LIFESPAN BIOSCIENCES

ALIAS™ Automated Imaging & Analysis System

The increasing use of large numbers of tissue specimens and tissue microarrays in research has created a need for a high-throughput system to capture high quality images for automated analyses, including identification of normal and abnormal cells and structures, and localization and quantification of proteins stained by immunohistochemistry.

ALIAS™ was developed to meet these requirements of high throughput and image quality. In order to do this, LifeSpan overcame significant technical barriers that limit the performance of other systems. When combined with a growing number of sophisticated analytical software packages, ALIAS™ promises to be a powerful tool for automated imaging and analysis applications in cancer detection, biomarker analysis and toxicologic pathology.

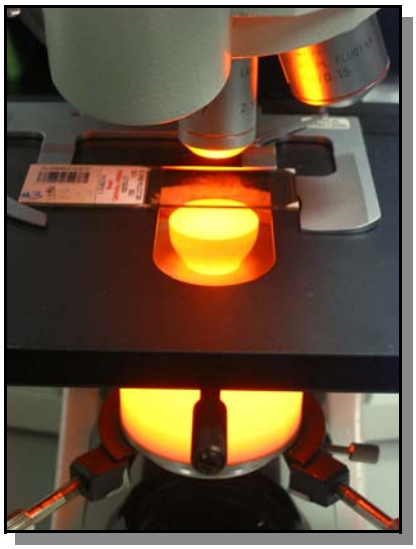

Image Quality

Accurate analysis of pathology images demands high resolution and the maximum possible amount of color information. ALIAS™ was designed to produce such analytical grade images. LifeSpan's proprietary LED light source is immediately stable upon power-up and produces multispectral light with virtually no infrared contamination. Custom microscope components and precision Leica objectives deliver a uniformly flat field of light at magnifications from 1.25X to 40X, a requirement for automated image analysis, while ALIAS™'s software ensures accurate auto-focusing across large slide areas even at the highest magnifications. By combining the multispectral LED light source with a monochrome camera the spatial resolution of the system is improved 2-fold over systems using conventional Bayer mask cameras, in which alternating pixels detect either red or green or blue light, degrading image resolution.

High Throughput

ALIAS™ allows up to 300 slides to be loaded for fully automated image acquisition and analysis. A bar code reader enables the system to retrieve multiple tissue layout templates, execute predefined imaging scripts, and manage the resulting data for each slide. A proprietary tissue mapping algorithm minimizes imaging time and disk storage space by automatically locating tissue elements on each slide, so that blank areas are not imaged. The total time necessary for moving the microscope stage, focusing, image capture, and image stitching is further minimized by using a large format 2048 x 2048 pixel CCD/monochrome camera, which captures almost 4 times more information than systems with smaller format cameras. Image analysis speed is increased by using 2 to 16 3.2 GHz Xeon processors and up to 12 TB of local disk storage.

Open System

In order to maximize its utility in the laboratory, ALIAS™ has been designed with an open software architecture to allow for integration of image analysis applications from the user, from LifeSpan and from third parties. LifeSpan is currently developing software for IHC quantification, cancer detection, normal tissue structure recognition and toxicology.

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FOR RESEARCH USE ONLY

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The LifeSpan ALIAS™ imaging platform provides all that is needed to capture and manage high-quality, analytic-grade images from full specimen and tissue microarray slides.

Hardware Specifications

- 1.25, 5, 10, 20, 40X objectives
- LED Light Source
- Camera: Large Format (2048 x 2048 pixels)
- Barcode / Label Imager-Decoder
- Slide Vacuum Control System
- Dual Xeon Processor 3.2 GHz
- 2 GB RAM
- 70 GB Local HD
- Keyboard/Mouse/Monitor
- Vibration Isolation System
- Light/Dust Cover
- Ethernet 10/100/1000 x 2

Software Applications and Licenses

- ALIAS™ Imaging Control Application enables the user to define custom imaging protocols for the documentation of specific study materials. Slide barcodes can be read and used to identify slide formats and imaging parameters. Solid tissues can be automatically mapped or tissue microarray grids applied to maximize imaging efficiencies. Stage movement, vacuum, camera, light wavelength, auto-focus, and white balance are controlled automatically so optimal images can be taken at various magnifications and the data stored for analysis.
- ALIAS™ Image Viewer enables the user to review and manipulate images produced by ALIAS™. Images can be recalled based upon project, slide number, or file name.
- ALIAS™ includes a license to JPEG2000 and WinXP Professional

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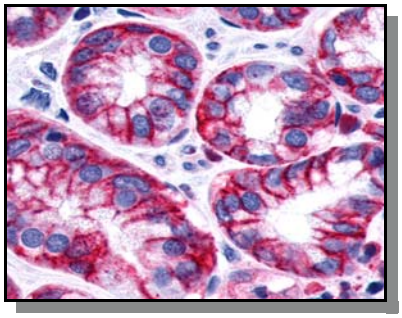
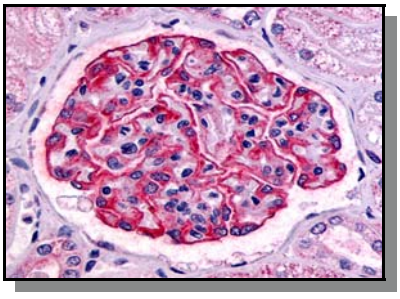
ALIAS™ Hardware Expansion Modules can be added to enable automatic loading up to 300 slides, to expand the system's storage capacity in 4 TB increments, and to increase the system's computational capacity for image analysis.



Stomach, Gastric Glands, 40x



Kidney, Glomerulus, 20x

Auto Slide Handler

300 Slide Autoloader
12 cassettes each holding up to 25 slides
Modified Vibration Isolation System and Light/Dust Cover

Image Storage System

4 TB Local Image Storage
Dual 3.0 GHZ Xeon, Windows 2003 Server based
19" Rack Mount
UPS with KVM Switch and Cables
10/100/1000 Layer 2 Switch and Ethernet ports

Image Analysis Units

3.2 GHz Dual Xeon Processors 4 GB RAM, 800 MHz FSB
Rackmount configured
Two 10/100/1000 ethernet ports
WinXP Professional OS

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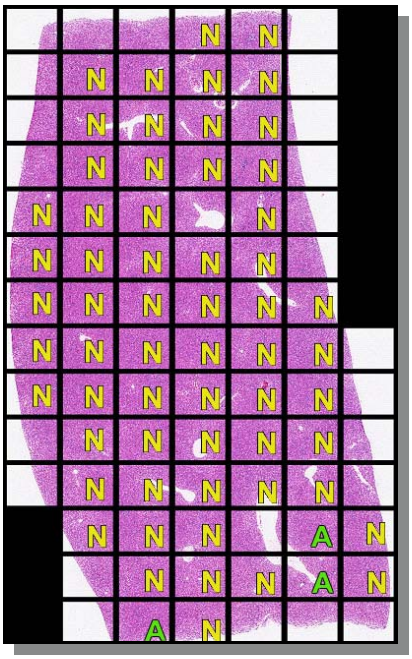
ALIAS™

Automated Image Analysis

LifeSpan develops automated image analysis applications under contract for clients with specific analytic needs. Examples Include:

- Human and animal tissue recognition, structure and cell type identification and quantitation.
- Histology Quality Control that recognizes preparation artifacts, tissue location variations and evaluates stain quality prior to pathology review.
- Cancer diagnosis and morphometric analysis (six major cancers).
- Immunohistochemistry signal quantitation, cell counting and sub-cellular localization.
- Automated evaluation of images of toxicologic tissue samples for normal and non-normal status, lesion identification, and quantitation.

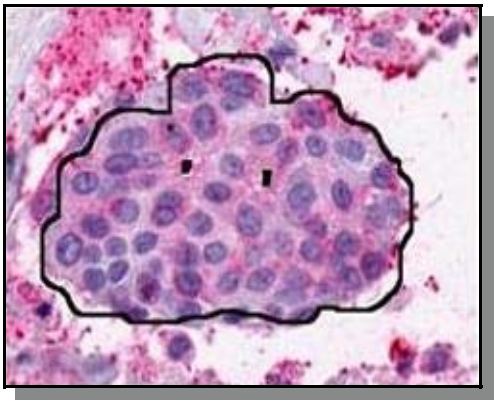
LifeSpan provides customized solutions to pathology related image analysis and quantitation bottlenecks.



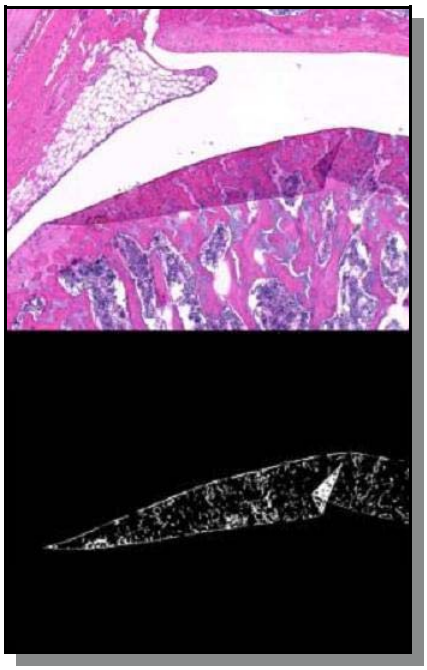
Rat Liver Screening
Automated Results

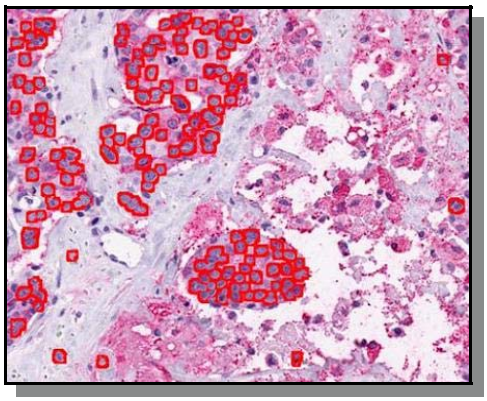
N = Normal
A = Abnormal ##

Cancer Detection #
based on Hematoxylin morphology



Automated Fold Detection





IHC Quantitation: After cancer is localized based on hematoxylin signal the marker is quantified in nuclear & cytomplasmic areas.

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