

SMART MITOCHONDRIAL ASSAY^{LIVE}

Smart Mitochondrial Assay^{LIVE}

The world's first fully automated solution for noninvasive, quantitative assessment of mitochondrial dynamics

www.nanolive.com

Powered by high-resolution label-free imaging and AI-driven analysis, the **Smart Mitochondrial Assay^{LIVE}** is the world's first fully automated solution for noninvasive, quantitative assessment of mitochondrial dynamics. Created to accelerate drug discovery, it provides deeper insights into mitochondrial responses without any need for dyes or complex sample preparation.



One-click
assay



Timelapse
imaging without
phototoxicity



Capture dynamic
mitochondrial
responses



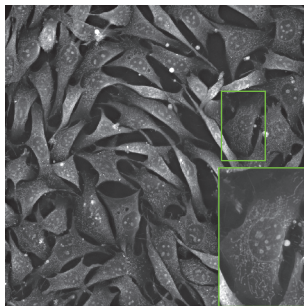
Quantify
morphological
changes at
mitochondrion
and network
resolution



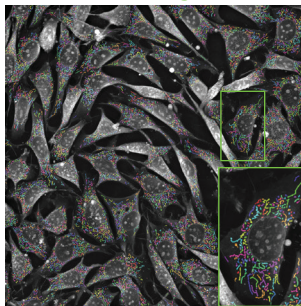
Correlative
fluorescence and
functional
analyses

Unique, comprehensive metrics

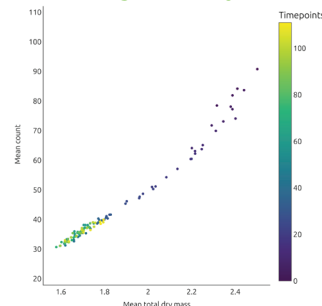
Refractive Index



Mitochondrial segmentation



Integrated Analysis



Label-free mitochondrial segmentation in HeLa cells. Nanolive's refractive index holotomographic images of HeLa cells at the population level, with a zoomed-in view of a single cell. Refractive index image alone (left) and with digital mitochondrial overlays (center) following analysis performed with the Smart Mitochondrial Assay^{LIVE}. On the right we display an analysis output showing the relationship between mitochondrial dry mass, count, and time. Both metrics decrease in tandem, confirming that mitochondria within the cells are being progressively degraded.

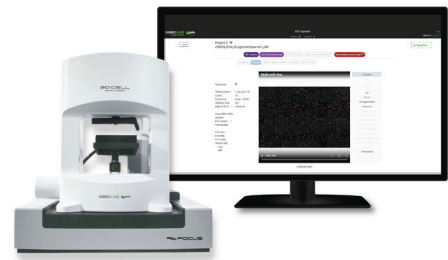
Mitochondria in Nanolive's holotomographic images are automatically segmented and measured to produce more than 30 label-free metrics per mitochondrion and per cell, including mitochondrial:

- ✓ count
- ✓ length
- ✓ dry mass density
- ✓ number of endpoints
- ✓ radius
- ✓ dry mass
- ✓ number of branches
- ✓ number of junctions

These comprehensive, dye-free insights empower biopharma researchers to assess critical mitochondrial dynamics, such as fission, fusion, swelling, mitophagy, and network complexity, key for evaluating metabolic function, cellular stress, and drug-induced toxicity with unmatched precision.

Automated analysis with EVE Explorer

Our integrated analysis package for high-content live cell imaging data quantifies cellular and organelle responses with an intuitive automated workflow, customizable plotting options, and seamless data management, enabling researchers to make data-driven decisions and focus on discovery.



Multiplex with integrated fluorescence

In parallel with Nanolive's standard label-free imaging, optional fluorescence imaging, visualization, and quantification provide researchers with an additional layer of actionable insights from every well. Automated analysis in EVE Explorer Pro enables:

- Correlative fluorescence imaging with refractive index-based structures, to associate protein expression with morphological properties for deeper insights.
- Definition of distinct cell sub-populations in co-cultures by fluorescence signal, enabling comparison of responses across specific cell types.
- Quantification of fluorescence changes over time allowing for the monitoring of dynamic functional responses, such as ROS production, to evaluate drug efficacy and toxicity.



"The introduction of the label-free Smart Mitochondrial Assay^{LIVE} is a very exciting development, delivering a range of metrics that allow us to interrogate the dynamics of mitochondrial biology in undisturbed, live cells in unprecedented detail. This new module will be an invaluable tool for the deep phenotyping of our opti-ox powered human iPSC-derived cells and disease models."

Stefan Milde
Imaging Lead, Bit.bio

Applications of the Smart Mitochondrial Assay^{LIVE}



Drug safety

Use mitochondrial response as a marker for investigative toxicology



Oncology

Evaluate the efficacy of mitochondrial-targeting therapies



Mitochondrial disease

Characterize dysfunction by studying fragmentation, swelling, and network disruption



Drug delivery

Monitor uptake of fluorescent drugs, nanoparticles, or therapeutic mitochondria