NanoSurface **Cultureware**

Nanoscale Topography Promotes Physiological Structure and Function

"Cells in the Dish Should Resemble Cells in the Body"

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Recapitulate the Extracellular Matrix with NanoSurface Cultureware

Nanoscale topography mimics the aligned architecture of the ECM.

NanoSurface Cultureware provides your cells and tissues a biomimetic surface to improve the physiological relevance of your experiments. Shortly after plating, cells cultured on NanoSurface Cultureware exhibit enhanced structural and phenotypic development when compared to cells grown on conventional dishes. NanoSurface topography promotes cytoskeletal reorganization, cellular alignment, and functional development. NanoSurface Cultureware is available in familiar standard formats, featuring glass-bottom wells for high-quality imaging.

NanoSurface dishes promote the structural and phenotypic development of many cell types:

- Skeletal muscle cells
- Smooth muscle cells
- Neuronal cells
- Cardiomyocytes
- Endothelial cells
- Epithelial cells
- Fibroblasts
- Cancer cells
- Induced pluripotent stem cells
- Mesenchymal stem cells
- Human embryonic stem cells
- And many more

NanoSurface Cultureware Benefits

Reproducibly Structured Cell Cultures
Highly uniform, precise, and accurate nanopatterns ensure that your results are consistent from plate to plate.

High-Quality Imaging
Compatible with high-magnification, high-NA transmitted light and fluorescence microscopy techniques. No spectral loss across commonly used fluorophores.

Industry Standard Culture Formats
Cultureware comes in a variety of ANSI/SLAS compliant form factors to guarantee compatibility with existing instrumentation and hardware.

Biomimetic Technology
Nanoscale topography mimics the aligned architecture of the extracellular matrix.

NanoSurface Cultureware vs. Conventional Dish

NanoSurface Cultureware features a nanopatterned culture surface which provides a cellular microenvironment that mimics the aligned architecture of the native extracellular matrix – improving physiological relevance by promoting development. Cells can align, elongate, grow, and even migrate along the pattern while exhibiting more physiologically representative structural and functional phenotypes.

Conventional cultureware does not utilize biomimetic surface topography, which results in random structural orientation. The disorganized isotropic cell and tissue architectures result in immature functional phenotypes that do not reproduce in vivo function. These inaccuracies lead to imprecise, hard-to-reproduce results and wasted time and effort.

Product Specifications

Product Type	Product Code	Approximate Pattern Growth Area (cm^2)	Total Well Volume (µL)	Working Volume (µL)
25mm Coverglass	ANFS-CS25	4.90	–	–
35mm Single Dish	ANFS-0001	3.14	17000	3000
6-well Plate*	ANFS-0006	3.14	17000	3000
24-well Plate*	ANFS-0024	1.65	3400	1000
96-well Plate*	ANFS-0096	0.33	360	200

**ANSI/SLAS compliant. All numbers approximate and subject to revision.*

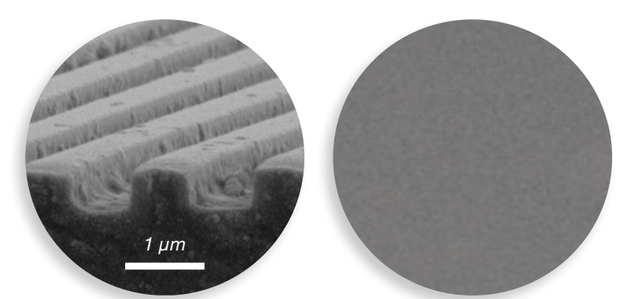

Fig. 1: *NanoSurface Cultureware (left) vs. Conventional dish (right).*

NanoSurface Cultureware | Conventional Dish

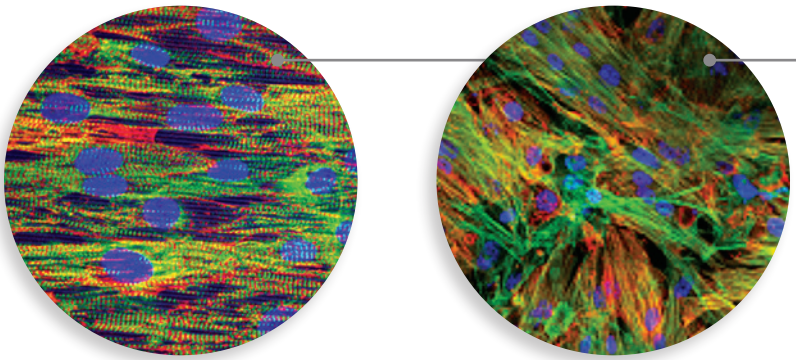

Fig 2: CDI iCell cardiomyocytes on a NanoSurface dish (left) vs. conventional dish (right). Cardiomyocytes elongate in the direction of the nanopattern, develop structurally organized cytoskeletal networks, anisotropic cell shapes, striated and physiologically-spaced sarcomeres, and exhibit polarized expression of gap junction proteins. These and other changes lead to cardiac cells with more physiological and mature electrical and mechanical properties such as faster action potential conduction in the direction of the nanopattern, and improved contraction force and velocity.

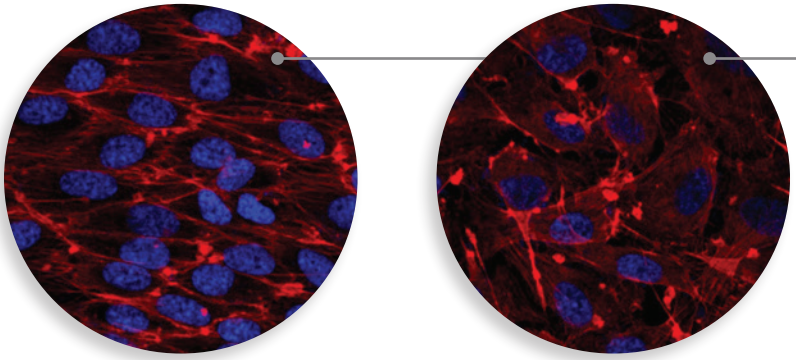

Fig. 3: Endothelial cells on a NanoSurface dish (left) vs. conventional dish (right). Endothelial cells form aligned layers with physiological anisotropy, and exhibit lower expression of inflammatory cytokines.

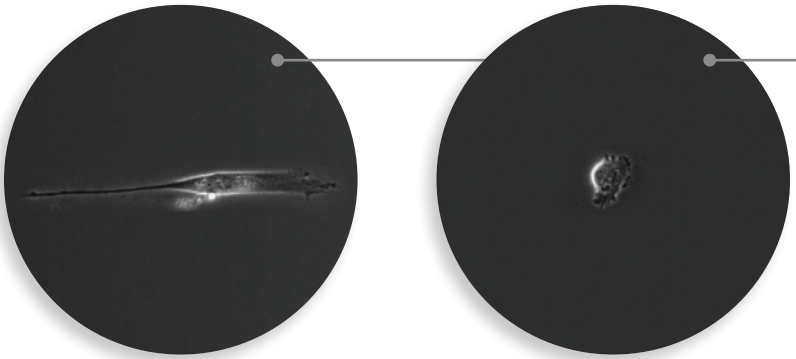

Fig. 4: Directed migration of cancer cells on a NanoSurface dish (left) vs. on a conventional dish (right). Glioblastoma cells grown on traditional flat cultureware lose their migratory phenotype in culture, while cells grown on patterned dishes maintain it, with migration directed along the length of the pattern. Images from Smith et. al. Cell Reports 15(12):2016.

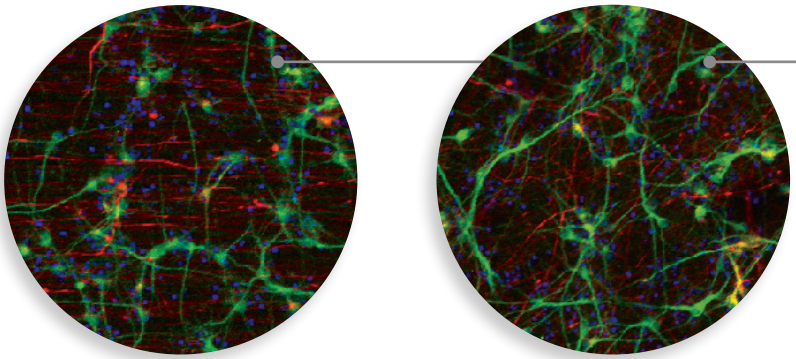

Fig. 5: Two-channel confocal image of CDI cortical neurons cultured on NanoSurface Cultureware (left) vs. on a conventional dish (right). On NanoSurface Cultureware, neurofilaments (red) align along the direction of the nanotopography while dendrites (MAP2 stain; green) do not.

NanoSurface dishes benefit many cell types, including cardiomyocytes, skeletal and smooth muscle cells, endothelial cells, undifferentiated stem cells, cancer cells, fibroblasts, epithelial cells, and many more.

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For ordering and more information, please visit **www.emsdiasum.com** or contact:

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ANSI/SLAS Compliant