

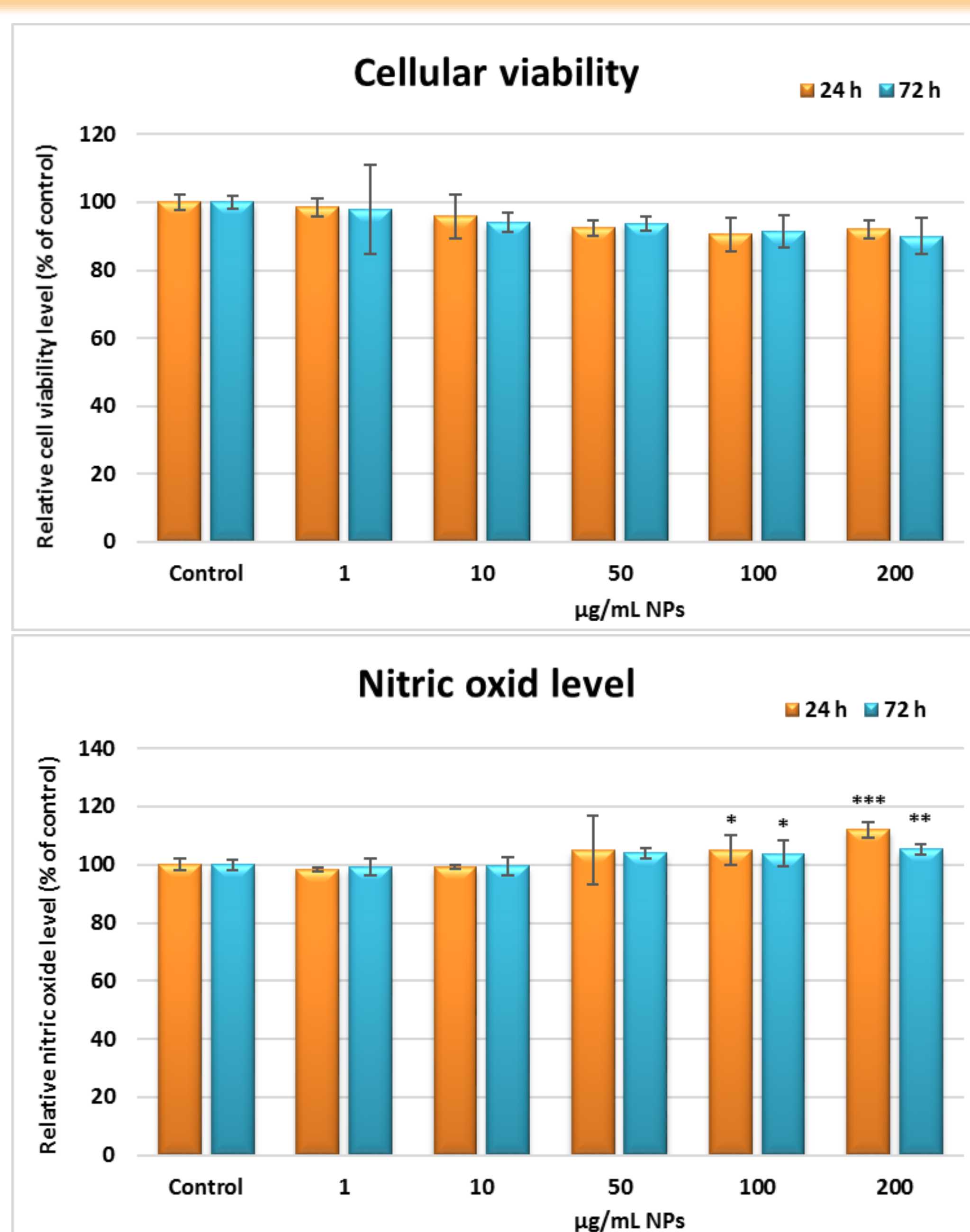
In vitro evaluation of rare earth-doped phosphor nanoparticles to assess their anti-tumoral efficiency on lung cancer cells

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AIM. Rare earth-doped nanoparticles have been investigated for their use in disease diagnosis, drug delivery, tumor therapy and bioimaging. In this context, we selected rare earth-doped phosphor nanoparticles (**BaSO₄:Eu phosphor nanoparticles**), commercially available by Merck, to evaluate their antitumoral efficiency for prospective therapeutic applications, as no study was previously performed.

METHODOLOGY. Lung carcinoma epithelial cells (A549 cell line) were incubated with these barite (BaSO₄) nano-phosphors up to 72 hours.



CONCLUSION. Our investigation revealed no significant anti-proliferative properties of the BaSO₄:Eu phosphor nanoparticles on lung tumor cells, but further investigations related to their cytotoxicity should be performed for a better characterization in a biological environment.

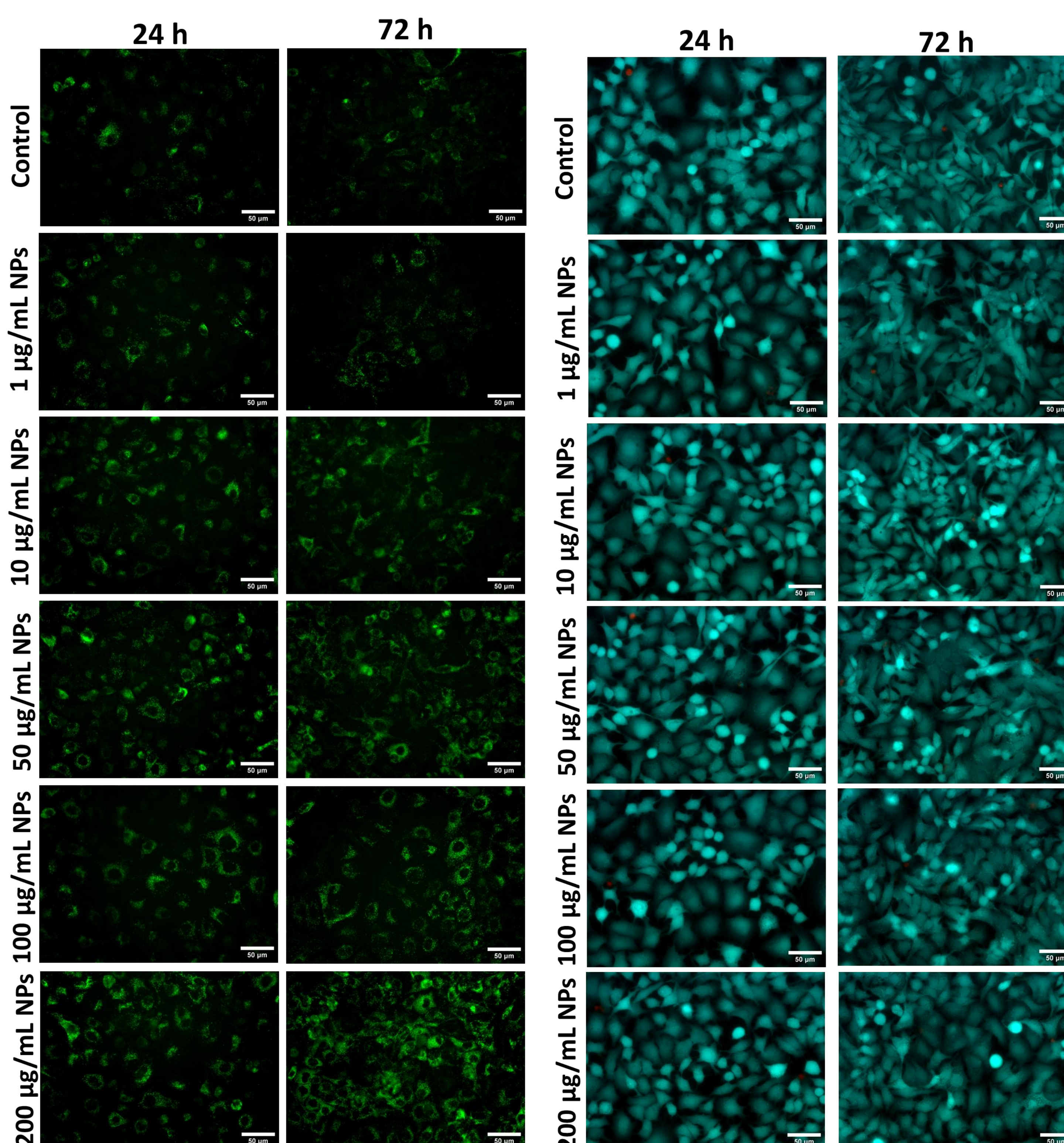
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RESULTS.

- The highest concentration tested (200 µg/mL NPs) decreased the number of viable cells only by 10% from control as measured by **MTT test**.
- This result was also confirmed by **double staining of viable and dead cells** with calcein AM and ethidium homodimer, respectively.
- In addition, **the level of nitric oxide** released by cells in the media after the incubation with the NPs increased with 10% above control, showing that no major inflammation was induced, even in the presence of high concentrations of particles.
- However, an increased accumulation of lysosomes was noticed by **LysoTracker Green DND-26** in a time- and dose-dependent manner. This finding could suggest the uptake of Eu-doped barite particles in these acidic organelles in order to be eliminated further by the cells.

Lysosomes staining

Live&dead staining



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