



Figure 4. Roles of genome organization in determining chromosome translocations. The nonrandom organization of genes and chromosomes contributes to the formation of cancer translocations. (A) The physical distance of MYC to its translocation partners IGH, IGL, and IGK correlates with their translocations frequency (MYC-IGH > MYC-IGL > MYC-IGK). (B) Translocations preferentially occur between proximally positioned chromosomes (red, green), and only rarely between distally located chromosomes (blue). Closely juxtaposed double-strand breaks (yellow stars) occurring at the interface between chromosomes create free chromosome ends that may recombine to form a chromosome translocation by illegitimate joining. (A, Adapted from Roix et al. 2003; B, reproduced, with permission, from Misteli 2010, © Cold Spring Harbor Laboratory Press.)