Electronic Supplementary Material (ESI) for Lab on a Chip.

Supplementary Information for

Standalone cell culture microfluidic device-based microphysiological system for automated cell observation and application in nephrotoxicity tests

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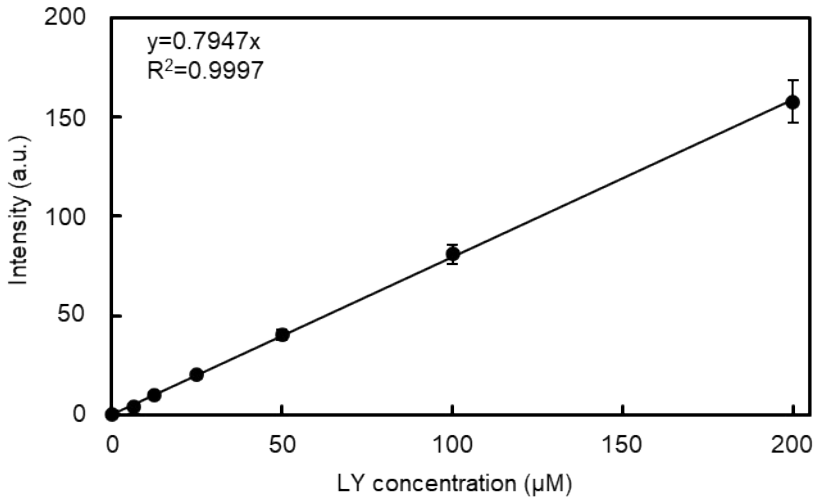


Fig. S1 Graph and calibration curve of fluorescence intensity versus concentration change in Lucifer yellow (LY) obtained using the standalone cell culture microfluidic device and the BioStation CT-based automatic cell imaging system.

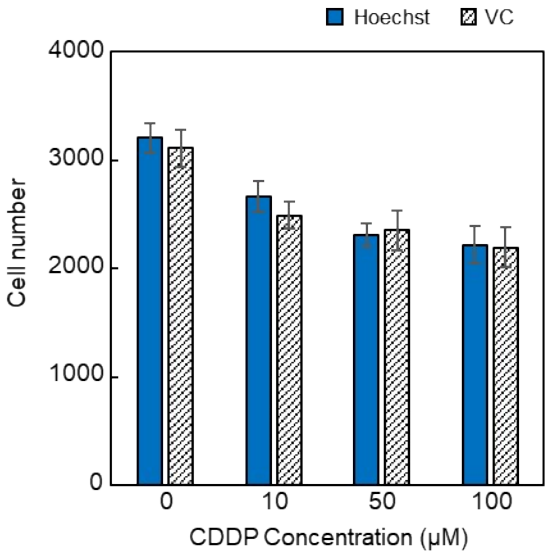


Fig. S2 Cell counts of renal proximal tubular epithelial cells during cisplatin (CDDP) exposure are compared between the volume contrast (VC) method and fluorescent images obtained using Hoechst staining. Under both conditions, the error in cell counts measured using the VC method is less than 10% of the value obtained by counting the number of nuclei with Hoechst staining. The high reliability of the method proposed in this study for evaluating cell counts by automatic segmentation from VC images has been verified.

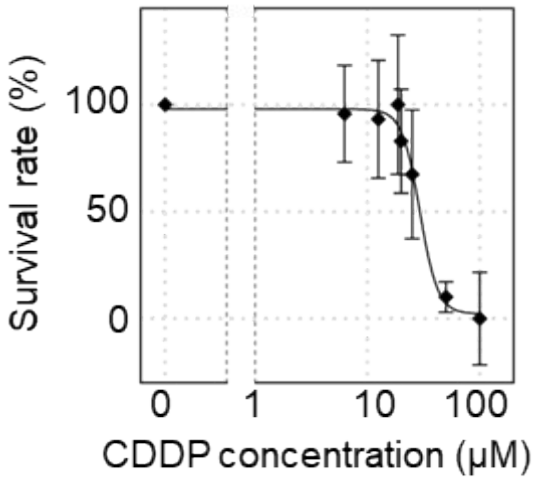
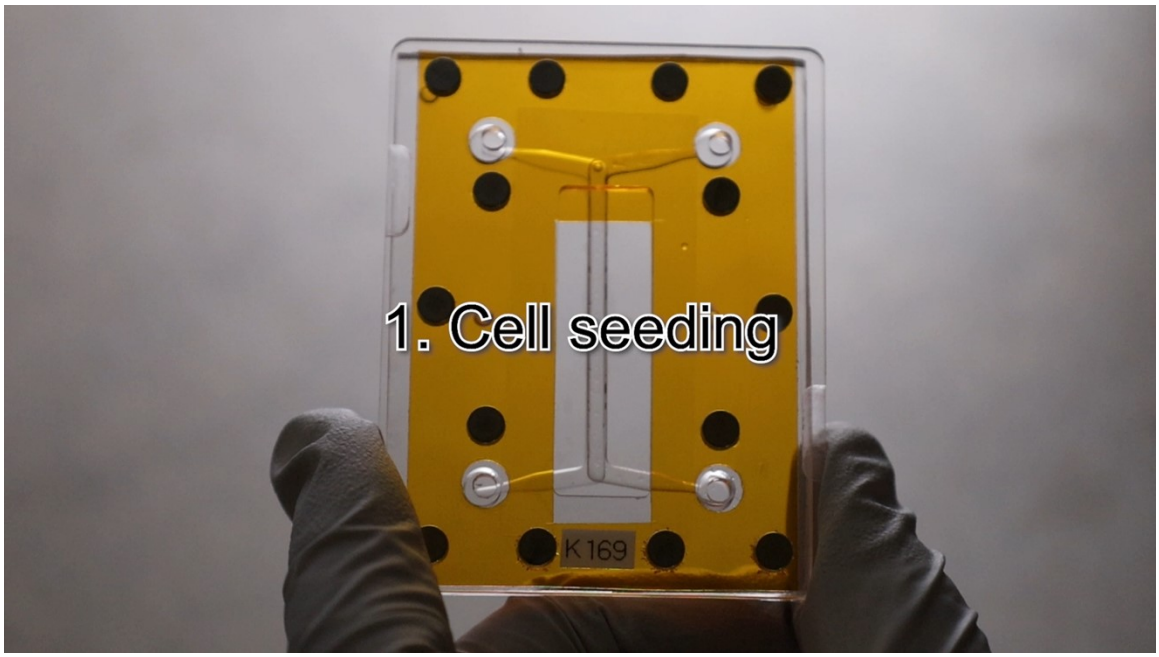


Fig. S3 Cisplatin (CDDP) toxicity study results using the conventional method through cell culture inserts. In this experiment, the conditions including the extracellular matrix coating and RPTEC/TERT1 cell seeding, and incubation period are the same as those in the standalone cell culture microfluidic device experiment. After 3 days of exposure to CDDP, cell viability is measured. The median effect concentration (EC_{50}) value of CDDP obtained from the results of this experiment is 29.3 μM.

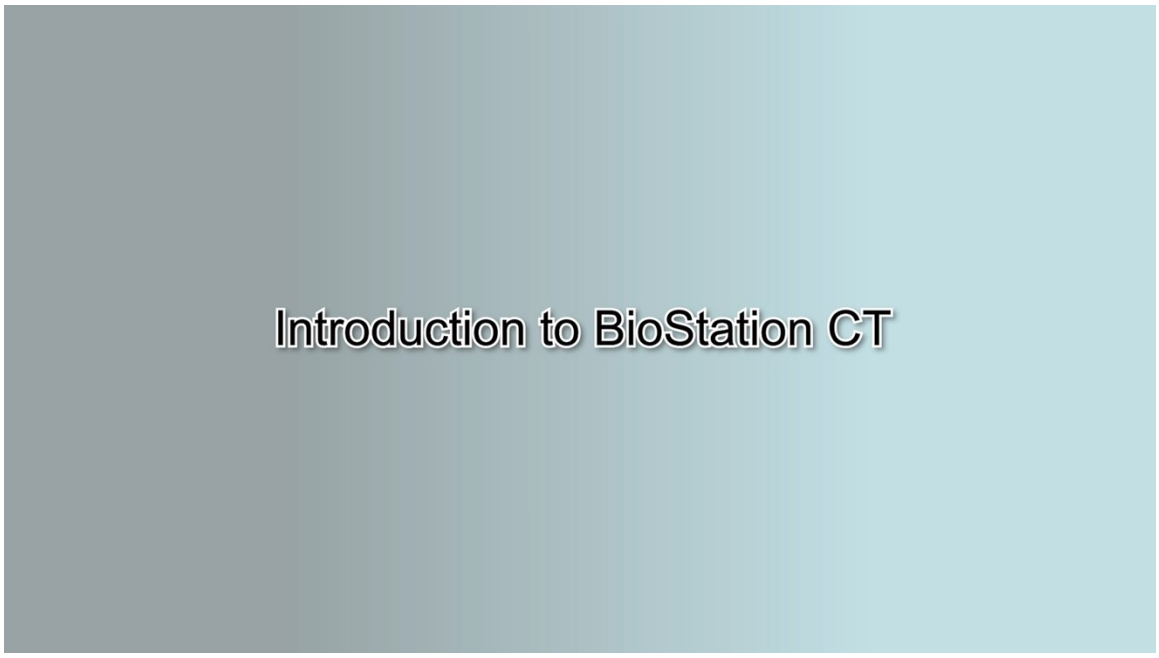
Table S1 TaqMan probes used for quantitative real-time PCR

Gene aliases	Gene symbol	Assay ID (gene expression assay reference)
MATE1	*SLC47A1*	Hs00217320_m1
MATE2K	*SLC47A2*	Hs00945652_m1
P-gp/MDR1	*ABCB1*	Hs00184500_m1
Aquaporin-1	*AQP1*	Hs01028916_m1
E-cadherin	*CDH1*	Hs01023895_m1
PPIA	*CYPA*	Hs04194521_s1

PCR, polymerase chain reaction



Movie S1 Operations of the standalone cell culture microfluidic device (SCCMD) for perfusion culture



Movie S2 Standalone cell culture microfluidic device (SCCMD), which is stored in the storage racks, moved using the transport unit, and observed at the observation stage in the BioStation CT-based cell-culture observation system.