

# Guest Lecture

**Monday the 8th of May at 11.00 in the BMB Seminar Room**



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## **Development-specific regulation of cell division during morphological differentiation of swarmer cells by a bi-functional cell pole-determinant ParC and the Min-system**

### **Abstract:**

Cell division is tightly regulated, particularly during differentiation where changes in morphology or cell-type increase the complexity. Depending on the environmental conditions, *Vibrio parahaemolyticus* has two developmental stages: short swimmer or highly elongated swarmer cells. We show that the localization dynamics of FtsZ and the placement of the division site are differentially regulated depending on the developmental stage. We identify the cell pole-determinant ParC as a major regulator of cell division during swarmer cell development. ParC inhibits polar division events in swarmer cells by interacting with and actively preventing polar localization of FtsZ. ParC functions in cooperation with the Min-system, which regulates cell division in both developmental stages. Localization-dynamics of MinD is developmental-stage specific and switch from a pole-to-pole oscillation to a multi-node standing wave oscillation during morphological differentiation, in correlation with a transition from mid-cell to pole-proximal positioning of FtsZ, resulting in a switch from symmetric to asymmetric cell division. This work uncovers that nature has evolved several mechanisms regulating cell division in order to accommodate differentiation associated morphological changes, and identifies ParC as a protein

of dual-function that ties together the spatio-temporal regulation of diverse processes such as bacterial chemotaxis, cell pole development and regulation of cell division.

Host: Associate professor Jakob Møller-Jensen, Syddansk Universitet, BMB.