

Drug Sensitivity Screening for Patients with Sarcoma

The Center for Therapeutic Innovation (CTI) in collaboration with the Sylvester Comprehensive Cancer Center at the University of Miami, have recently developed a cancer-specific drug sensitivity-screening platform.

This multidisciplinary group of experts aim to implement a precision medicine approach that allows rapid stratification of patients for cancer treatment in order to align them with the best possible treatment option, regardless of whether it was used for the particular cancer in the past. The approach should provide improved potential for positive outcomes and reduced risk for side effects and toxicity, especially from previously unsuccessful treatment approaches.

Their precision medicine approach has been successfully implemented as part of a clinical trial in patients with relapsed/refractory acute myeloid leukemia, where the use of the screening platform for treatment stratification resulted in response to treatments that the patients would not have otherwise been prescribed.

The patient's individual treatment responses are established towards a panel of 215 FDA-approved anti-cancer agents. The cancer will respond to a specific set of drugs unique to that person and those drugs displaying low normal tissue toxicity can be recommended for patient treatment by a physician. With a two-week turnaround time, the screen can be used for clinical decision making without significantly delaying treatment. A larger multi-center clinical trial in AML is in planning stages and additional trials in other cancer types will be possible using a similar trial framework.

The drug sensitivity-screening platform is being adapted for sarcoma patients and is being evaluated for a potential clinical trial. Before clinical work can begin, the approach needs to both be adapted specifically to sarcoma, and also evaluated for the potential to yield meaningful results. An initial sarcoma screen has been completed in one patient already. The screen used small pieces of fresh tumor samples (2x2mm) from standard of care surgery to evaluate the patient's treatment response towards a panel of 215 FDA-approved anti-cancer agents including compounds commonly used in the treatment of sarcoma as well as compounds used in other malignancies. The treatment responses of the tumor samples are then compared to the response of the corresponding normal tissues in order to evaluate potential for toxicity in healthy tissue (which may cause side effects). Compounds displaying high specificity toward the patient's cancer cells in combination with low potential for toxicity are communicated to the treating physician within two weeks.

The value of this precision medicine approach for sarcoma patient treatment stratification is currently being evaluated for potential to initiate a pilot clinical trial at the Sylvester Comprehensive Cancer Center. This approach will be especially beneficial for pediatric cancer patients, who carry the highest burden of treatment toxicity.

