Prostate HistoScanning™
Visual Reassurance for Decision Making and True Targeting
Prostate HistoScanning™ is a unique Tissue Characterisation technology, specifically developed to detect, visualise and pinpoint the tissues under suspicion of harbouring cancer. It gives clinicians an immediate and clear view with accurate identification, location and volume of differentiated tissue in the prostate.

Prostate HistoScanning™ TT complements Tissue Characterisation with True Targeting functionality, enabling real-time guided biopsy in the same patient session.

Prostate HistoScanning™ and Prostate HistoScanning™ TT will guide clinicians in making immediate, independent and informed decisions for each particular patient in their daily diagnostic routine, and opens up the options for least-invasive treatment.

Prostate HistoScanning™ TT displays suspicious tissues in colour, along with guided biopsy target planning (CLI-103). Ultrasound images are displayed as three sectional views, and can be rendered as 3D volumes.
Comprehensive in Prostate cancer care

"My centre was one of the first to start working with Prostate HistoScanning™ which in my opinion is an ideal imaging tool in hands of urologists to diagnose prostate cancer. I’m convinced of the benefits of the guided biopsy system for all of us."

PD Dr. med. Jürgen Zumbé
Klinikum Leverkusen, Germany
Comprehensive in Prostate cancer care

**Example of guided biopsy**

Target selection in the coronal plane and visualisation in 3D (CLI-101).

![Image](Image courtesy (CLI-101) of Dr. Johan G. Braeckman, Universitair Ziekenhuis Brussel (UZB), Belgium)

**Example of planning for brachytherapy**

"Cognitive HistoScanning™-based intra-prostatic boost ‘dose painting’ using temporary brachytherapy is not easy to realise, yet—as our preliminary clinical trial data suggests—it is feasible."

![Graph](DVH values:

PD 70.00000cGy

NPD N/A

CTV

Urethra

Rectum

HR-CTV

Example of planning for nerve sparing surgery

Preoperative knowledge of the distribution and size of tumours might be useful for treatment planning of a nerve-sparing radical prostatectomy. A virtual cutting line was drawn on both sides of the prostate corresponding to areas where slices for Frozen Sections (FS) were taken. The FS is used to assess the posterior lateral margin of the excised prostate to determine whether there is any cancer at the margin of the resection line. If the margin is cancer-free then the primarily preserved neurovascular bundle can be left in situ without compromising the removal of all cancerous tissues. [12]

It was shown that when no Prostate HistoScanning™ volume or a volume <0.20mL was found at the left or right side of the prostate, the probability of a negative surgical margin at that side was 91%.

![Graph](Image courtesy of PD Dr. med. Georg Salomon, Martini Klinik, Hamburg, Germany © 2013, BJUI. [12])

Contact your local representative for more clinical case studies; our library includes among others, cases of patients on active surveillance, cases of patients monitored after high-intensity focused ultrasound treatment.
Typical workflow of a Tissue Characterisation procedure

1. Acquire 3D NRF data
2. Contour the prostate
3. Automatic processing with algorithms
4. Clinical interpretation
5. Report and plan next step(s)

This fast and simple five-step procedure provides the visual reassurance clinicians need for initiating dedicated minimally-invasive prostate cancer care.

Images courtesy (CLI-097) of Dr. Johan G. Braeckman, Universitair Ziekenhuis Brussel (UZB), Belgium.
"When the patient arrives prepared, the examination with Ultrasound, Tissue Characterisation and the Guided biopsy procedure are perfectly feasible in one session!"

Dr. Johan G. Braeckman
Universitair Ziekenhuis Brussel (UZB), Belgium

Define target(s)

Start assisted transrectal navigation

Real-time guidance

Hit your target(s)

Biopsy session review

Images courtesy (CLI-103) of Dr. Johan G. Braeckman, Universitair Ziekenhuis Brussel (UZB), Belgium.
**Raise your standards with True Targeting**

**True Targeting comprises:**

- One **accessible** examination session with Tissue Characterisation and guided biopsy ensuring a fast and easy workflow for optimising your biopsies.

- Taking informed decisions on where to biopsy and how to select **your targets**: either your standard biopsy scheme, or your individual targets within or outside the differentiated area(s).

- Real-time guidance with easy navigation of the transducer towards the selected targets and providing **live visual reassurance** that the needle hits the intended spot.

- A quick **quality** check of the performed biopsies with the video report of the needle path.

See [www.histoscanning.com](http://www.histoscanning.com) for demonstration videos of Tissue Characterisation and True Targeting.

“I have been using Prostate HistoScanning™ within a research setting and in my practice. My data on its accuracy in detecting prostate cancer before radical prostatectomy are very promising. This makes it an interesting tool for planning and aiding decision-making before radical prostatectomy. I also see future benefits for targeted biopsies or for active surveillance of selected patients without the need for repeat biopsy.”

Petr Macek, MD PhD
General University Hospital and First Faculty of Medicine Charles University Prague, Czech Republic
In cooperation with Institut Mutualiste Montsouris, Paris, France
Technology Background

Prostate HistoScanning is a novel tissue characterisation technology based on artificial intelligence algorithms. It aims to improve the utility of ultrasound by providing additional information not available in conventional B-mode imaging.

Prostate cancer tissue microscopically differs from normal tissues as illustrated in the histopathological image (Images 1 and 2b). These differences impact the backscattered ultrasound waves. Due to the limited resolution of conventional ultrasound scanning, the precise histological structure cannot be viewed directly. However, the backscattered information contains a signature or fingerprint of the underlying structures from where they originate. Since these differences are not always visible, or even discernible through B-mode imaging, HistoScanning™ works directly with 3D raw ultrasound data or the Native RadioFrequency (NRF) data containing all the backscattered information (Image 2c). Compared to a B-mode image, a raw data frame contains approximately 30 times more data.

The HistoScanning™ artificial intelligence algorithm characterises and recognises particular tissue types (Image 2d) based on their backscattering properties. It has been trained on pathology data from radical prostatectomies (Image 2a) that have been processed to not only identify the presence of cancer but also its location within the prostate (Image 2b).

The output of the HistoScanning™ algorithm is displayed as colour markings overlaid on the B-mode image (Image 2e).
Clinical validity

Multiple studies have thoroughly validated the ability of Prostate HistoScanning™ to identify and characterise cancer foci with histology results from radical prostatectomy specimens as reference test. [1–10, 13, 14]

The exploratory proof-of-concept study PHS-01 demonstrated high concordance between Prostate HistoScanning™ and histology results: [2, 3]

- A strong correlation in diameter of index tumour \( (r=0.95, P<0.001) \);
- 100% concordance in attribution of multifocality and laterality;
- A strong correlation in lesion volumes \( (r=0.99, P<0.001) \) and total cancer volume \( (r=0.98, P<0.001) \);
- Prostate HistoScanning™ performed well in detecting cancer foci bigger than 0.50 mL on histology as illustrated in Table 1.

The multi-centre, European study PHS-02 examined the diagnostic accuracy of Prostate HistoScanning™ to locate a cancer focus of at least 0.20 mL or 0.50 mL in a sextant in patients with organ-confined prostate cancer and scheduled for radical prostatectomy. Prostate HistoScanning™ showed 90% sensitivity and 70% to 72% specificity (Table 2). [13]

### Spectrum of clinical benefit

- **Detection and Diagnosis**
- **Treatment planning**
- **Treatment guidance**
- **Surveillance**

Multiple users show in independent studies that Prostate HistoScanning™ provides key support to make informed decisions throughout prostate cancer treatment to provide optimal patient care; including:

- determining the need for biopsy or surveillance
- prediction of biopsy outcome and improved targeting of biopsies
- guidance in treatment planning and execution
- aid in monitoring of patients after treatment

Ask your local AMD representative for the latest Clinical Studies Summary – regularly updated under reference MK2U00399.
Bibliography


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Integration of society guidelines or clinical protocols, as well as any form of automation, reporting and networking are under the user's responsibility.
The functionalities are depending on product configuration and availability. Currently supported ultrasound devices compatibility you find listed at www.histoscaning.com.