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OTHR-04. DEVELOPMENT OF A FUNCTIONAL PLATFORM FOR REAL-TIME PERSONALIZED DRUG SENSITIVITY PROFILING OF PATIENT-DERIVED 3D FRESH TUMOR TISSUE CULTURES IN THE PEDIATRIC PRECISION ONCOLOGY PROGRAM INFORM

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The international precision oncology program INFORM enrolls relapsed/refractory pediatric cancer patients for comprehensive molecular analysis. We report a two-year pilot study implementing ex vivo drug sensitivity profiling (DSP) using a library of 75-78 clinically relevant drugs. We included 132 viable tumor samples from 35 pediatric oncology centers in seven countries. DSP was conducted on multicellular fresh tumor tissue spheroid cultures in 384-well plates with an overall mean processing time of three weeks. In 89 cases (67%), sufficient viable tissue was received; 69 (78%) passed internal quality controls. The DSP results matched the identified molecular targets, including BRAF, ALK, MET and TP53 status. Drug vulnerabilities were identified in 80% of cases lacking actionable (very) high-evidence molecular events, adding value to the molecular data. Striking parallels between clinical courses and the DSP results were observed in selected patients. Overall, DSP in clinical real-time is feasible in international multicenter precision oncology programs.