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UM Joins Prestigious Research Network to Accelerate Translational Science

Efforts to effectively treat tumors with targeted therapies are moving beyond identification of genes that become dysregulated or activated in the malignancy process. Now investigators are focusing on the role the *location* of the mutations in tissue could play in promoting cancer.

Mapping out the tumor-gene environment appears promising. To learn more, the University of Miami recently joined forces with many other prominent research institutions to share best practices and translate findings into useful therapies in the clinical setting.

Dr. J. William Harbour

“The University of Miami is among the first in a prestigious group of institutions involved in this unique collaboration that allows us to work with other successful teams to learn how to use spatial genomics technology most efficiently,” said J. William Harbour, M.D., vice chair for translational research, director of ocular oncology, and associate director for basic research at Sylvester Comprehensive Cancer Center at the University of Miami Miller School of Medicine. The consortium includes investigators from 38 other international institutions. “It’s a multidisciplinary and multicenter collaboration,” Dr. Harbour said. “Everyone is coming to the table with information and insight.”

10x Genomics developed the Visium Spatial Gene Expression technology and provided Dr. Harbour’s lab with early access to it. In return, he is helping 10x Genomics understand how to use and optimize this exciting new technology. “Working with them has been a win-win relationship,” said Dr. Harbour, who is also professor of ophthalmology and Mark J. Daily Chair in Ophthalmology at Bascom Palmer Eye Institute at the University of Miami Health System.

“Before the availability of this spatial genomics technology, we could identify individual tumor cells based on their genetic profile, but couldn’t tell where they were located three dimensionally in relation to other tumor cells and immune cells infiltrating the tumor,” said Dr. Harbour.

Through efforts such as the 10x Genomic Visium Clinical Translational Research Network, Dr. Harbour’s lab research into eye cancers bridges Bascom Palmer and Sylvester. His laboratory also trains many UM students, including medical

scientist training program M.D./Ph.D. students James Dollar and Michael Durante, who worked with Dr. Harbour on this initiative.

Dr. Harbour's lab focuses on uveal (ocular) melanoma. Recent discoveries using an earlier 10X Genomics technology called single-cell sequencing led to the discovery that the lymphocyte-associated gene 3 (LAG3), a factor that can lead to the exhaustion of immune system T cells in cancer, may be a key therapeutic target. This discovery has led to the opening of a first-of-its-kind clinical trial for patients with metastatic uveal melanoma at Sylvester, with Dr. Jose Lutzky as principal investigator and Dr. Harbour as co-principal investigator.

Going forward, Dr. Harbour hopes the global research network collaboration will help answer another big remaining question in cancer: Do mutations and other genomic aberrations in cancer arise as a result of altered immune systems, or is it the altered immune system that creates a selective pressure that drives the emergence of certain genomic aberrations?

"I hope that we can answer this question in the next five years," Dr. Harbour said.

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