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## Breast cancer and personalized medicine: A perspective on how to improve prudence and pioneer cancer treatment reforms

Cancer, per se, remains one of the most challenging diseases to treat. Indeed, breast cancer is the second leading cause of death among women affecting 1 in 8 women in the USA and the most common cancer among women worldwide. Despite increases in the number of people surviving cancer, there yet exists a vast rift in the number who died each year, despite excepted standard treatment regimens. The challenge of standard and generic treatment modalities, ascribed specifically for the various tumor types in some measure, undermines the ability to achieve remission status as there still remains, in 2017, a persistent and steady risk of recurrence post 5 years of treatment. Unachievable remission status is also attributed to the heterogeneity of tumors. Most cancers are monoclonal in origin however, due to innate genetic instability subsequent cell generations take on new characteristics, creating a heterogenic disease well-defined by genetic clonal expansion complete with epigenetic changes. But, tumors cells are not the only contributors of tumor heterogeneity, as the entire micro environmental constituents and its non-tumorous cells further exert have an absolute influence. Thus, there exists a reciprocal and dynamic interaction between tumor cells, microenvironment constituents and non-tumorous cells that produce a well-defined individualized tumor phenotype. The clinical relevance is that the tumor and its micro environmental components contribute significantly to the efficacy of chemotherapy. Further, drug transporter genetic variants cause population-specific differences in drug transport and therefore impart considerable inter-individual variation in pharmacotherapy and thus clinical response to a myriad of agents. This divergence underscores the necessity of personalizing medicine wherein the data garnered from a person's own cancer is utilized to develop a highly individualized therapeutic regimen that encompasses the totality of the tumor mass. This commentary provides an assessment on the advent, progression, challenges and opportunities of one lab's capability to establish an in-vitro assay with the adeptness to predict in-vivo response. A perspective on how to improve prudence and pioneer cancer treatment reforms is presented to provide insight and provoke ideology.

### Speaker Biography

Sherry Bradford has completed her PhD at the New York State University at Buffalo Medical School/Roswell Park Cancer Institute Division. She is the founder and Chief Scientific Director of AccuTheranostics, a premier biotechnology research and clinical laboratory services, located in the heart of Buffalo's Medical Corridor. She has published many papers/book chapters, been an invited speaker at many national/international meetings and is currently serving as an Editorial Board Member of peer-reviewed journals. She holds two patents and three pending.

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