# The Role of Crescentin Generating Cell Curvature of *Caulobacter crescentus*

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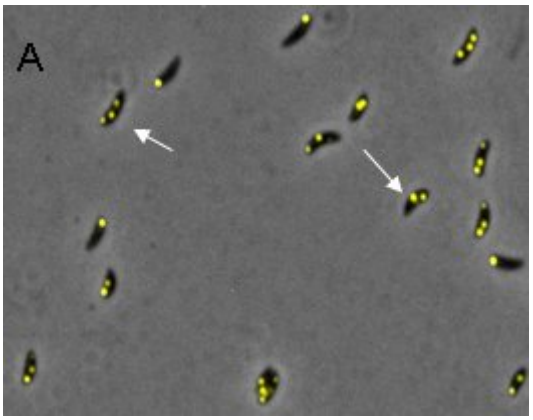
*Caulobacter crescentus* is a ubiquitous, non-pathogenic freshwater bacterium with a characteristic curved cell shape. This bacterium also has a special life cycle which makes it a model organism to study how this life cycle is regulated. In contrast to many other bacteria, cell division in *Caulobacter* is asymmetrical. The two daughter cells are not exactly the same, because cell division leads to a so-called stalked cell which can not swim but which can start a new round of cell division immediately. The other daughter cell is a so-called swarmer cell with the ability to swim. It can swim for example towards better nutrients to differentiate back into a stalked cell to start cell division.

In 2003 the protein responsible for cell curvature in *Caulobacter crescentus* was found to be the so-called crescentin. Without crescentin, the cells are just rod-shaped. Until today it is not known how crescentin manages to generate this cell shape. To affect the shape it would need to have contact to the bacterial cell wall. But it is known that crescentin has no contact with the cell wall. Because of this the group I was working with hypothesised that it somehow interacts with other proteins which themselves stay in contact with the cell wall. A new system was used which should help to pick up putative interaction partners of crescentin. One very promising candidate called CC3277 is a member of a protein family that actually helps to build up the bacterial cell wall and thereby could affect its shape.

In parallel I worked with candidates that were previously found to interact with crescentin. To gather more information about the function of these proteins I turned off their production in the cell. I observed microscopically if I could see changes in the appearance of the cells. To turn of production of the protein CC1883 led to dramatic changes in the appearance of the cells and it might be essential for *Caulobacter*. A useful method in biology is to mark proteins with fluorescent makers to be able to see their localisation in the cell.




For the protein CC3145 I could not see a difference in the cell shape but the protein showed a very specific localisation in the cell. It was located in a dot shaped manner to one or both poles of the cells and in addition in the middle of the cell. This localization of CC3145 and its fluorescent marker in the cell middle was never observed before in *Caulobacter* and does not affect the shape of the cell. This fact allows the conclusion that crescentin is not only involved in cell curvature but also helps other proteins to localise correctly in the cell.

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