Supporting Information

Zhang et al. 10.1073/pnas.1416411111

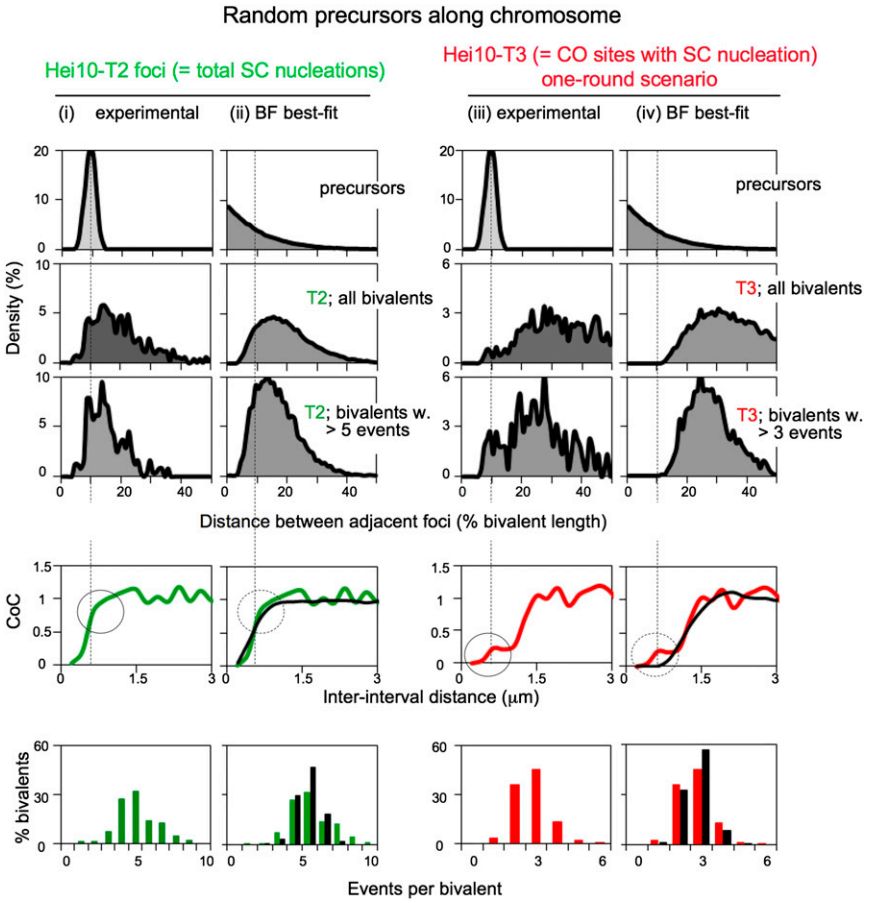

Fig. S1. T3 foci do not occur preferentially at the distance corresponding to the interprecursor distance if those precursors tend to be randomly, rather than evenly, spaced. Experimental patterns of T2 and T3 foci (*i* and *iii*) are compared with beam-film (BF) simulations (*ii* and *iv*) of patterning by a one-round scenario in which T2 and T3 foci both arise from the same set of original total recombinational interactions ("precursors," *Top Row*) as described in the text and shown in Fig. 4, *ii* and *iv*, except that precursors are spaced randomly along the chromosomes rather than spaced relatively evenly as in Fig. 4. Parameter values for BF simulations with random precursors were the same as for the one-round scenario with evenly spaced precursors (*Materials and Methods*) except that, for T2 foci the extent to which the precursors spread along the bivalent (E) = 0, the extent to which the number precursors along the bivalent in different nuclei is constant or corresponds to a random distribution (B) = 1, and the maximal level of global stress (Smax) = 6, and for T3 foci E = 0, B = 1, and Smax = 2.2.

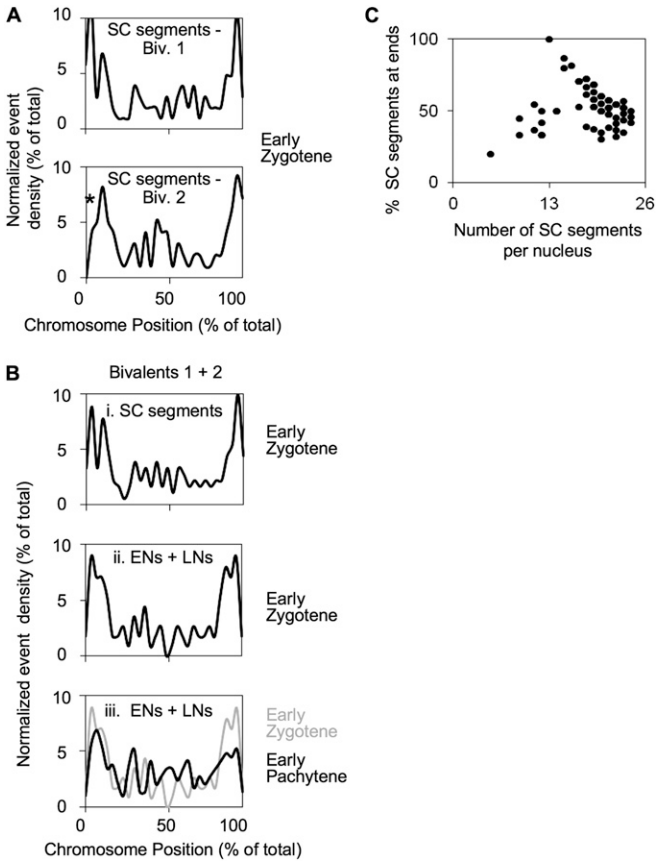

Fig. S2. Synaptonemal complex (SC) segments and recombination nodules (RNs) appear first at chromosome ends. (*A*) Positions of SC nucleations marked by SC segments at early zygotene along bivalents (Biv) 1 and 2. Bivalent 2 has one end localized within the nucleolus (indicated by an asterisk) with a correlated suppression of SC nucleations at that position. Early zygotene bivalents are defined as those in which no SC segment has more than a single RN (e.g., group I of Fig. 2) (40 bivalents analyzed). (*B*) Bivalents 1 and 2 considered together. (*Top*) Positions of SC nucleations at early zygotene (sum of distributions in *A*). (*Middle*) Positions of all RNs [ENs + late nodules (LNs)] in the same early zygotene nuclei. (*Bottom*) The black trace shows the positions of all RNs (ENs + LNs) at early pachytene, when all nodules have emerged. The gray trace shows data merged with the early zygotene distribution. (*C*) Analysis of SC segments in early/midzygotene nuclei ($n = 71$ nuclei in which all bivalents could be clearly traced). For each nucleus, the percent of total SC segments with one end juxtaposed to the nuclear envelope is plotted as a function of the total number of segments. SC nucleation tends to occur near, but not exactly at, the ends of the chromosomes. The percent of SC e segments juxtaposed to the nuclear envelope first increases as more segments are initiated and then extend to the nuclear envelope and then decreases as additional segments are initiated interstitially rather at or near ends.

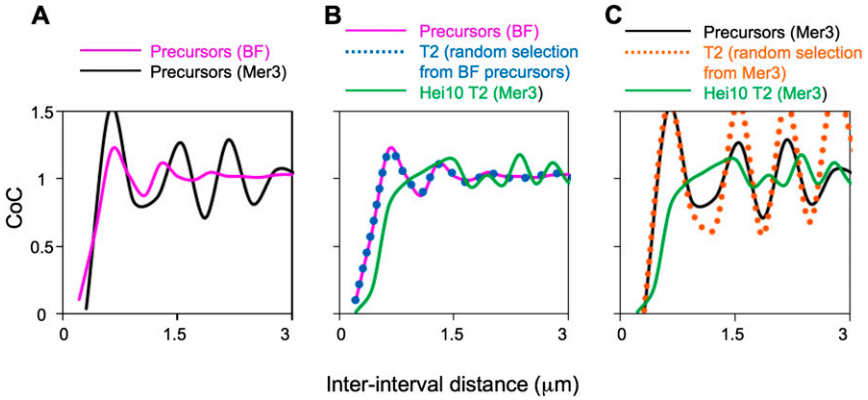

Fig. S3. T2 foci do not arise by random selection among total interactions. We considered a two-round scenario in which T2 foci arise by random selection among total recombinational interactions and then T3 foci arise from those T2 foci by an interference-mediated process. In this scenario the distribution of T2 foci would match that of total interactions. This is not the case. (*A*) Comparison of the CoC curves for experimentally defined total recombinational interactions (Mer3 foci, black trace) and the precursor array specified for BF simulations (pink trace). (*B*) The BF simulation program shows that random selection of T2 foci from the BF-specified precursor array gives a distribution of T2 foci that matches the precursor distribution (blue dotted trace), not the experimental T2 distribution (green trace). (*C*) The same comparison using the precursor array defined by the experimental distribution of Mer3 foci for the simulation.