

C. elegans: a window to bridge nanotechnology and biology

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Caenorhabditis elegans (*C. elegans*) is a transparent invertebrate worm that shares 60% genetic homology with humans, and it offers a platform for amenable experiments in various fields. In our group, we use this small organism as an in vivo metrology to reduce the number of higher animals used, comply with the 3R principles, and speed up the translation process of NPs or biopolymers to the market.

Several NPs have been produced, suggesting promising drugs, drug carriers, and therapies. However, the lack of time—and batch-efficient methods to evaluate NPs and processes prevents establishing general fundamental principles and impedes the progress of these future drugs and therapies unless high-throughput methods advance. Using this worm, we demonstrated how nanoparticles' distinct chemical and structural properties (NPs) could modulate their interaction with small organisms.^{1–3}

Biopolymers are also highly sought in nanomedicine because they offer a biocompatible platform for cell scaffolds, drug carriers, or tissue regeneration. In this presentation, we will explore how bacterial nanocellulose can impact the worm's GI tract, enabling us to elucidate changes in lipid metabolism.⁴

These simple experiments can potentially revolutionize the engineering of NPs and biopolymers by decreasing the time, cost, and effort required. In this talk, we will exemplify some of the latest results obtained on this subject from the Group of Nanoparticles and Nanocomposites at the Institut de Ciència de Materials de Barcelona (ICMAB-CSIC).

References

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Figures

