TECHNICAL SPECIFICATION SHEET

TachyNA™ Direct Pass cfDNA Kits

(For Isolation of Circulating Cell-Free DNA (cfDNA) from Human Plasma and Serum)

Research Use Only (RUO)

1. Product Overview

The **TachyNA™ Direct Pass cfDNA Kit** is a rapid nucleic acid purification platform for isolation of circulating cell-free DNA (cfDNA) from human plasma and serum.

Powered by proprietary **NA-DP™ (Nucleic Acid Dynamic Pass)** technology, the system uses a selective adsorption–filtration mechanism that retains proteins, lipids, inhibitors, and other interfering contaminants while allowing nucleic acids to dynamically pass through the purification matrix with minimal irreversible loss.

Unlike conventional silica-binding or magnetic bead extraction workflows, TachyNA™ is designed to improve recovery of fragmented, low-abundance cfDNA while significantly reducing workflow complexity and processing time.

The platform supports both manual and automated workflows.

2. Key Features & Benefits

Feature	Benefit
NA-DP™ Direct Pass Technology	Minimizes nucleic acid loss associated with irreversible binding
Rapid Workflow	cfDNA purification in as little as 1–3 minutes after sample lysis
Room Temperature Processing	Simplified lysis workflow without heated incubation
Short Fragment Recovery	Efficient recovery of fragmented cfDNA, including very small fragments
Low Sample Input Requirement	Suitable for small plasma/serum volumes
Flexible Workflow Formats	Manual, semi-automated, and automated compatibility
Inhibitor Removal	Reduces proteins, detergents, cellular debris, and PCR inhibitors
Downstream Compatibility	Compatible with qPCR, dPCR, ddPCR, NGS, methylation, and fragmentomics workflows

3. Product Formats

Format	Catalog No.	Workflow Type	Application
Spin Unit	NA11-100	Manual centrifuge workflow	Standard laboratory use
Syringe Unit	NA11-200	Manual / automation compatible	POCT / liquid handling
96-Well Plate	NA11-300	High-throughput automation	Laboratory automation
Preparative Column	NA11-400	Large-volume processing	Scale-up applications

4. Kit Contents (Spin Unit Example)

Catalog No. NA11-100 — 50 Preparations

Includes:

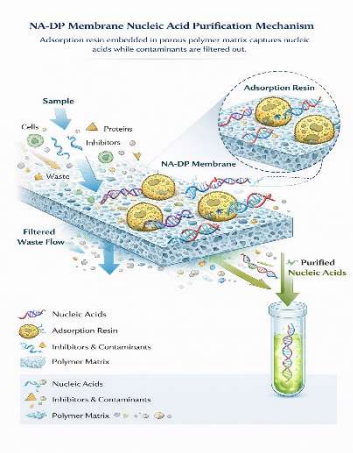
- TachyNA™ Direct Pass cfDNA Spin Columns (50)
- 2 mL collection tubes (50)

- 1.5 mL microcentrifuge tubes (50)
- TachyNA™ Lysis Buffer
- TachyNA™ Rinse Buffer
- Quick Start Protocol

5. Technical Specifications

Parameter	Specification
Sample Type	Human plasma, human serum
Intended Use	Research Use Only
Sample Input Volume	50–100 µL (Spin Unit)
Processing Time	5–12 minutes total workflow
Purification Step	1–3 minutes
Lysis Time	2–10 minutes
Fragment Recovery	Efficient recovery of fragmented cfDNA
Small Fragment Recovery	Internal validation includes fragments as small as 66 bp
Elution / Output Volume	40–100 µL
Automation Compatibility	Yes
Centrifuge Requirement	Standard benchtop centrifuge
Vacuum Compatibility	Yes
Liquid Handler Compatibility	Hamilton, Tecan, Tomtec, compatible systems
POCT Compatibility	Syringe Unit format
Storage Conditions	Room temperature (see labeling)

6. Technology Principle



NA-DP™ (Nucleic Acid Dynamic Pass) Technology

Conventional nucleic acid purification methods rely on binding nucleic acids to solid surfaces followed by elution, which can reduce recovery of fragile or low-abundance analytes.

TachyNA™ uses a fundamentally different purification mechanism:

- **Interfering contaminants are selectively retained**
- **Nucleic acids dynamically pass through the purification matrix**
- **Minimal irreversible nucleic acid binding**
- **Improved preservation of fragmented cfDNA**

This mechanism is particularly suited for applications involving low-concentration circulating nucleic acids.

7. Workflow Summary

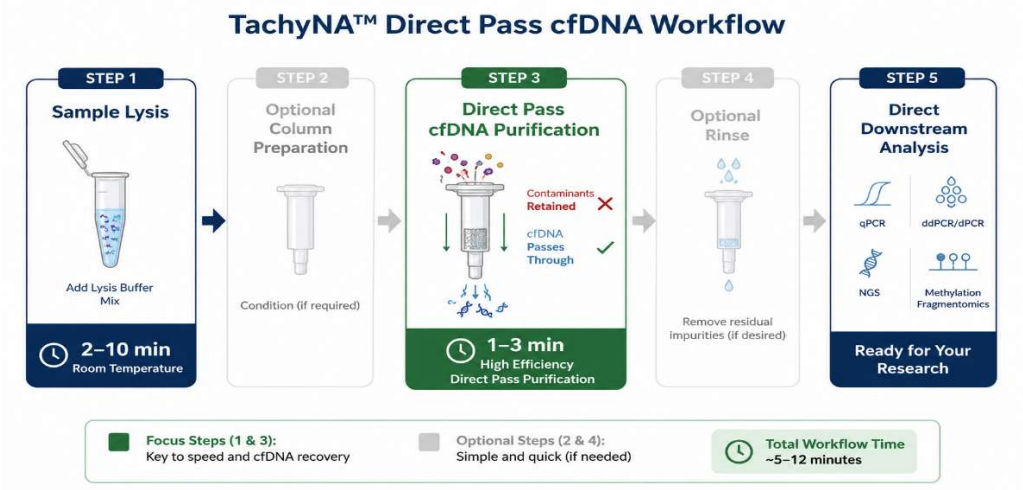
Step 1: **Sample lysis (2–10 min, room temperature)**

Step 2: Optional column preparation

Step 3: **Direct Pass cfDNA purification (1–3 min)**

Step 4: Optional rinse

Step 5: Direct downstream analysis



8. **Performance Summary**

   Internal comparative studies demonstrated:

   - Superior cfDNA recovery versus selected comparator workflows
   - Efficient recovery of short cfDNA fragments
   - Significant reduction in purification time compared with conventional workflows
   - Improved compatibility with downstream PCR-based analysis

   Performance data available upon request.

9. **Downstream Applications**

   Compatible research workflows include liquid biopsy assay development, ctDNA research, fragmentomics, methylation analysis, qPCR, dPCR, ddPCR, NGS library preparation, and translational biomarker research.

10. **Ordering Information**

    Biomics Inc.
    29540 Kohoutek Way
    Union City, CA 94587 USA

    Technical Support: **info@biomicsinc.com**
    Website: **www.biomicsinc.com**

11. **Regulatory Statement**

    Research Use Only. Not for use in diagnostic procedures.
    These products are intended for molecular biology research applications only and are not intended for the diagnosis, prevention, or treatment of disease.

12. **Legal Notice**

