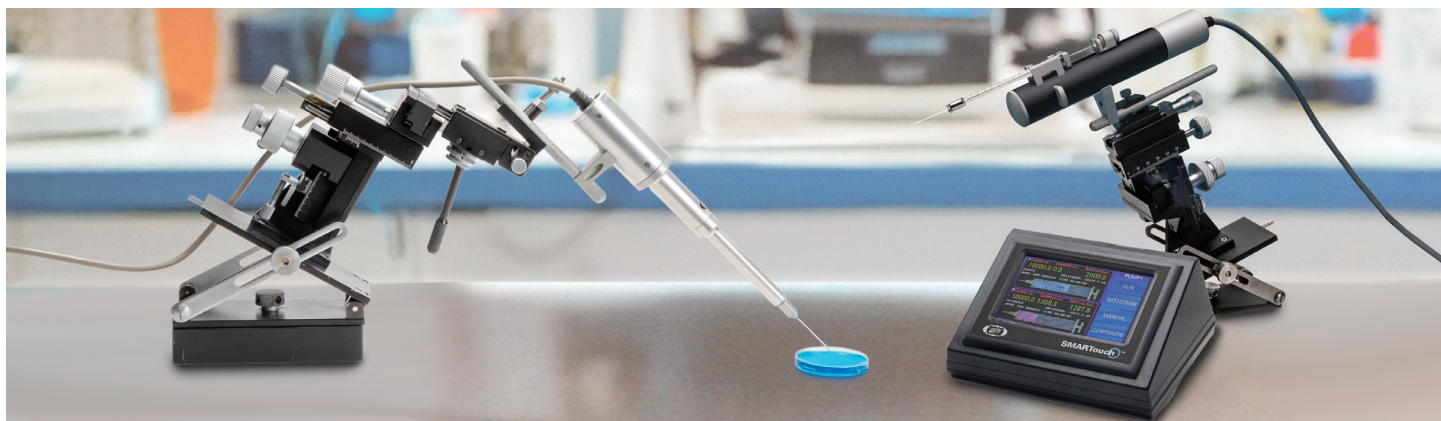




UMP3 & NANOLITER2020

Microinjection for Oncology Drug Delivery & Preclinical Cancer Model Development



OVERVIEW

Development of preclinical models and novel therapeutics are at the forefront of oncology research. From deploying gene-editing reagents into cells or animals to delivering cell therapies to patients, the ability to accurately inject very small volumes into very specific locations is critical.

WPI's UMP3 syringe pump and NANOLITER2020 positive-displacement injector have been implemented across a wide array of preclinical studies. Studies involving developing animal models in which cells are implanted to create xenograft models or genome editing tools are injected for somatic cell gene editing have utilized WPI's UMP3 syringe pump and NANOLITER2020 positive displacement pump (Jablon et al., 2022; Chen et al., 2020; Shen et al., 2017; Umans et al., 2021). Similarly, WPI's microinjectors has been used for delivery of therapeutic agents targeting localized tumor growth or directly to the brain to overcome the blood-tumor barrier or the blood brain barrier, respectively. Finally, When ultra-low volumes of injection are required, the NANOLITER2020 is a preferred injector and has been leveraged for making germline mutations into cells for cloning.

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NANOLITER2020 Specifications



Plunger OD	482 μ m
Plunger Movement for 100 nL Volume Dispensed	550 μ m \pm 55 μ m
Piston Movement per Dispensed Volume (nL)	5.5 μ m/nL
Linear Travel per Full Stop	12.7 μ m/step
Min. Volume Injection	5 nL
Recommended Glass:	
<ul style="list-style-type: none"> TIP10XV119 (Microinjection) 504949, 504950 (1.14 mm OD Fire Polished Glass Capillaries) 	
Glass Use Capabilities:	
<ul style="list-style-type: none"> 1.10–1.15 mm OD Glass with Green Front Gasket 1.30–1.356 mm OD Fire-polished Glass with Black Front Gasket 1.5mm OD Fire-polished Glass with Red Front Gasket 	
Min. Recommended Volume Injection:	
<ul style="list-style-type: none"> 25 nL with 1.14 OD Glass (TIP10XV119 & Green Front Gasket) 50 nL with 1.5 mm OD Glass (Fire Polished 1.5 mm Glass & Red Gasket) 	
Maximum Possible Volume	4200 nL
Maximum Rate	644.nL/sec

UMP3 Specifications



NORMAL MODE	
Travel	62 mm
Minumum Injection Volume	25 nL
Linear Motion per Step	3.175 μ m/half step
Weight	325 g (11.5 oz)
Mounting Rod Diameter	7.9 mm (0.31 in.)
Mains Power Supply	90–264 VAC @ 47–63 Hz
Dimensions	\varnothing 32 mm \times 190 mm (\varnothing 1.3 in. \times 7.5 in.)
MICROSTEPPING MODE	
Precision increases 8-fold	