

# Pioneering new 3-D cancer model to speed new treatments

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A scientist at the University of Virginia School of Medicine, working with local biotech company HemoShear Therapeutics, has created a physical, three-dimensional model of a cancer tumor that can replicate the complex nature and behavior of a real tumor. The model will help researchers better understand the disease and accelerate the development of new and better treatments.

The multicellular model also can be customized to behave like a particular patient's tumor, so that doctors can determine how the tumor will react to different drugs. That could allow them to identify the best treatment option based on a simple biopsy.

"This model enables us to understand the inner workings of tumors to systematically identify and test new ways to treat cancer," said researcher Dan Gioeli of UVA's Department of Microbiology, Immunology and Cancer Biology and the UVA Cancer Center.

## Better Understanding Cancer

The new model – sort of a tumor in a petri dish – mimics the tumor "microenvironment" for pancreatic cancer and non-small-cell lung carcinoma. It could, however, benefit the battle against many types of solid tumors, Gioeli said. The model will enable scientists to better understand how cancer takes root and how the cancer cells grow, spread and develop resistance to treatment.

Gioeli's model, made in collaboration with HemoShear, reflects the complexities of cancer by incorporating different cell types that are found in tumors. For example, it includes [vascular endothelial cells](#), the cells that line blood vessels and are exposed to the tremendous shearing forces of blood flow.

Researchers will be able to manipulate the

different components of the model in a way not possible with existing methods, according to HemoShear. This should provide important insights during the development of new treatments, Gioeli said.

"This model incorporates tumor hemodynamics and biological transport in a way that other [tumor](#) models do not," he said. "We believe this [model](#) can be used for the rapid evaluation of novel precision therapies."

## New Model Unveiled

Gioeli will present the [new model](#) in Boston next week at a scientific meeting, 3-D Tissue Models Oncology 2018.

Gioeli has worked as senior director of [cancer biology](#) at Charlottesville-based HemoShear while on sabbatical from UVA. He has a financial stake in the company.

HemoShear's core technology was originally developed by two UVA researchers to create more accurate models of human disease for deeper understanding of how diseases develop and to discover safer and more effective drug therapies.

Provided by University of Virginia

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