INTRODUCTION
Organoid and stem cell-derived culture systems are evolving and enhancing our basic understanding of developmental biology and improving the predictability of in vitro disease modeling and drug screening. The quality and consistency of the adhesion matrix substrates, such as mouse EHS tumor basement membrane extracts (BME), used to embed organoids and expand pluripotent stem cells can greatly impact model variability. This study describes an advanced BME designed to address current shortfalls of existing EHS-derived matrices.

Cultrex™ UltiMatrix Reduced Growth Factor (RGF) BME is a soluble form of basement membrane that provides high tensile strength, enhanced levels of entactin/nidogen, elevated protein concentration, and robust clarity and purity. These compositional enhancements translate into substantial performance benefits that make Cultrex UltiMatrix RGF BME an ideal cell scaffolding matrix for stem cell and organoid cell culture.

IMPROVED SPHEROID (ACINAR) FORMATION

Cultrex UltiMatrix BME Improves Acinar Formation and Consistency. Single MCF10A cells cultured with Cultrex UltiMatrix BME, Cultrex Type R1, or Matrigel for 12 days will differentiate into luminal "acini" structures. A) Quantification of "acini" in Cultrex UltiMatrix BME show increased size and consistency compared to Cultrex BME, Type R1 and Matrigel, respectively. B) Representative images of acini in different matrices.

VERSATILE FOR ORGANOID CULTURE - LUNG, INTESTINAL, AND BRAIN

Lung Organoids Cultured Using Cultrex UltiMatrix BME. Adult stem cells isolated from human lung biopsy tissue were embedded in Cultrex UltiMatrix BME, Matrigel, or Cultrex Type R1 and cultured in airway lung media. A) After 13 days, lung organoids were analyzed for size. Cultrex UltiMatrix BME produced larger lung organoids while maintaining consistency. B) Representative images of lung organoids in respective matrices.

IPSC-derived Intestinal Organoids Grown in Cultrex UltiMatrix BME. Human iPSCs were embedded in Cultrex UltiMatrix BME and cultured in growth medium. iPSC-derived intestinal organoids cultured for 13 days were imaged using A) brightfield microscopy or processed and B) stained for Chromogranin A (green), Vilsa (white), E-Cadherin (red), and DAPI (blue).

Cultrex UltiMatrix BME Displays Optimized Tensile Strength 3D Culture Applications. Cultrex UltiMatrix BME displays consistent similar gelling rates and high tensile strength (storage modulus) compared to Matrigel.

CONCLUSION
Cultrex UltiMatrix RGF BME is designed to accelerate 3D and 2D model development for basic research, disease modeling, and drug discovery. This EHS-derived matrix provides a versatile matrix with compositional and performance benefits, including:

- Optimized extracellular matrix protein composition.
- Consistent ECM composition across lots.
- Elevated entactin concentration resulting in tensile strength ideal for 3D cell culture.
- Supportive of pluripotent stem cell expansion and differentiation.

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