

RNAscope™ Plus small RNA-RNA Co-detection Assay

For biodistribution, safety and efficacy assessment of small RNAs and to visualize the therapeutic, its target gene and cell-specific marker genes with morphological context.

Introduction

Advances in drug development utilizing small RNAs like antisense oligonucleotides (ASOs) and small interfering RNAs (siRNAs) are currently amongst the most promising RNAi therapeutics. Oligonucleotide therapies for undruggable protein targets have been exploited by using microRNA (miRNAs), ASOs and siRNA to achieve longer-term effects with lower drug development costs. As these therapeutics target a broad variety of RNA molecules (pre-mRNA, mRNA, long non-coding RNA, miRNA), they offer promising treatment strategies for a spectrum of diseases including neurodegenerative diseases, cancer, and rare diseases.

RNAscope™ Plus is an ideal tool to evaluate safety and efficacy of the oligonucleotide therapeutic and visualize its targets in intact tissues

Highlights

- **Visualize** - 1 small RNA (ASO, miRNA, siRNA) + up to 3 mRNA markers
- **Evaluate expression** - of the target gene and cell-specific marker genes with morphological context
- **Assess *in vivo* biodistribution** - of ASOs and siRNAs, determine cellular uptake, and persistence over time
- **Safety and efficacy** - screen for potential toxicity and off-target effects

Multiplex with TSA Vivid dyes for increased boost in signal intensity for small RNA targets.

Table Headers

Component	Part Number (ACD, Bio-Techne)	Assay Compatibility
RNAscope Plus smRNA-RNA HD Reagents Kit	322785	For Manual Workflow
RNAscope Plus smRNA-RNA LS Reagents Kit	322786	For Leica BOND RX Workflow

Specific and Sensitive Quantitative Fluorescent Detection - One small RNA (miRNAs, siRNAs, ASOs) + Three mRNA

Detection of small RNAs requires a highly specific and sensitive assay with quantifiable signal. ACD's new RNAscope Plus assay leverages the patented core technology that enables signal amplification and background suppression for multiplex fluorescent visualization of one small RNA with up to three mRNAs in formalin-fixed paraffin-embedded (FFPE) and fresh frozen samples. This assay utilizes Tyramide Signal Amplification (TSA)-based fluorescent readouts and is compatible with the new fluorescent Vivid™ dyes. The RNAscope Plus assay can be automated on the Leica BOND RX autostainer.

The RNAscope™ Plus small RNA-RNA Fluorescent Assay detects effective suppression of the target gene using a single siRNA therapeutic in FFPE mouse liver tissue

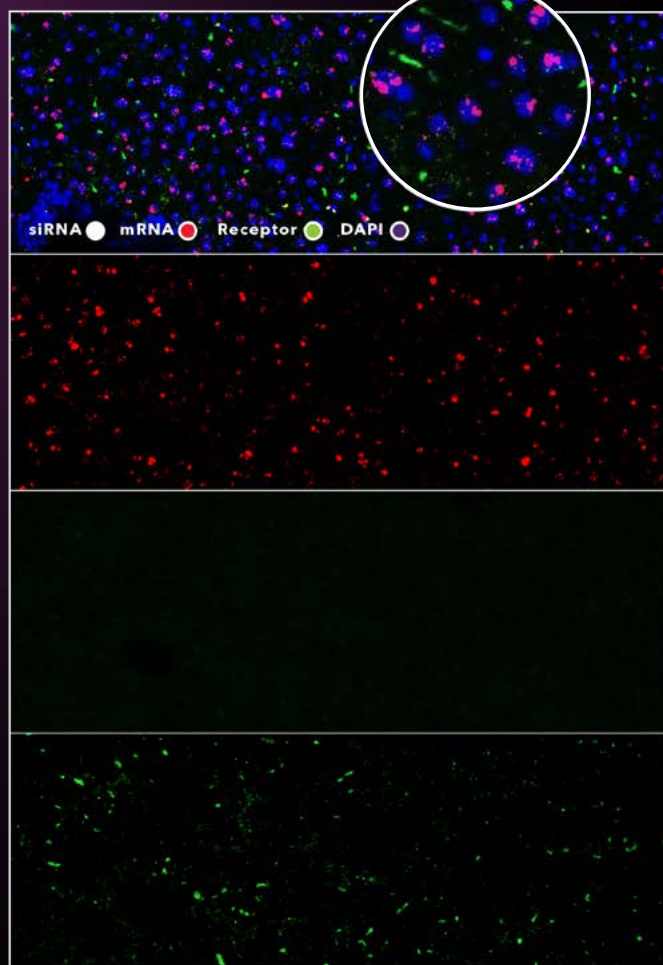
Case Study with the RNAscope Plus small RNA-RNA Fluorescent Assay

siRNA therapeutics act by silencing specific gene targets. This example from a leading biopharma company demonstrates detection of a single siRNA therapeutic and its cell-specific knockdown of target mRNA. With the multiplexing capability of the RNAscope plus smRNA-RNA assay, researchers were able to simultaneously study:

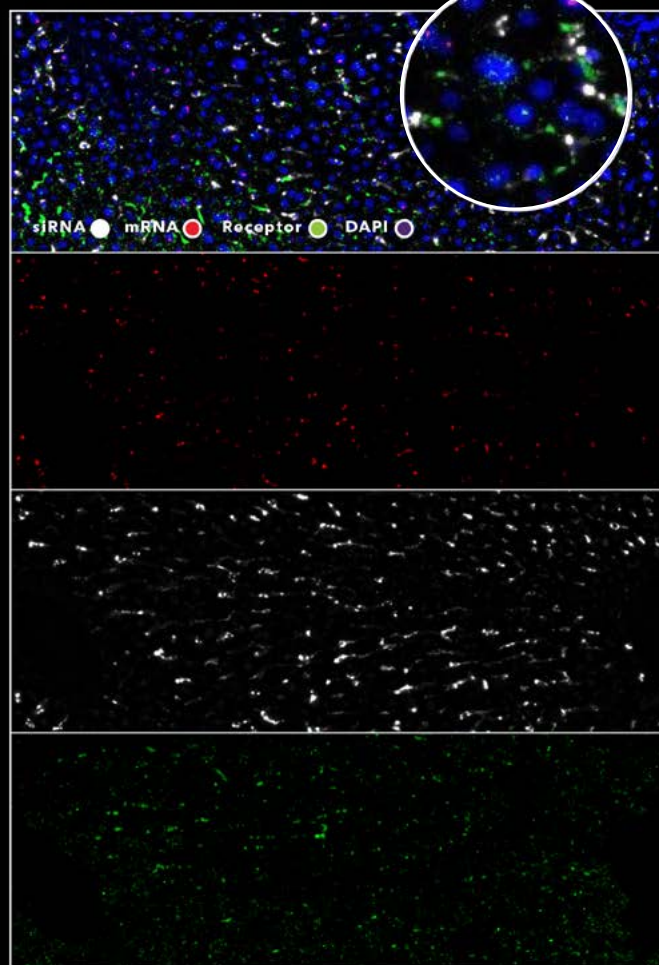
- The biodistribution of their therapeutic siRNA
- Detect the target mRNA along with the cell-specific marker

This indicates successful delivery and robust knockdown of the target gene by the therapeutic. Furthermore, its multiplexing capability allows conservation of precious samples while providing meaningful insights into disease pathology and drive advances in oligonucleotide-based drug development at single cell resolution.

Mouse liver tissue - PBS control



Mouse liver tissue - Treated (10mg/kg)



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