COLD+ / ORGANOID WORKFLOWS

Automated Matrigel dome preparation for organoid drug testing

Cooled dispensing on the Thermo Scientific Multidrop Combi.



COLD+ on a Multidrop Combi.

96-well	72 h	4 µL
Organoid assay format	Drug-treatment endpoint	Matrigel domes

From cooled matrix to functional assays

Matrigel dome preparation is a key handling step in organoid research. COLD+ combines passive cooling with automated dome placement, bringing temperature-sensitive matrix handling to the Thermo Scientific Multidrop Combi.

In a study of Barrett's esophagus and gastroesophageal adenocarcinoma, Anand, Schoemig and colleagues investigated targeted pathway inhibition in murine organoids. [1] COLD+ supported Matrigel dome preparation during the study's murine organoid drug-treatment workflow.

APPLICATION WORKFLOW

From Matrigel to assay-ready cultures

The workflow combines cooled preparation of the organoid-containing matrix with automated dome placement, followed by drug treatment and functional readout.

01

Prepare the matrix

Mix organoids with Matrigel and medium; keep the suspension cooled.

02

Place 4 µL domes

Automatically dispense organoid-containing matrix into 96-well plates.

03

Polymerize + treat

Allow the domes to gel, then add 100 µL drug-containing medium.

04

Measure responses

After 72 h, acquire brightfield images and quantify viability with CellTiter-Blue.

METHOD SNAPSHOT

Model	L2-LKP murine organoids: $Kras^{G12D}$ activation with Trp53 loss
Matrix	Matrigel (Corning 356231), mixed 1:1 with supplemented DMEM/F12
Plate	96-well plate, Corning 3603
Dome volume	4 µL
Treatment	100 µL drug-containing medium added after polymerization; 72 h treatment
Readouts	Incucyte S3 brightfield imaging and CellTiter-Blue viability assay

PHOTO 01

COLD+ on the Multidrop Combi used for Matrigel dome preparation.

PHOTO 02

4 µL Matrigel domes placed in a 96-well plate.

PUBLISHED RESULTS / MURINE ORGANOIDS

Organoids reveal drug responses

The published L2-LKP organoid experiments combined brightfield imaging with a quantitative viability endpoint. Selected SHP2 and MEK1/2 treatment results are shown below. [1]

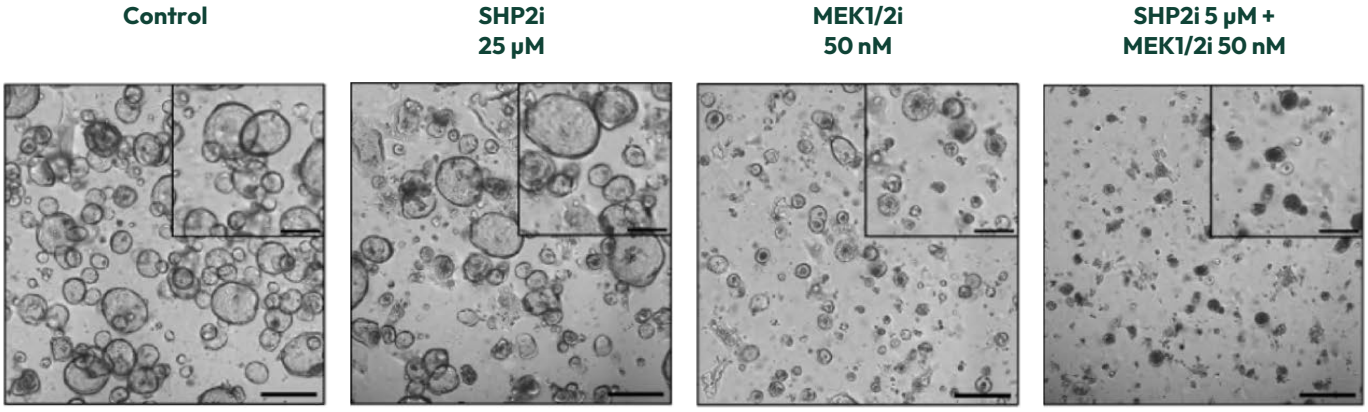


Figure 1. Selected brightfield images after 72 h treatment. SHP2i: TNO155; MEK1/2i: trametinib. Scale bars: 300 µm; insets: 150 µm.

Quantitative viability after 72 h

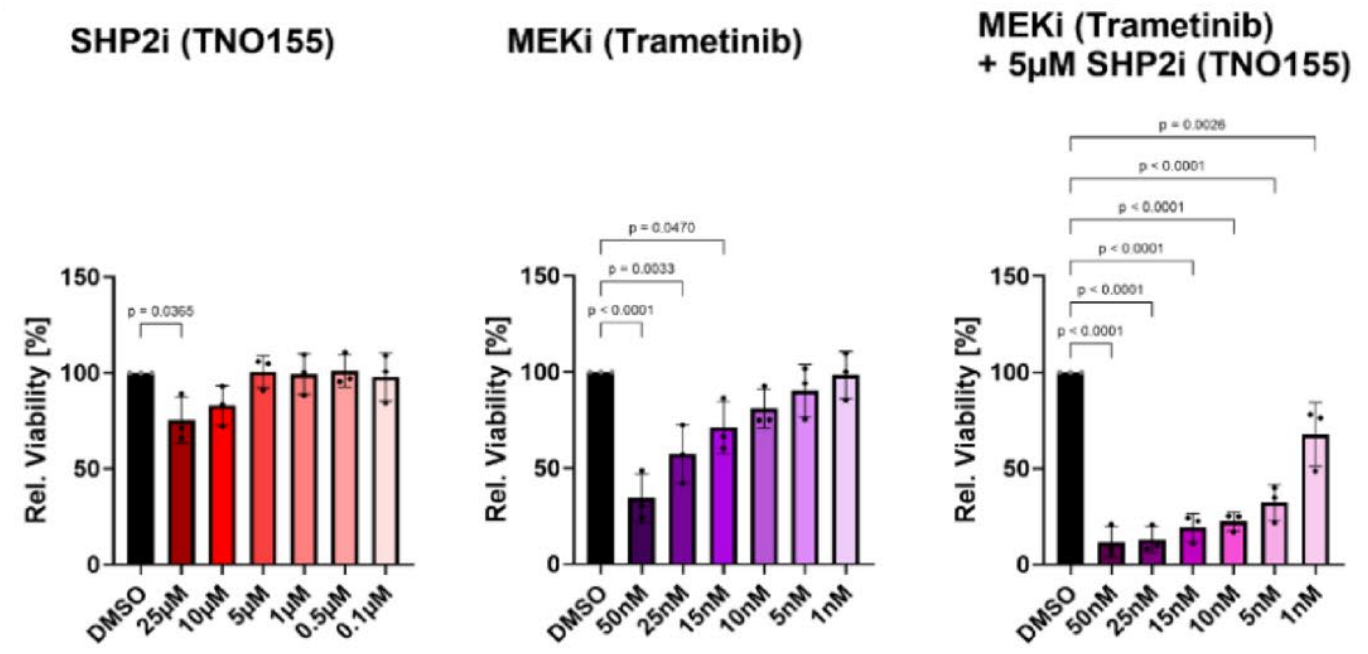


Figure 2. Selected CellTiter-Blue results from the study (Fig. 4F, upper row). One independent L2-LKP organoid line; three independent experiments with triplicate or quadruplicate technical replicates. Mean ± SD. Ordinary one-way ANOVA with Dunnett's multiple comparison test.

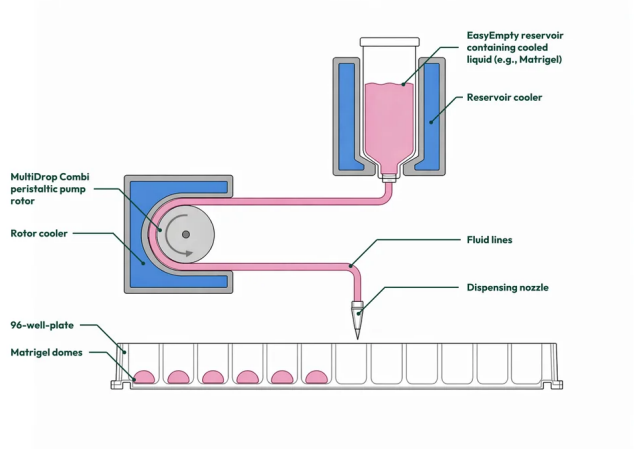
Figures 1-2 adapted from Anand et al. [1], Fig. 4E-F. © The Author(s) 2026, CC BY 4.0.

APPLICATION INSIGHT

Connect cooled dispensing to organoid research

In the published experiments, combined SHP2 and MEK1/2 inhibition reduced organoid viability at lower concentrations than the single-agent treatments and altered organoid morphology. The imaging and viability data illustrate the functional assays performed downstream of Matrigel dome preparation. [1]

COLD+ brings cooled dome dispensing to the Thermo Scientific Multidrop Combi. For laboratories developing similar workflows, this application connects automated matrix handling with organoid-based drug testing.



COLD+ operating principle.

Passive cooling

Keep Matrigel cold during dispensing without active refrigeration.

Automated dome placement

Place 4 µL Matrigel domes automatically into 96-well plates.

Existing instrument

Add cooled dome dispensing to your Multidrop Combi without modifying the instrument.

REFERENCE

[1] Anand, A., Schoemig, L. R., Klaas, L. et al. Targeting Kras signalling in a Trp53/Kras^{G12D} mouse and organoid model inhibits Barrett esophagus to gastroesophageal adenocarcinoma progression. Scientific Reports **16**, 29356 (2026). doi:10.1038/s41598-026-71355-y.

Bring cooled dome dispensing to your organoid workflow.

Discuss your application

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