CyFlow® Ploidy Analyser
High-resolution DNA analysis

For agroscience · breeding · aquaculture

www.sysmex.com/la_flowcytometry

A dedicated solution for ploidy analysis and genome size determination

Determining ploidy is a particularly important form of analysis in plant breeding and aquaculture: controlling the ploidy level is often essential for monitoring the outcome of breeding procedures and quality in seed and plant production.

As such, accurately determining genome size and ploidy levels plays a major role in today's evolutionary biology, taxonomy and ecology. It helps to characterise and understand how species develop and the details of population structures.

Counting chromosomes by classical light microscopy has been replaced by flow cytometry, i.e. determining fluorescently labelled nuclei and their analysis in a flow cytometer. This method is time- and cost-saving as it provides precise results quickly with an efficient and validated workflow.

CyFlow® Ploidy Analyser with Robby 6 Autoloading Station

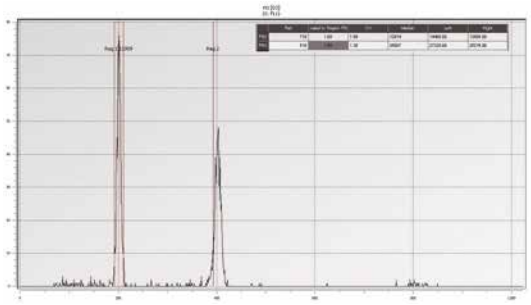
Example of a ploidy analysis report

"Flow cytometry is the state-of-the-art method in the breeding industry and in research for determining both the ploidy level and genome size in plants, animals and microorganisms."

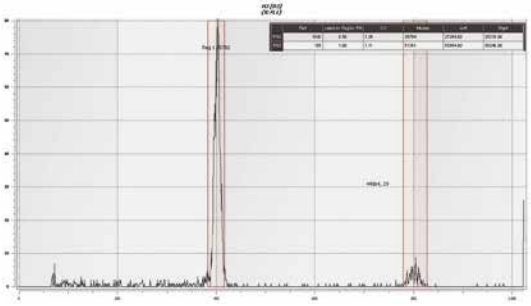
Based on the proof of concept of its predecessors in industry and research, Sysmex Partec is proud to offer you an up-to-date flow cytometry solution with its third-generation CyFlow® Ploidy Analyser (CyFlow® PA).

- Genome size determination requires stoichiometric DNA labelling and lowest coefficients of variation in DNA quantification. The CyFlow® PA uses a 532 nm laser and the DNA fluorochrome propidium iodide, which produces superior results for genome size analysis compared to standard flow cytometers using lasers of 488 nm.

- Due to its superb high-resolution DNA histograms and its ease of use, the fluorescent dye DAPI is the most powerful, fast and economic solution for analysing ploidy level and detecting aneuploidy. Sysmex Partec's unique UV LED (365 nm) is the optimal light source to fully exploit this fluorochrome's features.



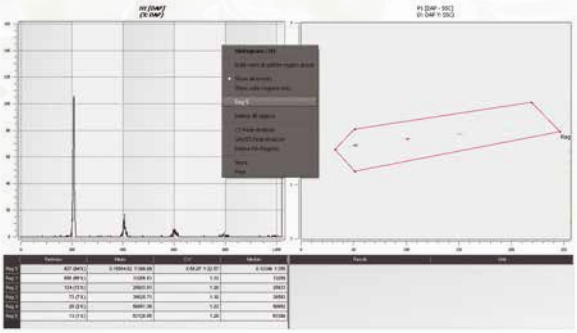
Zea mays, 2n – diploid, CyStain® DAPI staining



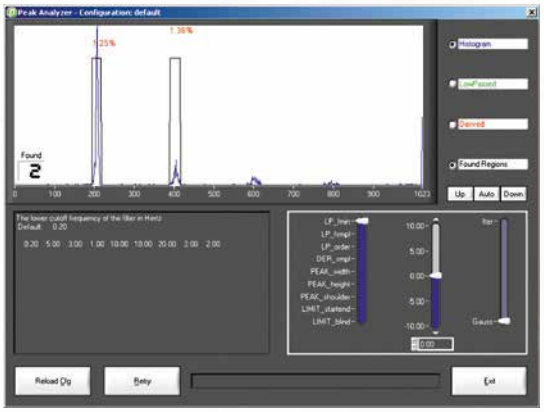
Zea mays, 4n – tetraploid, CyStain® DAPI staining

The CyFlow® PA provides ploidy and genome size analysis in less than two minutes. The instrument is available in the three following versions: for the analysis of samples stained with (1) DAPI, (2) PI or (3) DAPI and PI.

For higher throughput, you can equip the system with an Autoloading Station that accepts up to two 96-well plates or 120 test tubes as a single load. Sample preparation is easy, quick and cost-effective thanks to Sysmex Partec's ready-to-use staining reagents and protocols.



The CyView™ software integrates instrument control and complete data analysis for ploidy and genome size measurements. It combines a 1-parameter DNA histogram display for genome size and ploidy determination with a 2-parameter dot-plot display (64 – 4,096 channels) to gate and separate intact and fragmented nuclei.



CyView™ features two automatic peak-finding algorithms and man-ual peak definition. The software also lets you create user-defined peak-finding procedures to optimise this function in terms of the requirements of specific experiments. Results of data analysis are clearly represented on screen and can be directly exported together with the related DNA histograms to MS Excel worksheets for further analysis.

Optimal sample preparation

We offer a range of different Sysmex Partec reagent kits to prepare your samples for flow cytometry analysis on your CyFlow® PA. The reagent kits include ready-to-use staining solutions and nuclei extraction for analysing absolute or relative genome size variation and ploidy level of plant cells and cells of different origin (e.g. leaf and root tissue, seed, *in vitro* material). The staining can be applied to various biological tissue specimens.

Order-No.	Reagents	Dye
05-5001	CyStain® UV Ploidy	DAPI
05-5002	CyStain® UV Precise P	DAPI
05-5002-a	CyStain® UV Precise P automate	DAPI
05-5003	CyStain® UV Precise T	DAPI
05-5003-a	CyStain® UV Precise T automate	DAPI
05-5004	CyStain® DNA 1 step	DAPI
05-5005	CyStain® DNA 2 steps	DAPI
05-5022	CyStain® PI Absolute P	PI
05-5023	CyStain® PI Absolute T	PI

CyStain® PI Absolute T reagent kit

Technical specifications

Instrument models and light sources

Model	Light source(s)
CyFlow® Ploidy Analyser DAPI	UV LED (365 nm)
CyFlow® Ploidy Analyser PI	green laser (532 nm, 30 mW)
CyFlow® Ploidy Analyser DAPI + PI	UV LED (365 nm) green laser (532 nm, 30 mW)

Optics	1 or 2 optical parameters with selected photomultiplier tubes (PMT) Standard set-up and filters for propidium iodide (PI) and/or DAPI/SSC
Flow system	Quartz flow cuvette for laminar sample transport and hydrodynamic focusing Sample port with biosafety cleaning function True Volumetric Absolute Counting (TVAC) based on mechanical volume measurement Computer-controlled syringe pump speed, adjustable from 0 – 20 µL/s Fluid and waste reservoirs with fluid level sensors
Electronics and signal processing	Selectable linear or 4-decade logarithmic scale 16-bit analogue-to-digital converters, selectable trigger parameter and individual threshold level settings
Software	Operating system: Microsoft Windows™ Sysmex Partec operating software for real-time data acquisition, display, analysis and reporting Data format: flow cytometry standard (FCS)
Computer system	Integrated Microsoft Windows™ PC with Microsoft Office® Integrated, foldable 15" colour LCD TFT display Ethernet and USB ports DeskJet colour printer Optional external screen (dual screen mode)
Options	CyFlow® Robby 6 Autoloading Station
Weight	18 kg; with Autoloading Station 30 kg
Dimensions (W x H x D)	385 x 290 x 280 mm; with open display 528 mm height; with Autoloading Station 741 mm width

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