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Revisiting the dynamics of cell wall synthesis in ovococci using click metabolic labeling and dSTORM imaging

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Ovococci form a morphological group that includes several human pathogens (enterococci and streptococci). Their shape results from cell wall synthesis and remodeling processes that allow cell division and elongation. These processes are performed by multi-protein complexes that assemble into ring-like structures scaffolded by the cytoskeletal protein FtsZ at midcell. While most growth and division proteins are known, we still barely understand how they assemble into functional machineries *in vivo*, and how they coordinate their activities to ensure proper cell division and morphogenesis. Recently, we set up a combination of bioorthogonal labeling (using copper-free click chemistry) and dSTORM (direct STochastic Optical Reconstruction Microscopy) techniques to study cell wall synthesis in the human pathogen *Streptococcus pneumoniae*. I will present our approach and discuss how the nanoscale localization data it generates allow revisiting the current model for cell wall synthesis in ovococci.