Preclinical research has demonstrated enhanced anti-leukemic activity both in vitro [3-5]. Crenolanib is a novel Type 1 TKI that can inhibit both ITD and TKD FLT3 mutants, including FLT3 mutation is found in about 30% of adult AML patients and about 20% of pediatric AML. Any # prior therapies AML, CNS leukemia, Extramedullary AML 1 (11%) CNS: Central nervous system, EMD: Extramedullary disease, TID: Twice daily, THR: Thrice daily. *2 cases did not have CSF examination. **Extramedullary disease. ***CNS involvement. ****Peripheral blasts at enrollee. **Note: All but 1 patient had disappearance of peripheral blasts. Patients 1 and 8 did not have cholesterol precursors present in marrow. Conclusions • Crenolanib 66.7 mg/m2 TID can be safely combined with sorafenib at 150 mg/m2 QD and 200 mg/m2 OD in pediatric patients with relapsed/refractory FLT3–AML. • Even patients with prior exposure to sorafenib, this combination showed clinical benefit for AML patients, represented by rapid reduction of bone marrow and peripheral blasts on cycle 1 of study. • Thrombocytopenia seemed favorable for pan-leukemic and hematological stem cell transplantation. • Future crenolanib trials in pediatric patients are planned. References 1. Mall, C.H., et al., Sorafenib treatment of FLT3-ITD acute myeloid leukemia: favorable role autonomy and mechanisms of subsequent nonresponsiveness associated with the emergence of a BCR mutation. Blood, 2012. 111(20): p. 2283-40. 2. Fierro, P., et al., Wnt/β-catenin, FLT3 and GAB1 mutations in pediatric AML with French-Ancient incidence and after initial response to chemotherapy. Leukemia, 2014. 28(11): p. 2205-14. 3. Schnitt, S.C., et al., Crenolanib in a selected Phase I trial cohort. Proc Am Soc Clin Oncol, 2016. 34(14): p. 2019. 4. Zhang, W., et al., Reversal of acquired drug-resistance in FLT3-mutated acute myeloid leukemia cells via distinct drug combination strategies. Cancer Gene Ther, 2014. 20(9): p. 458-74. 5. The Ohio State University, Columbus, OH; 4Arog Pharmaceuticals Inc., Dallas, TX; 5Comprehensive Cancer Center, The Ohio State University, Columbus, OH.