

During division bacterial cells must equally split their components. However, due to their small size these cells do not possess complex machinery to help equipartition cell contents and to also place the division plane at the correct location prior to physical cell separation. Instead biochemical reactions must be used to guide the spatial and temporal separation of cell components. In this talk, we discuss mathematical models that capture the spatial and temporal localization of proteins involved in the division of *Caulobacter Crescentus* bacteria. Using PDE models we show that these species can not only be used to equally separate bacterial genetic material but can also be used to correctly place the division plane at the midcell prior to division. Model analysis shows that the model can generate oscillatory behavior, which turns out to be in alignment with recent experimental data.