Extracellular Vesicles in Caenorhabditis elegans Reproduction

Emily SCHIFANO, *Sapienza University of Rome*

The small nematode Caenorhabditis elegans has emerged as a powerful model organism across various fields of research, aligning with the principles of the 3Rs. Its unique characteristics enable the replacement of higher animals, reduction in the number of animals needed, and refinement of experimental procedures, thereby promoting ethical and effective research. C. elegans has been instrumental in identifying evolutionarily conserved mechanisms, including aging processes and, more recently, extracellular vesicle (EV) signaling pathways.

There is growing evidence that EVs play a functional role in tissue repair and anti-aging by transferring the contents of donor cells to recipient cells. This talk will explore C. elegans as a platform for significant insights into the mechanisms of EV biogenesis and their functions in reproduction and development. Additionally, the hypothesized role in the lifespan extension of C. elegans will be examined, particularly focusing on Dauer larvae, known as "ageless" nematodes, and their ability to secrete EVs. Tissue enrichment and gene expression analyses suggest that secreted EV proteins are likely derived from the intestine, muscle, and excretory tissues. By understanding these processes in C. elegans, we can shed light on the broader implications of EVs in developmental biology and their potential applications in biomedical research.