

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: **Patient Info.** Patient clinical information and sequencing data availability.

File Name: Supplementary Data 2

Description: **Patient list.** List of all patients and samples included.

File Name: Supplementary Data 3

Description: **Fusion Calls.** Fusion calls from primary and secondary samples.

File Name: Supplementary Data 4

Description: **Overexpressed.** Genes showing significant overexpression in fusions samples.

Association testing was done using Student's t-test (two-sided) (continuous expression) and Fisher's Exact Test (two-sided) (categorical expression).

File Name: Supplementary Data 5

Description: **Kinases.** Kinase fusion annotation including intact kinase domains.

File Name: Supplementary Data 6

Description: **Fusion Filtering.** Fusions removed from analysis through soft filters.