



## Further aspects of *Toxoplasma gondii* elimination in the presence of metals

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*Toxoplasma gondii*, the etiological agent of toxoplasmosis, infects nucleated cells and then resides and multiplies within a parasitophorous vacuole. For this purpose, the parasite secretes many virulence factors for the purpose of invading and subverting the host microbicidal defenses in order to facilitate its survival in the intracellular milieu. Essential metals are structural components of proteins and enzymes or cofactors of enzymatic reactions responsible for these parasitic survival mechanisms. However, an excess of non-essential or essential metals can lead to parasite death. Thus, infected host cells were incubated with 20  $\mu\text{M}$   $\text{ZnCl}_2$  in conjunction with 3  $\mu\text{M}$   $\text{CdCl}_2$  or  $\text{HgCl}_2$  for 12 h in order to investigate cellular events and organelle damage related to intracellular parasite death and elimination. In the presence of these metals, the tachyzoites undergo lipid uptake and transport impairment, functional and structural mitochondrial disorders, DNA condensation, and acidification of the parasitophorous vacuole, thus leading to parasite death. Additional research has suggested that lysosome-vacuole fusion was involved in parasite elimination since acid phosphatases were found inside the parasitophorous vacuole, and vacuoles containing parasites were also positive for autophagy. In conclusion, low concentrations of  $\text{CdCl}_2$ ,  $\text{HgCl}_2$ , and  $\text{ZnCl}_2$  can cause damage to *Toxoplasma gondii* organelles, leading to loss of viability, organelle death, and elimination without causing toxic effects to host cells.

Palavras-chave: autophagy, metals, *Toxoplasma gondii*.

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