

| Primary antibodies | | | | |
|----------------------|--------------------|---------------------------|-------------|--------------|
| Target Protein | Host | Source | Cat. Number | IHC Dilution |
| γ -H2AX | Mouse | Merck Millipore | 05-636 | 1:10,000 |
| SYCP3 | Mouse | Abcam | ab97672 | 1:600 |
| SYCP3 | Rabbit | NOVUS | NB300-231 | 1:2500 |
| CREST-serum | Human | FitzGerald | 90C-CS1058 | 1:600 |
| ATR | Rabbit | Cell Signaling Technology | #2790 | 1:100 |
| RAD51 | Rabbit | Thermo Fisher Scientific | PA5-27195 | 1:200 |
| MLH1 | Mouse | BD Pharmingen | 550838 | 1:50 |
| MDC1 | Sheep | Bio-Rad Laboratories | AHP799 | 1:600 |
| SYCP1 | Rabbit | Abcam | ab15090 | 1:600 |
| HORMAD1 | Rabbit | Abcam | ab155176 | 1:400 |
| Secondary antibodies | | | | |
| Fluorescence | Host | Source | Cat. Number | IHC Dilution |
| Alexa Fluor 488 | Donkey anti-Mouse | Thermo Fisher Scientific | A21202 | 1:1000 |
| Alexa Fluor 488 | Donkey anti-Rabbit | Thermo Fisher Scientific | A21206 | 1:1000 |
| Alexa Fluor 555 | Goat anti-mouse | Thermo Fisher Scientific | A21424 | 1:1000 |
| Alexa Fluor 555 | Donkey anti-Rabbit | Thermo Fisher Scientific | A31572 | 1:1000 |
| Alexa Fluor 647 | Goat anti-Human | Thermo Fisher Scientific | A21445 | 1:1000 |
| Alexa Fluor 647 | Donkey anti-Sheep | Thermo Fisher Scientific | A21448 | 1:1000 |

Supplementary Table 2: Antibodies used in this study.