ANDOR
an **Oxford Instruments** company

Komet 7

Acquisition and Analysis Software for the Comet Assay - Research and GLP

Komet 7

Now with Zyla 5.5 USB 3.0 support. Score comets faster than ever, less scanning more scoring.

Komet software allows the capture and analysis of images from the Comet Assay. The Comet Assay permits the quantification of DNA damage and repair in single cell preparations and is applicable to any eukaryotic cell.

The assay can be used in both in-vitro and in-vivo testing and has been shown to be a powerful and sensitive predictor of genetic toxicity.

Komet is available as a standard research product and a GLP product.

Key Features

Flexible - Software control of wide range of cameras from sCMOS to video, Firewire (IEEE1394) and USB
Large Field of View options with Andor sCMOS integration - faster scoring option
"Virtual Camera" - scores live images from **any** camera you already own
LED light sources - replace mercury bulbs with safe, efficient, long-life illumination
Certified Windows 7 compatibility - Windows 8.1 coming soon
Fast and easy to use - pop-up controls accelerate scoring and minimize fatigue
Fully automatic or interactive computation of Head/Tail %DNA, Tail Length, Olive Tail moment, etc.
Background correction for every cell scored
User-friendly, freely distributed Database Viewer (DBV) application
Databases include all comet images, parameters and audit trails **GLP**
Proven performance - reliable data analysis with backward compatibility
Integrated creation of summary statistics - optimizes data workflow and reporting
Facilitates OECD TG 489 guideline requirements for data and statistical analysis **GLP**
Fulfills FDA 21CFR part 11 requirements for electronic data **GLP**
Developed under ISO9001 quality assured engineering processes
"Experiment" mode guides the user through analysis - slide by slide
Scoring can be suspended and resumed in multiple sessions
24 parameters are computed from the comet image based on intensity and migration patterns
User can over-ride to interactive scoring on-demand - especially useful for "hedgehog" or heavily damaged comets
Cell saturation check prevents unsuitable analysis and warns you to adjust the camera or illumination

Komet 7 now available with Zyla 5.5 USB 3.0

Large field of view for rapid comet scoring; ideal for industrial labs where high-throughput is essential.

For more information on the Zyla 5.5 USB 3.0 sCMOS camera visit andor.com/zyla-55

Komet 7-GLP

Komet 7-GLP ensures FDA 21CFR part 11 compliance: electronic signatures safeguard your data and audit trails certify scoring for quality assurance. Komet Datasets fulfill the recommendations of OECD Testing Guideline 489 for the In-Vivo Alkaline Comet Assay.

Komet 7-GLP lets a study manager create datasets for each study, manage scorers and select or create a suitable scoring protocol.

Komet captures an image for every comet scored and records this image in the dataset along with key, internationally agreed, analysis parameters. Datasets are password protected and are reviewed, decoded and prepared for statistical analysis in the Database Viewer (DBV).

Komet 7-GLP datasets include audit trails for GLP quality assurance.

Key Features

Password protection to avoid unauthorized access
Electronic signature to validate dataset contents and assure data integrity
Audit trail information which includes: • Dates and times of scoring sessions • Scorer profile per session • Slide IDs scored per session

To record and coordinate this information in the dataset, Komet 7-GLP supports different levels of control over the software. To achieve this it uses the Windows 7 User Groups.

Komet Administrator must be a member of that User Group and is able to control hardware settings, Komet system-level settings and create Study Managers
Study Managers is a Windows User Group able to create new studies, define study dataset properties and scoring protocols, and assign scorers
Scorers are able to score comets from their assigned studies

Important Notes on Komet 7-GLP and GLP Validation

For use in GLP (Good Laboratory Practice) contexts, software must be validated in each individual laboratory and it is done in combination with standard operating procedures in the laboratory. According to FDA 21CFR part 11 regulations, Komet 7-GLP can be considered an 'off-the-shelf' software for Comet Assay analysis. Proceeding with local validation will be significantly simplified if this designation is used.

Further, because all changes in the computer system (including the Windows operating system) may impact performance and require repeat validation, we recommend that the Komet 7-GLP workstation is operated on a computer in which automatic updates of Windows are disabled. We also recommend that workstations are not connected to the internet due to the risk of infection by malware.

> Komet software is reliable and easy to use and in my experience Andor has been the only company to adapt the software to user needs rather than force users to adapt to the software. We strongly recommend Komet to research and safety testing labs alike.

Marie Vasquez, Operations Director
Helix3 Inc., USA

You can read Marie's paper entitled "Recommendations for Safety Testing with the In-Vivo Comet Assay" here:
http://www.sciencedirect.com/science/article/pii/S1383571812001878

Database Viewer (DBV)

DBV provides a portable, convenient and flexible tool for the GLP and research laboratory, which can be managed by the team without support from the IT department.

As part of the Komet software suite, DBV provides a unique solution for data management and analysis.

To simplify QA, review and reporting of data, DBV has been packaged for free distribution meaning the Komet user can supply DBV to clients, colleagues or the QA team with a dataset and password to enable study of the data for the desired purpose.

In addition to data storage and audit trails, DBV provides essential data review and preparation functions prior to statistical significance testing including log transformation of data.

Key Features

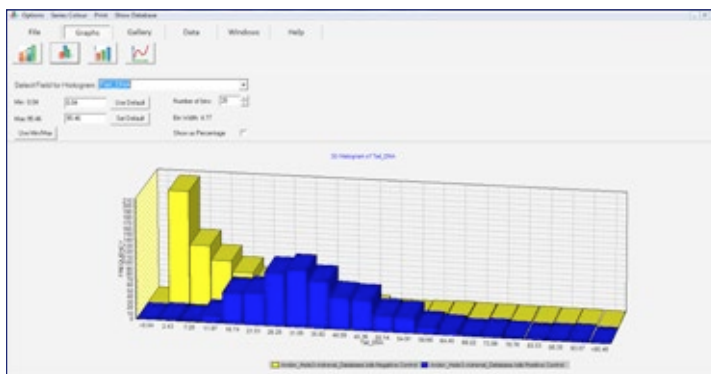| |
|---|
| Decoding for blind-scored studies, essential for GLP purposes |
| Data Review image by image or by creating image galleries (see Fig. 3 opposite) |
| Graphical Data Review including bar graphs, 3D histograms and dose response curves |
| Organization of data by treatment or exposure groups for significance testing |
| Locked database provides security and validation of data |
| Facilitates OECD TG 489 guideline requirements for data and statistical analysis |
| DBV can be distributed free of charge with the data for review at other sites |
| Integration and comparison of data from multiple databases |

Figure 1 - 3D Histogram created in DBV from a Helix3 dataset

> " We especially like the freely available Database Viewer (DBV) which ensures our data quality and consistency by allowing us to easily view all comets scored. The DBV also enables decoding of blind-scored studies and summarizes results for statistical analysis in just a few mouse clicks.

Marie Vasquez, Operations Director
Helix3 Inc., USA

Figure 2 - Data Summary Table created in DBV from a Helix3 dataset

Key Applications for Komet

Komet is the most highly referenced Comet Assay analysis solution in research publications: invest in Komet for your DNA integrity research.

The Comet Assay is a powerful tool for applications as diverse as cancer research, safety testing of pharmaceuticals and chemicals, environmental and occupational studies, dietary and even fertility research.

The assay is widely used in many different disciplines because it can be adapted to virtually any cell-type from almost any organism and study. Designs can be created to characterize DNA damage and repair as well as DNA integrity and comparisons between different populations.

Key Applications

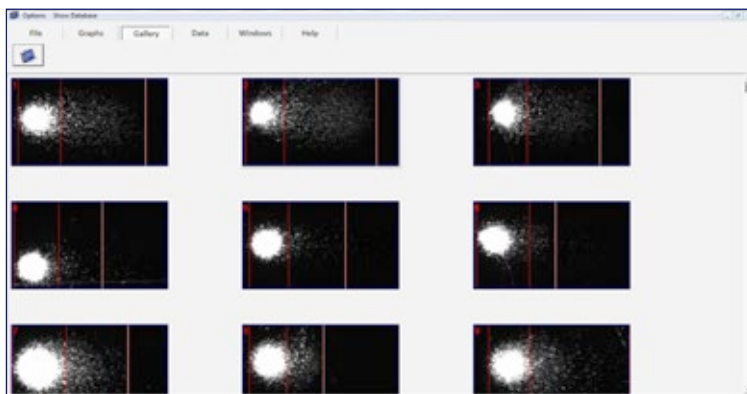| |
|---|
| Cancer research |
| Safety testing of pharmaceuticals and chemicals (Toxicity Studies) |
| Environmental and occupational studies |
| Dietary research |
| Fertility research |
| Study of DNA damage, repair and integrity |
| Comet-FISH - determine sequence or gene specific damage and repair |

Figure 3 - A Comet Image Gallery produced produced by DBV from Helix3 dataset
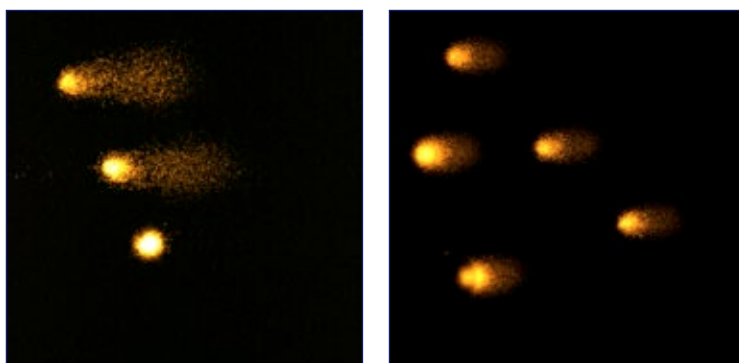

Figure 4 - Images from the Comet Assay acquired using Komet software

> I have been using Komet software from Andor Technology for the past 20 years and many of my colleagues also use it for their acquisition and analysis of the Comet Assay. The technical support from Andor has been outstanding and I cannot recommend Komet software enough.

Professor Diana Anderson,
University of Bradford, UK

You can read Diana's paper entitled "Sensitivity and specificity of the empirical lymphocyte genome sensitivity (LGS) assay: implications for improving cancer diagnostics" here:
http://www.fasebj.org/content/28/10/4563.short

Komet Scoring (Live or from File)

Komet software is so versatile it can score comets either during a live acquisition using the many cameras it supports or from files that have been saved and need scoring and analysis.

The Comet Assay is a test to evaluate the integrity of DNA in cells. Any eukaryotic cell can be tested, making the assay widely applicable. Under an electrophoretic field, damaged cellular DNA is separated from intact DNA, yielding a classic "comet tail" shape under the microscope.

The extent of DNA damage can be easily measured using Komet software. With just a single mouse click, statistics are instantly available therefore allowing the user to quickly define the level of DNA damage in the sample.

Live Scoring Features

Scoring is fast - 300-400 comets per hour
Pop-up controls reduce user fatigue
One right mouse click initiates capture and analysis
Automatic background correction for every cell
As each cell is scored measurement calipers provide visual feedback on accuracy of analysis
For each comet analysis, results and intensity profile data are instantly shown in the analysis panel
Pseudo-color display enhances tail visibility (see below)

Scoring From File

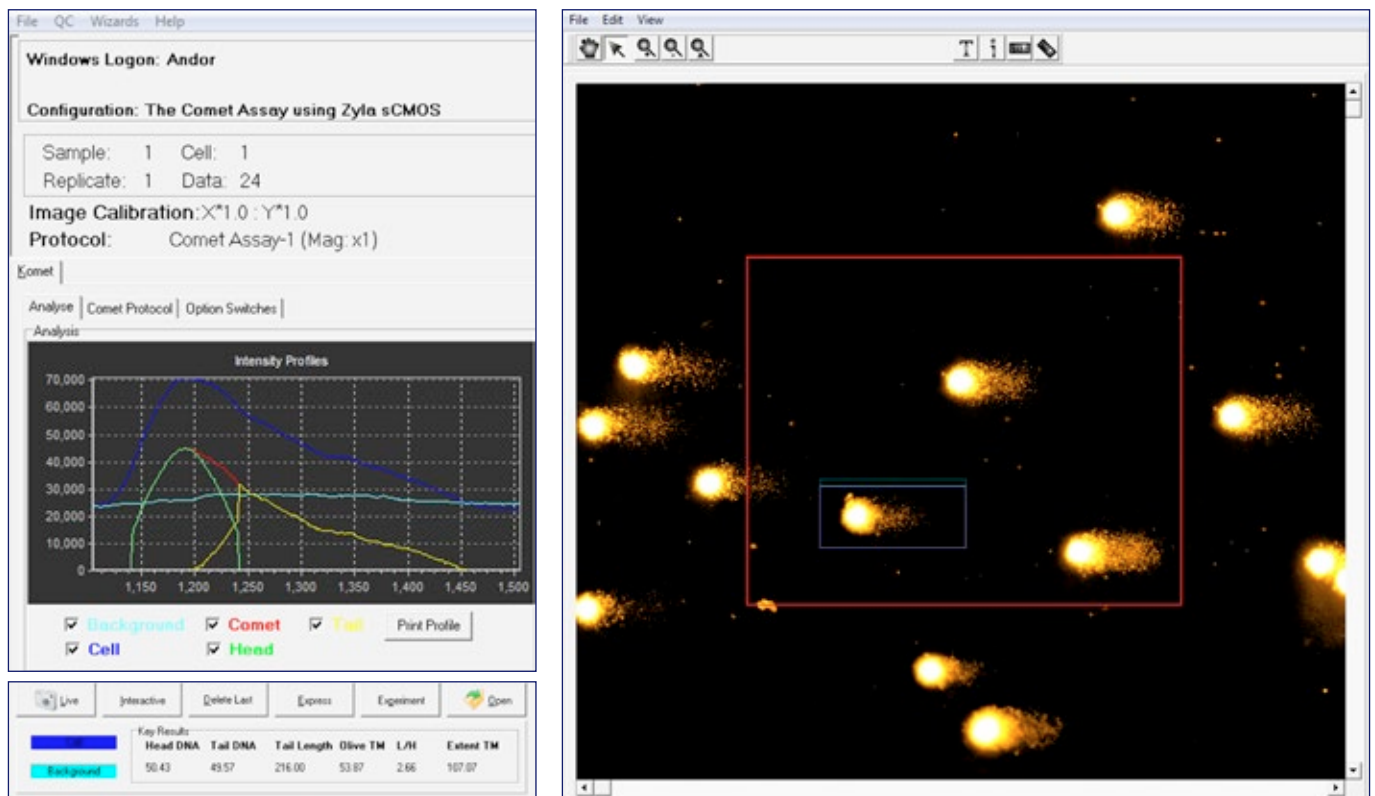| |
|---|
| Standard and proprietary 8, 12, 16 bit gray and 24 bit color files are handled seamlessly |
| "Apply Calibration on Open" calibrates images for real measurements |
| "Flip or Rotate on Open" function allows images (with comet tails to left) to be automatically oriented for analysis |

Figure 5 - Analysis panel on left shows User and Experiment context; intensity profile data and analysis results. The image shows the field of view of Zyla 5.5 (2560 x 2160 pixels) vs standard CCD (1280 x 1024) with a 20X objective. The standard camera shows three comets which could be scored in its field of view, while the Zyla 5.5 includes up to 11; this feature provides faster scoring with less time scanning the slide.

Komet Packages

As manufacturer of both camera and software, Andor is able to offer a new range of Komet workstation packages, which include Komet 7, Data Base Viewer (DBV), a state of the art sCMOS camera and high performance Windows workstation, providing best value and guaranteed performance. Komet 7 can provide an upgrade path to existing users, either through the new workstation package or via re-use of existing third party cameras.

Package	Order Code	Description
KOMET R with Zyla 5.5, USB 3.0 and PC	KOMET-R-WSTN-Zyla	Zyla 5.5 USB 3.0, 5.5 MP, 6.5 µm pixel sCMOS camera with USB 3 connectivity, power supply and cables included. KOMET R and DBV pre-installed and burn-in tested. High performance Dell T1700 8GB RAM, 512 GB SSD, Firepro performance graphics, 24" LED Monitor. Full functionality guaranteed out of the box.
KOMET GLP with Zyla 5.5, USB 3.0 and PC	KOMET-GLP-WSTN-Zyla	Zyla 5.5 USB 3.0, 5.5 MP, 6.5 µm pixel sCMOS camera, with USB 3 connectivity, power supply and cables included. KOMET 7GLP and DBV pre-installed and burn-in tested. High performance Dell T1700 8GB RAM, 512 GB SSD, Firepro performance graphics, 24" LED Monitor. Full functionality guaranteed out of the box.
KOMET-R for capture and analysis	KOMET	Komet R Software for imaging and analysis of comet specimens. Supplied with Andor Database Viewer for data audit, archive and summary for reporting and statistical significance testing. Supports software licence. Andor camera support included - third party see driver CD for purchase.
KOMET-GLP for capture and analysis	KOMET-GLP	Komet 7-GLP Software for imaging and analysis of comet specimens. Supplied with Andor Database Viewer for data audit, archive and summary for reporting and statistical significance testing. Supports software licence. Andor camera support included - third party see driver CD for purchase.
KOMET PC	KOMET-WSTN	Dell PC, T1700 with 8 GB RAM and 512 GB SSD installed with Windows 7 (64 bit) for use with Komet software. Included 24" Ultrsharp LED monitor (1920 x 1200).
KOMET-R Upgrade	KOMET-R-UPG	Upgrade to Komet 7 with remote installation support.
KOMET-GLP Upgrade	KOMET-GLP-UPG	Upgrade to Komet 7-GLP with new OECD compliance with remote installation support.

Accessory	Order Code	Description
CoolLED pE-300	LL-PE300-WHT-NK1-I	Suitable for Nikon Ti, TE2000, Eclipse 50-90i, E400-600, FN1, AZ100
CoolLED pE-300	LL-PE300-WHT-OL1-I	Suitable for all Olympus microscopes apart from BH2, LV200, LEXT, IMT
CoolLED pE-300	LL-PE300-WHT-LE1-I	Suitable for all Leica compound microscopes (not stereo microscopes)
CoolLED pE-300	LL-PE300-WHT-ZS1-I	Suitable for all Zeiss microscopes
Video-USB connector	KOMET-VID-USB	Startech Video to USB Video Capture Device Cable with BNC adapter.
	KOMET-VID-USB2	The Imaging Source DFG/USB 2.0 pro converter, including USB 2.0 cable and BNC adapter
Virtual camera	IQ-VIRT-CAM	Driver required for Virtual Camera and Third Party Camera (not required for Andor camera)

Customer Support

Andor products are regularly used in critical applications and we can provide a variety of customer support services to maximise the return on your investment and ensure that your product continues to operate at its optimum performance.

Andor has customer support teams located across North America, Asia and Europe, allowing us to provide local technical assistance and advice. Requests for support can be made at any time by contacting our technical support team at andor.com/support.

Andor can offer installation and training in the following formats:

- On-site product specialists can assist you with the installation and commissioning*
- Training services can be provided on-site or remotely via the Internet*

*Prices available upon request

Customer Assurance Plans and Maintenance Contracts are available for Andor products, giving customers the flexibility to select as appropriate to their needs.

Such plans give access to additional levels of service and include both single year and multi-year options, allowing users to fix their support costs over the duration of a project or product life cycle.

Find us on

Komet requires the following minimum computer configuration:

- Windows 7 Professional
- Minimum Ram 2 GB, recommended 8GB
- 1 TB Hard Disk (Solid State Disk preferred)
- Graphics adapter with a minimum resolution of 1280 x 1024 and 16K colours.
- A suitable display. We recommend at least a High Definition 24" monitor with resolution set at 1920 x 1080.
- Mouse or other suitable pointing device.

A number of sensitive Charge Coupled Device (CCD) and Zyla sCMOS cameras are supported, which will require installation of specific drivers and in some cases installation of hardware. To run the full version of Komet, you will need to plug a USB software protection key (dongle) into your PC.

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