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Rewiring metabolic and redox networks in cancer as a novel diagnostic and therapeutic strategy

One of the most exciting strategies that has recently gained traction for treatment of cancer is to target metabolic processes. Although metabolic drugs that work in theory have been identified, the glycolytic status of the tumors often makes these approaches ineffective. Recent work from the Rosner laboratory has identified a transcription factor that controls the respiration status of triple-negative breast cancer (TNBC), the most aggressive subtype of breast cancer. Therapeutic removal of this protein promotes sensitivity to agents that target oxidative phosphorylation such as metformin. Bioinformatic analyses of patient data also suggests that use of this transcription factor in conjunction with genes involved in oxidative phosphorylation can serve as biomarkers to predict therapeutic response to such treatments in not only breast cancer but across multiple cancer types. These findings provide a conceptual framework for cancer therapy development and can be leveraged in conjunction with other complementary treatments for both patient selection and long-term treatment.

Speaker Biography

Marsha Rich Rosner has earned her BA in Biochemistry from Harvard University and her PhD in Biochemistry from MIT. In 1982, she became an Assistant Professor in the Dept. of Applied Biological Sciences at MIT. She has joined the University of Chicago faculty as an Associate Professor in 1987 and was promoted to Full Professor in 1994. She was the Founder and First Chair of the Committee on Cancer Biology, a degree-granting graduate program leading to the PhD in Cancer Biology. She was appointed the Charles B Huggins Professor and later became the Chair of the Ben May Department for Cancer Research for 13 years. She is currently a Fellow of the Institute for Molecular Engineering and the Institute for Genomics and Systems Biology. She has received several honors including election as a Fellow of the American Association for the Advancement of Science (AAAS) in 2011.

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