FIELD GUIDE

Beyond the snapshot: Dynamic, label-free EC50 profiling for smarter drug development

Challenges in measuring EC50 with conventional technologies

Determining the half-maximal effective concentration (EC50 value) is essential for evaluating drug potency and efficacy. However, conventional assays often rely on labeling, which can introduce artifacts, and are typically limited to single time points and can therefore miss important dynamic responses, such as early, delayed, or transient effects.

- **Label dependence:** compromises data reliability and delays go/no-go decisions
- **Single-timepoint measurements:** risk missing early or delayed drug effects
- **Manual EC50 extraction:** requires extra work that delays project milestones and slows data-driven decisions

How do current approaches compare?

Technology	Label-free	Real-time	Single-cell & Temporal resolution	Throughput	Automatic EC50 calculation	Time-resolved EC50 calculation	Automatic EC50 curve & data plotting	Consolidated workflow	Cost effectiveness
Plate reader (Fluorescence/ Colorometric	○	○	○	●	◑	○	◑	○	●
Flow cytometry	○	○	○	●	○	○	○	○	◑
Fluorescence live cell imaging	○	◑	◑	◑	◑	○	◑	◑	◑
Nanolive	●	●	●	●	●	●	●	●	●

○ = Low ◑ = Moderate ● = High

The label-free, automatic and dynamic EC50 calculation solution

Nanolive's LIVE Cytotoxicity Assay transforms EC50 analysis by providing a **fully automated, label-free, and time-resolved** solution.

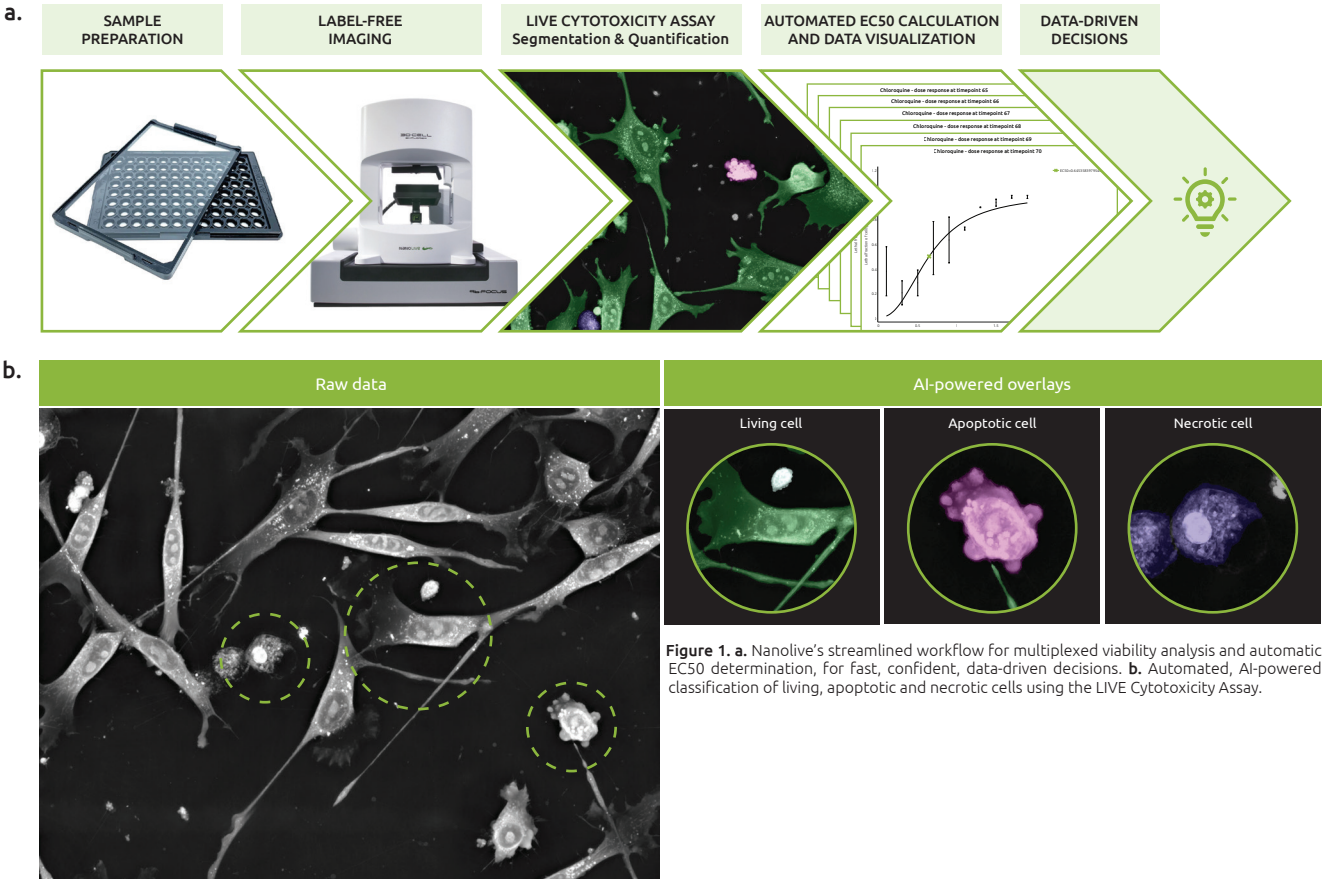

Figure 1. a. Nanolive's streamlined workflow for multiplexed viability analysis and automatic EC50 determination, for fast, confident, data-driven decisions. **b.** Automated, AI-powered classification of living, apoptotic and necrotic cells using the LIVE Cytotoxicity Assay.

By continuously monitoring cell death kinetics in real-time, Nanolive:

- **Preserves natural cell behavior** for more physiologically relevant results
- Eliminates manual gating and calculations **with AI-powered analysis**, increasing reproducibility and removing user-dependent bias
- **Eliminates days of manual data analysis and curve fitting,** delivering decision-ready results automatically
- **Reveals how efficacy and toxicity evolve over time,** enabling detection of drug liabilities that could be missed with conventional single-timepoint assessments
- **Accelerates dose selection and compound evaluation,** with a streamlined workflow from data acquisition to actionable insights

Go beyond static readouts

Instead of a single static EC50 value, Nanolive delivers a complete, time-resolved profile of a compound's potency. By measuring EC50 at every timepoint of image acquisition, **Nanolive captures the full progression of drug effects**. These time-resolved EC50 curves reveal how both efficacy and toxicity change over time, providing deeper mechanistic insights than conventional EC50 assays alone. By ensuring transient drug responses are never missed, **Nanolive supports lead development with more biologically relevant, predictive data.**

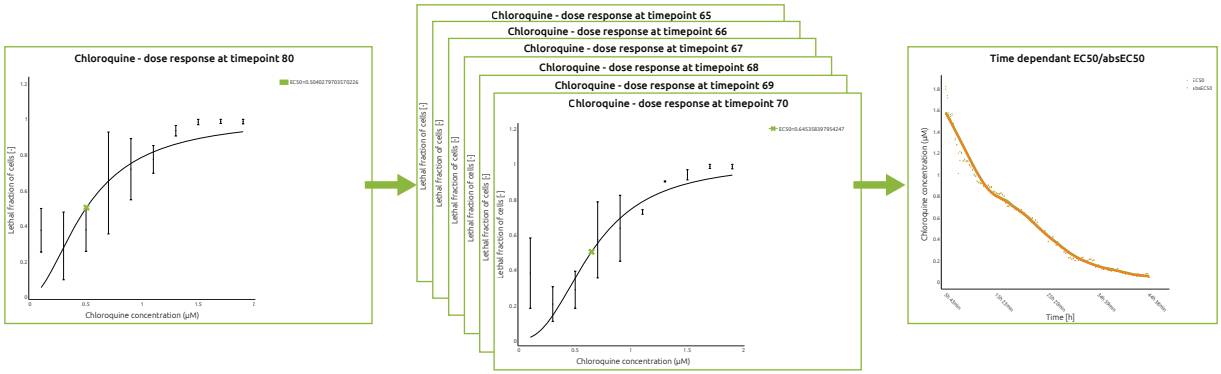

Figure 2. Dynamic EC50 analysis of Chloroquine-treated HeLa cells. **a.** Extract ready-to-use EC50 values with automatic dose-response curves. Here an EC50=0.5 µM is calculated at 24h. **b.** Capture every response, without missing transient drug effects: Absolute EC50 plots are automatically generated for each time point from 0 to 44 h. Gain deeper mechanistic insights and improve translational relevance with time-resolved EC50 curves.

DISCOVER HOW DYNAMIC EC50 PROFILING CAN GIVE YOUR TEAM THE CONFIDENCE TO CHOOSE THE RIGHT COMPOUNDS FASTER

Contact us to schedule a discussion or request example data

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