

In a world full of 3D models, researchers build a new one for leukemia

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Ben Frisch, PhD, holds the bone-marrow-on-chip device in his lab. Credit: University of Rochester Medical Center

A Wilmot Cancer Institute scientist published data that show a new microchip-like device that his lab developed can reliably model changes in the bone marrow as leukemia takes root and spreads.

Ben Frisch, Ph.D., assistant professor of Pathology and Laboratory

Medicine and Biomedical Engineering at the University of Rochester, and colleagues have been building what is known as a modular bone-marrow-on-chip to enhance the investigation of leukemia stem cells. The tiny device recapitulates the entire human bone marrow microenvironment and its [complex network](#) of cellular and molecular components involved in blood cancers.

Similar tissue-chip systems have been developed by others, but they lack two key features contained in Frisch's product: osteoblast cells, which are crucial to fuel leukemia, and a readily available platform.

The fact that Frisch's 3D [model](#) has been published in *Frontiers in Bioengineering and Biotechnology* and is not a one-off fabrication will allow others in the field to adopt a similar approach using the available microfluidics system, he said.

Azmeer Sharipol, a second-year graduate student in Biomedical Engineering at UR, is taking charge of the project in Frisch's lab and is first author of the study. Another fundamental contributor is Maggie Lesch, now a first-year graduate student, who kicked off the project during her time as a technician in the lab.

Often when scientists study [leukemia](#) in the lab, Sharipol noted, they are limited to human or mouse cells and not able to see the bigger picture of how disease develops. "We hope that by modeling the [bone marrow](#) niche, we will gain a better understanding and be able to discover potential therapeutic targets."

More information: Azmeer Sharipol et al, Bone Marrow Microenvironment-On-Chip for Culture of Functional Hematopoietic Stem Cells, *Frontiers in Bioengineering and Biotechnology* (2022). [DOI: 10.3389/fbioe.2022.855777](https://doi.org/10.3389/fbioe.2022.855777)

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