School of

Biological Sciences

Fall 2017 Weekly Seminar Series

Protecting genomes from gene drivers with meiotic silencing by unpaired DNA

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Meiosis is a cell division process that halves the number of sets of chromosomes in a cell. This is a necessary process for the production of functional gametes and the propagation of sexually-reproducing species. The process of chromosome set reduction involves pairing similar chromosomes and aligning them along the center of the cell. The pairing and alignment process is poorly understood, as are the processes that act upon chromosomes during this stage of the meiotic cycle. It appears that the chromosomes, during the pairing and alignment stage of meiosis, are comprised of chromatin loops: complexes of DNA and protein that emanate from a scaffold between pairs of chromosomes. While these loops could simply represent a convenient packaging state for DNA during meiosis, our experiments suggest that the loops are carefully examined by a process that searches for selfish genetic elements. This process, called meiotic silencing by unpaired DNA, appears to physically scan loops of chromatin from similar chromosomes at the nucleotide level. Although the mechanism by which the scanning process works is unknown, our evidence suggests it may use a novel "double-strand-break independent" mechanism that quickly compares chromatin loops by searching for specific patterns of interspersed homology between them.

Thursday, October 12, 2017 at 4:00 p.m.

Moulton Hall 214

Pre-seminar refreshments will be served from 3:30 - 3:50
Felmley Science Annex outside Room 133