The structural basis for meiotic chromosome dynamics

During meiotic prophase, chromosomes undergo dramatic conformational changes as chromosome axes form, homologs pair, the synaptonemal complex (sc) assembles and disassembles, chromosomes remodel and condense. This dynamic process is tightly regulated to ensure the coordination between critical meiotic events and accurate chromosome segregation. The SC is an ordered but highly dynamic structure homologous assembled between chromosomes to control interhomologous crossover formation, ensuring accurate meiotic chromosome segregation and successful gamete production. Although it has been 60 years since this protein structure was identified, the mechanisms underlying its assembly and dynamics remain unclear. *Caenorhabditis elegans* is a great model organism for the investigation of meiotic chromosome dynamics.

The germ cells are organized in a perfect temporal-spatial gradient manner in the gonads, and germ cell number is highly abundant in the adult worms, making it easy to study meiotic progression through cytological and biochemical approaches. With immunoprecipitation and mass spectrometry analysis, we identified novel SC components SYP-5 and SYP-6 in *C.elegans*. The discovery of these new components allows us to elaborate in depth on the mechanisms of SC assembly and dynamic regulation during meiosis.