



**Supplementary Figure 1.** Distributions of 3D measurements of the separation distances between genes. (a) Map of mouse chromosome 7 depicting the locations of the genes analysed. (b) Box and whiskers plots of separation distances. A, RNA FISH of *Hbb-b1* and *Eraf* in anemic spleen (n=79); B, DNA FISH of *Hbb* and *Eraf* in anemic spleen (n=130); C, DNA FISH of *Hbb* and *Uros* in anemic spleen (n=143); D, DNA FISH of *Hbb* and the inactive gene *Fgfr3* in anemic spleen (n=87); E, DNA FISH of two inactive genes, *P2ry6* and *Gprc5b* in anemic spleen (n=89); F, DNA FISH of *Hbb* and *Eraf* in normal spleen (n=89); G, DNA FISH of *Hbb* and *Uros* in normal spleen (n=129). Lower and upper "whiskers" denote the 10th and 90th percentiles of the distribution respectively. The lower and upper limits of the "boxes" denote the 25th and 75th percentiles. Solid and dashed lines within the boxes indicate the median and mean respectively. Outliers, i.e. values above and below the 10th and 90th percentiles are shown as •.