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# Brain Tumor Stem Cell Program Established at UTHSC

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A brain cancer stem cell program has recently been established at the University of Tennessee Health Science Center (UTHSC). Only a few other centers of this type exist in the U.S., including programs at Stanford University and the University of Michigan. Operating as part of the UTHSC Department of Neurosurgery in collaboration with Semmes-Murphey Neurologic and Spine Institute and Methodist University Hospital Neuroscience Institute, the program is funded primarily by the Methodist Healthcare Foundation. Methodist University Hospital and UTHSC formally affiliated in 2002 to form an academic medical center environment.

Valery Kukekov, Ph.D. and Tatyana Ignatova, Ph.D., were recruited from the University of Florida to join the Department of Neurosurgery to lead an effort to combine the fields of tumor cell and stem cell biology.

"This is a major achievement for the UT Health Science Center and Methodist and will put us at the forefront of brain cancer research nationally. This research team will unite physicians and scientists of diverse backgrounds and will attempt to answer questions about the role of cancer stem cells in all biological aspects of brain tumors from both children and adults," said Jon Robertson, M.D., head of the UTHSC Department of Neurosurgery. Dr. Robertson is a physician with Semmes-Murphey Neurologic and Spine Institute, the largest neurosurgery group in the country.

Dr. Christopher Dunsch, a group leader for brain cancer research and development in the UTHSC neurosurgery department, said, "Drs. Kukekov and Ignatova are considered pioneers in the field of stem cell and tumor stem cell research, and we are very fortunate to recruit them to Memphis to start this program."

Both researchers previously worked at UTHSC and have fond memories.

"We knew that coming here would give us a unique opportunity to initiate a multi-disciplinary program that will integrate two branches of biomedical science: basic and clinical, to study the origins of brain tumors and brain metastases from different primary tumors," said Dr. Kukekov.

They were also enticed knowing they would have a large volume of brain tumors to use in their studies. Methodist Healthcare has one of the most active neurosurgery programs in the country, performing hundreds of surgeries for brain tumors annually.

The concept of stem cell biology has changed the paradigm of how healthy tissues develop and how injured tissues regenerate. Similarly, the concept that cancer is a stem cell disease will yield exciting new potential for understanding how cancers arise, spread, and resist treatment. The ultimate goal of the Department of Neurosurgery tumor stem cell program is to define the true nature of a cancer stem cell, and then use this information to design novel therapies including a cancer vaccine targeting this unique cell population.

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Dr. Kukekov is a pioneer in adult brain stem cell research. In the late 1990s, he collaborated with Dr. Ignatova, an experienced cancer cell biologist, to isolate stem-cell-like cells from human brain tumors. This landmark study was presented at the Annual Neuroscience Society meeting in Los Angeles in 2000, and demonstrated for the first time the existence of cancer stem cells in human brain tumors. During more recent studies at the University of Florida, the researchers, in collaboration with an orthopedic surgeon, Dr. Parker Gibbs, similarly isolated cancer stem cells from bone and cartilage tumors, demonstrating that all cancers may be derived from a cancer stem cell.

"In our stem cell model, the bulk of tumor cells are innocent. Only the seeds, or stem cells, are dangerous," said Dr. Kukekov. "If we can isolate and study these cells, it will be easier to invent therapies and drugs that are more targeted by interfering with the process of tumor growth and with metastasis to the brain."

Drs. Kukekov and Ignatova will join Dr. Duntsch's existing tumor research group, and together they will combine stem cell and tumor cell biology research into a new research direction, tumor stem cell research. They will combine the study of cancer stem cells derived from human brain tumors treated here in Memphis with animal models to further develop their paradigm for how these stem cells are related to the biology of brain tumors. The unified goal of this effort will be to develop new therapeutic approaches to cure brain cancer.

Over the next few years, they will work to establish this research and solicit public funding from the National Institutes of Health.

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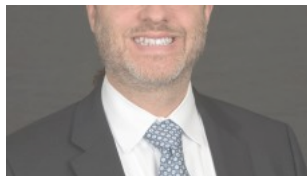
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


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