

# T-Cell Therapy Trafficking and Activation Analysis Using RNAscope™ *In Situ* Hybridization

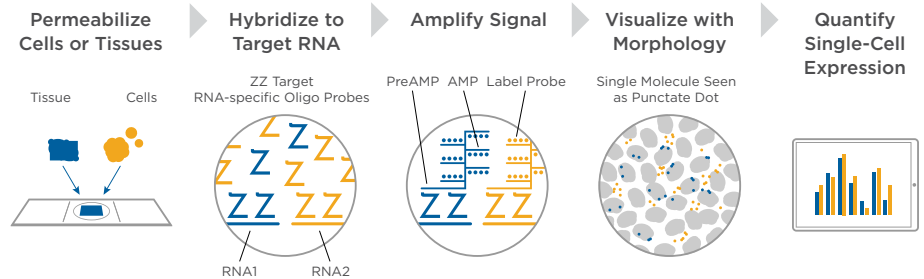
Cell therapies including CAR and TCR T-cell approaches have proven to be highly effective in treating hematologic tumors, and applications in solid tumors are the next frontier. Assays of efficacy and activity in T-cell recruitment and tumor cell killing are important for understanding therapeutic mechanisms of action. The RNAscope *in situ* hybridization (ISH) technology is a highly sensitive and specific method to detect and quantify CAR- and TCR-engineered T-cells in solid tumor tissues.

## Features

- High sensitivity for detecting single-copy transcripts
- Universal assay conditions suitable for for clinical FFPE or frozen tissues
- Custom probes designed within 1-2 weeks

## Benefits

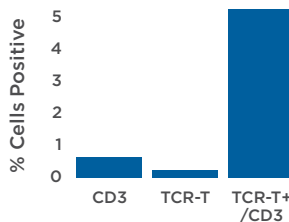
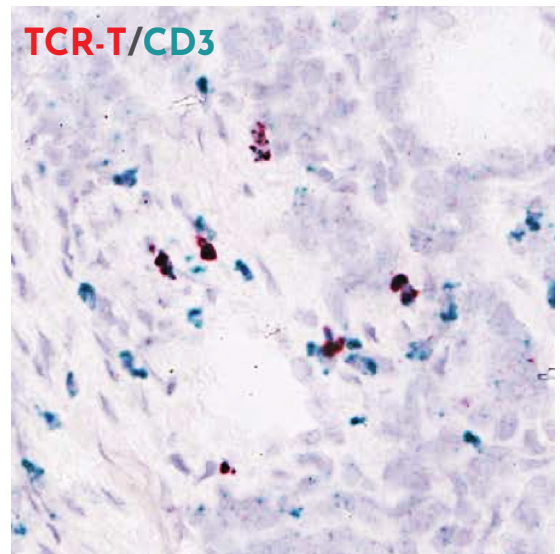
- Visualize CAR and TCR T-cell infiltration within the TME
- Quantify infiltrating transduced T-cells, along with cytokine expression and recruitment of endogenous TILs
- Assess on-target/off-tumor antigen expression with high sensitivity for target safety assessment
- Quantify integrated vector copy number using DNA *in situ* hybridization



## Monitor the infiltration of CAR and TCR T-cells in tissue

By designing RNAscope or BaseScope™ ISH probes against the 5' or 3' UTR from the CAR or TCR vector transcript, engineered T-cells can be detected and quantified in the tumor microenvironment (TME) or any other intact tissue. The high sensitivity of the RNAscope assay enables pre-clinical screening for target antigen expression at the RNA level to avoid adverse effects resulting from on-target/off-tumor activity.

Human clinical liposarcoma FFPE sample stained with RNAscope ISH followed by IHC to detect modified TCR T-cells (red, ISH) and CD3 (teal, IHC)



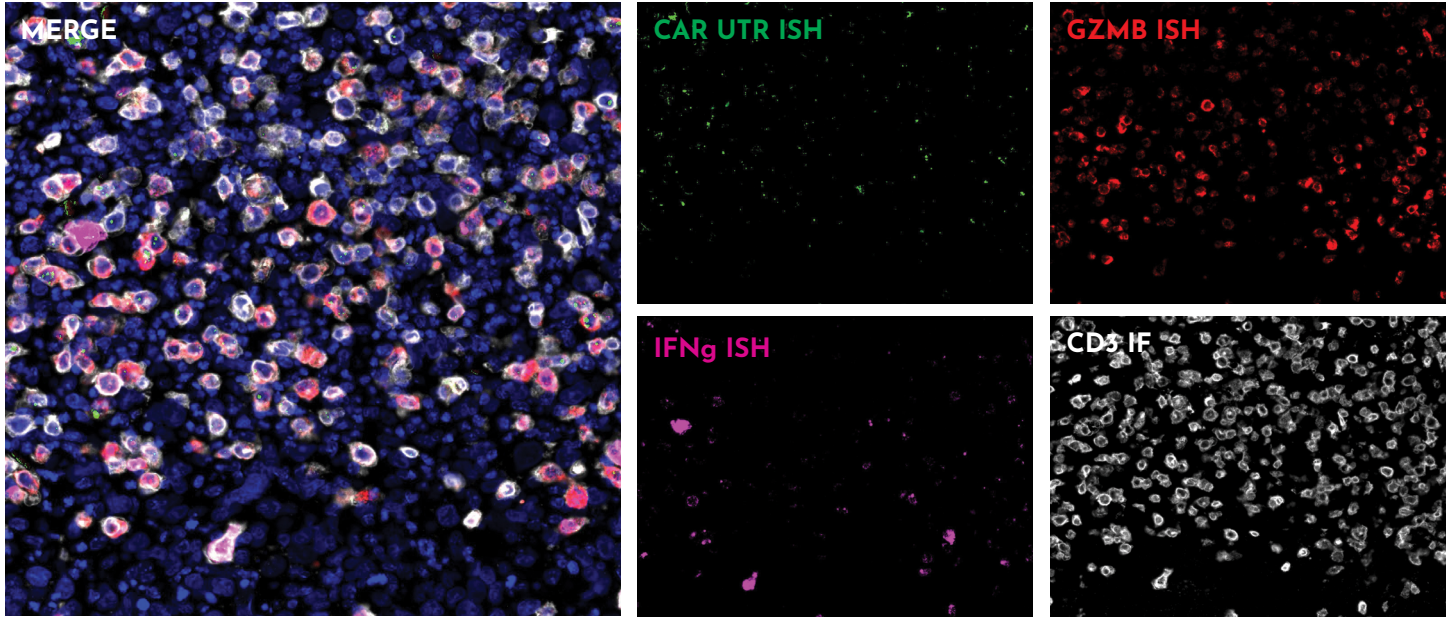
RNAscope probes can be designed to target the 5' or 3' UTR of the CAR vector.



# Assess CAR- or TCR T-cell functionality and activation state



The multiplexing capabilities of the chromogenic and fluorescent RNAscope ISH assays enable simultaneous detection of multiple targets on the same slide. CAR or TCR vector transcripts can be co-stained with IFN $\gamma$  and GZMB to assess activation state, or with cell-type markers such as CD3 and CD8 to discern engineered CAR- or TCR T-cells from endogenous T-cells.



RNAscope Multiplex Fluorescence ISH/IF assay showing Granzyme B and IFN $\gamma$  expression and CD3+ T cell infiltration in a BCMA+ xenograft tumor treated with anti-BCMA CAR-T cells.

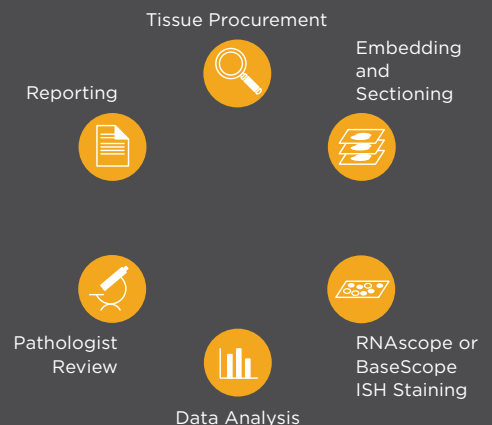
## Partner with ACD's Pharma Assay Services

- Trust your study to the experts in RNAscope and BaseScope™ ISH
- Have confidence in the science, data and research conclusions
- Receive actionable results in weeks rather than months

*"We've had a great experience in working with ACD. Using their service team we are able to move faster through our testing for Phase I trial, we are very happy with the quality of data, thoroughness in the reports we receive and would highly recommend them for ISH assay development and implementation."*

— Dr. Omar Kabbarah

Learn more about Pharma Assay Services at [www.acdbio.com/PAS](http://www.acdbio.com/PAS)



Learn more about the RNAscope technology for Cell Therapy Applications at: [www.acdbio.com/genetherapy](http://www.acdbio.com/genetherapy)

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