



Isolation and separation of DNA and RNA from a single tissue or cell culture sample



Han Wei Ph.D., Lauren Saunders Ph.D., Brittany Niccum Ph.D., Antonia Hur, and Asmita Patel • Beckman Coulter, Indianapolis, IN

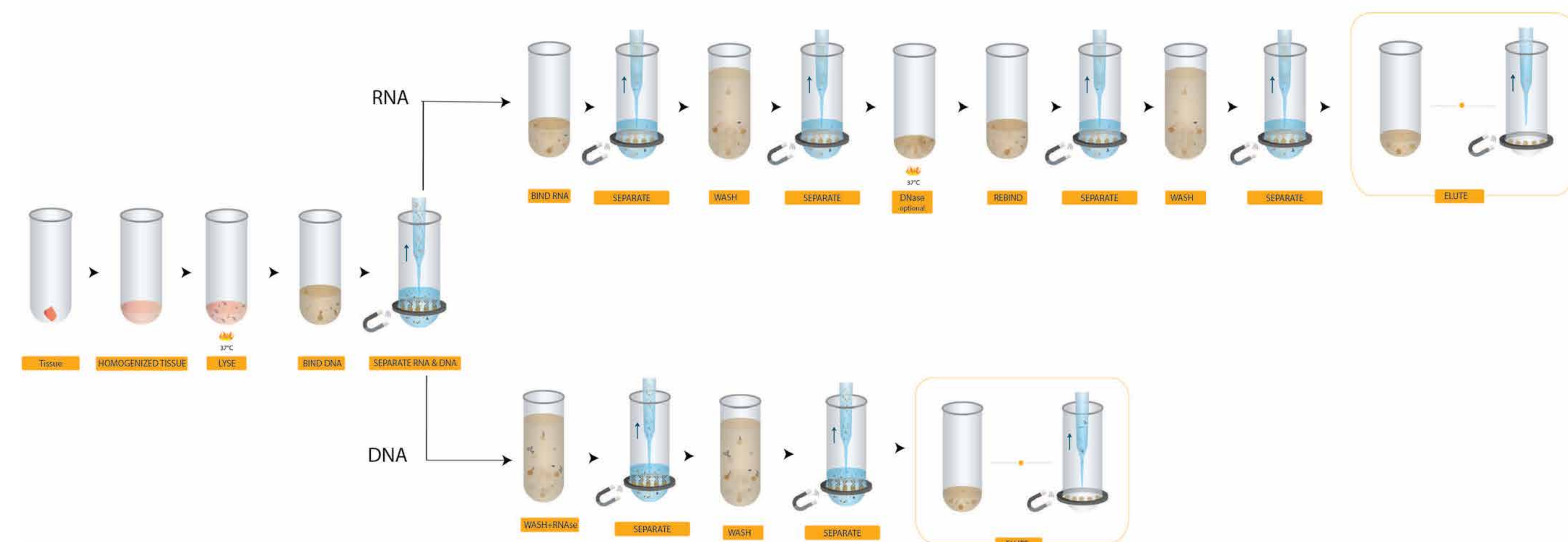
Introduction

Understanding the transcriptome and the genome of any organism relies on the accurate sequencing of both the RNA and DNA from an organism.

Current technologies rely on splitting a sample pool in two after or before lysis. This in effect only allows for half of the total RNA or DNA available to be isolated and requires either a large sample size or two separate sample pools.

To overcome this challenge, we are currently developing a product using proprietary bead based technology that selectively binds DNA to the beads to effectively separate DNA and RNA independently. This allows for the extraction of all nucleic acids from one experimental setup.

Versatile workflow for a variety of sample types



- Extraction has been demonstrated with tissue and cell samples
- Extraction is being optimized for additional sample types
- Our team of Proof of Principle scientists can help you adapt this workflow to your sample type

AMPure XP as a Tool for Nucleic Acid Extraction

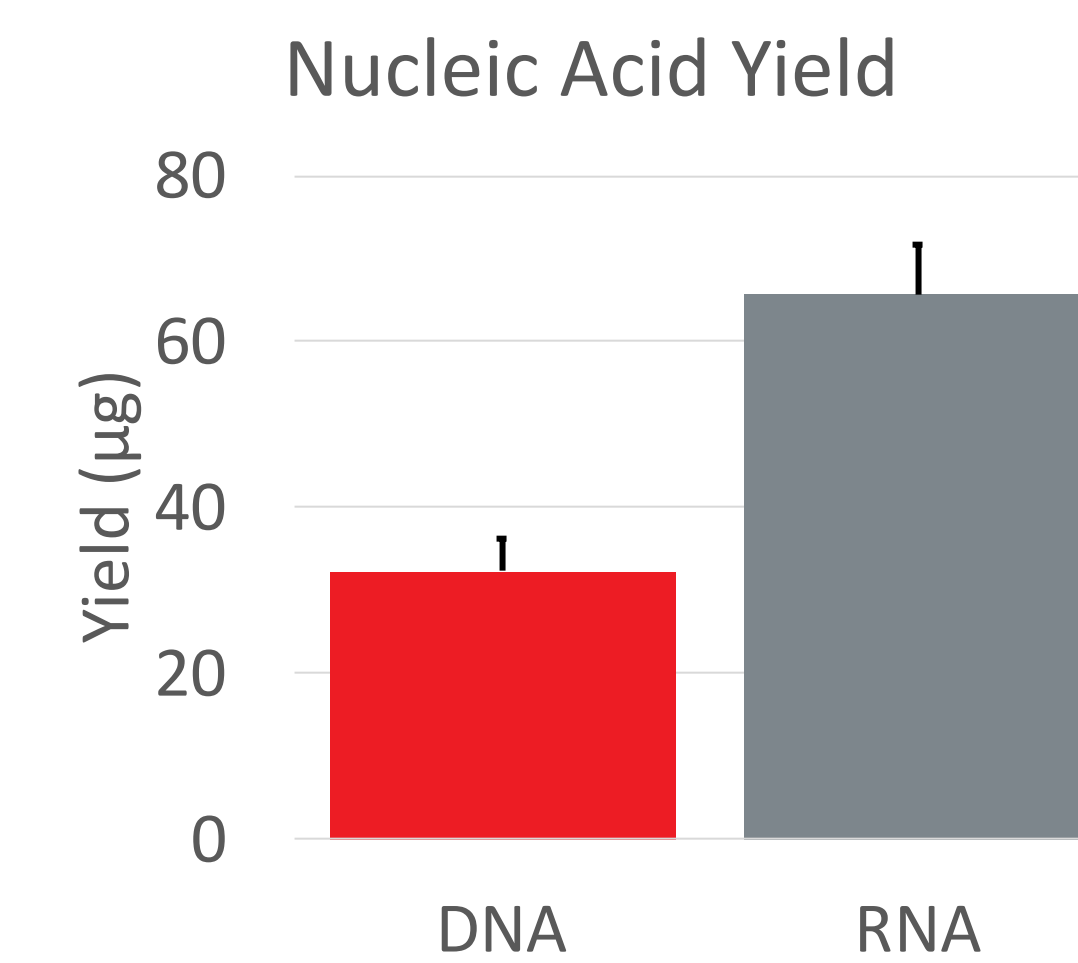
Beckman Coulter Life Sciences Offers a Variety of Extraction Kits based on the same technology as AMPure XP. These chemistries are customizable for you DNA and RNA extraction needs.

- Beads don't clog like columns can with viscous samples
- Gentler on nucleic acid since does not have to be pulled through columns
- Workflows are straightforward and can be adapted for many different sample types



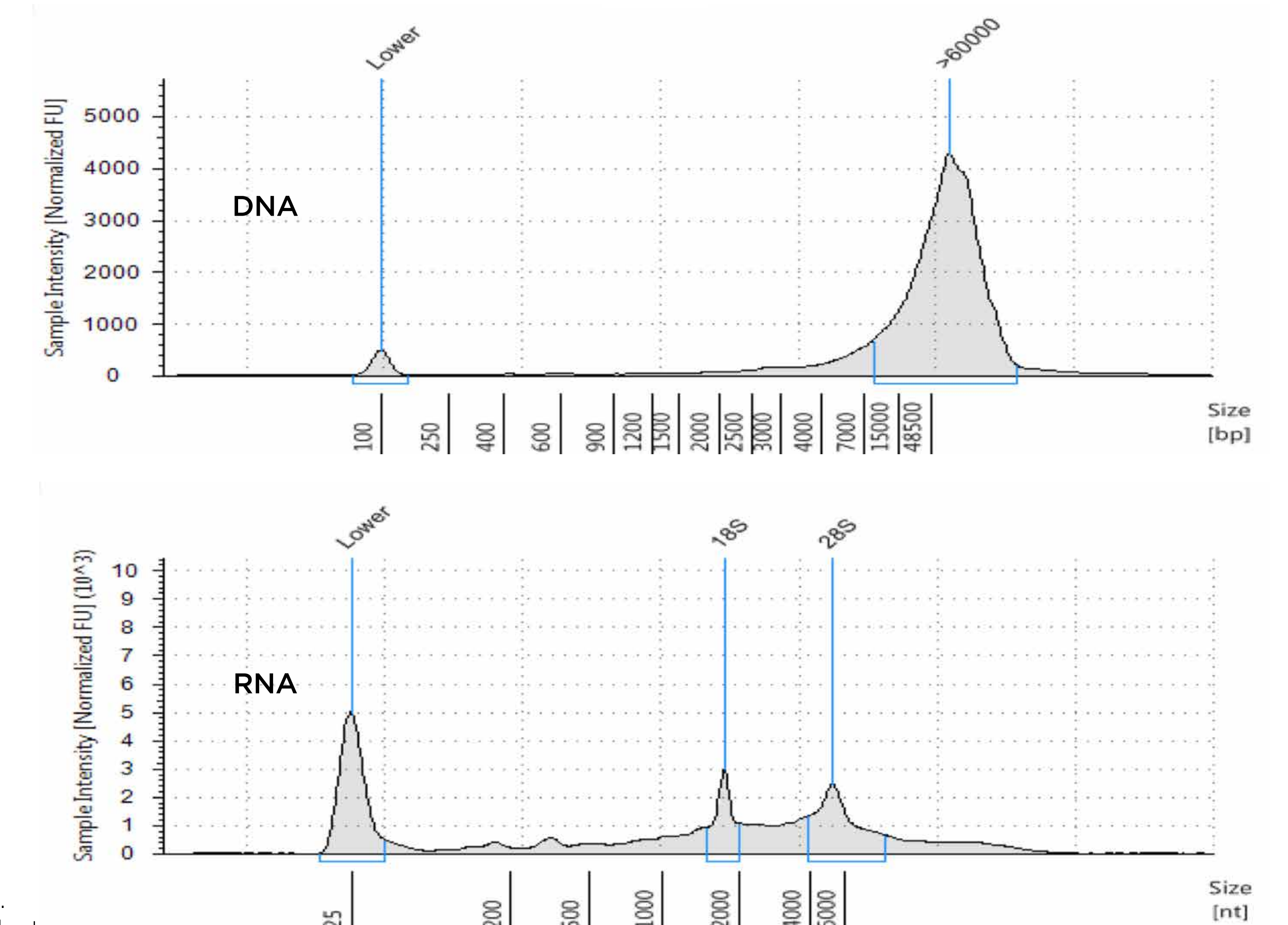
DNA and RNA was isolated from 10mg of mouse liver tissue by using selective binding of DNA.

- DNA yield averaged 32 µg, RNA yield averaged 66 µg from three technical replicates.
- DNA sizes averaged >60,000 bp, and two prominent rRNA peaks were observed in the RNA fraction



The yield of nucleic acid was estimated using the Quant-iT DNA assay kit (Thermo Fisher Scientific). The size of DNA and RNA was visualized on the Agilent Genomic DNA Screen Tape and RNA Screen Tap.

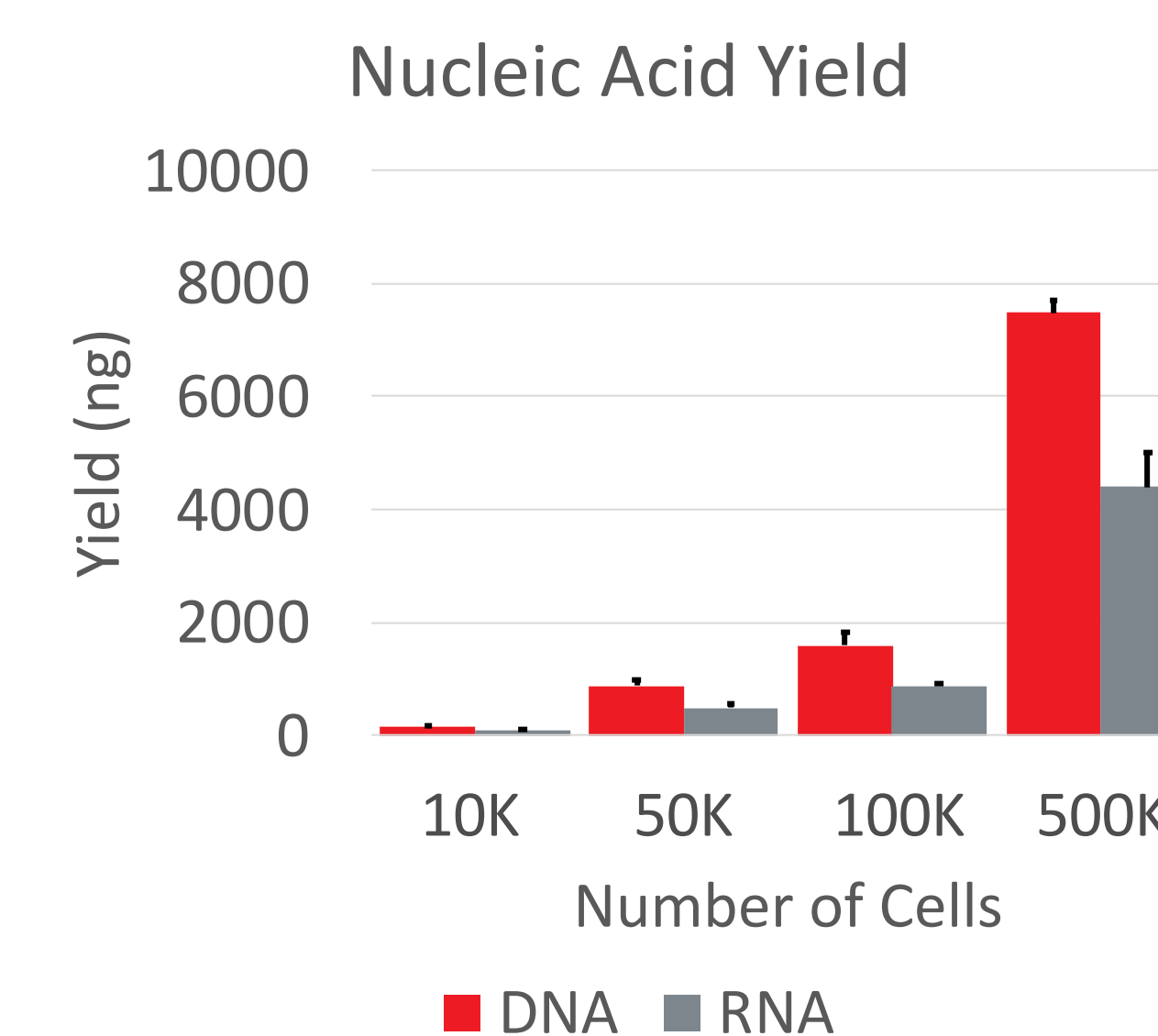
Tissue Sample



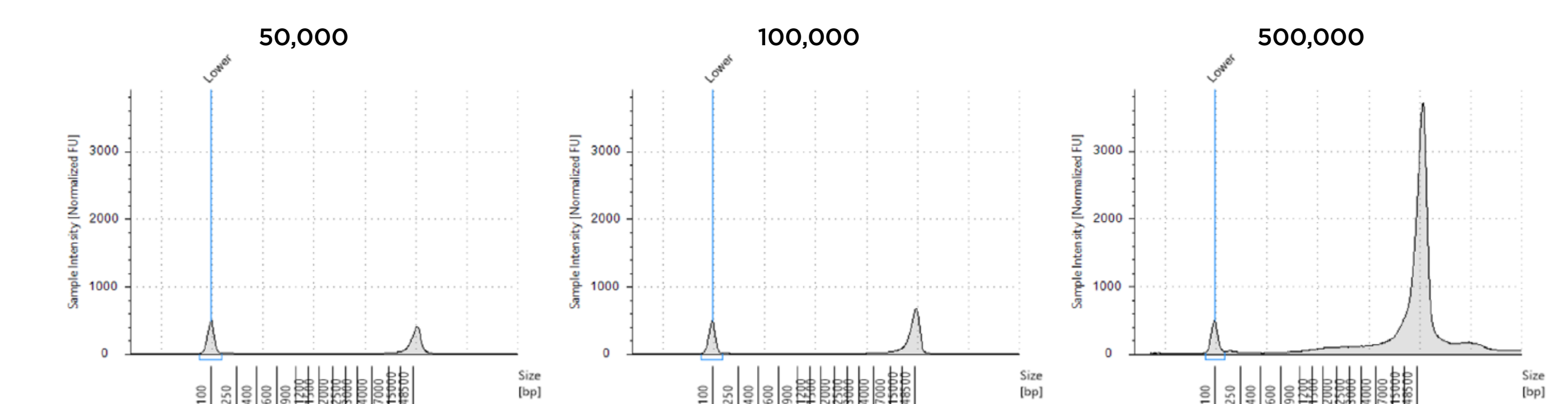
Cell Culture Sample

DNA and RNA was isolated from increasing amounts of cells.

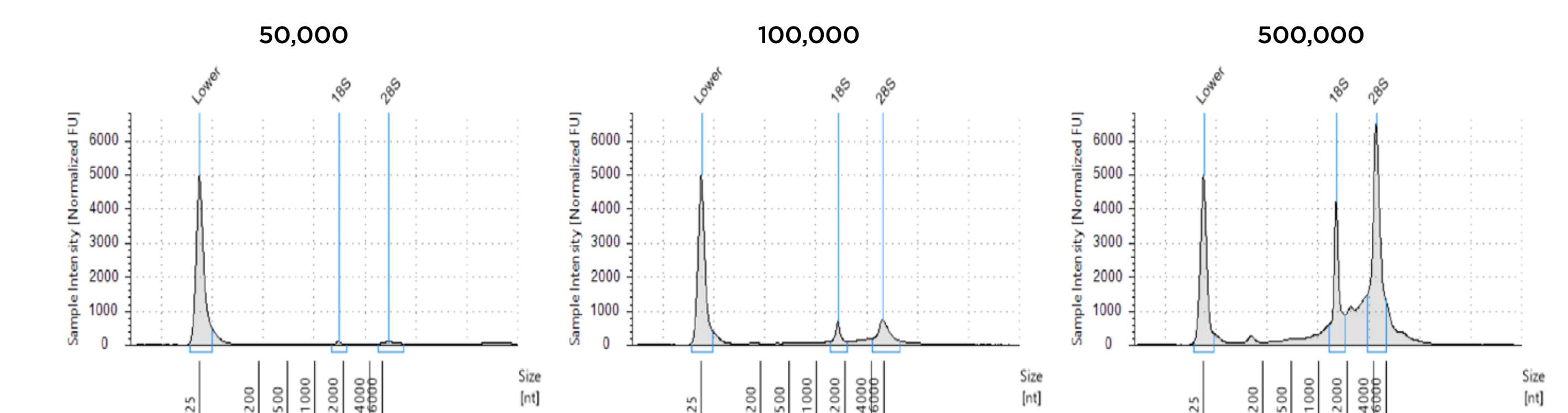
- Both DNA and RNA yield increased linearly with cell input.
- The DIN and RIN scores for DNA and RNA isolated from 50,000, 100,000 and 500,000 cells were consistent and above 9; indicating that DNA and RNA is intact.
- The concentration of nucleic acids from 10,000 was too low for an accurate measurement.



DNA Traces



RNA Traces



Cell Number	DIN score (DNA integrity)	RIN score (RNA integrity)
50,000	9.2	9.5
100,000	9.0	9.2
500,000	9.1	9.4