



**Fig. S3.**

LCR22A in haploid cell line CHM1 A) Fiber FISH assembly and its decomposition to duplicons. B) Predicted optical map generated by *in silico* DLS labeling of hg38 duplicon sequences in the order observed by fiber FISH depicted by blue rectangle with red lines (DLS labels). C) Optical map aligned single molecules support the predicted haplotype structure with three discrepancies attributed to polymorphisms shown by red arrowheads.