# Q&A WITH DARRELL BORGER

**Immuno-Oncology Laboratory Director, Translational Research/Biomarker Laboratory, Massachusetts General Hospital Cancer Center**

**The Immuno-Oncology market has seen rapid growth in the last decade. What do you believe is the main reason for this?**

Immuno-oncology has emerged as one of the hottest areas in cancer treatment. Much of this momentum has come from therapies that target immune checkpoints that are involved in immune evasion and exhaustion. Studies have shown survival benefits that can significantly exceed those provided by traditional targeted therapy in at least a subset of patients. With proof of principal that the immune system can be successfully modulated to help fight cancer, a number of other immune therapy approaches are rapidly emerging, including cancer vaccines, oncolytic viruses, adoptive cell transfer, and cytokine treatment. This has fast-tracked drug development and created an exciting diversity of clinical trials that are open to advanced cancer patients. The level of success from these trials continue to change the standard of care across a number of malignancies through the granting of numerous FDA approvals.

**Your work focuses on merging translational research with innovative molecular techniques to improve cancer care. What are your main priorities at the moment?**

The successes of immune therapy in the treatment of cancer has led to a large number of clinical trials evaluating a diversity of immune modulators, often in combination with standard therapy or additional immune treatments. While this provides great opportunities for the cancer patient who has failed standard of care, this diversity of opportunities create uncertainty as to which particular trials may be most beneficial for a particular patient. Therefore, we are focused on identifying underlying biomarkers in the patient's tumor that can direct them to specific clinical trials, much like what cancer genotyping has provided for traditional targeted therapies. However, the nature of tumor-immune corollary markers require very different testing approaches, many of which continue to evolve or are only starting to emerge.

**Darrell Borger, Immuno-Oncology Laboratory Director, Translational Research/ Biomarker Laboratory, Massachusetts General Hospital Cancer Center**

Darrell R. Borger, PhD works at the Massachusetts General Hospital where he has played key roles in driving promising translational findings into clinical testing, providing a foundation for delivering precision cancer therapy. As co-director of the Translational Research Laboratory, he helped develop one of the first CLIA laboratories that provided tumor genotyping as part of standard clinical care in a hospital setting. As director of the Biomarker Laboratory, he expanded platform testing to facilitate the stratification of advanced cancer patients to experimental therapies in early-phase clinical trials based on an underlying tumor signature. Most recently, he serves as Scientific Director for the Immuno-Oncology Laboratory where he is working to implement the next generation of platforms that can rationally direct cancer patients to immunotherapies using a tumor-immune biomarker approach.

**You are going to be giving a talk at our Immuno-Oncology USA Congress on platform integration to identify immunological biomarkers. What are the main challenges you are facing in this work?**

The nature of tumor immune escape mechanisms requires an understanding minimally of the infiltrating immune cells, the cancer driver mechanisms, the secreted microenvironment, along with their spatial relationships within the tumor. The difficulty is that the sheer number of tumor-immune markers or mechanisms of potential clinical significance currently exceed the capabilities of histological approaches. Therefore, more traditional discovery techniques such as NGS and RNA expression profiling play an important role. While the required homogenization of the tumor tissue results in a loss of intra-tumor relationships, these techniques can narrow down potential mechanisms of interest for further evaluation through multiplexed histological techniques. However, this requires a significant amount of patient tissue that is often limiting. So a recurrent challenge is how to be as impactful in our analyses as possible in order to conserve these precious specimens.