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Corning® Matrigel® Matrix—Helping Make 3D Cell Culture Easier Than Ever

—Colin Bishop, PhD, Professor, Wake Forest Baptist Health

- “We’re very much moving into 3D cell culture now as we do work in body-on-a-chip. What we’re making is relatively small organoids, 200 to 300 microns across, with lots of different cell types.”
- “One of the things we’ve been looking at are brain cerebral organoids. We take induced pluripotent stem (IPS) cells and make an embryoid body of them. After we’ve induced them with specific neuronal media, we embed them in a 50 microliter drop of Matrigel® Matrix and let them sit at 37 degrees. Eventually we put them into a slow spinner flask and they develop very nicely.”
- “As a cellular matrix we’ve been very happy with Matrigel Matrix. It’s something we use and it works fine, so why change it? In fact, we tried doing some of our experiments without Matrigel Matrix and it really didn’t work at all well.”
- “We also use Matrigel Matrix to make lung acini. Usually when we make 3D cultures like liver and heart, we can add fetal calf serum and that gives them enough extracellular matrix to form together. That doesn’t seem to be the case with lung, so we add Matrigel Matrix into the mix to accelerate their formation. Matrigel Matrix seems to have a lot of excellent growth factors in there.”



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—Melissa Fishel, PhD, Associate Research Professor, Indiana University School of Medicine

- “A major focus of our lab is using a pancreatic cancer 3-dimensional (3D) model and looking at tumor spheroid formation *in vitro*. We’re really interested in doing a better job of modeling these tumors *in vitro* by using patient-derived cell lines and then adding different cell types from the tumor microenvironment.”
- “As additional steps, we add things like cancer-associated fibroblasts and neurons. We’re also starting a collaboration with a scientist who works with endothelial cells in the hopes of forming blood vessels.”
- “To look at tumor spheroid formation *in vitro* we have to do it in 3D. That means getting the cells to grow in suspension instead of attached to plastic and getting tumor spheroids to proliferate in ways that are more similar to a real tumor. That’s why we do all these assays in 3D with Matrigel® Matrix.”
- “Matrigel Matrix is a very rich, growth-stimulating media for cells to be in. And if I can still have an effect on tumor cell growth, even in the presence of all that stimulation, that starts to say to me that I’m targeting the right pathway. I also like that Matrigel Matrix has different varieties. I use the reduced growth factor Matrigel Matrix because one of the pathways we’re interested in affects a lot of cytokine production. I am confident that the observed changes I see is due to inhibition of my protein of interest instead of what the Matrigel is doing in stimulating production of different cytokines. I also use Phenol Red Free Matrigel Matrix if I’m going to do imaging. That’s really important because I have to trust the fluorescent signal is coming from my cells and not from the media.”
- “If I’m just floating cells in media, they would not grow as well and form the tumor spheroids nearly as nicely. It also would take a lot longer and the variability would be higher. Matrigel Matrix is providing that support to proliferate and better approximate *in vivo* situations, so it is critical to my experiments.”