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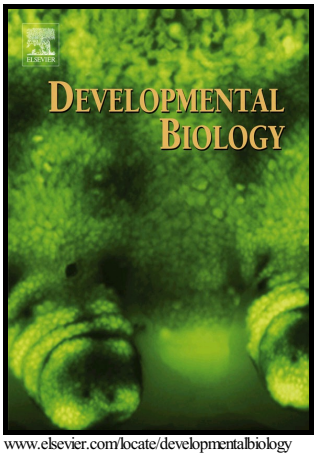

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Vaccinia-Related Kinase 1 is required for early uterine development in *Caenorhabditis elegans*

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Summary

Protein kinases regulate a multitude of processes by reversible phosphorylation of target molecules. Induction of cell proliferation and differentiation are fundamental to development and rely on tightly controlled kinase activities. Vaccinia-Related Kinases (VRKs) have emerged as a multifunctional family of kinases with essential functions conserved, from nematodes and fruit flies, to humans. VRK substrates include chromatin and transcription factors, whereas deregulation of VRKs is implicated in sterility, cancer and neurological defects. In contrast to previous observations, we describe here that *Caenorhabditis elegans* VRK-1 is expressed in all cell types, including proliferating and post-mitotic cells. Despite the ubiquitous expression pattern, we find that *vrk-1* mutants are particularly impaired in uterine development. Our data show that VRK-1 is required for uterine cell proliferation and differentiation. Moreover, the anchor cell, a specialized uterine cell, fails to fuse with neighboring cells to form the utse syncytium in *vrk-1* mutants, thus providing further insight on the role of VRKs in organogenesis.

Keywords

Anchor cell; Cell fusion; MosSCI; Protein kinase; Uterine development; VRK1

1. Introduction