Supplementary information

Simple assessment of viability in 2D and 3D cell microarrays using single step digital imaging

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Fig. S1. Optimization of the process used to image the whole droplet microarray using food color. (a) A digital photograph of a 14 × 14 array of droplets of 100 nL containing a serial dilution of food color. Scale bar: 2 mm. (b) Scan of droplets of 100 nL containing different dilutions of a food dye on the DMA. Scale bar: 0.5 mm. (c) Graphs showing mean grayscale values (left) and normalized mean grayscale values (right) after image analysis of scans of the DMA containing serial dilution of food dye. Image analysis was performed using ImageJ software to convert the images in 8-bit images before estimation of mean grayscale values. Error bars represent the standard deviation.
Figure S2. On-chip colorimetric analysis of cell gradients using resazurin and WST-8 viability assays compared to calcein AM staining followed by microscopy and cell quantification. (a) Table showing distribution of cell numbers across the whole droplet microarray (DMA). (b) Analysis of color intensity of the whole DMA containing cell gradients stained with resazurin. (c) Analysis of color intensity of the whole DMA containing cell gradients stained with resazurin and WST-8.

Figure S3. Results of analysis of the color intensity of the whole droplet microarray containing HeLa cells treated with different concentrations of doxorubicin and stained with WST-8 and resazurin.
Figure S4. Scans of droplet microarrays containing HeLa cells treated with different concentrations of (a) dasatinib, (b) pazopanib, (c) nilotinib and (d) vorinostat in random locations and stained with resazurin and WST-8 (left). Tables showing concentrations of drugs (µM) in random locations corresponding to the scans on the left (right).
Figure S5. Comparison of drug response of HeLa-CLL2 cells on the DMA and 384 well plates. (a) Graphs showing dose-response of HeLa-CLL2 cells to doxorubicin, pazopanib, vorinostat and dasatinib. (b) Table summarizing IC50 values in µM of drugs obtained on DMA and in 384 well plates. Dose–response curves were plotted in OriginPro using “Nonlinear curve fit,” category “Growth/Sigmoidal,” function “DoseResp,” iteration algorithm “Levenberg Marquardt,” and multidata fit mode “Independent fit.” IC50 values were calculated in OriginPro after curve fitting.
Figure S6. Figures showing droplets in high resolution with marked area of 41x41 pixels areas and histograms of the normalized pixel intensities of the whole droplet and 41x41 pixel area. One representative image from the following four conditions (a) media control stained with resazurin; (b) cells stained with resazurin; (c) media control stained with WST-8; and (d) cells stained with WST-8.