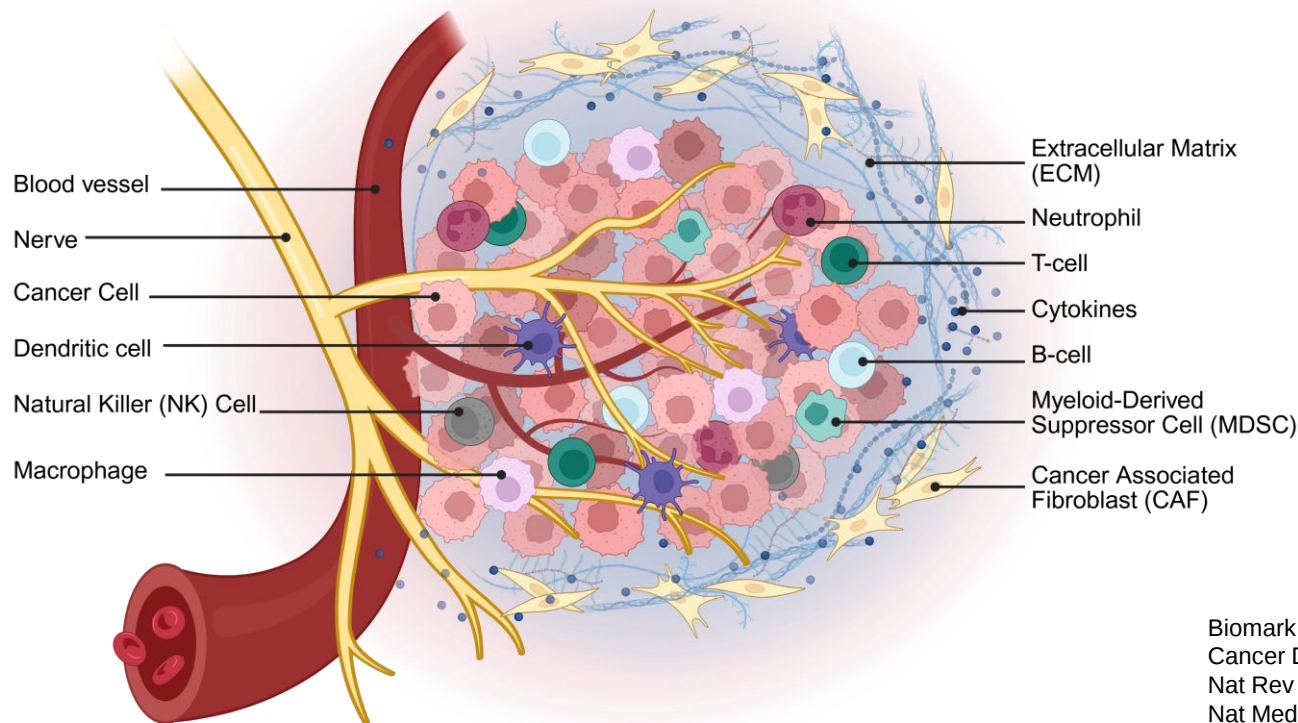


Clinical relevance of multiplex IHC-based characterization of the tumor immune landscape

PD Dr. Rebekka Wehner
NCT Immune Monitoring Unit Dresden
+ Institute of Immunology
Medical Faculty Carl Gustav Carus
TU Dresden

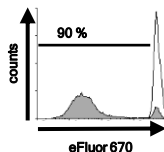
Tumor Microenvironment



Biomark Res 2022;10:19
Cancer Discov. 2021;11(4):933-959
Nat Rev Cancer 2020;20:662-80
Nat Med 2018;24:541-50
Nat Rev Clin Oncol 2017;14:717-34

NCT Immune Monitoring Unit Dresden

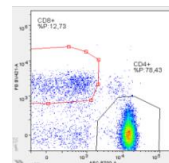
Functional
assays



ELISA

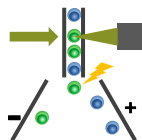
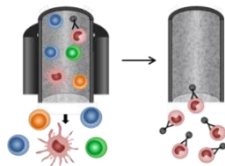


Nanostring® technology

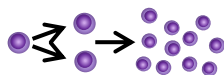


Multiparameter
flow cytometry

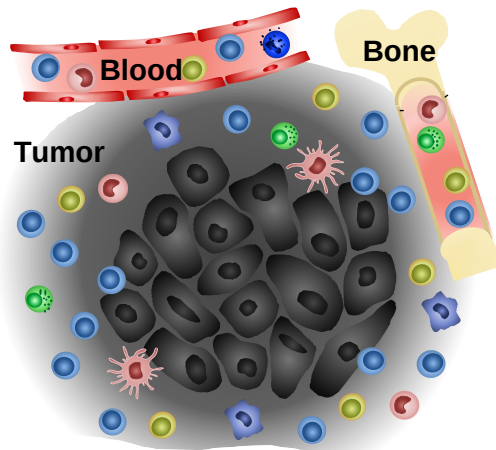
Magnetic cell
separation



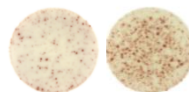
Flow cytometry-based sorting



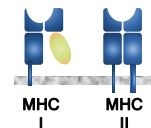
T cell cloning



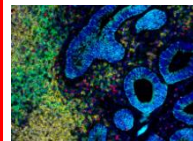
TCR sequencing



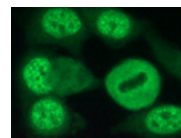
ELISPOT



HLA typing



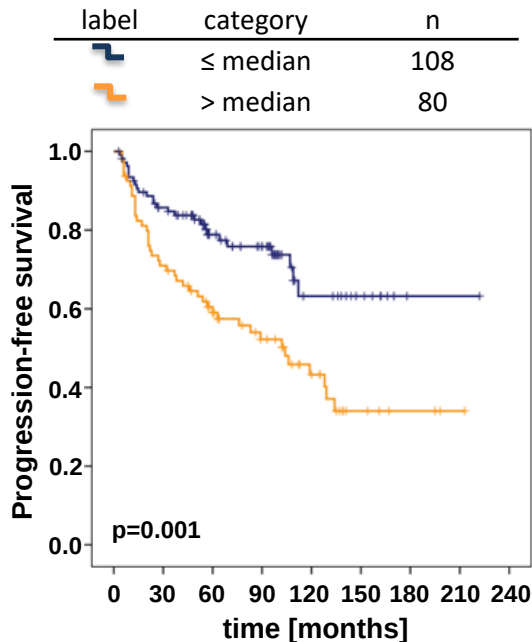
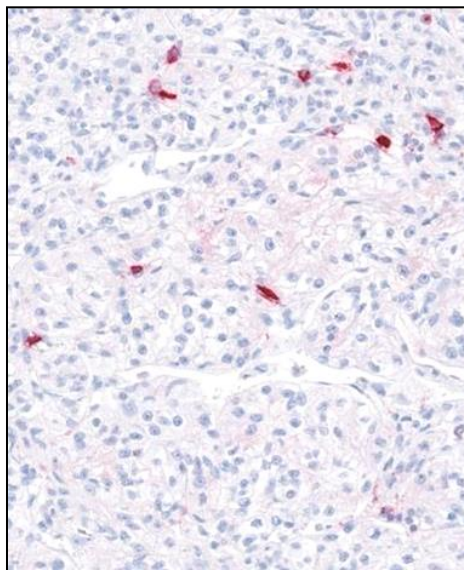
Multiparameter imaging
(Vectra®/PhenolImagerHT®
MACSima™)



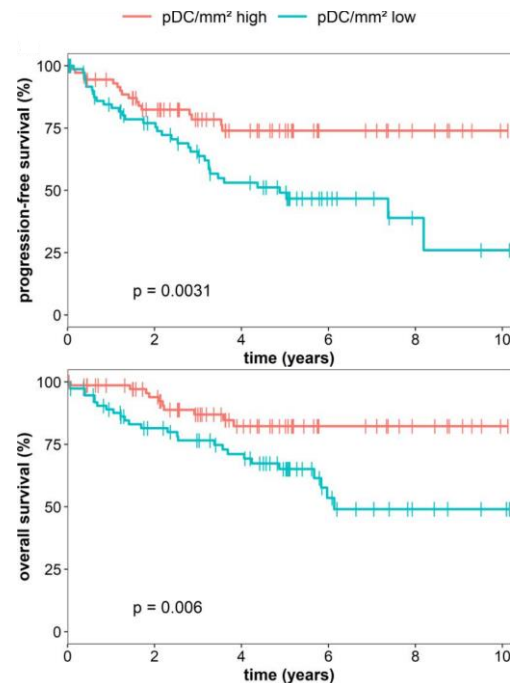
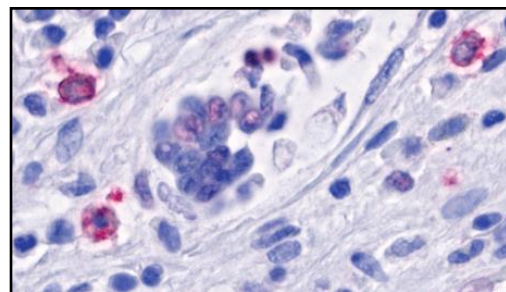
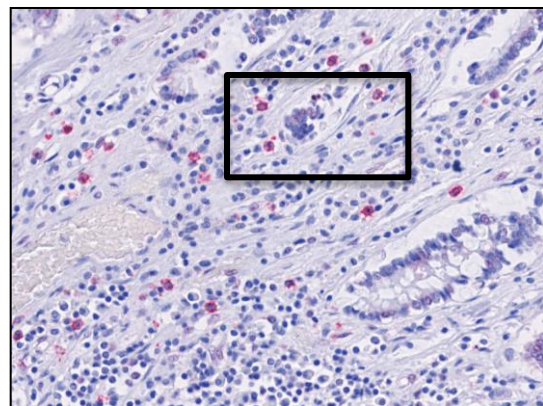
Autoantibody testing

Blood. 2025;blood.2025030816
Nat Commun. 2025;16:10042
Cancer Discov 2025;15:179-201
Immunity 2024;57:2688-2703.e11
Lancet Oncol 2023;24:347-359
J Exp Med 2023;220:e20220829
J Clin Oncol 2022;40:2128-2137
Cancer Discov 2021;11:2924-2943
J Immunother Cancer 2021;9:e001813
Sci Transl Med 2020;12:eaaz0463

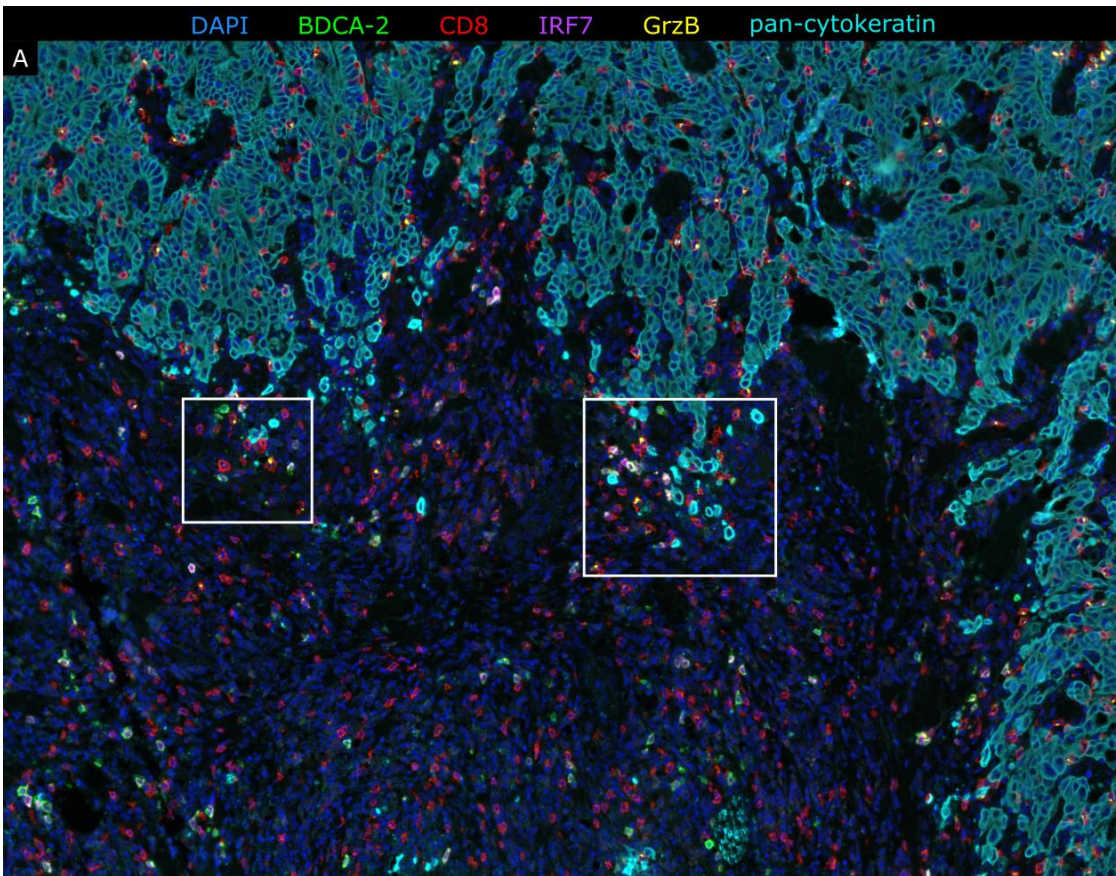
Frequency of slan+ monocytes was associated with survival of renal cell carcinoma patients



Number of tumor-infiltrating plasmacytoid dendritic cells determined the survival of colon cancer patients

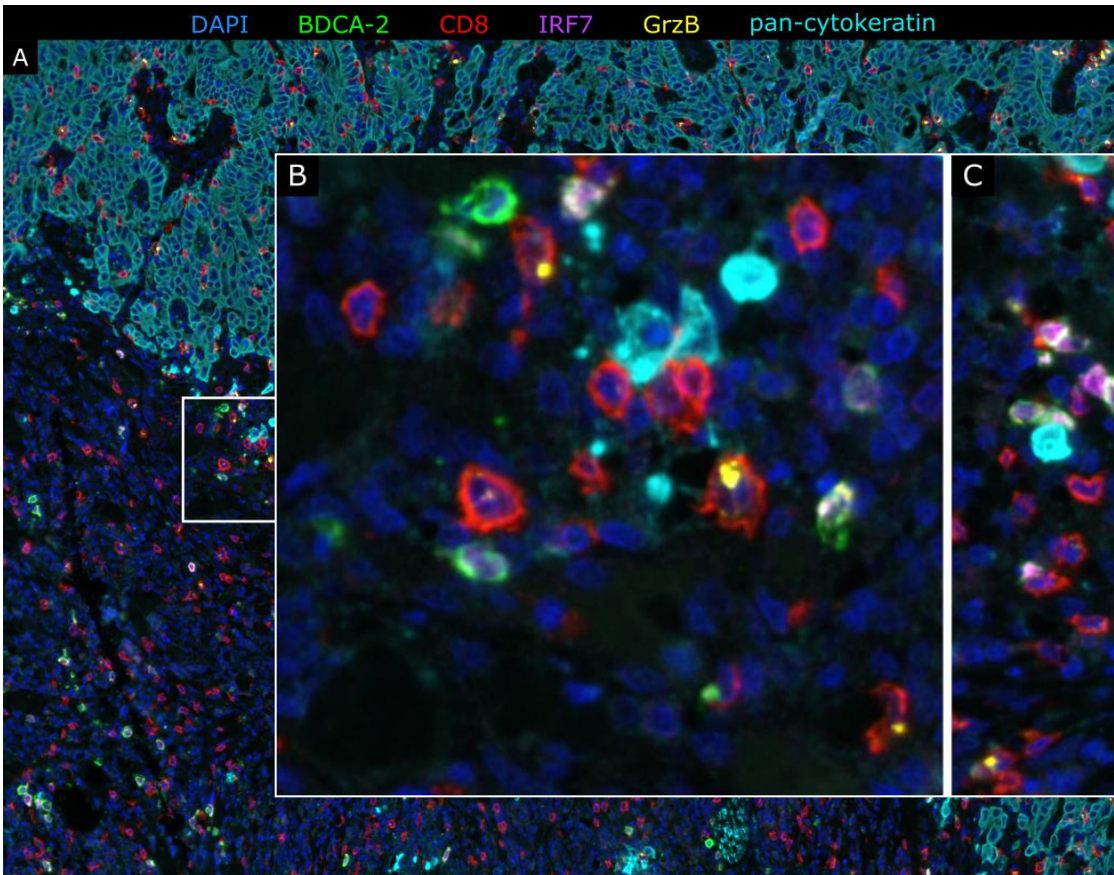


DAPI BDCA-2 CD8 IRF7 GrzB pan-cytokeratin



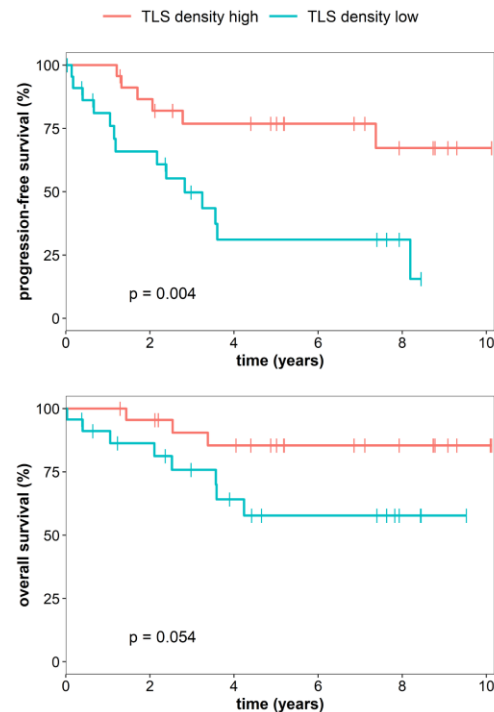
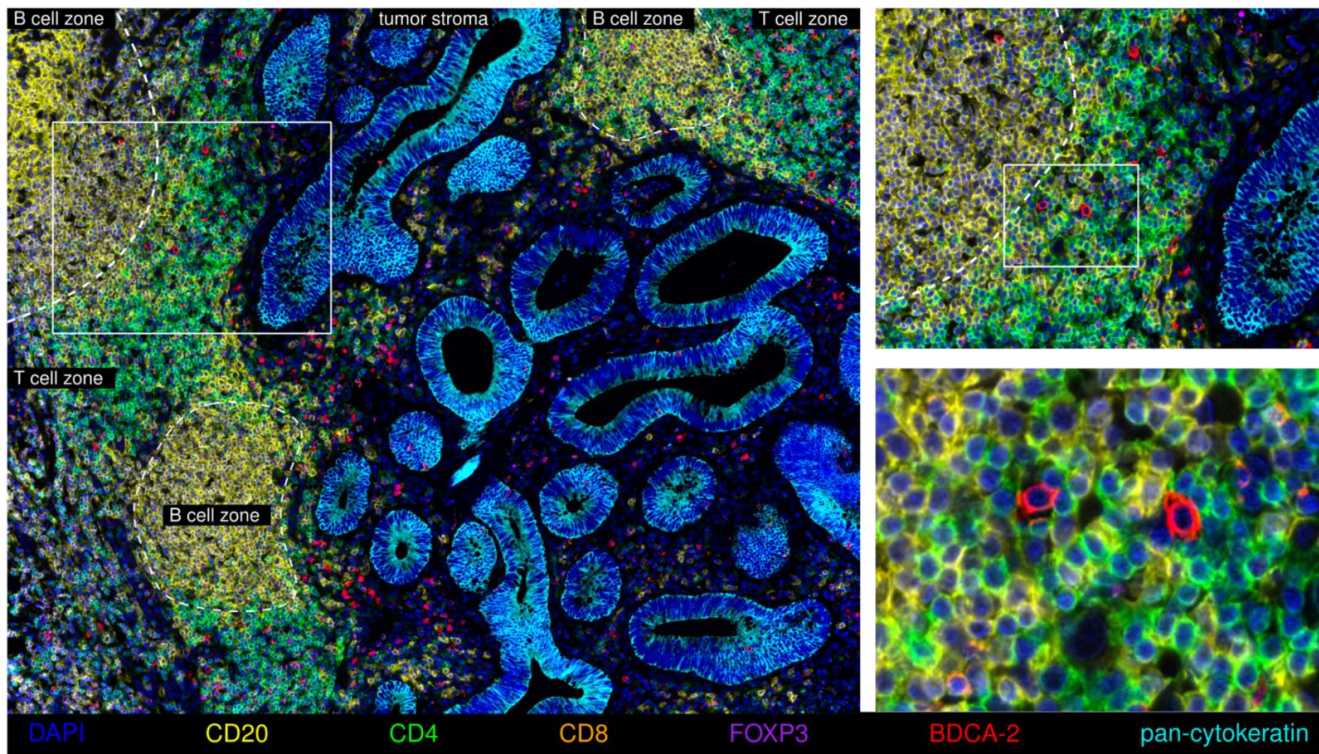
**Activated colon cancer-infiltrating pDC
are close to cytotoxic GrzB⁺ CD8⁺ T cells**

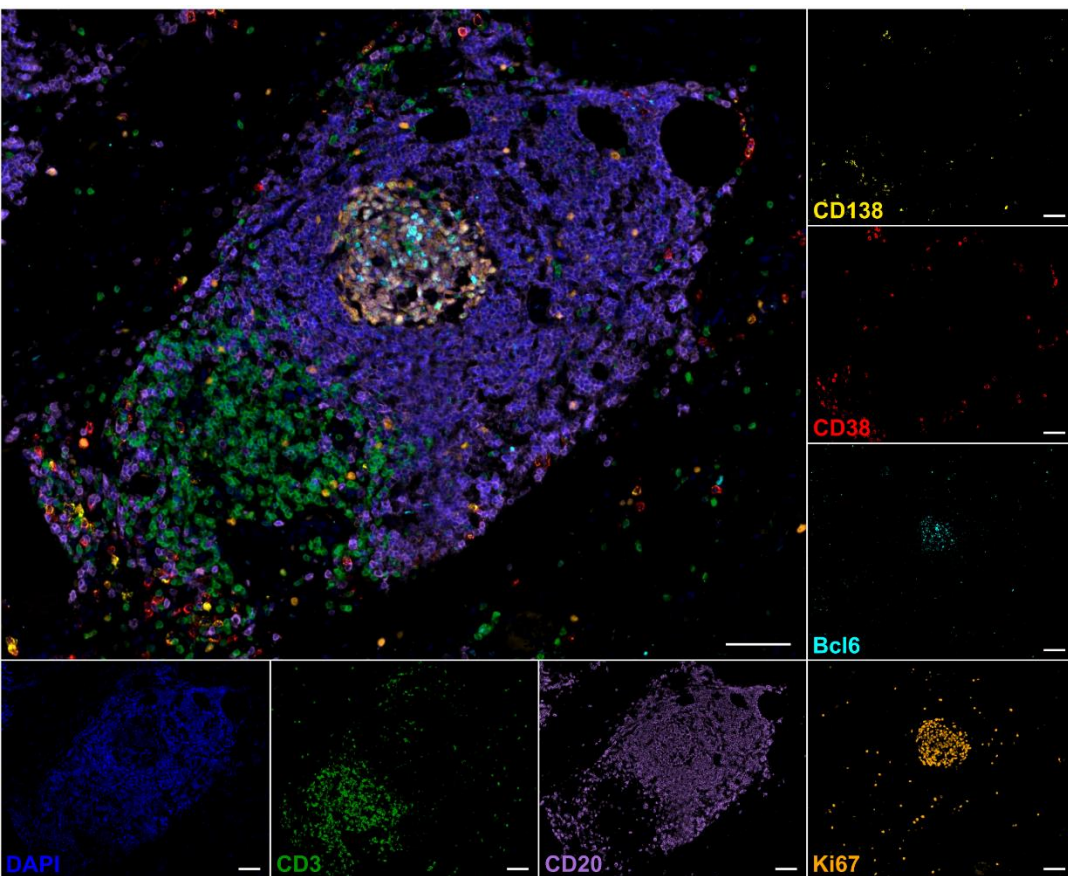
DAPI BDCA-2 CD8 IRF7 GrzB pan-cytokeratin



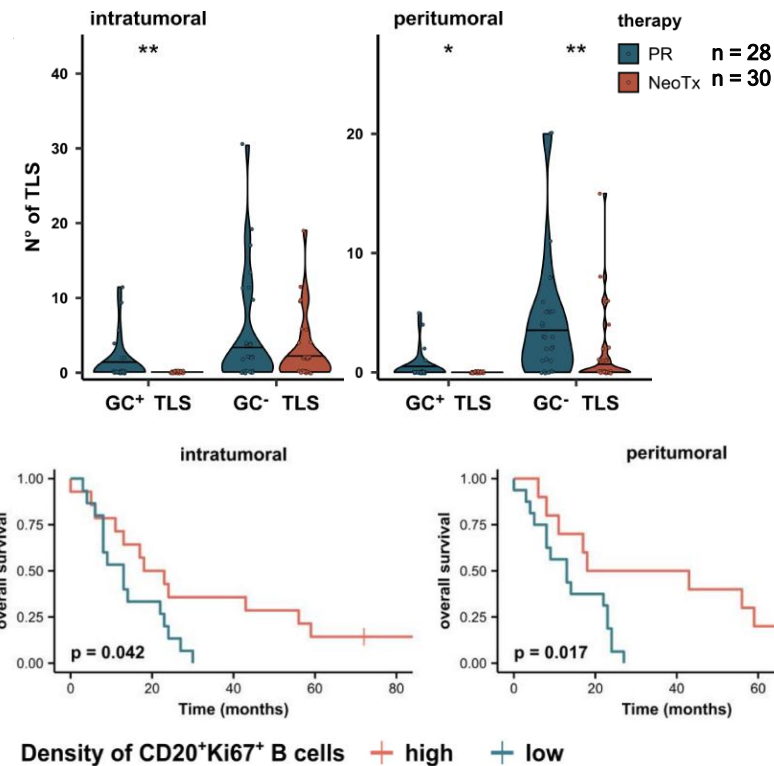
**Activated colon cancer-infiltrating pDC
are close to cytotoxic GrzB⁺ CD8⁺ T cells**

Tertiary lymphoid structures are linked to prolonged survival of colon cancer patients

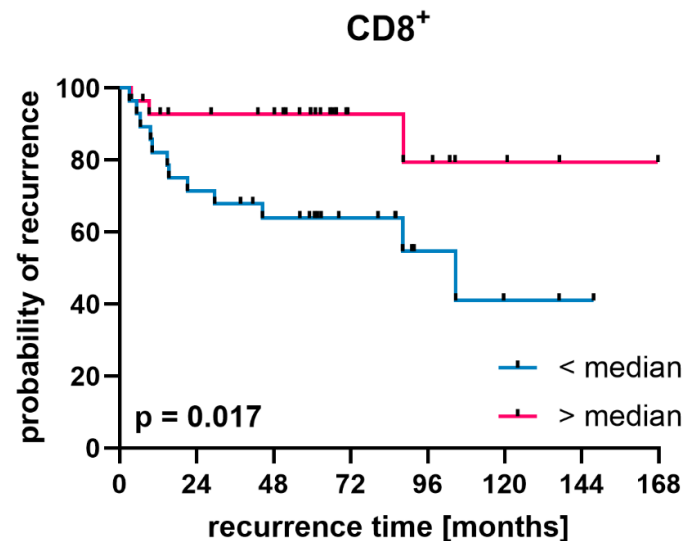
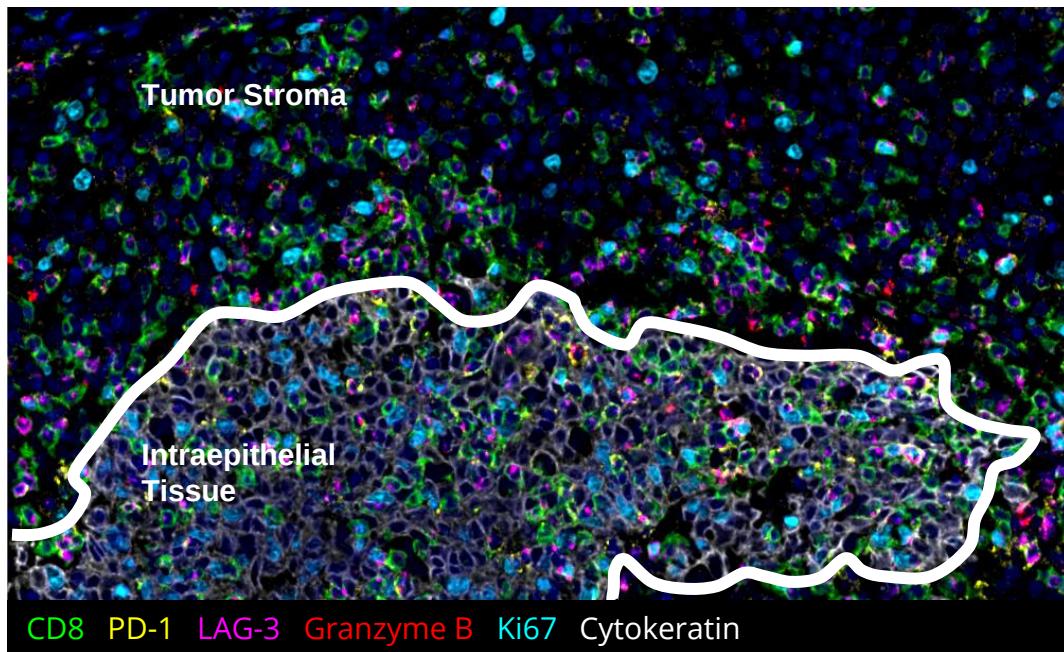




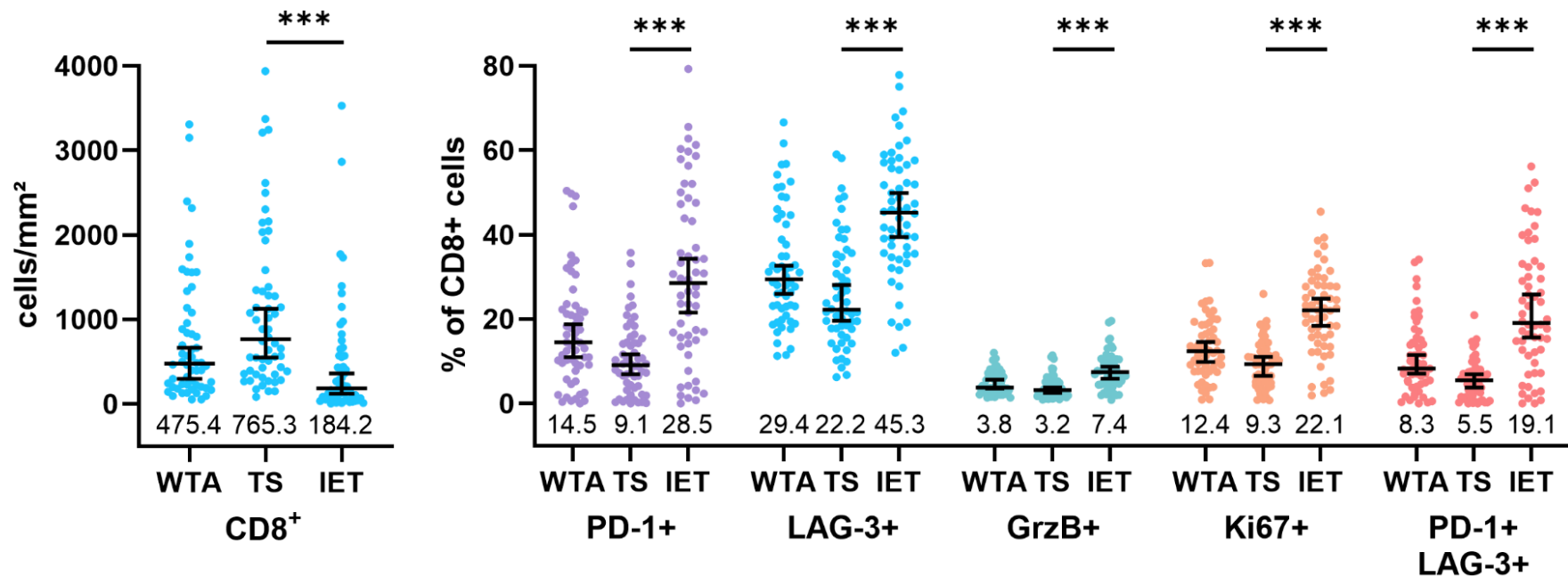
TLS in pancreatic ductal adenocarcinoma



Localization of CD8⁺ T-cell subsets in head and neck squamous cell carcinoma (NSCC) tissues



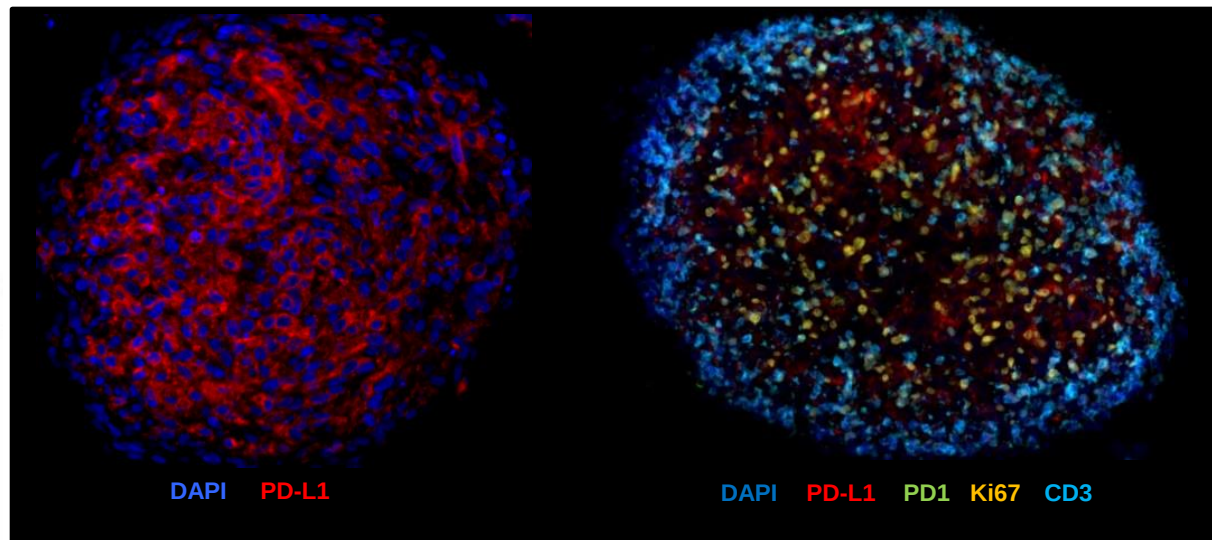
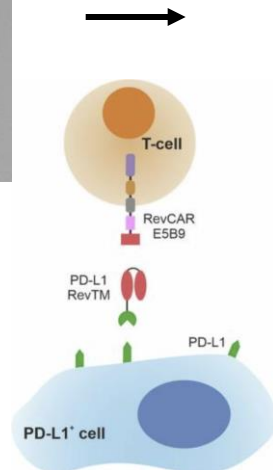
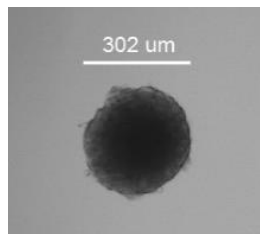
Frequency and phenotype of CD8⁺ T-cell populations in HNSCC



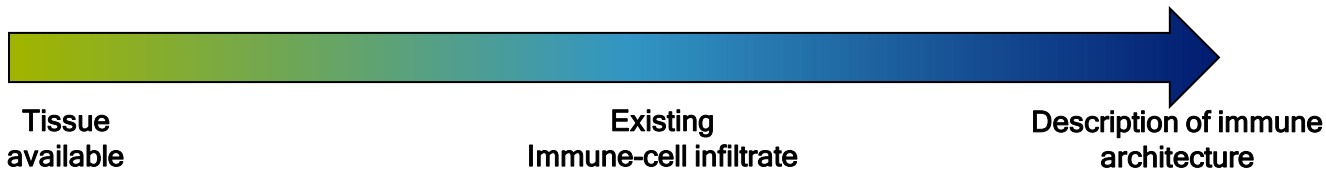
WTA – whole tumor area | TS – tumor stroma | IET – intraepithelial tumor area

RevCAR-armed T cells infiltrate into PD-L1-expressing sarcoma spheroids

spheroid formation



Integrating tissue immune cell characterization into the NCT MASTER Molecular Tumor Board



**Tissue
available**

**Existing
Immune-cell infiltrate**

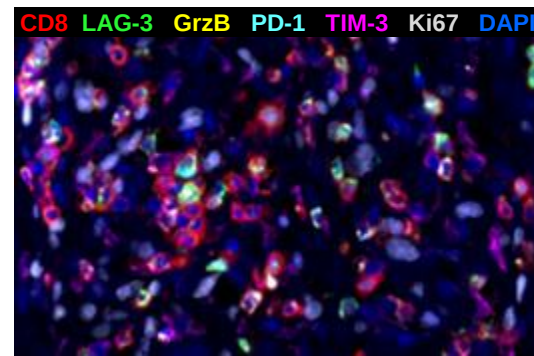
**Description of immune
architecture**

NCT DD
Master patient
Biopsy or resection
Irina Kerle
Daniela Richter
Hanno Glimm

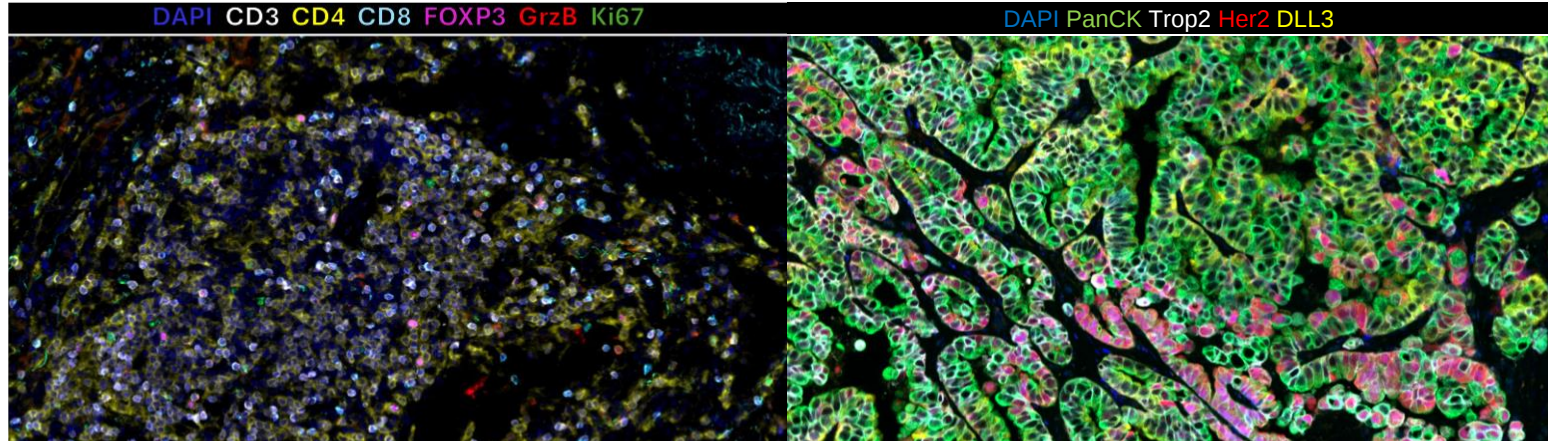
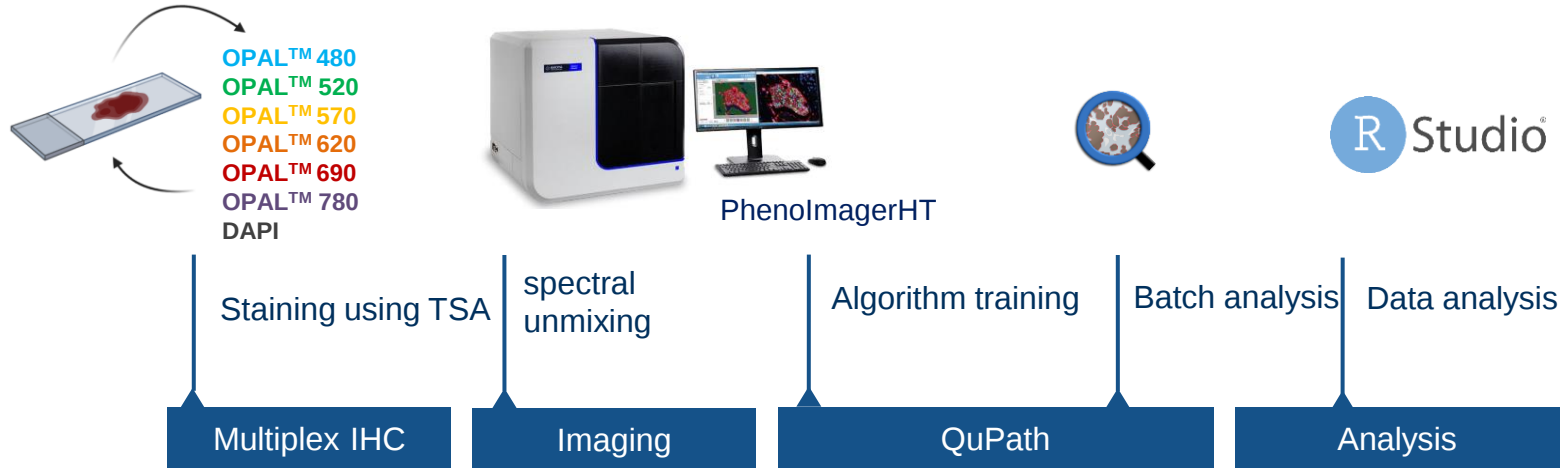
Pathology DD
Tumor- und Normalgewebebank (TNTB)
Irene Michalk
Sascha Brückmann
Daniela Aust
Quality control
H&E
Immunhisto
T cells: CD3, CD8
Treg: FoxP3
Macrophages: CD68
Tumor+immune cells: PD-L1 scores

NCT IMU
Cathleen Lippitsch
Susanne Doms
Rebekka Wehner
Multiplex Immunhisto
CD4/8: Ki67, PD-1,
LAG-3, TIM-3, GrzB

Tumor board
Knowledge Connector



Improved Therapy guidance for NSCLC-patients in the IMPALUX trial

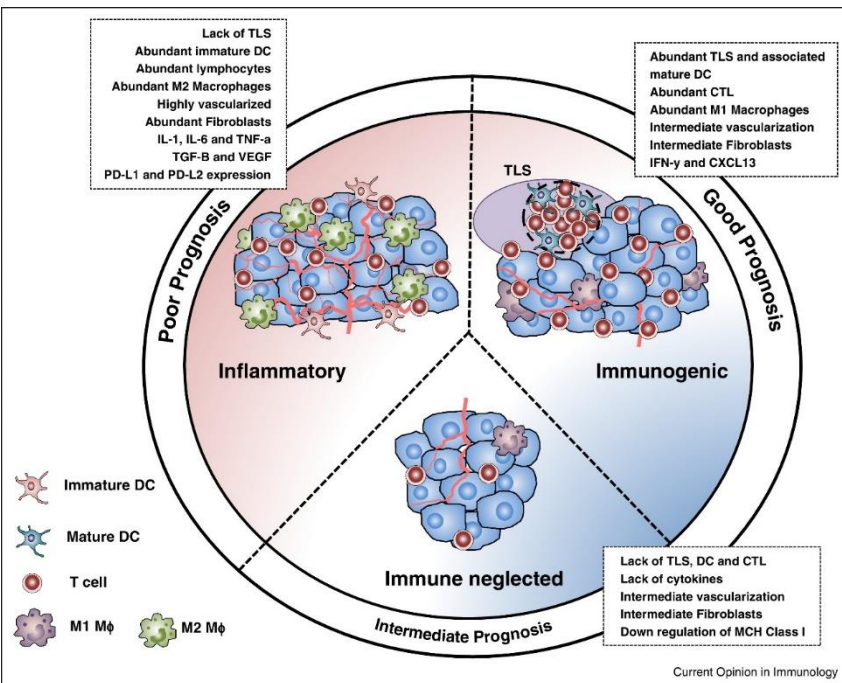


Summary

Detailed description of the tumor microenvironment

Aims:

- Identification of biomarkers for:
 - survival of patients
 - the selection of treatment responders
 - therapy resistance
 - treatment-related side effects
- Discover mechanisms underlying immunotherapeutic interventions
- Support the identification of appropriate treatment strategies for tumor patients



NCT Immune Monitoring Unit and Institute of Immunology



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Rothe



Susanne
Doms



Luise Rupp



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Plesca



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Franziska Eckert

Questions?

