Spatially resolved, multiplexed digital characterization of protein and mRNA distribution and abundance in formalin-fixed, paraffin-embedded (FFPE) tissue sections based on NanoString’s Digital Spatial Profiling (DSP) technology: applications to immuno-oncology (IO) and tumor heterogeneity

**Abstract**

Spatially resolved, multiplexed digital characterization of protein and mRNA distribution and abundance in formalin-fixed, paraffin-embedded (FFPE) tissue sections based on NanoString’s Digital Spatial Profiling (DSP) technology: applications to immuno-oncology (IO) and tumor heterogeneity.

**Proof of Concept Example**

**nCounter Digital Multiplexed IHC**

**Spatially-resolved detection down to a single cell**

**RNA Profiling Proof-of-Concept**

**Spatially-resolved digital characterization of proteins and mRNA in a highly multiplexed (up to 800-plex) assay. The assay relies upon probes coupled to photocleavable oligonucleotide tags which are released from discrete regions of the tissue using focused through-objective UV (~365nm) exposure. An automated prototype assay features:**

- Compatibility with FFPE
- Simple workflow
- High multiplex (currently 30, but scalable with no change in instrumentation to 800)
- All digital counting, with large dynamic range (> 10^5)

We have developed a novel platform based on the nCounter® barcoding technology that enables spatially resolved, multiplexed digital profiling of proteins and mRNAs in FFPE tissue sections. The nCounter® assay is based on the principle of photocleavage of barcode-oligonucleotides on selected ROIs. ROIs are defined using a focused UV exposure. The resulting spatially resolved digital counts are then quantified using nCounter® digital counting instruments.

**Assay features:**

- ROI selection using UV exposure
- Digital counting of probes coupled to photocleavable oligonucleotide tags
- Large dynamic range (> 10^5)
- High multiplexing (up to 800-plex)

**Spatially-resolved Multiplexed Profiling**

**Digital Spatial Profiling (DSP) technology**

- Allows for the analysis of proteins and mRNAs in FFPE tissue sections
- Provides high multiplexing capability
- Enables spatially resolved digital characterization

**Examples**

**Spatially-resolved Multiplexed Profiling**

**Proof of Concept Example**

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