3 Issues in Cell Monitoring – and how we solve them

Continuous observation, remote access, and automated cell counting for successful cell culture experiments

ZenCell Owl was developed to eliminate three critical weaknesses in cell culture laboratories: blind spots between manual controls, unstable time-lapse recordings, and phototoxicity from aggressive imaging protocols.

Error 1: Blind Spot Between Two Controls

The Problem

Manual checks typically take place once or twice a day. However, crucial events happen in the hours in between: cells become stressed due to pH drift, nutrient deficiency, or incipient contamination – and nobody sees it in time.

Consequences

- Entire experimental setups have to be discarded
- Expensive reagents and cell lines are lost
- Project timelines are delayed by weeks
- Reproducibility suffers from undetected variabilities

The Solution with ZenCell Owl

Remote Access Reduces Stress and Increases Control

Researchers can check their cultures at any time without opening the incubator door.

Continuous Monitoring Instead of Blind Spots

The system creates automated time-lapse sequences over hours or days. Morphological changes, growth stagnation, or signs of contamination become visible in real-time.

Error 2: Time-Lapse in the bucket

The Problem

Time-lapse experiments are highly sensitive to external disturbances. Even minimal temperature fluctuations, convection in the medium, or changes in cell morphology cause the field of view and focus to drift. The result: cells wander out of the image section, become blurred, or are no longer captured at all. Entire time series thus become unusable.

Consequences

- → Fragmented or incomplete datasets
- → Manual post-processing is extremely time-consuming
- → No reliable kinetic analyses possible
- → Frustration and repeated experiments necessary

The Solution with ZenCell Owl

Automatic Cell Counting and Confluency Analysis

ZenCell Owl integrates AI-based automatic cell counting directly into the workflow. The system not only captures images but also objectively and reproducibly quantifies cell density and morphology.

Stable Hardware for Consistent Image Series

The incubator-compatible optics and automated acquisition system ensure that the field of view, focus, and time intervals remain stable throughout the entire experiment duration.

Error 3: Beautiful Image, Dead Cells

The Problem

High-resolution, high-contrast images often require high light intensities and long exposure times. This leads to phototoxicity: cells are damaged by reactive oxygen species (ROS), their physiology changes, and growth and differentiation are impaired. The paradox: the images look good, but the biological significance is compromised.

Consequences

- → False-positive or false-negative results
- → Screening hits not reproducible
- → Time loss due to artifact-laden datasets
- → Ethical and scientific concerns with publications

The Solution with ZenCell Owl

High-Throughput Screening with up to 24 Channels in Parallel

ZenCell Owl is designed for high-throughput applications and can monitor up to 24 wells or positions in parallel. This allows many experimental conditions to be tested simultaneously.

Gentle Live-Cell Imaging

The system is optimised for minimal light exposure: reduced intensity, adapted exposure times and suitable objectives ensure a balanced ratio between image quality and cell vitality.

Summary: The Solution for Successful Cell Culture

The three biggest mistakes in cell observation in the incubator can be systematically eliminated with ZenCell Owl:

Key Benefits

Remote Access

Minimises disturbances and increases flexibility.

Automatic Cell Counting

Provides objective, continuous data.

High-Throughput Capability

Accelerates screenings without compromising cell vitality.

More successful experiments, fewer lost assays, better reproducibility – and significantly more relaxed researchers.

Interested in a live demo? Book a remote access session and experience ZenCell Owl in action: zencellowl.com/remote-demo

Questions? Contact us directly for a 15-minute Q&A about your specific use case.