Stereology
Module for Digital Pathology

Aperio, in collaboration with ADCIS and the European Cancer Centre Francois Baclesse, introduces a start-of-the-art, computer-assisted stereology module for pathology.

Stereology today is used in a wide variety of applications including neuropathology, pulmonary and kidney diseases, diabetes, and cancer. This tool allows you to acquire precise knowledge about 3D structures such as cells, vessels, alveoli, and tumor compartments.

Region of Analysis (ROI)

Obtain reliable and unbiased quantitative results of complex 3D biological structures using efficient statistical sampling techniques and estimators on 2D sections.
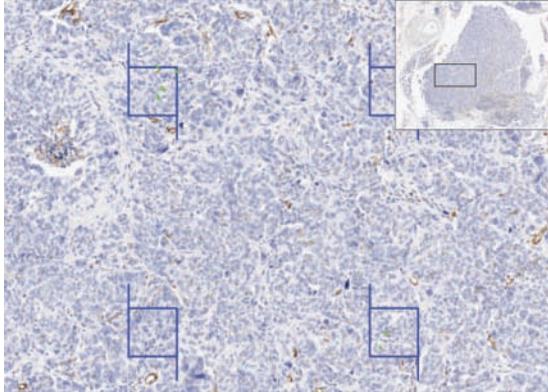

Grid

With this module, you can seamlessly integrate stereology into your digital pathology workflow.

STEREOLOGY IN 4 SIMPLE STEPS:

1 REGION OF INTEREST (ROI)
Define a region-of-interest consisting of one or multiple regions using rectangle, ellipse or freehand drawing tools.

2 GRID
Select the grid type, choosing from point counting and uniformly sampled squares with forbidden lines, and define the spacing.

Manual Classification

3 MANUAL CLASSIFICATION
Highlight structures of interest (e.g. biomarkers) on the grid.

4 STEREOLOGY RESULTS
The system automatically computes biomarker parameters such as volume fraction or numerical density of biomarker profiles per unit area based on stereological statistical analysis.

Stereology Results
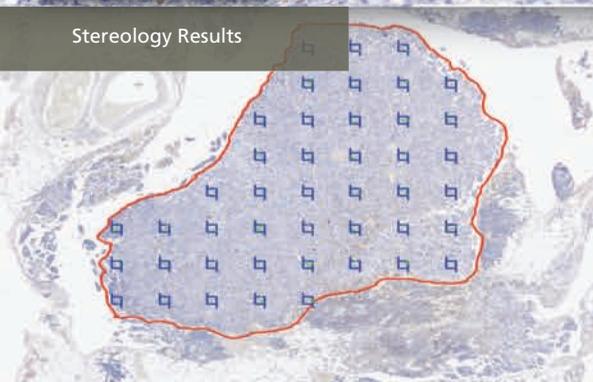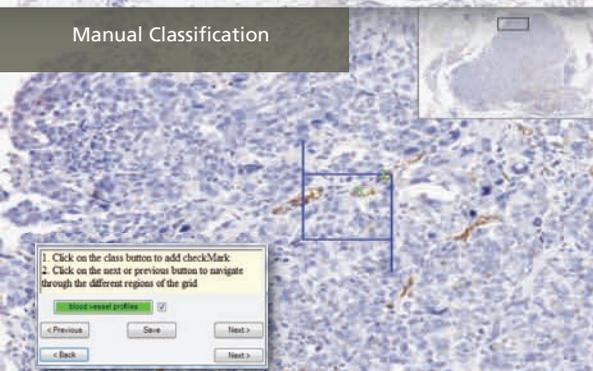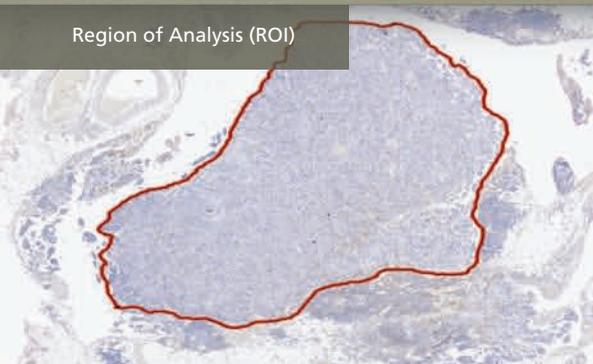
BEST METHOD FOR MANUAL WHOLE-SLIDE ANALYSIS

Compute quickly an unbiased and reliable estimate for the whole slide using our stereology tools (blue grid).

Without a robust image analysis application to analyze whole sides (due to complex structures of interest, problematic staining, and variability between slides) the only option is to analyze the whole slide manually, which is too time consuming even with computer-assisted tools (in the order of hours/days per slide).

The current practice of estimating the results for the whole slide from selected views provides an estimate in a reasonable amount of time, but is subjective based on the proper selection of a representative set of views.

Using stereology with systematic random sampling you can obtain unbiased and reliable estimates for the whole slides in a reasonable amount of time.

## 3D MEASUREMENTS OF BIOLOGICAL STRUCTURES

2D Section
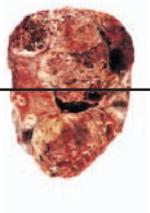
3D Specimen

Obtaining measurements of complex biological structures in a 3D specimen is important, but for complex structures of varying size, counting sliced views of the structure on a 2D slide may introduce severe bias when an appropriate estimator is not used.

Stereology, based on efficient statistical sampling techniques and estimators applied to biological specimens, allows you to correctly quantify 3D specimen properties from information sampled from a 2D section.

VALIDATION OF IMAGE ANALYSIS
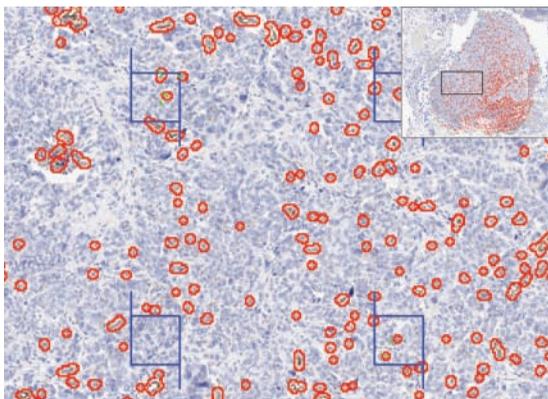
Determine the sensitivity and specificity of your image analysis applications by comparing the image analysis results (red markup) to a quickly computed, unbiased and robust estimate using our stereology tools (blue grid).

The validation of whole-slide image analysis is a difficult task. Having an expert annotate whole slides to provide the ground truth for the validation of an image analysis application is very time consuming.

Using stereology, a good estimate for the ground truth of whole slides can be obtained quickly and easily by providing the ground truth at sample locations, which now transforms whole-slide image analysis validation into a very manageable task.

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Make Pathology Extraordinary