TETHIS

“Seeing is saving”

See.d®
The first automated platform
for pre-analytical standardization
of multi-analyte liquid biopsy samples

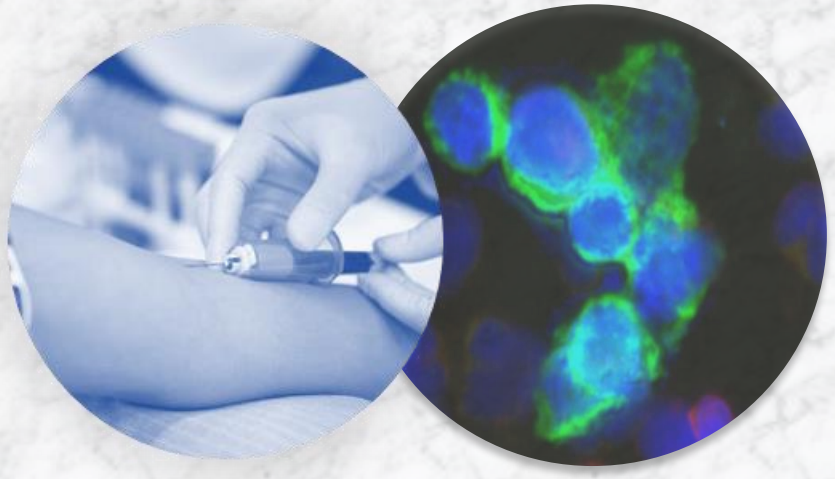
“Liquid Biopsies are drastically transforming the field of clinical oncology.”

Newer avenues in detection and continuous monitoring, treatment based on precision medicine and screening of biomarkers for therapeutic resistance

Liquid Biopsy: two key limitations and challenges

Lack of standardization of **preanalytical variables**

Need for demonstration of **the clinical value** of the "**cellular components from blood**", alongside plasma cfDNA in **a complete multi-omic approach** as a genuine **"Biopsy"** rather than **"Liquid Profiling"**

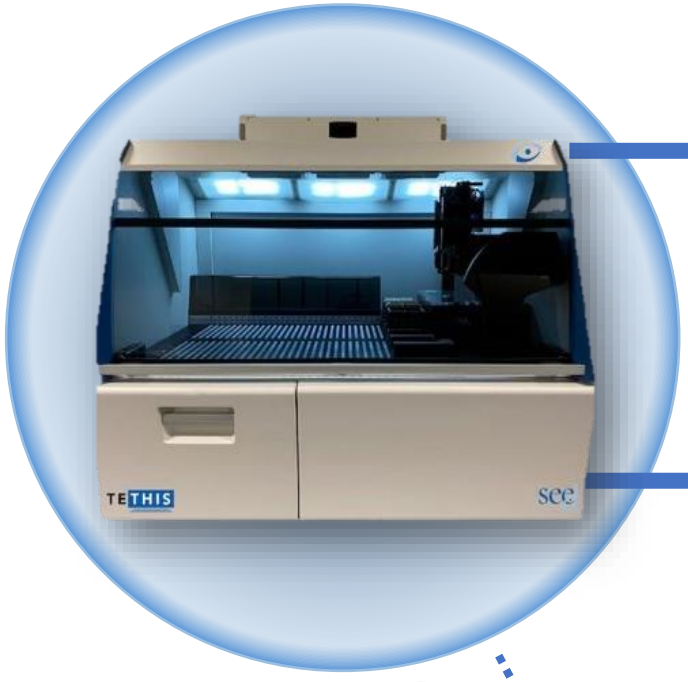


1. *Ignatiadis, M., Sledge, G. W., & Jeffrey, S. S. (2021). Liquid biopsy enters the clinic - implementation issues and future challenges. Nature reviews. Clinical oncology, 18(5), 297–312*
2. *Fleischhacker, Michael and Schmidt, Bernd. "Pre-analytical issues in liquid biopsy – where do we stand?" Journal of Laboratory Medicine, vol. 44, no. 3, 2020, pp. 117-142.*

Our solution:
the first automated platform for pre-analytical standardization of multi-analyte liquid biopsy samples

FRESH BLOOD

Collected in EDTA within 4-6 hours



See.d®

CYTOLOGY SLIDES

WBCs and CTCs

Seeded and fixed on proprietary SBS® slides

- Cell morphology
- Cluster formation
- Protein biomarkers
- Gene copy numbers (CNV, FISH, RNA of single cells)

PLASMA

Ready for cell-free content analysis

- Nucleic acids
- Exosomes
- Proteins
- Metabolites

WBCs

Ready for PCR, RNAseq, germline sequencing

- Germline DNA

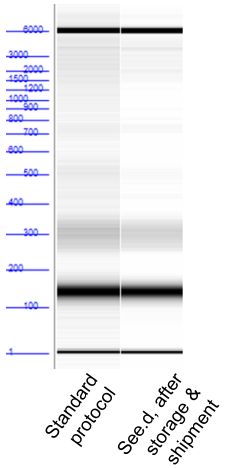
See.d®

our proprietary instrument for automated sample preparation

- Automated, standardized, **scalable** process
- **Plasma and cell** preparation is performed by a **gentle** approach to maintain clinical informativity
- **Immediate processing** at the **point of collection** – currently up to four samples per run
- **3.5 hour walk away protocol**, no need for specialized lab technicians

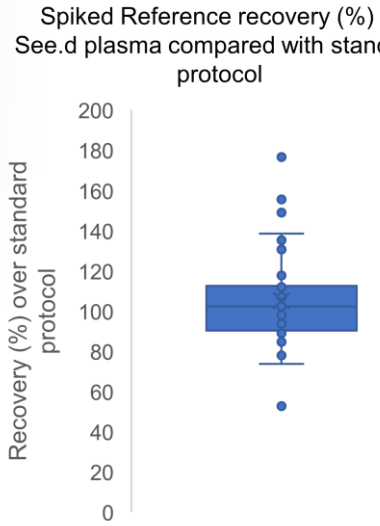
Patent filed in Italy with possibility for international extension.

cfDNA from healthy donor



Optimal stability, no increase in genomic contamination

Genomic contamination of cfDNA extracted from blood collected in EDTA and evaluated by Fragment analyzer



Equivalent recovery efficiency of spiked-in reference cfDNA

A synthetic fragment of a non-human sequence has been spiked in EDTA-collected blood (n = 41) for both See.d and standard plasma preparation, followed by cfDNA extraction and dPCR analysis

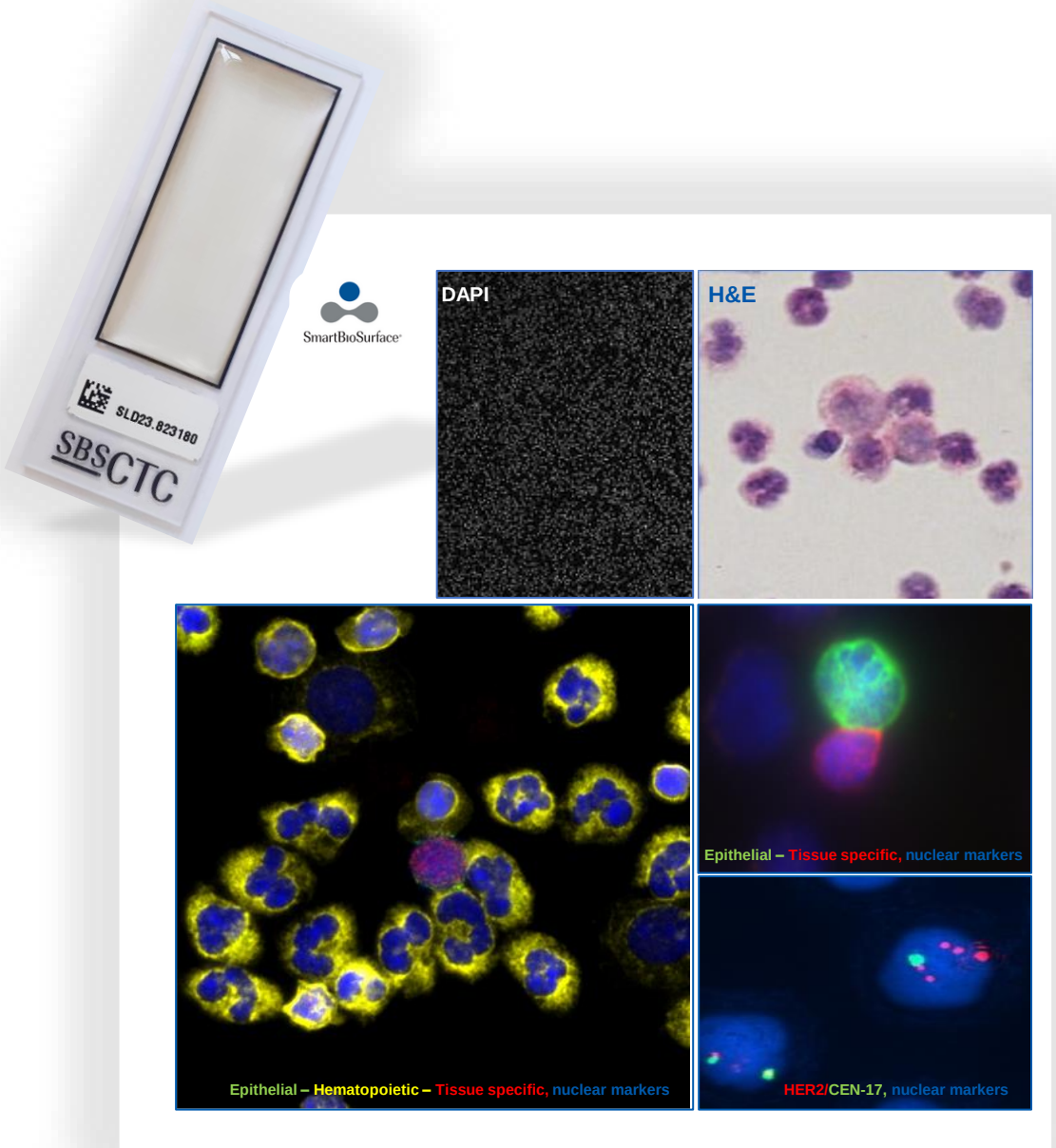
TETHIS

Plasma

standardized sample for established and emerging liquid biopsy assays

Stability testing: sample storage at 4°C for a week, followed by a three-day shipment at room temperature, avoiding immediate freezing at -80°C

- **Optimal stability, comparable level in genomic contamination** to manually prepared samples with Std protocol
- **Equivalent recovery efficiency** of spiked-in reference **cfDNA** from plasma prepared by See.d compared to plasma prepared by Std protocol



Cytology slides

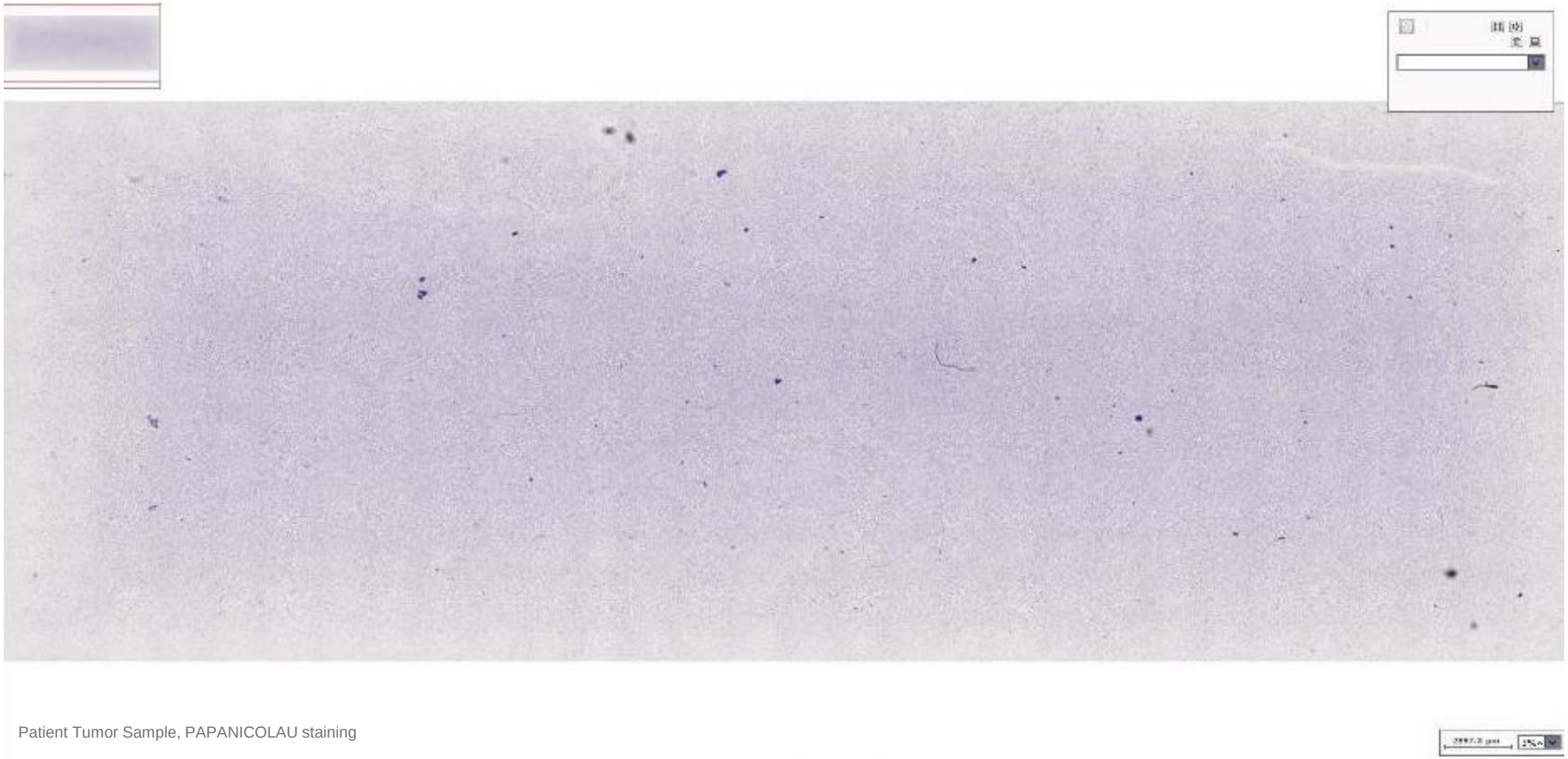
SBS® – Smart BioSurface

our proprietary nanocoated slides for cell seeding automation

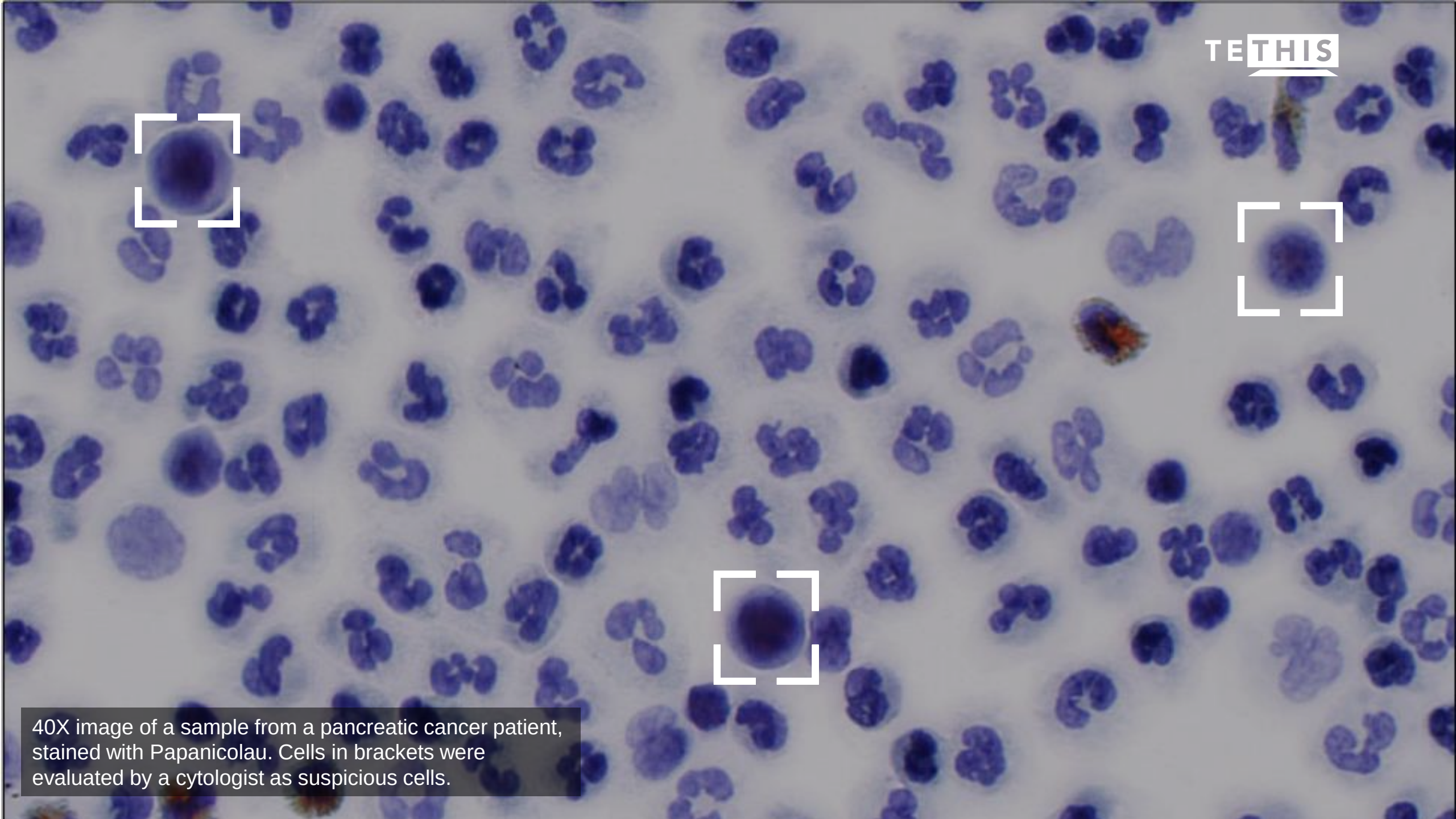
- **Over 99% adhesion of the entire fraction of living immune cells** in < 20 min at RT
- **Intact cell morphology**
- Uniform distribution of **2.5 million white blood cells**, **including rare cells**, **in a monolayer**
- **Strong cell adhesion** that **supports multiple staining rounds and protocols (BF, IF, ICC, FISH)** on the same slide
- Automated microscopy and **AI-based imaging algorithms** provide precise cell identification and classification
- Efficient **recovery of individual cells** through microdissection **for single-cell molecular analysis**

**Patent granted in Italy, intention to grant in Europe and Japan received, and pending in Australia, Brasil, Canada, USA, China, and Mexico.*

A monolayer of million cells from blood on SBS slides: a 2D tissue biopsy-like specimen



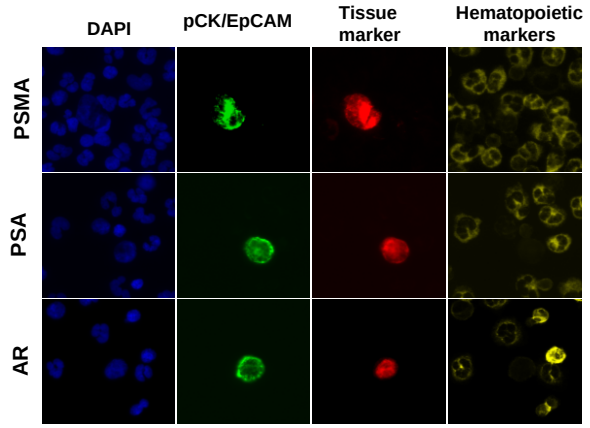
Patient Tumor Sample, PAPANICOLAU staining

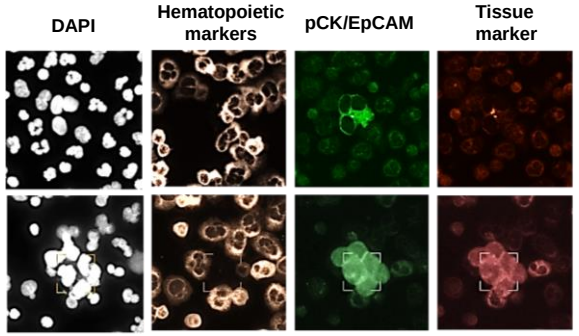


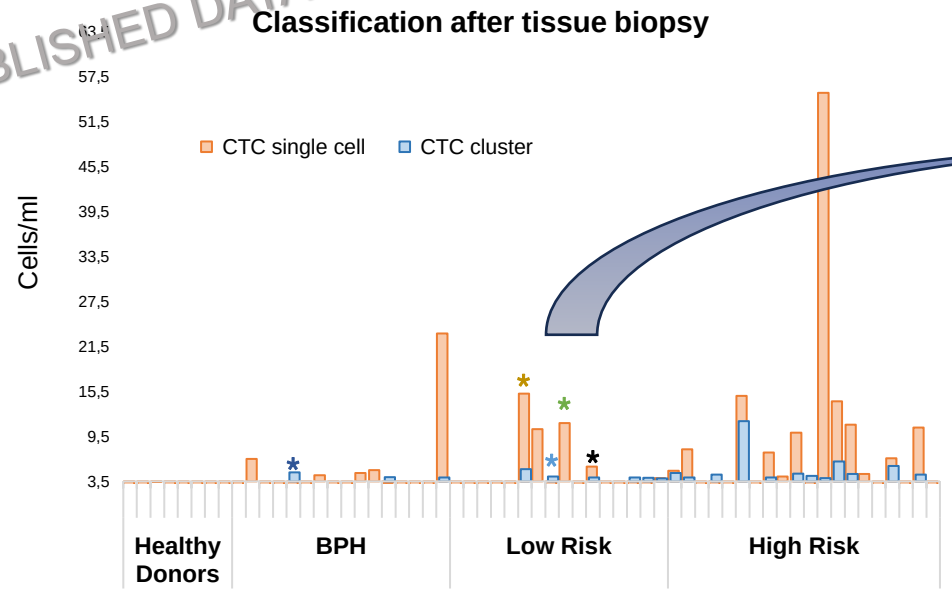
40X image of a sample from a pancreatic cancer patient, stained with Papanicolau. Cells in brackets were evaluated by a cytologist as suspicious cells.

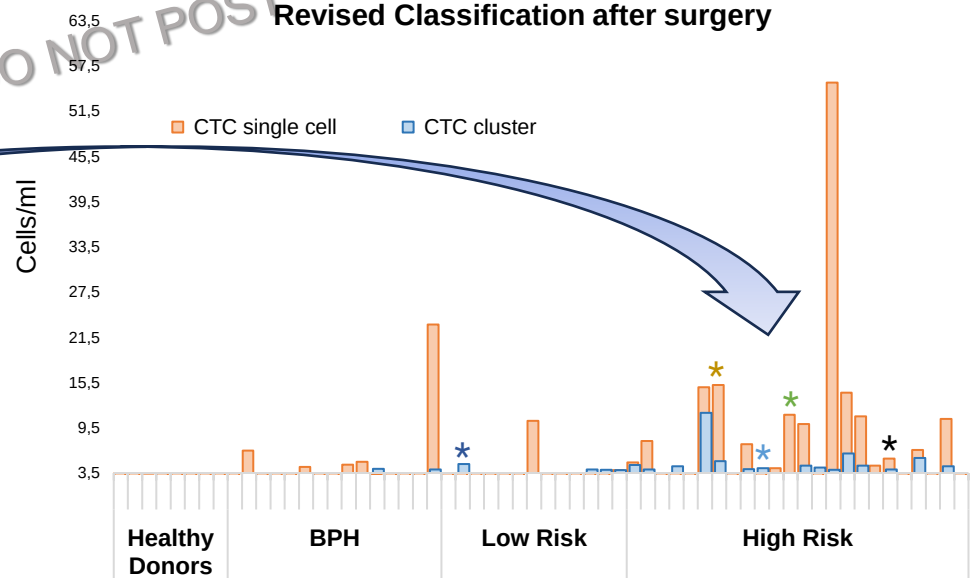
CTC and CTC clusters in localized prostate cancer as potential biomarkers for risk assessment and therapeutic intervention

Prostate cancer Trial Cohort (60 cases)	
Healthy Donors	8
	After Tissue Biopsy
BPH (Benign Prostate Hyperplasia)	16
Low Risk (PSA<10 ng/ml, and stage T1/T2a and *Gleason score 3+3)	16
High Risk (PSA>20 ng/ml or stage T3 or higher or *Gleason score 8-10)	20









See.d & SBS® a novel solution designed to enhance the clinical potential of a genuine *"multi-omic Liquid Biopsy"*

- **Standardizing the *preanalytical phase*** at the point of blood collection
- Preparing high-quality ***plasma*** from blood collected in **EDTA,** suitable for different molecular analyses
- Transforming the **cellular fraction** into a standardized ***cytology specimen*** **on SBS slides**, for **immune cells, CTCs, and CTC cluster** detection**,** for a **fully informative Liquid Biopsy sample**
- Providing ***multiple biomarkers*** from **fresh blood samples**, thereby improving sensitivity and specificity
- We have shown **preliminary findings** on ***clinical utility*** **in a pilot trial for prostate cancer,** other tests on different clinical settings (i.e. MBC) are ongoing

TETHIS

Come to see how See.d works at our booth!

Thanks to Tethis Team and our collaborators

OSPEDALE SAN RAFFAELE

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