

Figure S1. Representative interphase fluorescence *in situ* hybridization images. Panels show various cytogenetic aberrations detected in interphase nuclei (nuc ish), with results annotated according to the International System for Human Cytogenomic Nomenclature (2020). The specific findings are as follows: (A) nuc ish (DXZ1x1, DYZ3x0): One X-chromosome signal and absence of a Y-chromosome signal. (B) nuc ish (RUNX1x3): Three signals for the *RUNX1* locus, indicating gain or amplification of *RUNX1*. (C) nuc ish (CEP 8x3): Three centromeric signals of chromosome 8, consistent with trisomy 8. (D) nuc ish (TP53x1, D17Z1x2): Monoallelic deletion of the *TP53* tumor suppressor gene with two copies of chromosome 17 centromere. (E) nuc ish (LAMP1x3, D13S319x3): Three signals for both loci on chromosome 13, suggestive of trisomy 13 or partial amplification. (F) nuc ish (D20S108x3, ZNF217x3): Three signals for both loci on chromosome 20, indicating potential trisomy 20 or amplification. (G) nuc ish (DXZ1x0, DYZ3x1): Absence of an X-chromosome signal with a single Y-chromosome signal. (H) nuc ish (DXZ1x2, DYZ3x1): Two X-chromosome signals and one Y-chromosome signal. Nuc-ish, nuclear *in situ* hybridization.

