

Two Sides of the Mitochondrial Coin in Cancer



Dr. Mythreya Karthikeyan

Assistant Professor of Biochemistry and Molecular Biology
University of South Carolina

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11:30 a.m.–12:30 p.m.

Biology (Building 21), Room 256

Dr. Mythreya Karthikeyan is Assistant Professor of Biochemistry and Molecular Biology At the University of South Carolina. Her research group's main interest is in understanding the interplay between the TGF β family of growth factors and their receptors and how this impacts cancer progression and metastasis. In this lecture, Dr. Karthikeya will discuss her work, specifically with regard to the devastating disease ovarian cancer.

Late-stage cancers are marked by poor patient survival due to metastatic spread. In the case of ovarian cancer, late-stage disease is marked by tumor cells accumulating in the fluid of the peritoneal cavity, called ascites, which contributes to metastasis. The ascites fluid harbors tumor cells that are highly adaptable to surviving under the stress of no attachment (anchorage independence). Thus, understanding how the tumor cells adapt to such stresses will provide us new approaches to control mortality associated with ovarian and other cancers.

We recently uncovered growth factors that accumulate in ascites, which turn on and off key developmental genes such as Sox2. We find that such developmental genes are re-activated by the tumor cells to promote adaptation by regulating and changing mitochondrial function. Our current work focuses on how enhanced mitochondrial function may benefit tumor cells and also be exploited therapeutically.

Dr. Karthikeyan received her doctoral degree from the University of North Carolina at Chapel Hill in 2005. She did her postdoctoral work at Duke University discovering and defining new ways to control growth factor availability by co-receptors of the TGF- β family in cancer. She started her tenure track appointment at SC in 2013 through a joint appointment at the College of Pharmacy's Drug Discovery and Biomedical Science Program and the Department of Chemistry and Biochemistry.

Dr. Karthikeyan is a recipient of the prestigious Liz Tilberis Scholar award for her work in ovarian cancer and is funded through both the National Institutes of Health and research foundations. Her research group, which is comprised of undergraduate, graduate, and postdoctoral trainees, use molecular, cell biological, biochemical and *in vivo* tools. She is also engaged in undergraduate education, routinely teaching an upper-level biochemistry/ molecular biology class.