NIC+ Isolation Bundle with RNase Inhibitor V2

NIC+ Isolation Cartridge
P/N 100-215-389

Redesigned for the rapid isolation of high-quality nuclei for single-nuclei genomic applications from low input samples and deparafinized, rehydrated FFPE samples.

Description

The **NIC+ Isolation Bundle with RNase Inhibitor V2** is designed for seamless integration with the Singulator™ Platform and offers a highly efficient and rapid solution for nuclei isolation from solid tissue samples with minimal sample loss. This bundle includes all the consumables required for using the Singulator Platform to isolate nuclei from low input samples: **NIC+ Isolation Cartridges, Nuclei Isolation Reagent, Nuclei Storage Reagent**, and **RNase Inhibitor V2**. With the ability to process tissue samples from low as 2 mg in as little as 6 minutes, this bundle guarantees high-yield, high-quality nuclei, making it ideal for downstream genomic applications.

Key Features

1. **Reproducible and Precise:** When used with the Singulator Platform, the NIC+ Isolation Bundle with RNase Inhibitor V2 delivers consistent results across different users and days. The bundle isolates nuclei from diverse cell populations with minimal bias, which is critical for the accuracy and integrity of single-cell genomics applications.
2. **Automated:** Streamlines the workflow, reducing manual steps, saving time and minimizing opportunities for mistakes.
3. **Minimal Sample Loss:** Designed to minimize sample loss, preserving valuable biological material.
4. **Versatile:** The Nuclei Isolation Bundle with RNase Inhibitor V2 is compatible with fresh, frozen, OCT-embedded and FFPE tissues, as well as most tissue types, enabling broad single-cell genomics applications.

Protocol

1. **Select Protocol:** Select desired Nuclei Isolation protocol and precool the Singulator Platform.
2. **Prepare Sample and Load Cartridge:** Insert the whole tissue sample into the chilled NIC+ Isolation Cartridge along with RNase Inhibitor V2. Place the NIC+ Isolation Cartridge into the Singulator Platform.
3. **Run Protocol:** Initiate the hands-off automated isolation protocol on the Singulator Platform.
4. **Collect Nuclei:** After 6 minutes, retrieve the isolated nuclei from the cartridge for immediate use or further processing.

Performance

The **NIC+ Isolation Bundle with RNase Inhibitor V2** has been validated for use with fresh, frozen, OCT-embedded and FFPE tissues, enabling the isolation of high-quality nuclei from small samples in sufficient quantity for single-nuclei RNA-seq applications. Nuclei yields from frozen mouse tissues range from 20,000 to 300,000 nuclei from 2mg of input material from lung, kidney, brain, and heart tissues **(FIGURE 1)**. As expected, dense elastic tissues, such as heart, yield less nuclei per mg of tissue in comparison to tissues with higher cell density such as brain, kidney, and lung.

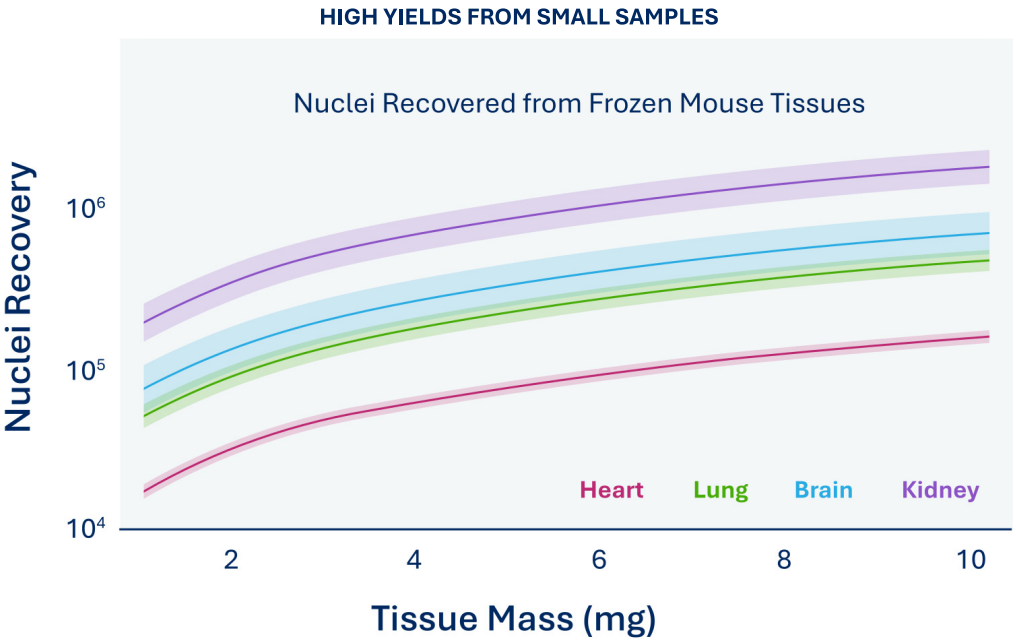

FIGURE 1: Yield of single-nuclei suspension isolated using the NIC+ Isolation Bundle with RNase Inhibitor V2 is sufficient for single-cell genomics applications from a wide variety of tissue types. Nuclei were isolated using the NIC+ Isolation Bundle with RNase Inhibitor V2 and the Singulator Platform's nuclei isolation protocols from frozen mouse tissues: brain, kidney, lung and heart.

To demonstrate the consistency of the Singulator Platform, six nuclei suspensions were isolated from a single mouse kidney using the **NIC+ Isolation Bundle with RNase Inhibitor V2**. The gene expression profiles of these nuclei were profiled with 10x Genomics Chromium Next GEM Single Cell 3'v3.1 kit. An integrated UMAP was generated and cells were colored by replicate **(FIGURE 2A)** demonstrating the reproducibility of the nuclei isolation. The same UMAP projection, now colored by cell type confirms the expected cell types were detected **(FIGURE 2B)**, demonstrating the precision of the nuclei isolation.

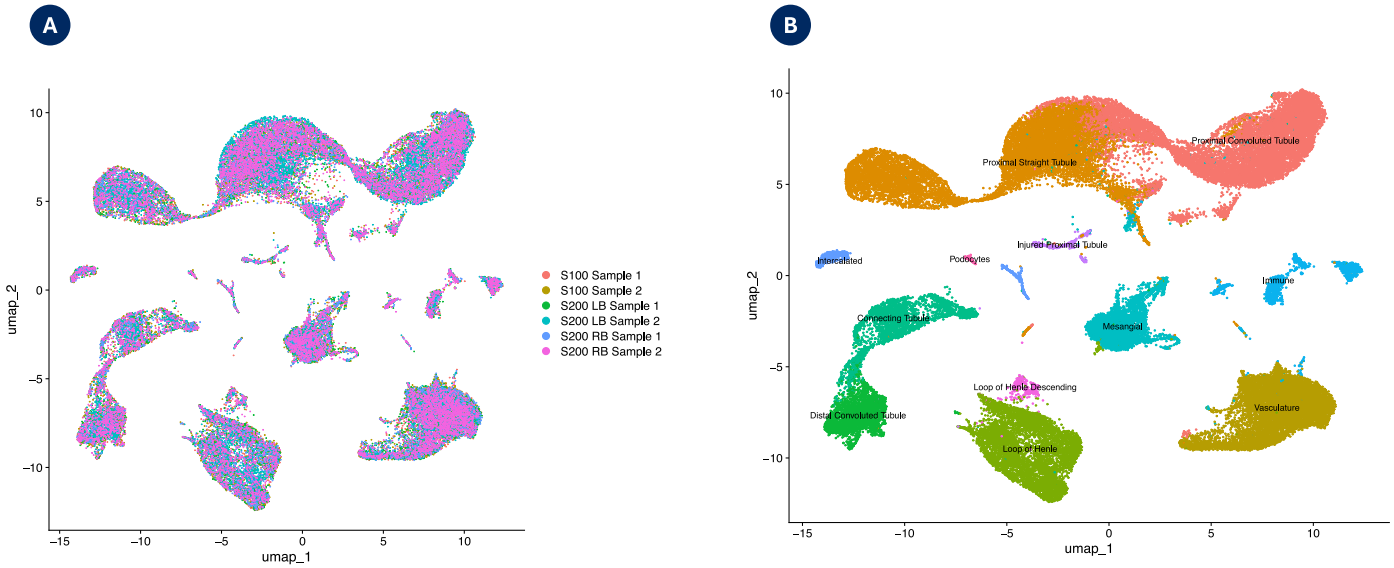

FIGURE 2: The Singulator Platform isolates highly reproducible and precise cell populations across technical replicates. (A) Integrated UMAP projection of six technical replicates isolated from a single mouse kidney dissociated with the Singulator Platform and colored by replicate. **(B)** Integrated UMAP projection colored by cell type, demonstrating the Singulator Platform is able to capture the representative cell types in kidney, including rare, fragile cells like podocytes.

Nuclei from four different mouse tissue types and three different preservation methods were isolated using the **NIC+ Isolation Bundle with RNase Inhibitor V2**, following the "Demonstrated Protocol – Nuclei Isolation from Frozen Tissue for Single Nuclei Sequencing Applications" (100-318-092) and "Demonstrated Protocol – Nuclei Isolation from FFPE Tissues for Single Nuclei Sequencing Applications (100-318-101). The isolated nuclei exhibit intact nuclear membranes with minimal aggregation and debris, appearing round and smooth with no signs of blebbing across the different mouse tissues and preservation methods **(FIGURE 3)**.

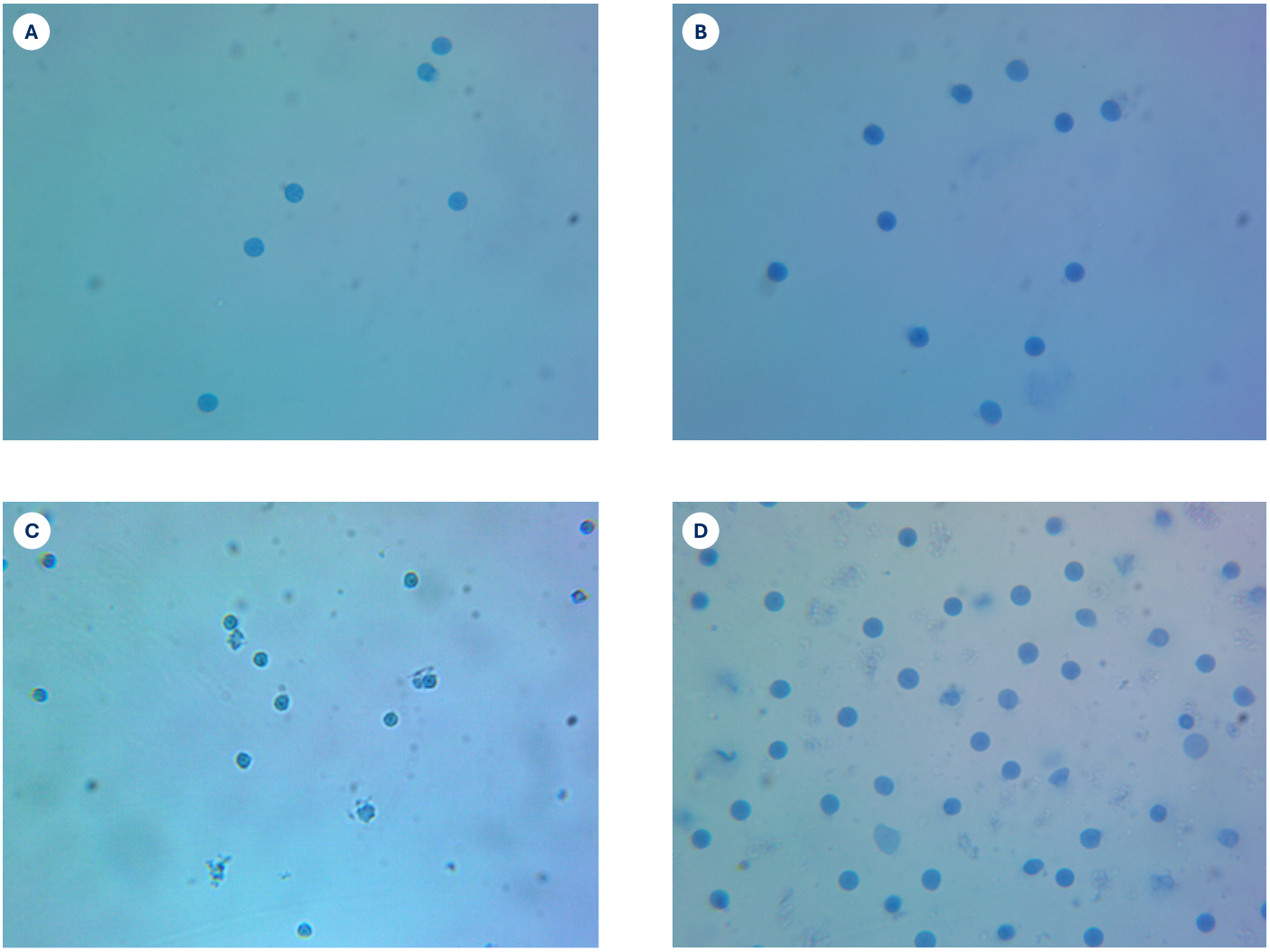

FIGURE 3: Single nuclei suspension generated from four mouse tissue types following the Demonstrated Protocol: Nuclei Isolation and Cleanup from Frozen Tissue for Single Nuclei Sequencing Applications. 40x magnified images of **(A)** frozen brain nuclei, **(B)** frozen kidney nuclei, **(C)** FFPE brain nuclei, **(D)** fresh lung nuclei isolated with the NIC+ Isolation Bundle with RNase Inhibitor V2.

Example Bundle: 100-289-152 NIC+ Isolation Bundle with RNase Inhibitor V2 (24 samples)

NIC+ Nuclei Isolation Cartridge
100-215-389

(Quantity 24)

Nuclei Isolation Reagent (24), 125mL
100-063-396

(Quantity 1)

Nuclei Storage Reagent (24), 125mL
100-063-405

(Quantity 2)

RNase Inhibitor V2, 8 Samples
100-288-916

(Quantity 3)

Specifications

Tissue Input: 2-300 mg
Compatible Preservation Methods: Fresh, Frozen, OCT-embedded and FFPE tissue

Storage

NIC+ Isolation Cartridge: Room Temperature
Nuclei Isolation Reagent: 4 °C
Nuclei Storage Reagent: 4 °C
RNase Inhibitor V2: -20 °C

ORDERING INFORMATION:

Part Number	Description		Quantity
100-291-531	**NIC+ Isolation Bundle w/ RNase Inhibitor V2 (8 samples)**		
	100-215-389	NIC+ Nuclei Isolation Cartridge	8
	100-063-396	Nuclei Isolation Reagent (24), 125 mL	1
	100-063-405	Nuclei Storage Reagent (24), 125 mL	1
	100-288-916	RNase Inhibitor V2, 8 samples	1
100-289-152	**NIC+ Isolation Bundle w/ RNase Inhibitor V2 (24 samples)**		
	100-215-389	NIC+ Nuclei Isolation Cartridge	24
	100-063-396	Nuclei Isolation Reagent (24), 125 mL	1
	100-063-405	Nuclei Storage Reagent (24), 125 mL	2
	100-288-916	RNase Inhibitor V2, 8 samples	3

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