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Integrative structural biology of cell extracts : an application to structurally undercharacterized organisms

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Integrative structural biology of cell extracts bridges the gap between the high resolution structural characterisation of highly purified, isolated biomolecules and in situ electron tomography. This booming technique combines mass spectrometry (MS)-based proteomics and cryo-electron microscopy (cryo-EM) of fractionated cell extracts to quantitatively and structurally characterise endogenous proteins and complexes. We chose to employ this method on *Physarum Polycephalum*, which is absent from protein sequence and structure databases (Uniprot, PDB, EMDB) in order to mimic the challenges posed e.g. by emerging pathogens. We will show how structural biology can be applied when only raw genomic data is available, and discuss the difficulties faced to identify and annotate protein and complexes structures when no prior information is available.

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