Zinc-oxide Nanoparticles Decrease *Klebsiella pneumoniae* Biofilm Formation

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Introduction:

- *Klebsiella pneumoniae* decreases reproduction in model soil nematode *Caenorhabditis elegans*

- ZnO NP reduces *K. pneumoniae* toxicity

- Is the reversal due to hindering biofilm formation?
EM Methods Used:

- **ZnO NP:**
  - Thermo Scientific Talos F200X TEM

- **K. pneumoniae** biofilms:
  - Grown on glass coverslips overnight
  - Critical point dryer: Leica CPD300
  - Sputter coater/glow discharge: Leica ACE600
  - FEI Quanta 250
TEM images of ZnO NP:

- 6 uL of NP (50 mg/L) were plated onto lacey carbon on copper grids
- Elemental mapping showed NP were Zn and O
- Diameter determined with imageJ

Median = 33 nm
STD = 11.6 nm
N = 100
SEM images of *K. pneumoniae* biofilm:

- **Initial biofilm formation in:**
  A. Untreated
  B. Zinc-oxide Nanoparticles
  C. Zinc ions

- **Morphological effects (red circles)**
Issues encountered:

- Uneven growth on coverslips
- Minimizing damage to biofilm during staining
- Difficulty sectioning nematodes
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