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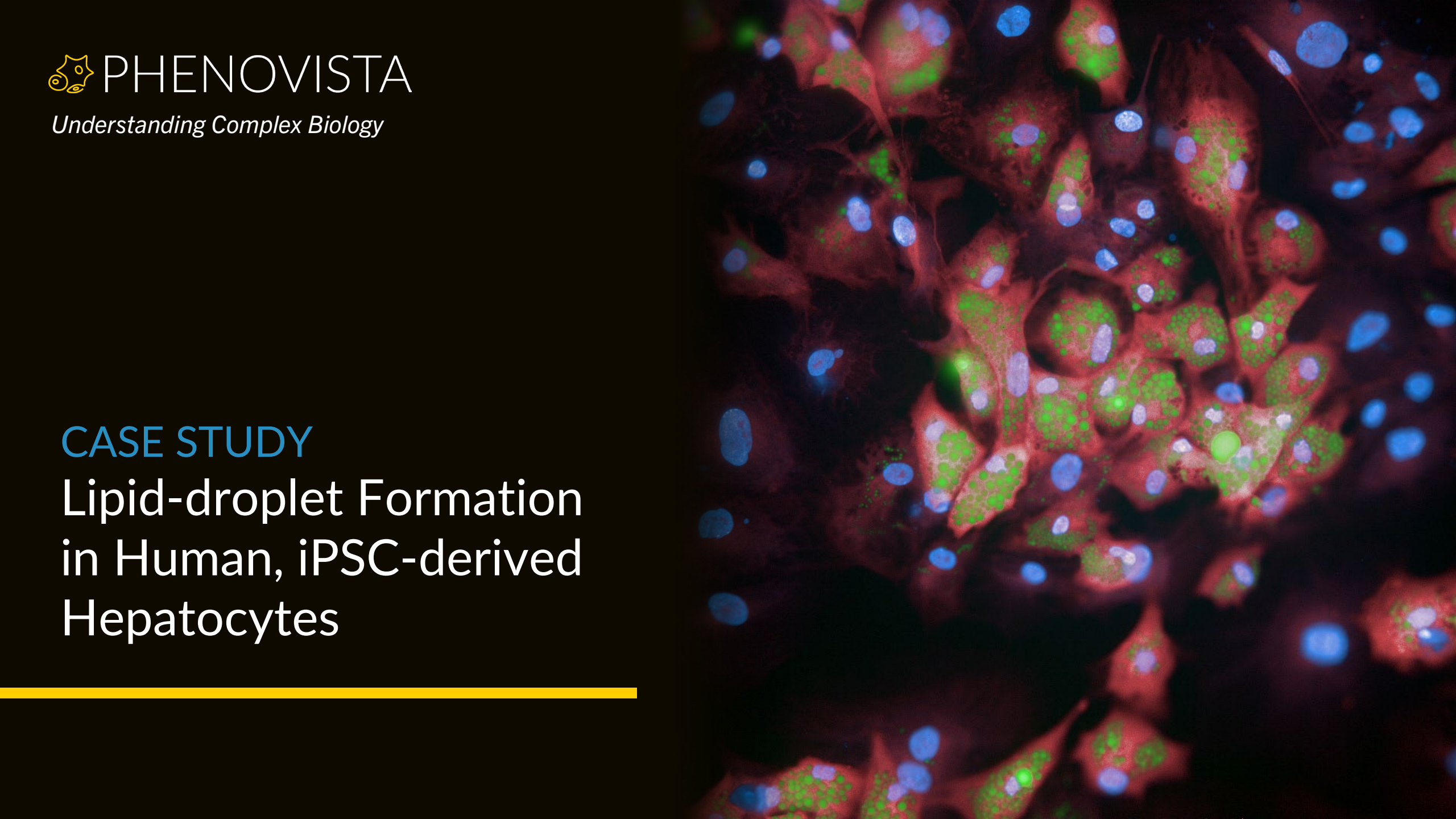
Understanding Complex Biology

CASE STUDY

Lipid-droplet Formation in Human, iPSC-derived Hepatocytes



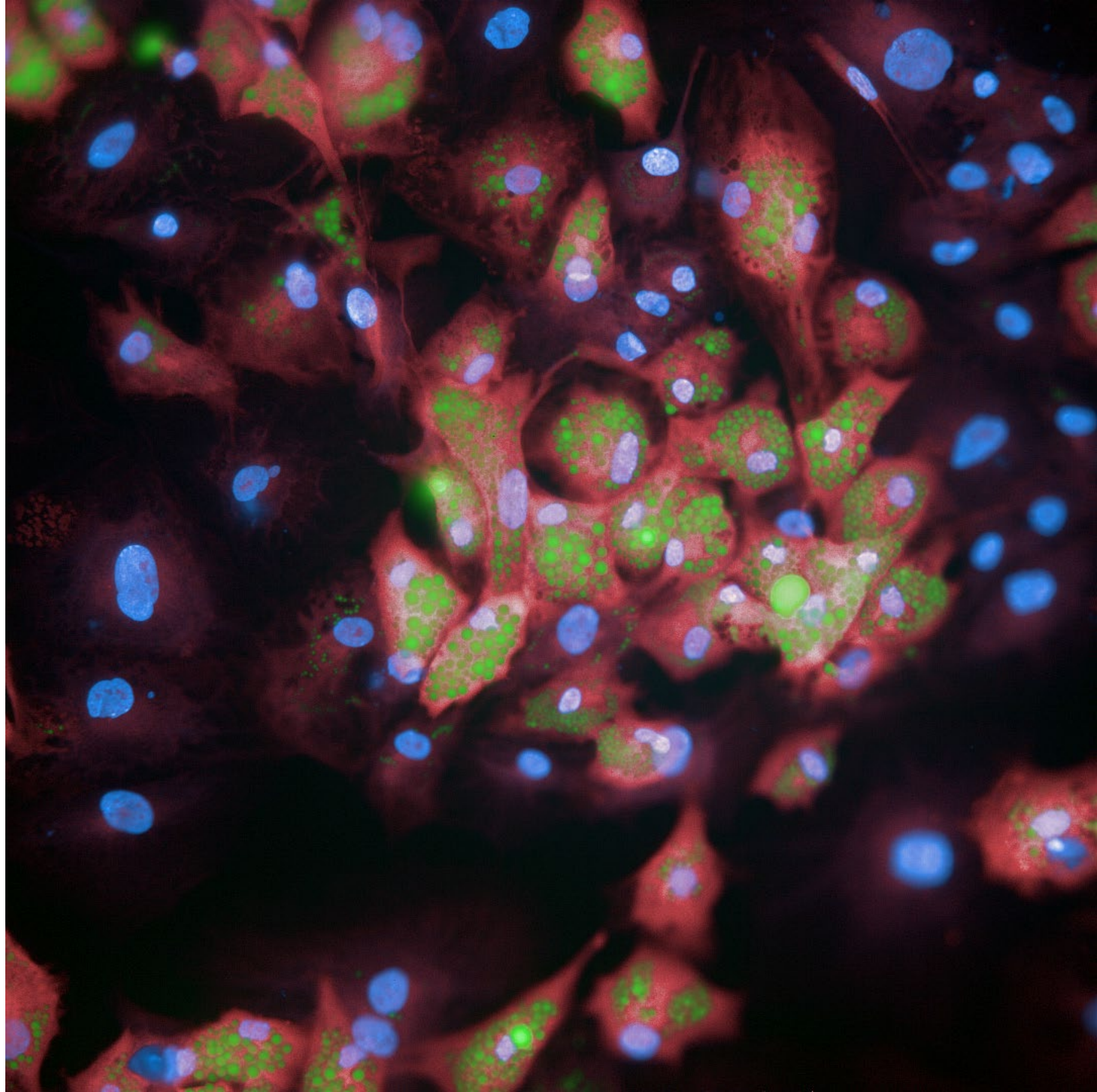
OBJECTIVE

A client requested a custom study to assess whether their therapeutic candidate affects lipid-droplet formation in human, iPSC-derived hepatocytes.

Goals

1. Establish an *in vitro* model for measuring lipid-droplet formation in hepatocytes.

2. Compare client-provided, therapeutic agent's ability to affect lipid-droplet formation.



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EXPERIMENTAL DESIGN

Cells

Human, iPSC-derived hepatocytes (FCDI)

Palette

Hoechst (nuclei)
BODIPY (lipid droplets)
CellMask (whole cells)

Optimization

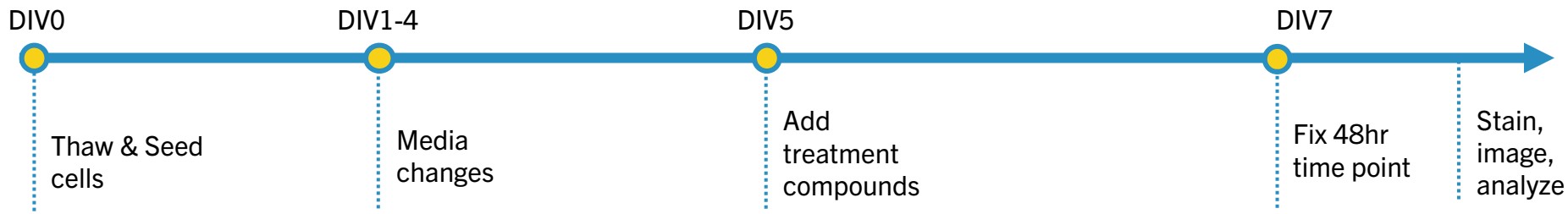
- Establish culture protocols.
- Establish treatment regimen for reference compounds.
- Establish times for fixed endpoint evaluation.

Treatments and Timelines

- Culture cells in 384-well, imaging microplates, utilizing bespoke culture protocol developed at PhenoVista.
- On DIV5, add treatments.
- Fix and analyze at 48 hrs post-treatment.

Deliverables

- May include cell count, lipid droplet area, number of lipid droplets, and other metrics, as appropriate for the study design.
- A presentation-ready report to include detailed methodology, statistical analysis and IC_{50} curve-fits, where applicable. Representative images will be provided for controls and for a reasonable selection of test conditions.



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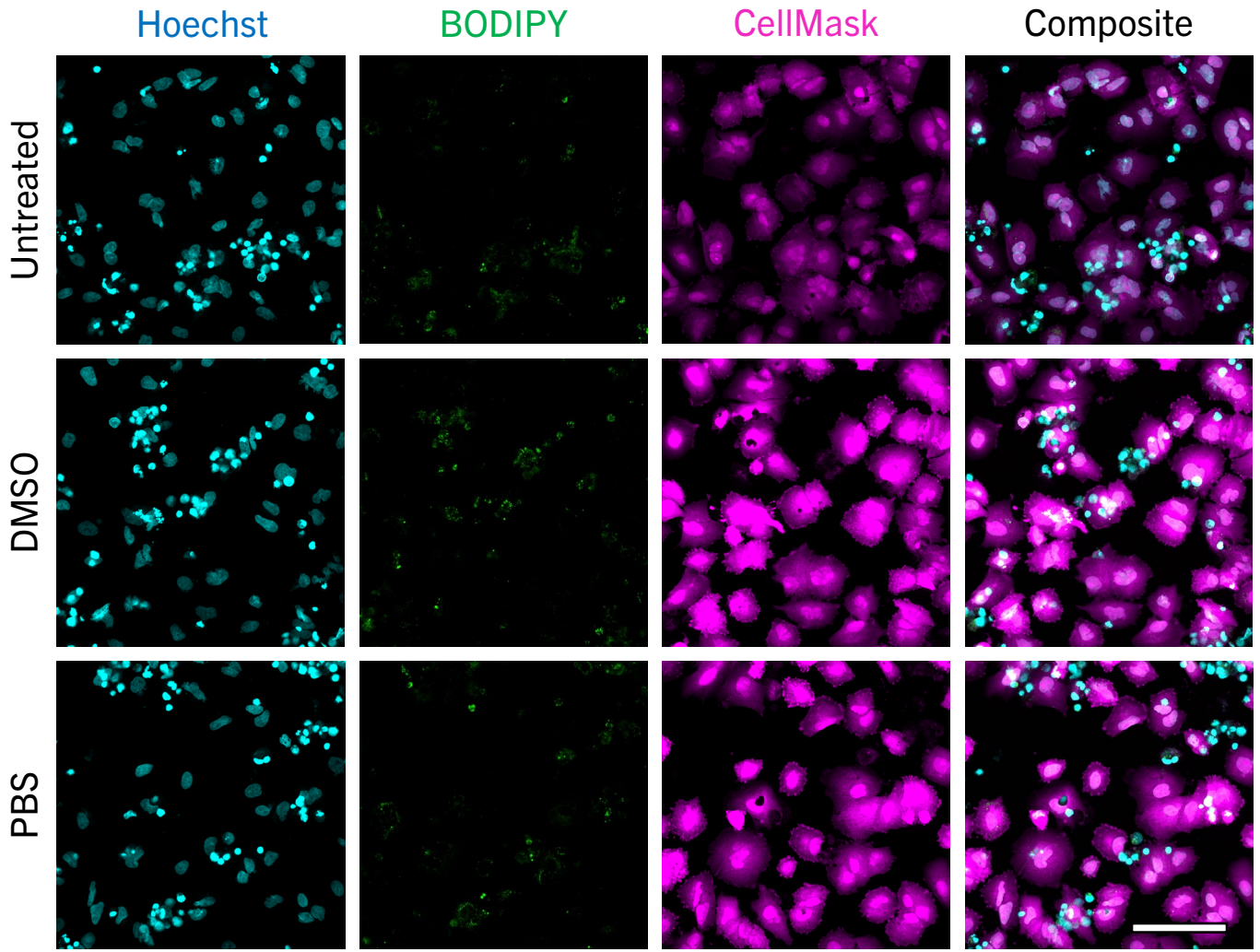
REPRESENTATIVE IMAGES

48hrs, Controls



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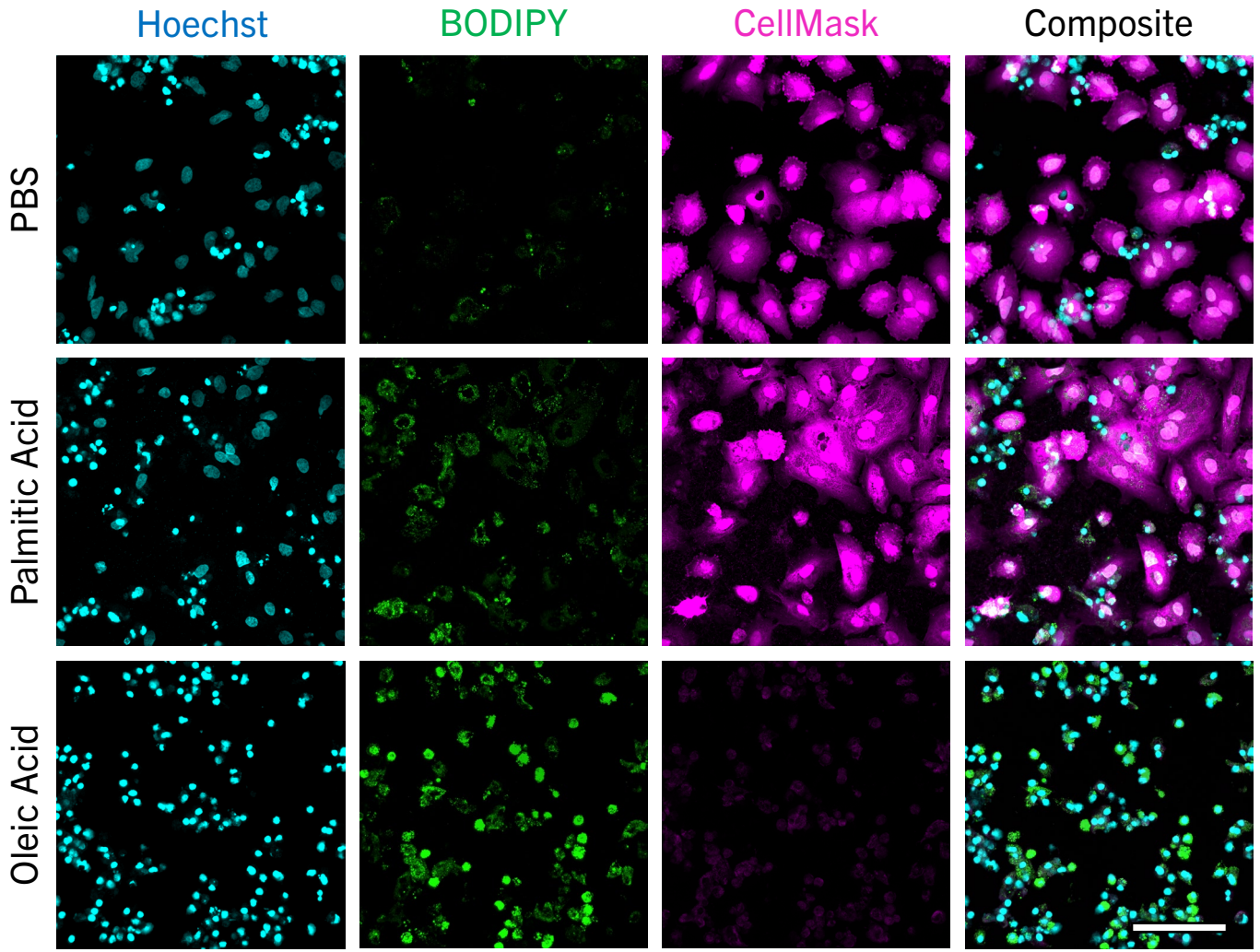
REPRESENTATIVE IMAGES

48hrs, OA and PA



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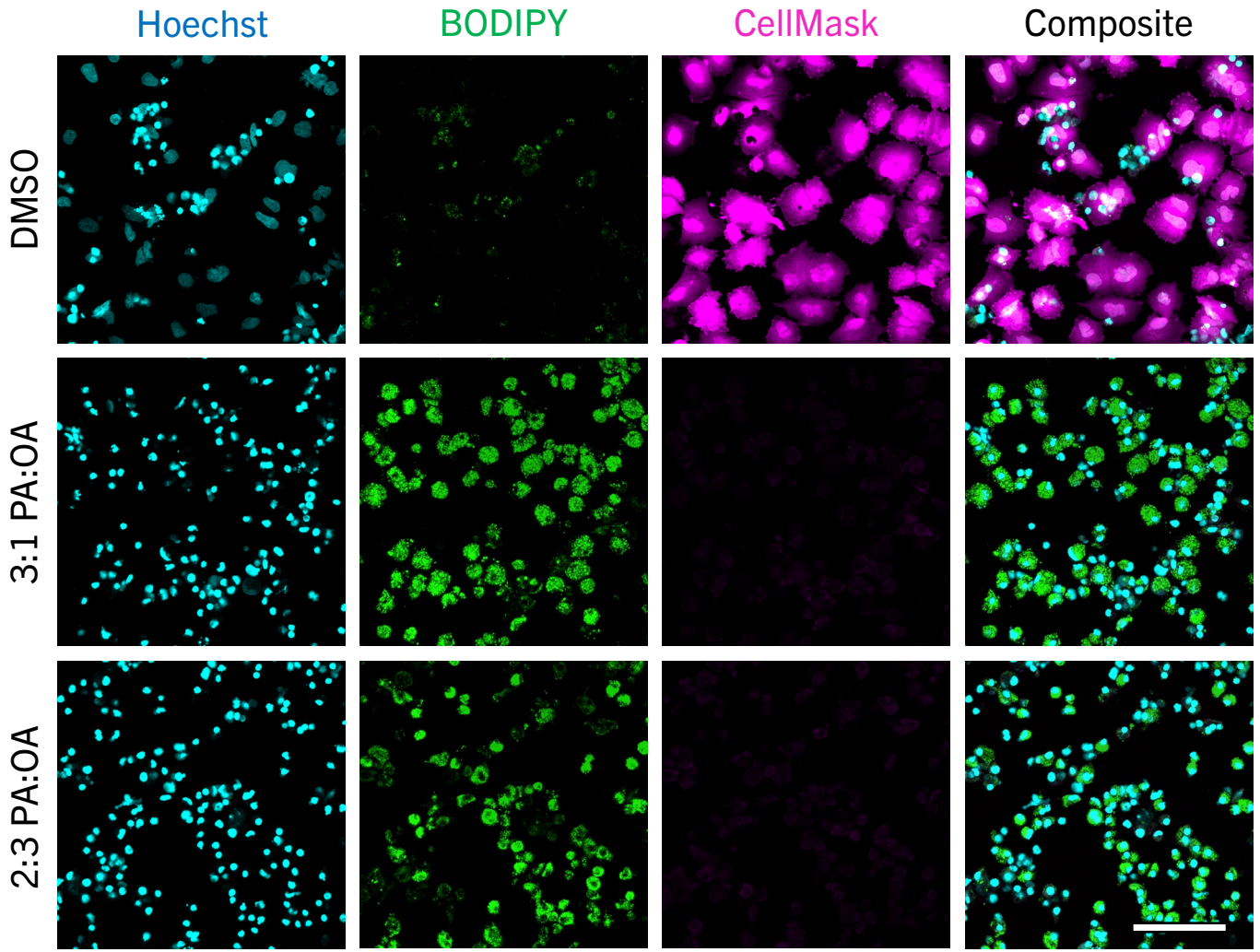
REPRESENTATIVE IMAGES

48hrs, OA + PA combinations



Scale bar = 200µm

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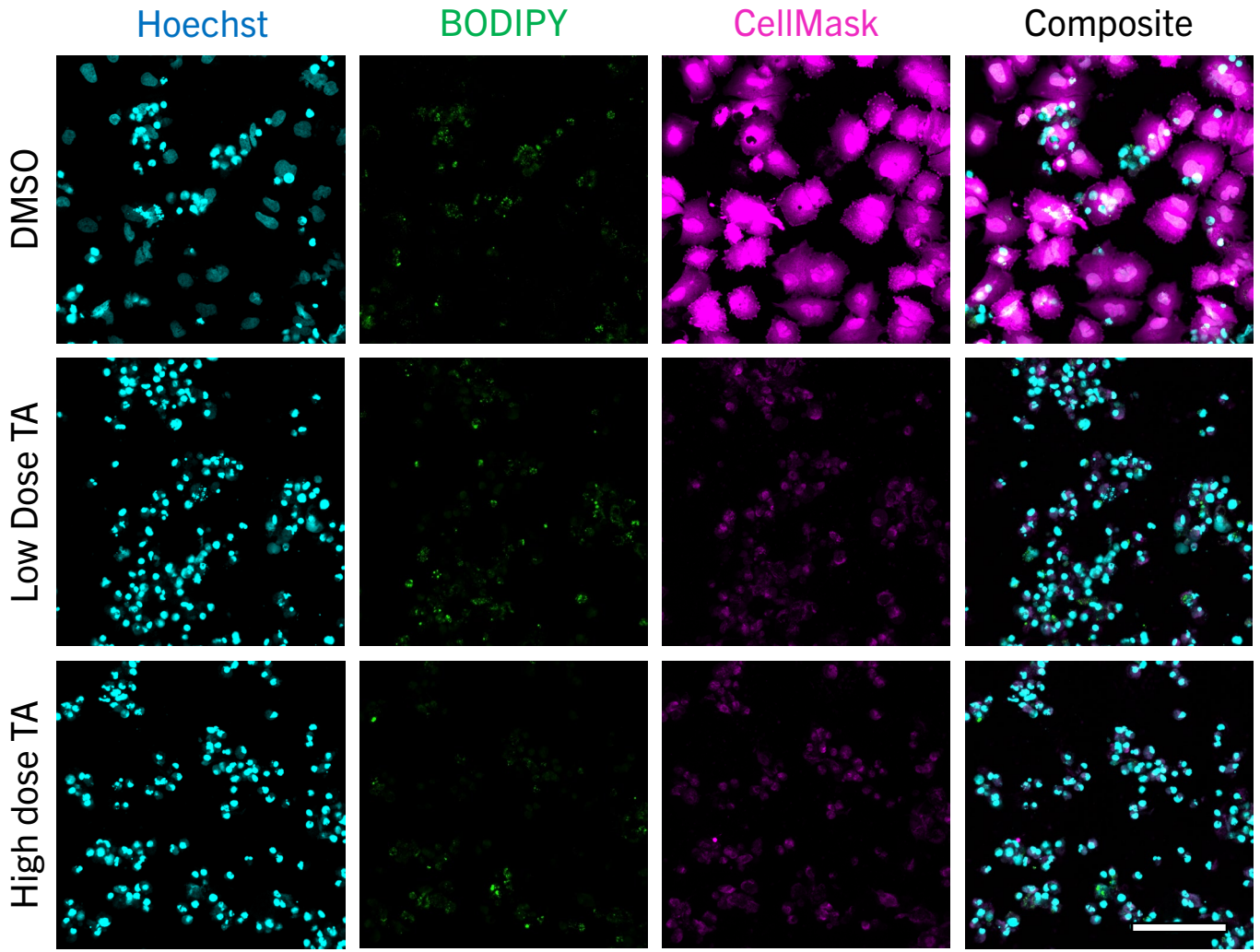
REPRESENTATIVE IMAGES

48hrs, Test article



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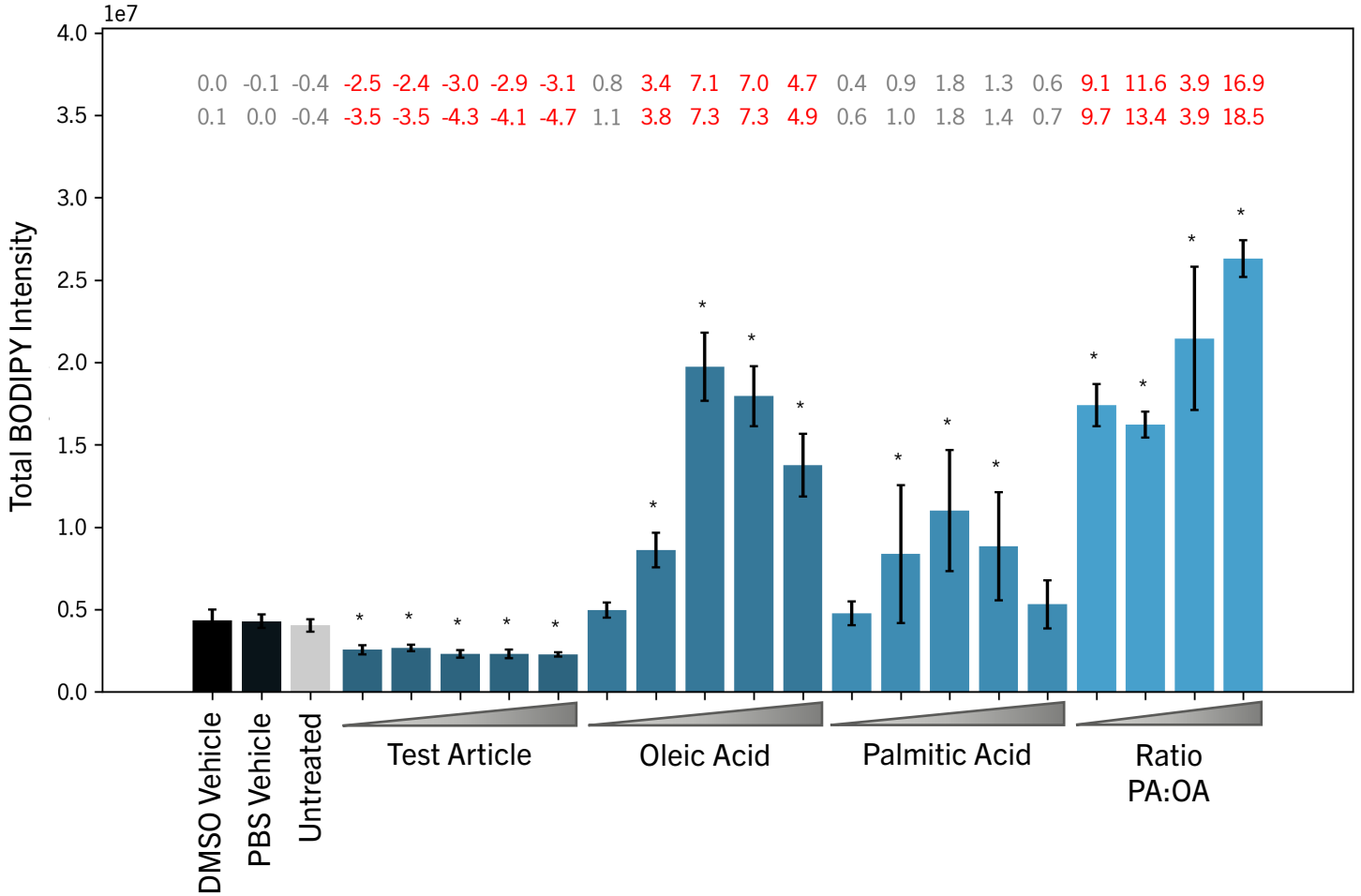
QUANTITATIVE DATA

Total BODIPY Intensity

- Total BODIPY intensity increased after treatment with OA, PA, and OA + PA relative to controls.
- Cells treated with TA had significantly less BODIPY intensity than controls.



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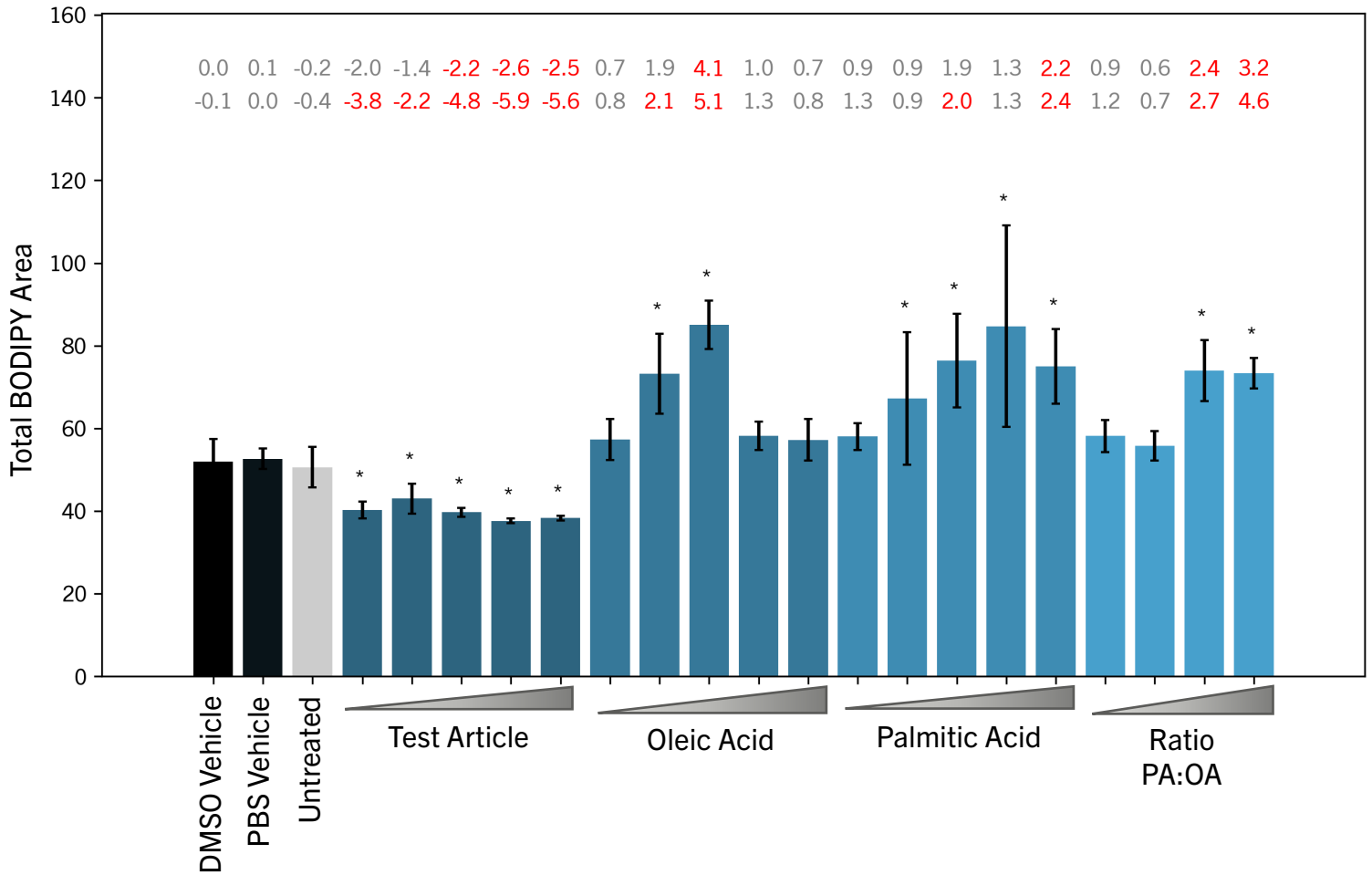
QUANTITATIVE DATA

Total BODIPY Area

- Total BODIPY area increased after treatment with OA, PA, and OA + PA relative to controls.
  - High doses of OA did not increase BODIPY area, likely due to cell death.
- Cells treated with TA had significantly less BODIPY area than controls.



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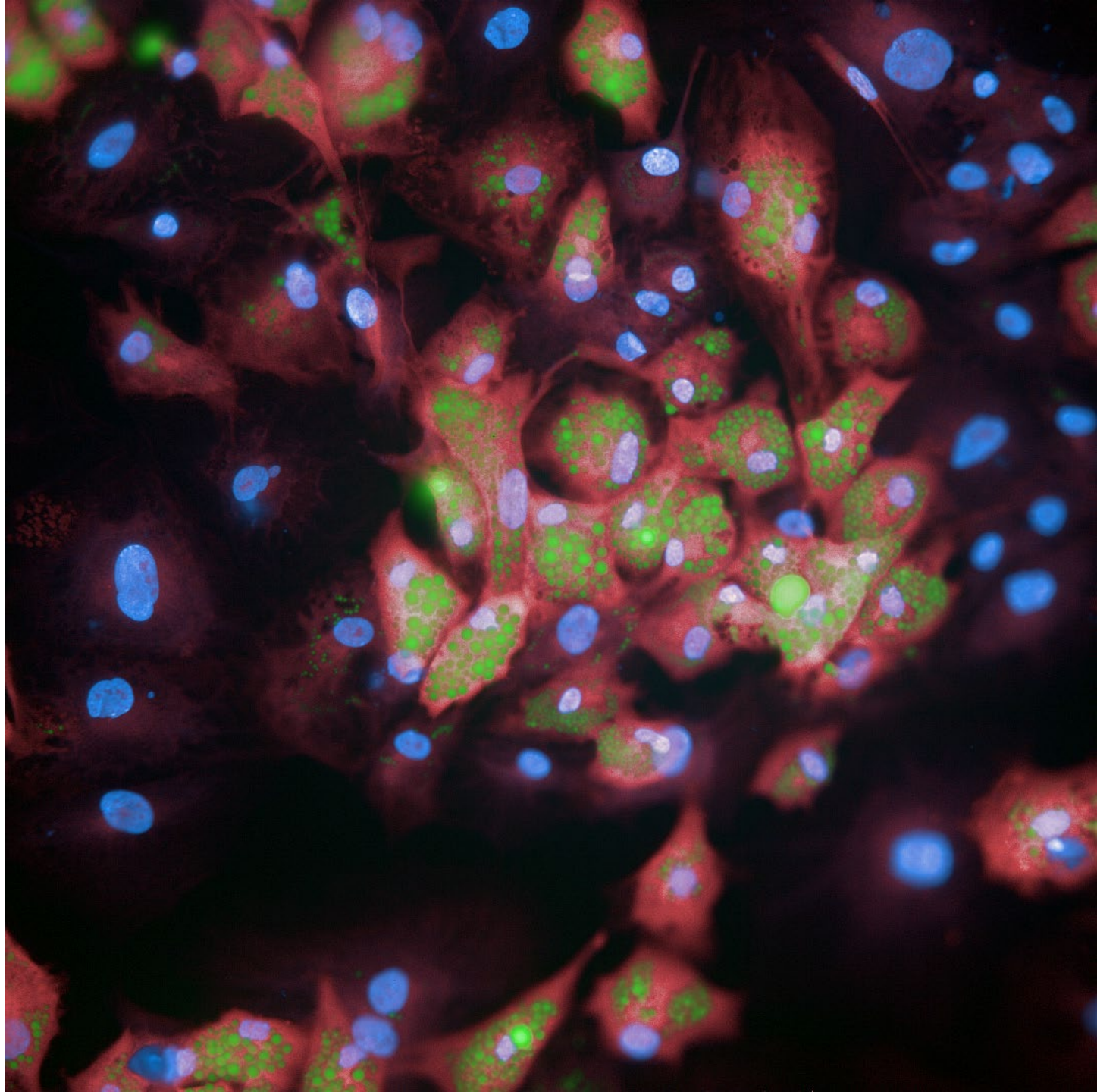
SUMMARY

1. Established a model of lipid-droplet formation using human, iPSC-derived hepatocytes.

2. OA and combinations of OA + PA generally increased lipid-droplet formation.

3. Test article did not promote lipid-droplet formation; treatment with the TA showed significantly lower lipid area compared to controls.



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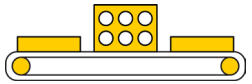
ADDITIONAL RESOURCES

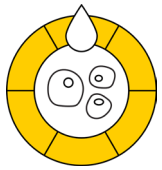
PhenoVista's Services

We develop assays in close collaboration with our clients to ensure that your specific questions will be answered. You can choose from a range of services to select the best fit for your needs. For more information, visit https://phenovista.com/assay-services

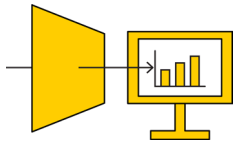
Custom Assay Services
Custom assays to answer your specific, complex biological questions.



Ready-2-Go Assay Services
Defined assay offerings across a range of disease and therapeutic areas.



Cell Painting
Compare your compounds' effects against those of reference compounds.



Imaging & Analysis
Send us plates of fixed & stained cells, and we'll send you data.

Learning Library

Visit https://phenovista.com/resources to browse additional resources such as

- Brochures
- Case studies
- Webinars
- Blog posts

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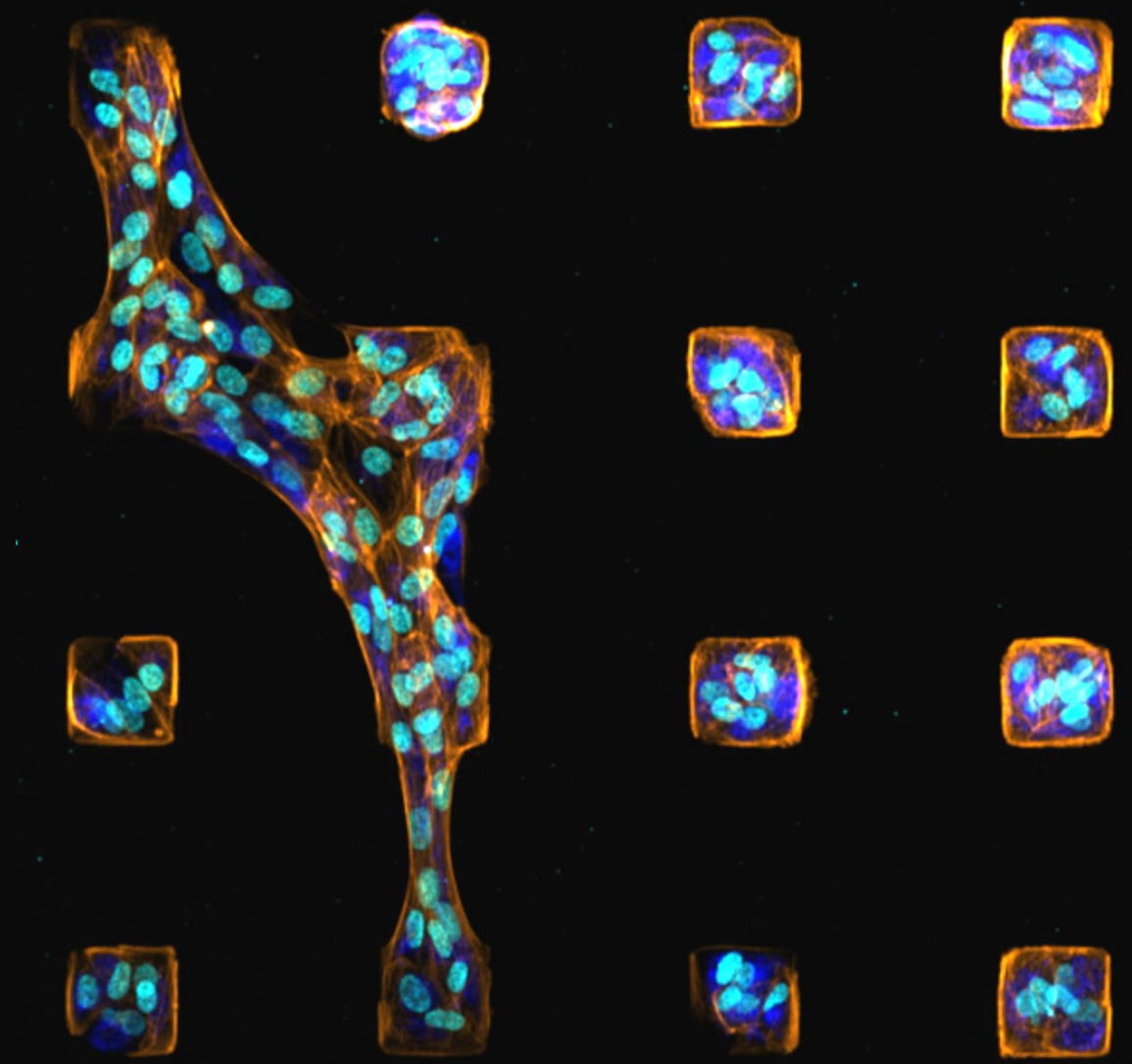

PhenoVista Biosciences
6195 Cornerstone Ct E, Suite #114
San Diego, CA 92121

www.phenovista.com