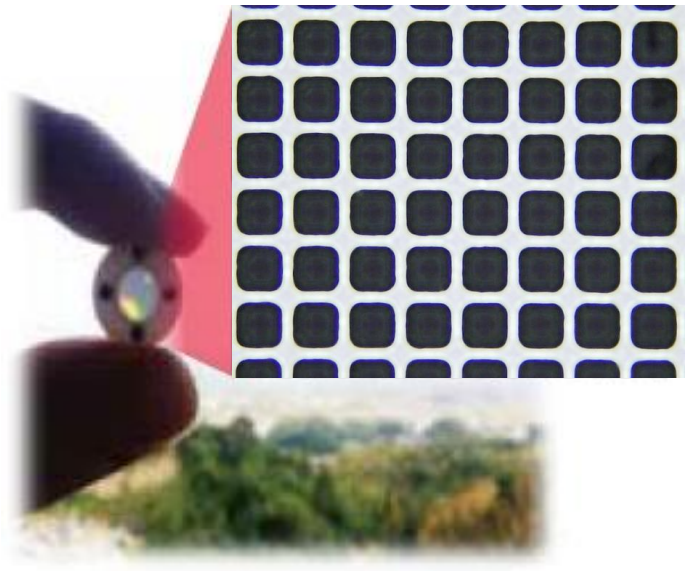
Application note Vol.3

Under Development

Specification and appearance are subject to change without notice

CELLNETTA MZM1 SERIES

Equalization of Spheroid size in drug efficacy studies



Background

The information obtained from pharmacological studies serves an important basis in determining human administration in drug development, making it necessary to provide highly objective scientific data. For this reason, it is important to efficiently obtain reliable information from pharmacological studies.
Here, we will introduce a case study of a spheroid drug efficacy study using CELLNETTA, conducted by Professor Shin Hasegawa of the Laboratory of Protein Function Analysis at the Nagahama Institute of Bio-Science and Technology.

Implementation method

(1) Culture RAS-transfected NIH3T3/EGFP cells in a 37°C incubator for 24 hours to generate spheroids of various sizes (Figure 1).
(2) Apply hydrophilic treatment to the CELLNETTA. *
(3) In the equalized size group, after passing the cell suspension through a 180-µm mesh CELLNETTA and again through a 100-µm mesh CELLNETTA, select spheroids trapped on the meshes, one at a time, and place them in a U-bottom plate (375 wells).
In the non- equalized size group, without using CELLNETTA, select spheroids one at a time and place them in a U-bottom plate (375 wells) (Figure 2).
(4) For each group, administer 1, 3, 10, 20, and 100 nM of the proteasome inhibitor Bortezomib, and after 48 hours of incubation at 37°C, measure the ATP activity levels using an ATP quantification assay (CellTiter-Glo®, Promega).

* For more information, please refer to the “Hydrophilic Treatment Manual” in the CELLNETTA User Guide.

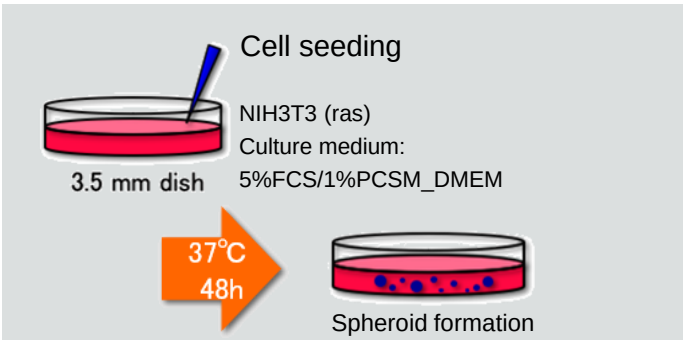


Figure 1: Preparation of spheroids

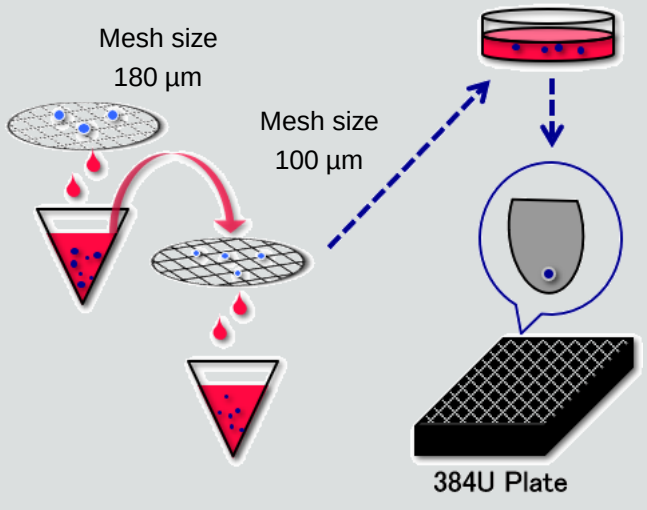


Figure 2: Filter through a 180-µm mesh CELLNETTA and again through a 100-µm mesh CELLNETTA, then recover the spheroids on the meshes, and place them one at a time in a 384-well U-bottom plate.

Results

In a comparison of the ATP activity rates of the equalized size group using CELLNETTA and non- equalized size group, the error bar in the equalized size group is smaller than that in the non- equalized size group. This indicates that reliable results can be obtained by conducting drug efficacy studies using spheroids whose sizes have been equalize using CELLNETTA.

These results indicate that the use of CELLNETTA to equalize the size of spheroids can produce highly accurate drug efficacy study results.

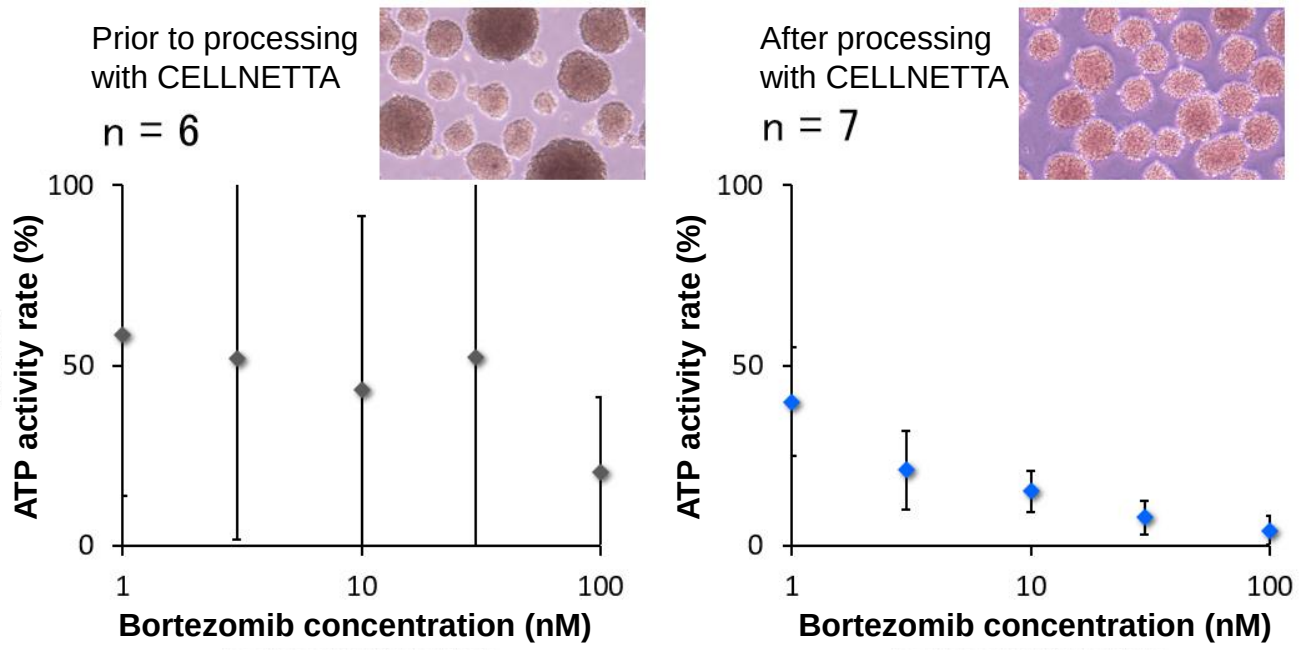


Figure 3: It can be confirmed that using CELLNETTA to equalize the size of the spheroids will provide more reliable test results.

Product used in this application note

Pore size	Gamma Irradiation	Product number (P/N)
100 µm	Gamma Irradiated	MZM1B100B50G
	Non-Gamma Irradiated	MZM1B100B50N
180 µm (custom-made)	Gamma Irradiated	Please contact us.
	Non-Gamma Irradiated	Please contact us.

Notes

- This product is not a medical device.
- This product is a sample for evaluation purpose.
- Please do not ship out your completed product with the sample.
- We shall not be liable for any claims on the sample in case it is shipped out to the market.

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CELLNETTA Website