Poster

Decoding the Role of a Microtubule-related protein in Meiosis

Rodrigo Rubio, Susana (1), Álvarez Tallada, Víctor (1), Flor Parra, Ignacio*(1)

(1)Área de Genetica. Universidad Pablo de Olavide / Centro Andaluz de Biología del Desarrollo. Ctra. de Utrera, Km 1, 41013 Sevilla.

Tutor académico: Flor Parra, Ignacio

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ABSTRACT

Several meiosis-specific proteins of Schizosaccharomyces pombe play essential roles in meiotic progression. In this study we report that a conserved microtubule-related protein is required for proper spore formation. Sporulation in fission yeast represents a unique model to study gametogenesis in sexual reproducing organisms. This event is accompanied by formation of the forespore membrane (FSM), which becomes the plasma membrane of spores [1]. After the two sequential meiotic divisions, FSMs expand and encapsulate the haploid nuclei, producing the membrane-surrounded spore precursors [2]. During anaphase II, two FSM sacs expand from the poles encasing the nuclei, and these elongates with the intranuclear spindle to divide into two. Finally, these sacs enclose four newborn nuclei individually. The leading edge of the elongating FSM forms a ring and comprises some associated proteins [3]. The leading edge ring is a crucial structure in meiosis that remains poorly understood. Our research investigates its role and dynamics, focusing on the localization and function of this microtubule-related protein during spore formation in fission yeast.

Transgenic S. pombe strains were generated by tagging the gene of interest with GFP along with either mCherry-labeled microtubules or mCherry-Psy1 to observe simultaneous dynamics of these markers throughout meiosis in vivo. Fluorescence microscopy was used to capture images at different Z-plane levels for 3D reconstruction. These experiments reveal that this protein is localizes in the leading-edge ring. In addition, we studied the lack-of-function by deletion of this gene, revealing a phenotype characterized by malformed spindles and delayed assembly/disassembly during meiosis II. This could lead to issues in chromosome segregation and result in mutants with altered chromosomal content.

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