Gazing Into A Crystal Ball With The TBBCF Scientific Advisory Board

by Michael Morin, PhD

We are sometimes asked about the nature of the research funding applications we receive now vs. at the very beginning of the TBBCF a decade ago. In a word- EXCELLENCE. The quality of our applicants and their research proposals has always been high because of our steadfast focus on breast cancer centers of excellence here in the northeast. We are not regional snobs- but we like to get out and meet as many of our fellows and their mentors as we can. It gives us an opportunity to remind them of our founders, our mission, and the hard work and many blisters that go into each dollar of funding. As the word has spread about the availability of this prestigious fellowship program, and as federal and other sources of funding has undergone a steady decline, both the size and the quality of the applicant pool has increased in an extraordinary way. Excellence has been compounded by excellence in the past few years.

Together we have built a compelling foundation and have enabled some truly outstanding work by our fellows – research that has brought us closer to understanding this horrible disease and the best ways to eradicate it. With that, it is interesting to think about what the future may bring.

Ten years ago ("the early days of TBBCF") we were deeply immersed in the Cancer Genomics era- which seemed to touch everything from breast cancer diagnostics and prognostics to treatment decisions to targeted therapies. And our applications reflected that. Over the last three or four years, we have entered the Cancer Immunity era, where it is now understood that tumors very actively undermine the body's effort to recognize and eliminate them. Initial data suggest that activating the immune system to eradicate breast cancer may be more difficult than in other diseases such as lung cancer or melanoma- diseases that have a higher tumor mutational burden (due to smoking and sun exposure, respectively) and are therefore more likely to be recognized as foreign by a reactivated immune system.

Recent data suggest, however, that a patient's breast cancer and her immune system are also involved in a close dance, but one syncopated to a very different rhythm than in other diseases. In one envisioned future state, we anticipate that the Cancer Genome and Cancer Immunity eras will coalesce and help improve our understanding of this close dance. If breast cancer is said to be less recognizable by the immune system, how does one explain "inflammatory breast cancer"- one of the most insidious and difficult to treat forms of the disease? And even if breast cancers have less of a mutational burden, we know that they can have significant genomic defects due to diminished capacity to repair their DNA (e.g. BRCA mutations). Some very important antigens do become over-expressed (e.g. erbB2), and these can become gateways to new

therapeutic approaches. Working together, those focused on the Cancer Genome and those focused on Cancer Immunity will soon likely collaborate on research to better define the breast cancer – immune system interface at a genomic and therapeutic level. When they do, we'll be there to offer our encouragement and support.