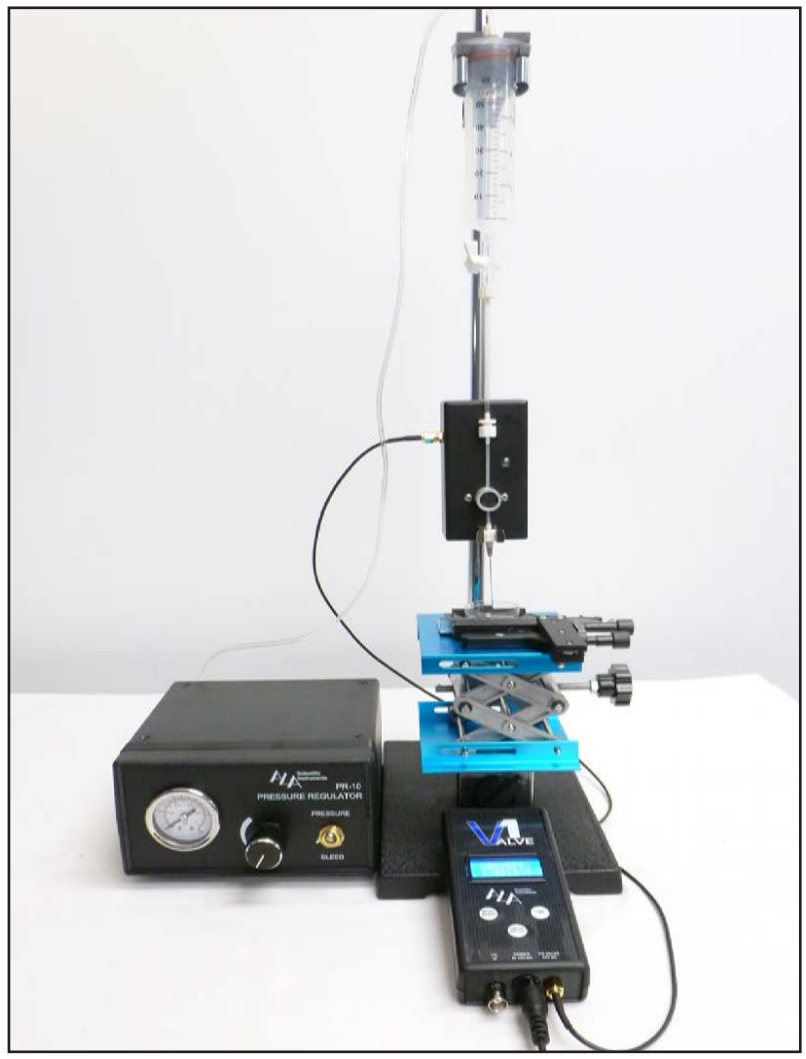


Fig.1a: Generating isolated plasma membranes on EM grids. See reference below.

ALA's RuFus System allows you to easily ***unroof cells on EM grids or coverslips***, ***unroof and fix membranes simultaneously***, and ***isolate plasma membrane sheets reproducibly***.

RuFus System

- lab stand and scissor jack
- X-Y positioner
- petri dish holder for 35mm dish
- needle canula
- pressurized 60ml reservoir with bracket for lab stand
- necessary tubing
- ALA Valve-1 Controller
- 3-way pinch valve manifold
- ALA PR-10 pressure regulator **(OPTIONAL)**



System Specifications	
Lab Stand Dimensions	4" x 7" base x 23" steel rod 100mm × 178mm base × 584mm steel rod
Lab Jack Dimensions	3.94" x 3.94" x 3.1"-14" vertical lift 100mm × 100mm plate 80–355mm vertical lift
Valve	3-Way Pinch , 12 VDC
SMC Cable	1m / 39"
Indicator LED	Green
Lab Stand Bracket	0.5" / 25 mm
Needle Canula	19 ga SS

Ordering Information	
RuFus	Cell Unroofing System
PR-10	Pressure Regulator

References

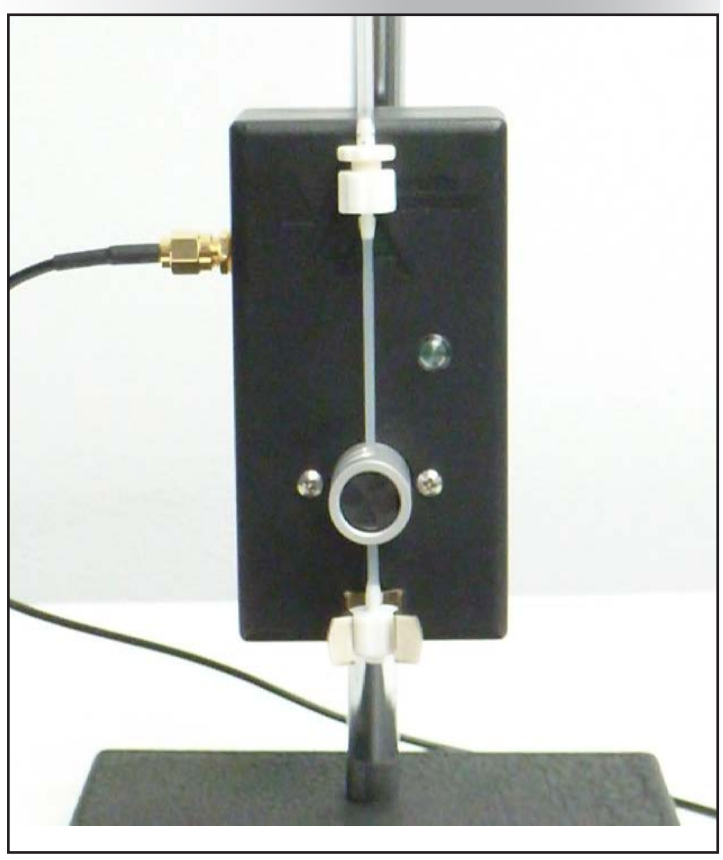
Sun, W.W., Michalak, D.J., Sochacki, K.A. et al. Cryo-electron tomography pipeline for plasma membranes. Nat Commun 16, 855 (2025). - https://doi.org/10.1038/s41467-025-56045-z

Valve-1

Single Valve Controller

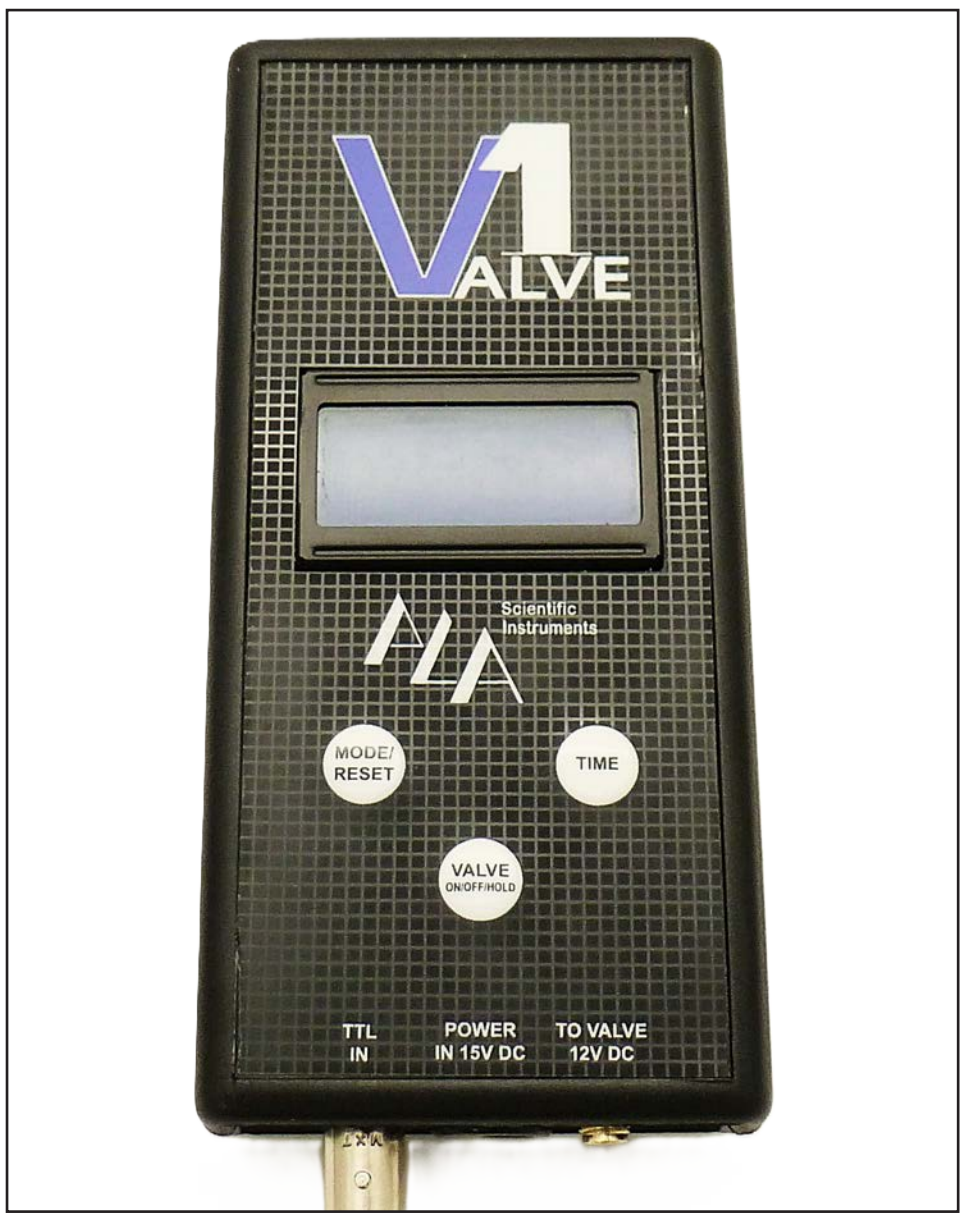
ALA Scientific Instrument's Valve-1 is a single valve controller. This controller can be used for a variety of experiments where a single solution needs to be applied on/off. The Valve-1 controller operates a 12V DC valve and has an on/off function, momentary on, timer mode, and TTL input for external on/off control.

The small hand controller fits nicely on any lab bench and has a large easy-to-read digital display. A single 3-way valve manifold is available that fits on a 1/2 inch pole and comes in its own enclosure with SMC power input and on/off indicator LED.



Valve-1 Key Features:

- Single Valve Control
- Multiple Control Modes
- Adjustable timing
- Compact Design



Specifications	
Valve-1 Dimensions	6" x 3" x 1" 152 mm x 76 mm x 25 mm
Weight	0.33 lbs / 150 g
Power In	15V .5A DC
Voltage/Current Output	12V DC / 300mA
TTL Input	TTL High turns valve on
Timer (0.1 sec min.)	0.1-99.9 sec

Ordering Information	
Valve-1	Single Valve Controller & Power Supply
VM-1P	Single 3-way pinch valve manifold, bracket, & stand