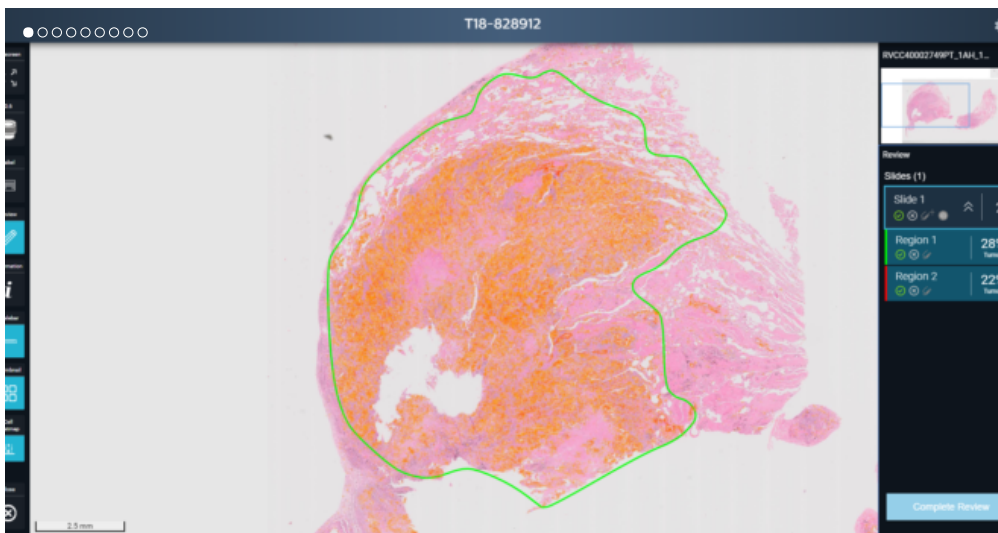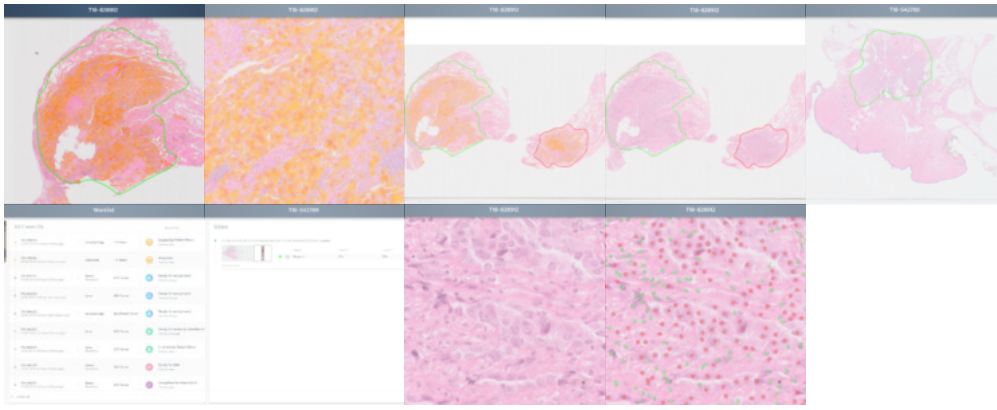# TissueMark
Computational pathology

Contact Us

Analyze solid tumor tissue samples fast and enhance the quality and accuracy of macro-dissection, nucleic acid extraction, and molecular profiling using TissueMark[1].

Gallery

Accurate and reliable tumor estimation powered by Deep Learning

TissueMark is a key offering in our computational pathology portfolio that assists the user to examine the region of interest for macro dissection by:

- Visualizing the region of interest (ROI) and
- Indicating the estimated cellular profile in the region of interest

TissueMark enables region of interest detection and cellular profile estimation in digital whole slide images of Lung Histology, Lung Cytology, Breast and Colon[2] formalin-fixed paraffin embedded, H&E stained tissue samples. The algorithms are trained to work on Philips iSyntax image format. The application provides three levels of visualization – a macro dissection boundary, a visual heat map of tumor density and, at higher magnification, cellular visualizations. Color-coded, this enables differentiation of the region of interest from stroma, inflammation, lymphocytes and necrosis thereby providing an accurate macro dissection boundary for further molecular testing.

Improve the quality of molecular tests with accurate ROI and cellularity guidance

Given the inter-pathologist variation that is widely acknowledged[3] in the industry, TissueMark macro dissection boundary suggestions show a higher acceptance by pathologists. TissueMark also measures the percent[4] of tumor nuclei to ensure sample quality and sufficient tumor nucleic acid for molecular profiling. TissueMark deep learning algorithms are trained to identify cellular structures from other morphology and classify identified cells into tumor vs non-tumor cells. This provides a reliable, accurate cellularity estimate that can help pathologists determine if the sample is sufficient for further molecular testing. Research studies have shown very high correlation (Pearson Correlation Coefficient > 0.95 across all supported tissue types) between TissueMark nuclei detection and the gold standard, hand counted estimations of pathologists.
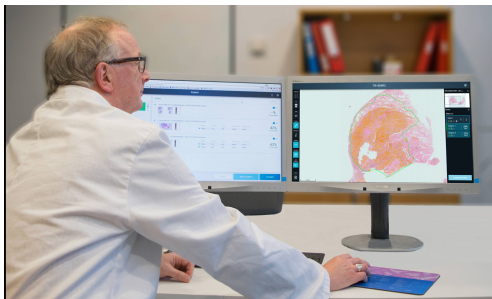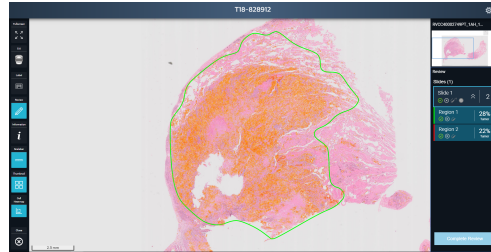

High throughput, intuitive workflow to saves valuable time of lab personnel

TissueMark is an easy-to-use, intuitive tool that is aligned to the needs of the modern day molecular lab. TissueMark helps organize and dispatch whole slide images rather than slide trays with glass slides which require manual sorting, preparation and logistical transport. The application provides automatic organization of the worklist of a pathologist. In comparison to the current glass based workflow, the pathologist[5] can view the entire worklist assigned to get an overview of the pending, completed, and urgent work.

Continued...

TissueMark algorithms are designed for fast execution with a runtime of 60 seconds[6] on every whole slide image across the tissue types supported. Fast algorithm execution combined with the work ow design ensures that the pathologist always has the results when they begin to review the slide, thereby saving valuable pathologist minutes in the lab.
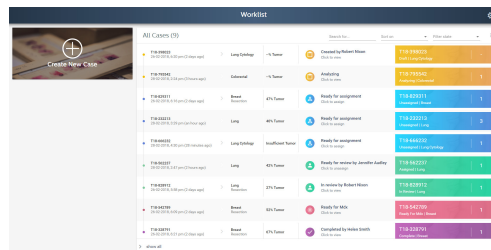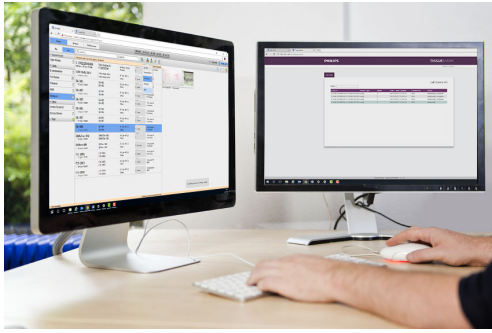
Interoperable with Philips IntelliSite Pathology Solution thereby providing a unified digital workflow

TissueMark is inter-operable with Philips IntelliSite Pathology Solution (PIPS) and via PIPS with your Laboratory Information System (LIS), thereby enabling automatic execution of algorithms on whole slide images (WSI) that are chosen for molecular testing.

Literature

- Brochure: TissueMark Brochure
- Research Paper: Automated tumor analysis for molecular profiling in lung cancer

Specifications

Minimum hardware requirements

CPU	Dual-core @1.65GHz	**Operating system**	Most recent web browser
RAM	3GB of physical RAM memory	**Other software**	A PDF reader (e.g. Adobe Acrobat Reader)
Screen Resolution	1024×768	**Connectivity**	
Browser	IE (11), Chrome, Firefox, Safari		100Mbit or 1Gbit Ethernet connection to internet/intranet

Related products
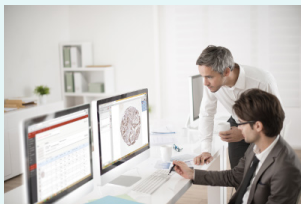
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1. TissueMark is not intended for diagnostic, monitoring or therapeutic purposes or in any other manner for regular medical practice.
2. PathXL is the legal manufacturer of TissueMark and is a Philips company.
3. A Prospective, Multi-Institutional Diagnostic Trial to Determine Pathologist Accuracy in Estimation of Percentage of Malignant Cells, Viray et al.
4. Independent pathologists' evaluation on 446 WSIs from multiple labs. Average boundary acceptance (including minor edits) of TissueMark generated macro-dissection boundaries, across Lung, Breast and Colon, at 80%
5. Relies on the level of PIPS-LIS interoperability with TissueMark.
6. As measured on whole slide images with tissue area of 15mmx15mm and run on server configured with 128GB RAM, processor: Intel ® Xeonr CPU E5-2640 v4@2.4 GHz, GPU Nvidia Tesla P4

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