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« Characterizing manganese ions in living organisms»

Metals ions play a critical role in life. They act not only as cofactors of many proteins but also as sole entities in signalling, regulation and non-enzymatic catalysis. Metal ions distribution and speciation in cells has gained great attention during the last years. However, the in vivo or in situ determination of the different chemical species that coexist inside a cell is difficult. Using a combination of continues-wave and pulsed High-Field Electron Paramagnetic Resonance techniques we were able to identify the chemical environment of Mn(II) in intact bacterial cells and assign the different spectral components to different Mn(II) species. We also observed how the relative amount of these species changed during the different phases of culture growth. These studies open the door to the in vivo determination of manganese speciation by EPR and will help to better understand the role and homeostasis of this metal ion.