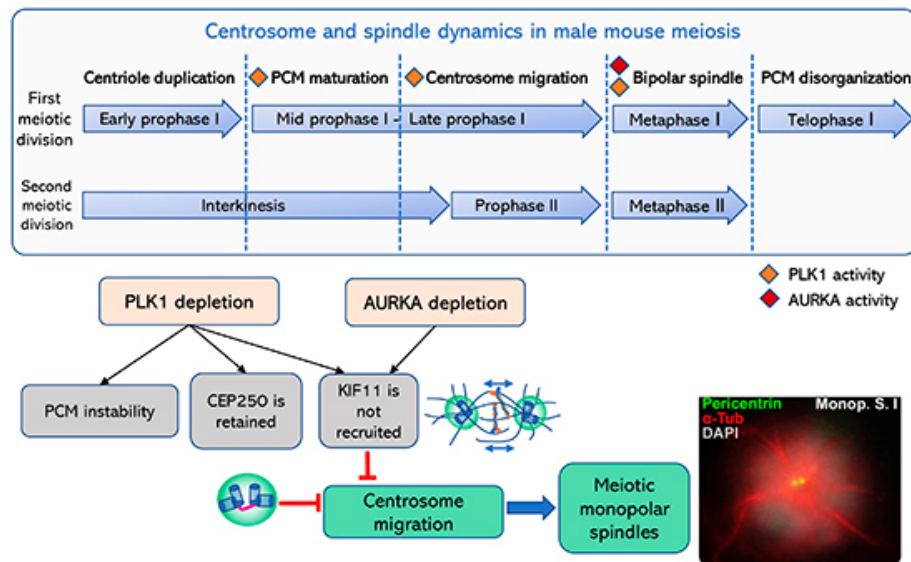


# PLK1 regulates centrosome migration and spindle dynamics in male mouse meiosis

Enrique Alfaro, Pablo López-Jiménez, José González-Martínez, Marcos Malumbres, José A. Suja and Rocío Gómez



Cell division requires the regulation of karyokinesis and cytokinesis, which includes an essential role of the achromatic spindle. Although the functions of centrosomes are well characterised in somatic cells, their role during vertebrate spermatogenesis remains elusive. We have studied the dynamics of the meiotic centrosomes in male mouse during both meiotic divisions. Results show that meiotic centrosomes duplicate twice: first duplication occurs in the leptotene/zygotene transition, while the second occurs in interkinesis. The maturation of duplicated centrosomes during the

early stages of prophase I and II are followed by their separation and migration to opposite poles to form bipolar spindles I and II. The study of the genetic mouse model *Plk1(D/D)* indicates a central role of Polo-like kinase 1 in pericentriolar matrix assembly, in centrosome maturation and migration, and in the formation of the bipolar spindles during spermatogenesis. In addition, *in vitro* inhibition of Polo-like kinase 1 and Aurora A in organotypic cultures of seminiferous tubules points out to a prominent role of both kinases in the regulation of the formation of meiotic bipolar spindles.

