3D Cell Cultures, 'Mini-Brains,' Human Tissue-based Bioinks and more…

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We are excited to see a trend emerging in which scientists are developing new gels and growth media to support advanced cell cultures that are entirely without animal components.

Scientific evidence continues to mount, proving that we can't experiment on animals and get accurate results, but until recently researchers didn't realize how all-encompassing that reality is.

The fact is, even many of the animal alternatives that are on the cutting-edge of technology are unfortunately mired in animal derived ingredients. Even when scientists prepare organoids or other advanced cell cultures from human cells, they are often grown in gels made from animal components.

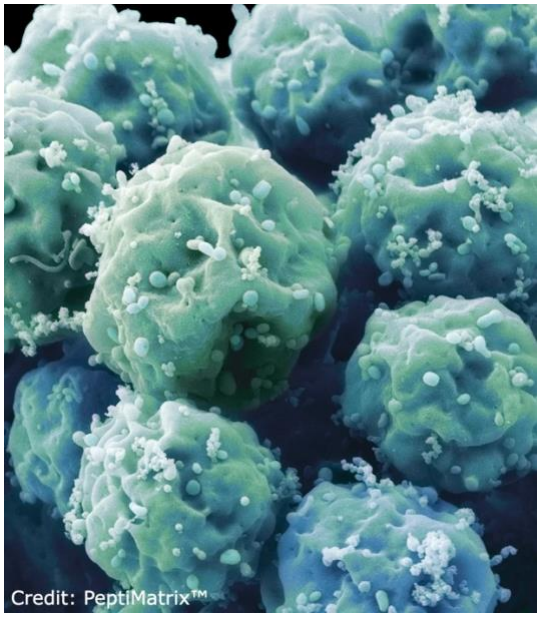
It's no surprise that these animal byproducts affect the efficacy of human cell and tissue cultures. Animal-derived ingredients lead to cell cultures that do not accurately reflect the physiology of human tissues and result in inconsistency and poor reproducibility between batches.

That's why we're excited to see a trend emerging in which scientists are developing new gels and growth media to support advanced cell cultures that are entirely without animal components.

As one scientist said: "When our brains are naturally developing in utero, they are of course not growing on a bed of extracellular matrix produced by mouse cancer cells.

By putting cells in an engineered niche that more closely resembles their natural environment, we predicted we would observe differences in organoid development that more faithfully mimics what we see in nature." [Ayşe Muñiz, Ph.D.]

Innovative 3D cell culture platform could replace the use of animals in research



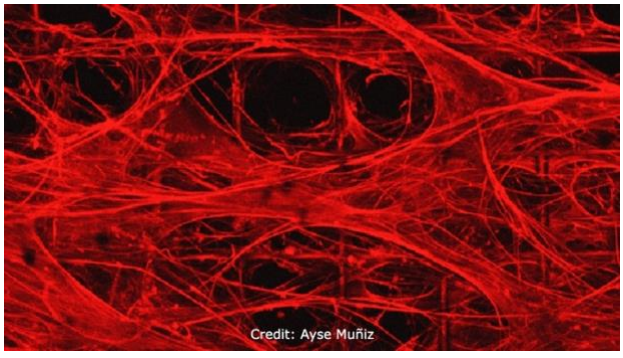
A team of scientists at the University of Nottingham in the UK has developed an entirely animal free platform for the creation of 3D cell cultures.

Their product, PeptiMatrix™, aims to address all the current shortcomings of available in vitro models that currently rely on animal-derived growth media to support 3D cell cultures.

PeptiMatrix™ is a fully synthetic self-assembling peptide hydrogel. The platform is totally customizable to mimic both the stiffness and composition of any target tissue type. The technology is entirely free of any animal products and is also highly reproducible, optically transparent and ready-to-use.

Company CEO, Dr. Johnathan Cure says, “By bringing a reliable synthetic alternative for animal-derived hydrogels (such as those derived from EHS mouse sarcoma) to market, researchers will be provided a way to generate more accurate and reliable data, whilst also helping to reduce (and eventually replace!) the use of animals.

Artificially grown 'mini-brains' without animal components bring opportunities for neuroscience

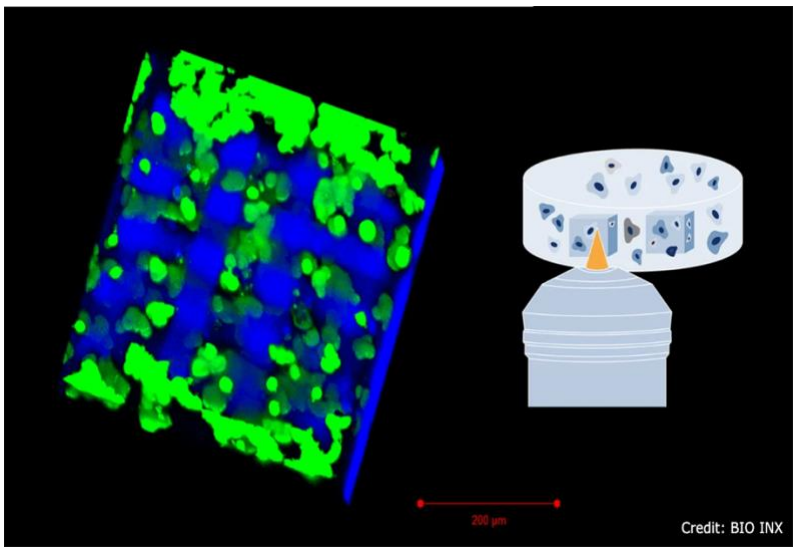


Human brain organoids, or mini-brains, are derived from human cells and mimic human physiology far more accurately than animals. However, they have so far used an animal-sourced matrix called Matrigel to provide the structure to the organoid. In addition to ethical concerns, Matrigel had significant disadvantages that resulted in undefined composition and variability between batches.

Now, researchers at the University of Michigan have developed a new culture methodto engineer extracellular matrixes for human brain organoids that improve the functionality while also eliminating animal components.

Senior author Dr. Joerg Lahann confirms “This advancement in the development of human brain organoids free of animal components will allow for significant strides in the understanding of neurodevelopmental biology”.

HU3DINKS project to develop human tissue-based bioinks for 3D bioprinting



Bioprinted human tissue models are a more ethical and scientifically superior method than testing on animals for learning more about human health and disease research. However, current bio inks used in the printing of 3D human tissues contain animal-derived components, limiting their efficacy and posing ethical concerns.

The HU3DINKS project, a collaboration between scientists from several different countries, seeks to create a high-performing human-based bioink that can replace animal-derived ingredients.

This will not only further eliminate the use of animals, it will improve the efficacy of human-based tissue models by making them more accurate in both design and composition.