BRUKER SPATIAL BIOLOGY

Cell & Gene Therapy Solutions

CAR-T • Stem Cell • Gene Therapy

Driving Cell and Gene Therapy Innovation with Spatial and Molecular Tools

Cell and gene therapies (CGTs) are reshaping modern medicine, offering targeted treatment options for cancer, rare genetic disorders, and other complex diseases. As CGT pipelines expand from discovery through clinical translation, researchers face critical challenges in optimizing cell engineering, evaluating therapeutic safety, and understanding biological activity in complex tissue environments.

Bruker Spatial Biology supports CGT researchers with technologies that provide high-resolution, quantitative profiling of gene and protein expression in tissue and cell-based samples. Whether you're validating engineered cell products, studying immune cell trafficking, or identifying biomarkers of treatment response, our platforms deliver the spatial and molecular information needed to accelerate therapeutic development.

Addressing Needs

Supporting the diverse needs of scientists across the CGT development pipeline is essential to delivering safe, effective therapies. At Bruker Spatial Biology, we collaborate closely with researchers to provide technologies and expertise that align with their scientific goals and workflow requirements.

Discovery

Design & Create

- CAR-T construct
- Gene Knock-in/out
- Pluripotent

Exploring

- Target potential
- Off-target effects
- T-cell response
- Innate & adaptive response

Pre-Clinical Development

Delivery & Targeting

- Confirming targeting
- Biodistribution
- Optimizing design
- Profile for toxicities

Optimizing

- Efficiency of delivery & transfection
- Safety & toxicity
- Characterizing immune response
- Combination therapy studies

Manufacturing/ Biomanufacturing

Manufacture

- Development of robust and reproducible therapeutics
- Ensure workflow is efficient
- Test to de-risk process

Analytical Testing

- Cell quality/purity
- Sterility/ Contamination
- Potency
- Dosing
- Characterizing the T-cell response

Clinical Development

Clinical Trials

- Human Testing
- Ph I / Ph II / Ph III
- Safety, Efficacy, Response

Profiling Response

- Characterizing response to treatment
- Characterizing innate & adaptive response

Post Market Monitoring

Design & Create

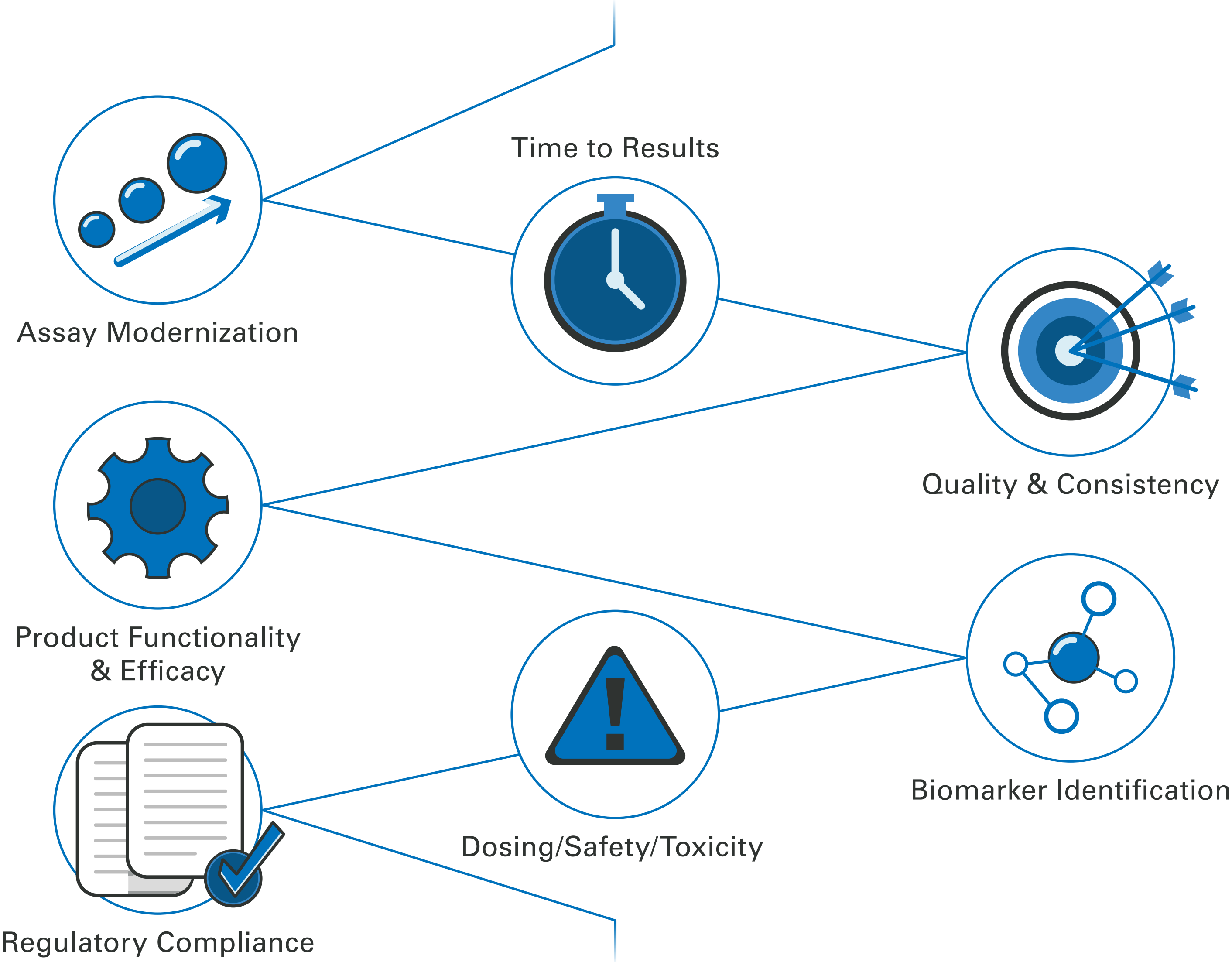
- Pharmacovigilance
- Monitoring for adverse events

Monitoring

- Durability
- Toxicities

Navigating Challenges

By understanding the complexities of CGT research, Bruker Spatial Biology helps you address both scientific and non-scientific hurdles in a systematic way to improve efficiency and accelerate progress.



Purpose-Built Tools for CGT Research

Bruker Spatial Biology provides best-in-class technologies to support cell and gene therapy research at every stage. The nCounter platform offers fast, reproducible gene expression and protein quantification for discovery, biomarker development, and translational studies. For deeper spatial or single-cell insights, the CosMx, GeoMx, and CellScape platforms extend your view into tissue context, cellular activity, and protein localization.

nCounter®

Analysis System

Rapid, reproducible gene expression and multiomics insights for translational research

- Identify predictive and prognostic biomarkers for patient stratification
- Track disease- and treatment-associated markers in clinical trial samples
- Profile RNA and protein from the same sample without amplification
- Support regulatory submissions with robust, standardized assay performance

CosMx®

Spatial Molecular Imager

High fidelity spatial exploration of the whole transcriptome with subcellular resolution

- Map cell type-specific responses to gene and cell therapies
- Uncover cell-cell interactions and niche-specific expression patterns
- Define spatial gene signatures associated with treatment response
- Investigate dynamic changes in cell states across time points or treatment arms

CellScape™

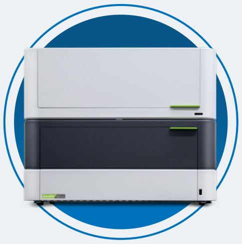
Precise Spatial Proteomics Platform

Straightforward, flexible quantitative spatial proteomics with best-in-class resolution

- Track engineered cell infiltration and persistence in tissue
- Resolve immune cell phenotypes and spatial localization of protein markers
- Maximize use of limited samples with iterative re-staining and analysis
- Design custom panels for tissue-specific or rare biomarker targets

GeoMx®

Digital Spatial Profiler



Regionally customized high plex multiomics for high throughput spatial insights

- Define spatial biomarker signatures across heterogeneous tissue landscapes
- Profile immune and stromal compartments in preclinical samples
- Quantify treatment-associated changes in specific regions of interest
- Scale translational studies with automated, high-throughput tissue analysis

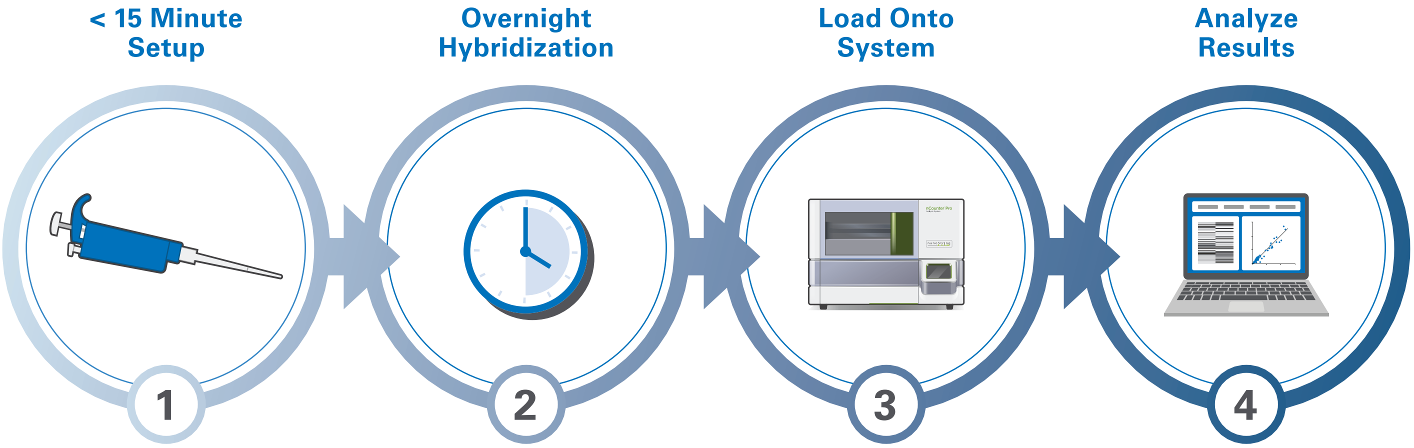
nCounter
Analysis System

Rapid, reproducible gene expression and multiomics insights for translational research

Accelerate your biomarker discovery and development with confidence and peace of mind. With robust performance on even the most difficult sample types (FFPE, peripheral blood) and unparalleled flexibility in multiomics content and throughput, you can rapidly translate discoveries into actionable clinical insights.

- **Multiomics capabilities:** RNA and protein sample-to-answer in 3 days from even the most challenging sample types with integrated data analysis
- **Robust RNA + protein detection up to 800 plex each:** panels assemble relevant pathways and processes known to play a role in disease, addressing important biological questions and delivering actionable biology
- **Rapid sample to answer:** minimal hands-on time, easy data analysis
- **Direct detection:** bypass amplification bias and elimination workflow errors with a no-enzyme, automated workflow
- **Broad sample compatibility:** Use any sample, including challenging archival FFPE tissues, biofluids, and lysates

Four Simple Steps Produce a Huge Amount of Data



Gene Expression Workflow

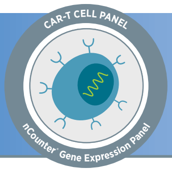
Gene Expression

for Modernized Assay Development

Pre-built application specific panels provide the starting point for assay development and allow for standardized molecular characterization on the nCounter Analysis System.

Standardized panels allow for early characterization and collaboration between discovery and biomanufacturing teams and into clinical trial follow-up. Capable of replacing outdated and timeconsuming assays, nCounter gene expression panels bring efficiencies to the challenging workflow by consolidating multiple cumbersome assays to the single platform, introducing speed and robust reliability that ensures quality and performance.

- Each pre-built panel has been designed to address important biological questions for comprehensive product characterization.
- Available in human and mouse versions suitable for all aspects of the development process.
- Customizable with a Panel Plus spike-in with up to 55 user defined genes, transgene inserts or microbial genes for detecting contamination.



CAR-T Characterization

Allogeneic-Autologus CAR-T Cell Therapies

Cell Quality Purity

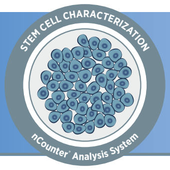
Sterility Contamination

Dosing Potency

Transfection Confirmation

TCR Diversity

Toxicity



Stem Cell Characterization

IPS, Mesenchymal Tissue Specific

Pluripotency

Sterility Contamination

Differentiation Status

Lineage Specification

Stemness

Gene Therapy Optimization

Viral and Non-viral

Innate Immune Response

Adaptive Immune Response

Interferon Response

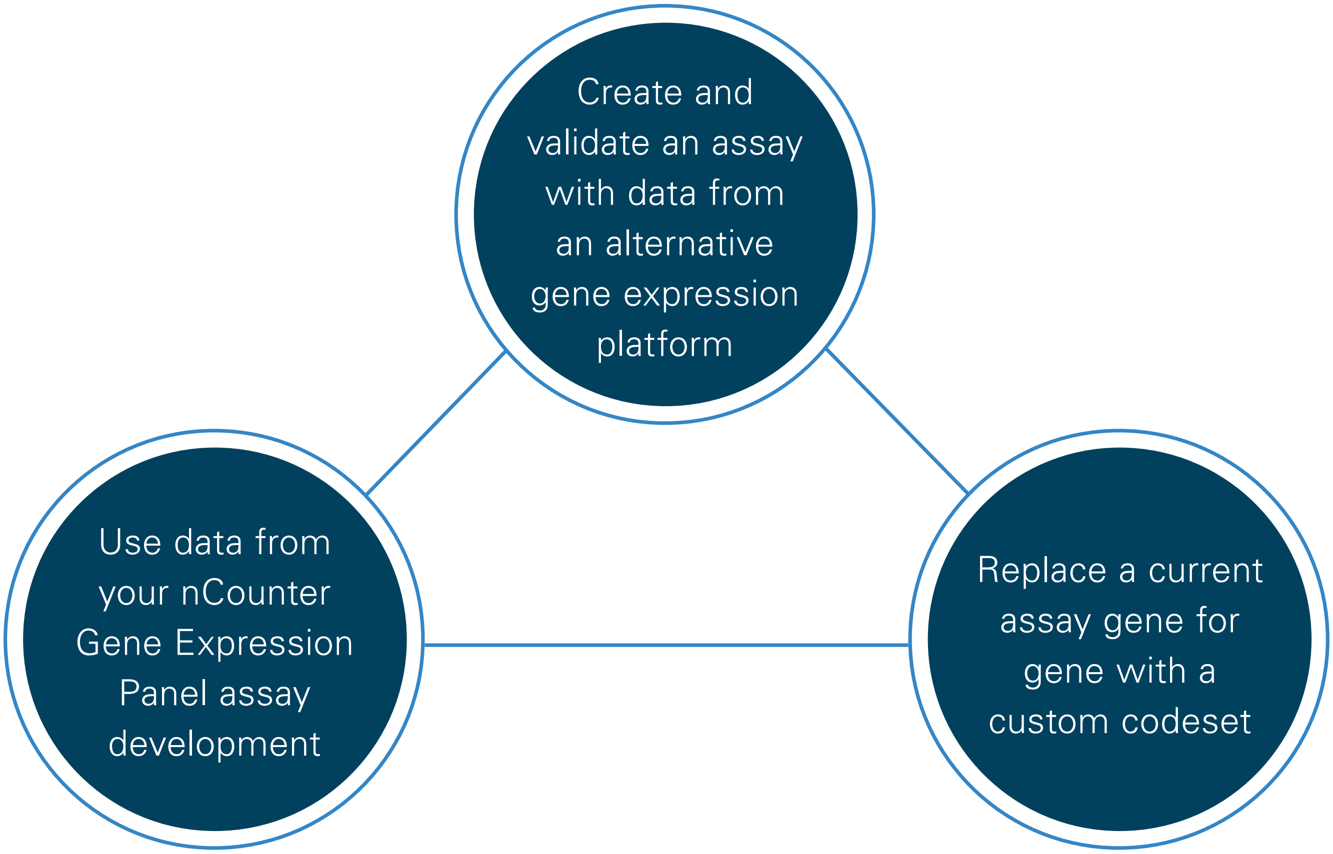
Viral Integration

Viral Secretion

Custom CodeSets

for Refined Assay Solutions

Design your own multiplex custom or high throughput nCounter assay. With help from Bruker Spatial Biology’s bioinformatics scientists you can create small gene sets for single-use studies or ongoing in-process analytical testing.



Create and validate an assay with data from an alternative gene expression platform

Use data from your nCounter Gene Expression Panel assay development

Replace a current assay gene for gene with a custom codeset

Custom CodeSet	Refine and create your final assay with individual custom panels targeting as little as 20 genes or as many as 800.
PlexSet™ Reagents	Design high throughput assays plexing 6-96 genes with up to 8 samples per well for up to 9,216 data points per run.
Panel Plus	Customize any nCounter panel with up to 55 user defined genes.

Data Analysis

Options for Discovery and Decision Making

Having access to a comprehensive range of analysis tools and services transforms your valuable data to bring test hypotheses, and deliver publication-quality results. Expedite analysis and accelerate discoveries with on-system data analysis tools, secure cloud-based platforms, expert bioinformatics support, and data analysis services.

nCounter Analysis Solutions

nSolver Analysis Software

- On-premises analysis tool
- Available at no charge
- Advanced Analysis Module for additional statistics

GeoMx DSP Data Analysis Tools

GeoMx DSP Data Analysis suite (DSPDA)

- On-instrument
- Data visualization and analysis

GeoScript Hub Open-Source Software

- Developed by Bruker Spatial Biology R&D
- Supplements capabilities of DSPDA

AtoMx® Spatial Informatics Platform

- A cloud-based, integrated informatics platform for spatial biology
- Analyze and visualize, large amounts of spatial multiomics data
- Preset analysis modules and pipelines
- Advanced analytics support global data sharing and collaboration

Analysis Services

Data Analysis Service

- nCounter differential gene expression data fully analyzed
- Interpreted by a Bruker scientist inclusive of a consultative reportout.

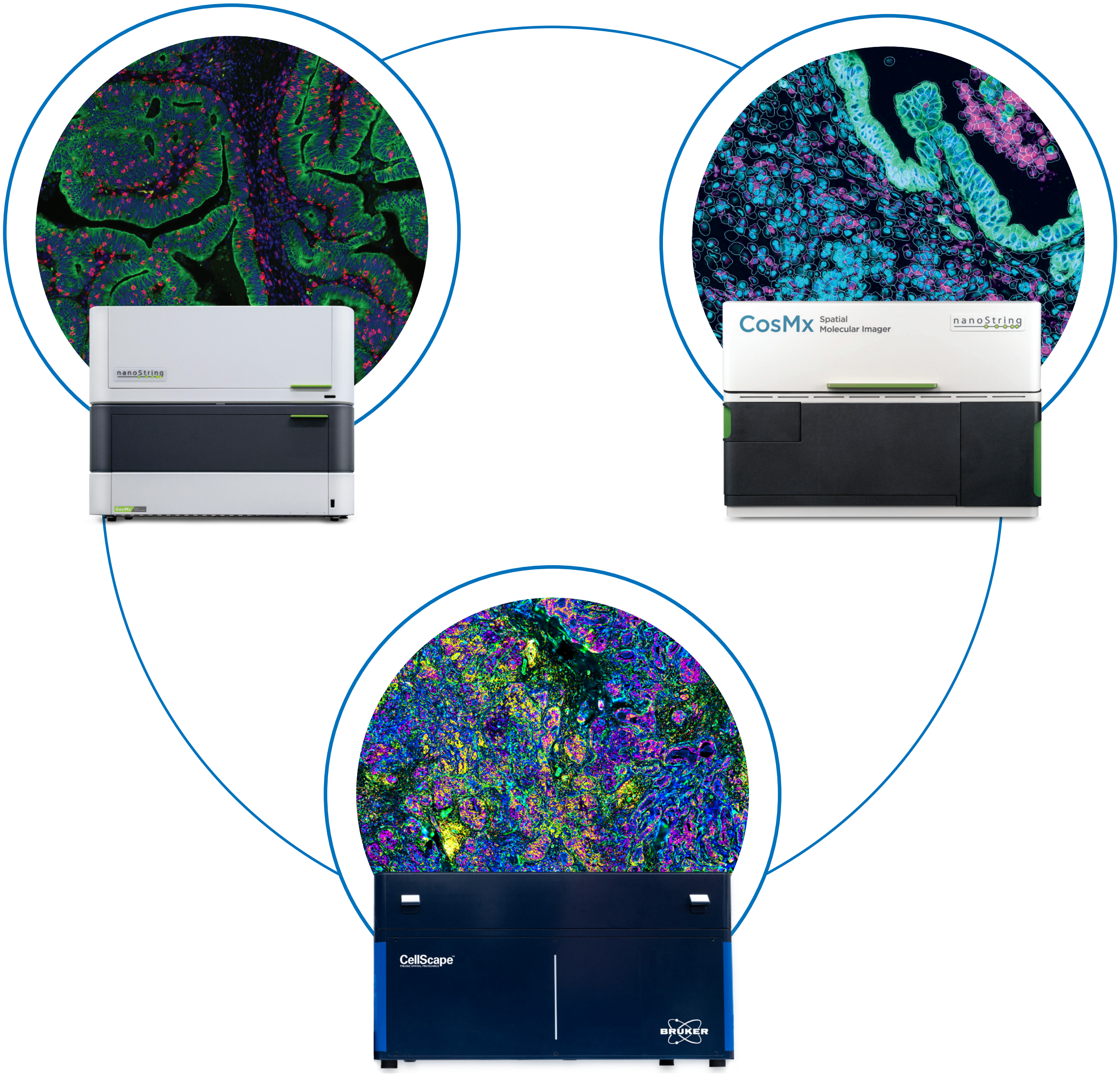
Spatial Data Analysis Service (sDAS):

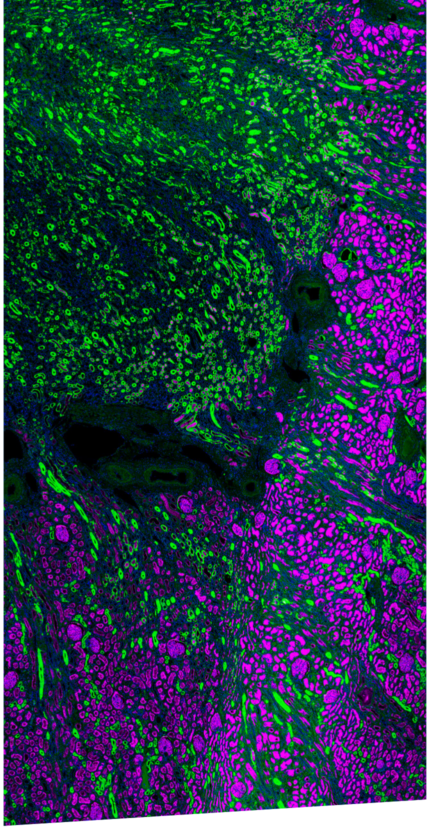
- Work one-on-one with Bruker Spatial Biology computational biologists
- Fully interpreted GeoMx data to answer biological questions.

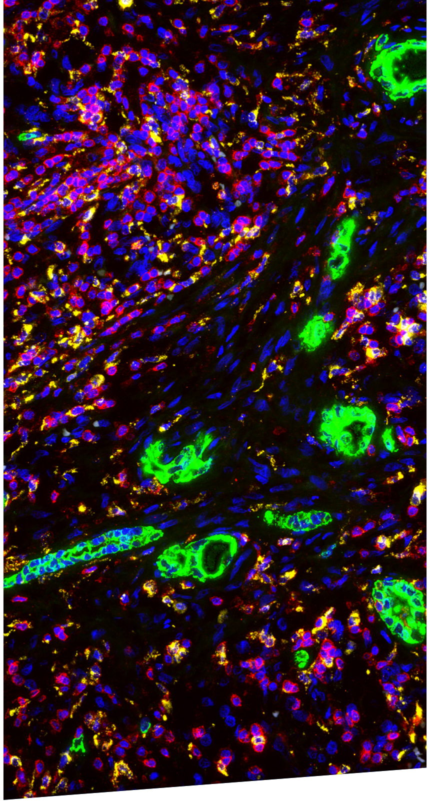
Spatial Resolution

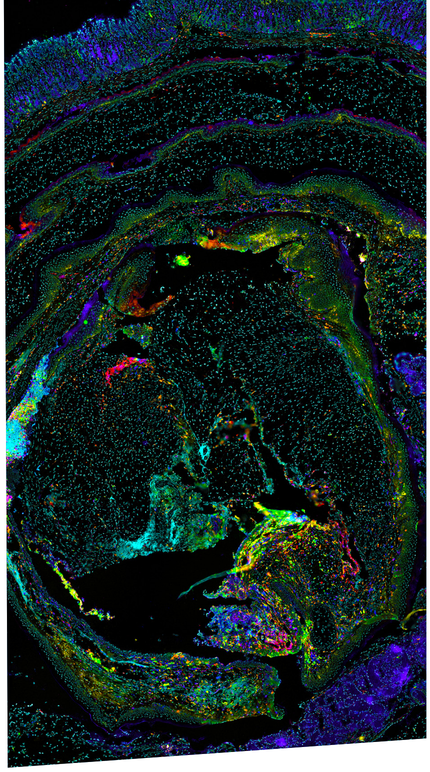
Addressing Advanced Spatial Applications

Our spatial biology platforms provide high-plex RNA and protein analysis across a range of resolutions, helping CGT researchers map immune cell infiltration, localize therapeutic effects, and understand treatment response in spatial context. GeoMx DSP is ideal for discovery multiomic studies and large cohorts, while CosMx SMI offers subcellular resolution of the entire transcriptome to define cell types and states within complex tissue environments. CellScape platform provides flexible, quantitative spatial proteomics to validate biomarkers and cellular phenotypes with exceptional image quality and resolution.









Key Capabilities

High Plex Multiomics

- Whole transcriptome or targeted RNA panels (CosMx SMI and GeoMx DSP)
- Pre-designed protein detection panels available (GeoMx DSP, CosMx SMI, and CellScape)
- Same-slide RNA and protein analysis (GeoMx DSP, CosMx SMI, and CellScape)
- Scalable throughput: process up to 40 slides per week with GeoMx DSP

Spatial Resolution

- Region-based profiling (GeoMx DSP)
- Subcellular resolution for RNA and protein (CosMx SMI)
- Quantitative spatial proteomics with subcellular resolution (CellScape)

Applications in Cell and Gene Therapy Research

- Biomarker discovery and spatial signature development
- Immune cell phenotyping in tissue context
- Transgene detection at cellular and subcellular resolution
- Biodistribution of engineered cells or viral vectors
- Spatial assessment of transfection efficacy
- Monitoring localized treatment response
- Evaluating safety and off-target effects

Bruker Spatial Biology | For more information, visit brukerspatialbiology.com

Bruker Spatial Biology, Inc.
3350 Monte Villa Parkway,
Bothell, WA 98021

T (888) 358-6266
F (206) 378-6288

nanostring.com
customerservice.bsb@bruker.com

Sales Contacts

North America	nasales.bsb@bruker.com	Asia Pacific & Japan	apacsales.bsb@bruker.com
EMEA	emeasales.bsb@bruker.com	Other Regions	globalsales.bsb@bruker.com

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