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Supplemental materials and methods

Antibody production

The following peptides were used for the production of antibodies in rabbits and rats: DPY-26 carboxyl terminus, CGGQPTTSDLGAIVEEEEMEE; DPY-28 carboxyl terminus, CKKSAVADDDSDSDEFMLDD; HCP-3 amino terminus, ADDTPIIEEIAEQNESVTRIMQRLKHDMQR; and HCP-6 carboxyl terminus, CGKEDLKNRKSQAYHLHNIFEEDEEES.

Templates for dsRNA production

Templates for in vitro transcription were PCR amplified from genomic DNA using the following primer sets. T7 and T3 RNA polymerase promoter sequences are underlined. *hcp-6, 5′-*GCGTAATACGACTCACTATAGGGTCGTGAAAAACTCGTCAAGCG CGCAATTAACCCTCACTAAAGGGTGGCAATTCTGGATGGTCTAGC-3′; *mix-1,* TAATACGACTCACTATAGGGTGATACTTACGCGCTTTCGGAC TAATACGACTCACTATAGGGACTTTGAATATCTTTCGAGTTAGCCG-3′; *hcp-3, 5′-*AATTAACCCTCACTAAAGGGTTTCGACCAAAAATGCTTCC TAATACGACTCACTATAGGGATGTCGTCTGCGTATTTCCC-3′; F54C8.2, 5′-TAATACGACTCACTATAGGTTTAATCAGAGATTTGGAAGGCA TAATACGACTCACTATAGGTTTCAAAGTGCGAAAATTTGATT-3′.

References

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Table S1. **Embryonic lethality in *hcp-6*(*mr17*ts)**

Temperature	Lethality	*n*
15°C	9%	1035
25°C	98%	430

Fewer than 1% of wild-type embryos are dead at either temperature.

Table S2. **Oocyte cellularization occurs relatively normally in *hcp-6*(*mr17*ts)**

Genotype	Oocytes per gonad arm	Gonad arms scored	SEM
wild type	10.0	53	0.5
hcp-6(*mr17*ts)	8.6	68	0.3

The number of oocytes per gonad arm was counted in age-matched wild-type and *hcp-6* mutant animals.

Table S3. **HCP-6 is required to remove or prevent the introduction of recombination-independent linkages between homologues.**

	DAPI-staining figures per oocyte (%)							Oocytes
Genotype	6	7	8	9	10	11	12	scored
spo-11(*me44*), 15°C	0	0	0	9	18	28	45	98
spo-11(*me44*), 25°C	0	0	1	9	19	26	45	98
hcp-6(*mr17*ts)*;spo-11*(*me44*), 15°C	0	0	1	2	21	20	55	206
hcp-6(*mr17*ts)*;spo-11*(*me44*), 25°C	11	14	8	15	21	16	15	158
spo-11(*ok79*), 20°C	0	0	0	0	27	32	40	77

The SPO-11 endonuclease creates double-strand DNA breaks that are required for the initiation of recombination. In *spo-11* mutants, recombination fails and homologues are achiasmate univalents in diakinesis. In *hcp-6*(*mr17*ts)*;spo-11*(*me44*) double mutants grown at 25°C, the precocious separation of homologues is reduced relative to double mutants grown at 15°C and *spo-11*(*me44*) single mutants grown at either temperature, suggesting that HCP-6 is required to remove or prevent the introduction of linkages between homologous chromosomes. Importantly, the disruption of recombination by *spo-11*(*me44*) was not temperature sensitive because this mutation resulted in similar levels of premature homologue separation in animals grown at 15°C and at 25°C. Moreover, the level of precocious homologue separation caused by *spo-11*(*me44*) was similar to that of the known null allele *spo-11*(*ok79*). Together with our finding that RAD-51 foci do not form on chromosomes of *spo-11*(*me44*) mutants, the similar phenotypes of *spo-11*(*me44*) and *spo-11*(*ok79*) mutants suggest that *me44* prevents DSBs and acts either as a null allele or a severe loss-of-function allele. Despite the apparent absence of recombination in *spo-11*(*me44*) and *spo-11*(*ok79*) mutants, the expected complement of 12 univalents was seen in less than half of oocytes. This discrepancy reflects our conservative scoring; when two univalents overlapped in space, they were scored as one DAPI-staining body.