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# SEMINAR SERIES 2023

## 28 NOVEMBER *SPECIAL SEMINAR 4:00 – 5:00PM AEDT*

## Professor Ariane Briegel

*Professor of Ultrastructural Biology/Co-director NeCEN*
*Leiden University*
*Netherlands*

Ariane obtained a Master's (Biology) from Ludwig-Maximillians-University, Munich, Germany, and PhD from the Technical University, Munich, Germany. She then moved to California as a Postdoc and later Research Associate at the California Institute of Technology/Howard Hughes Medical Institute, Pasadena, California. She is currently a Professor (Biology Department) at Leiden University, Netherlands; co-director of the Netherlands Center for Electron Nanoscopy (NeCEN) also at Leiden University; and holds a guest appointment of Medical Delta Professor Delft University of Technology, Netherlands.

Ariane is currently an advisory board member at the CryoEM Center Marburg; the CryoEM Center Pasteur Institute, Paris; for CryoET-101, University of Utah; representative for Instruct-ERIC Netherlands; a NWO research community committee member for Advanced Methods; and Mentor of dynaMENT mentoring program, University of Hamburg, Germany.

Ariane has over 20 years of experience in studying bacteria by cryo-electron tomography (cryo-ET). Her laboratory uses cryo-ET to study the structure and function of the molecular complexes involved in the bacterial cell's ability to sense and respond to their environment in their native state.

## Cryo-Electron Tomography contributes to our understanding of bacterial interactions with their environment

How are bacterial cells able to actively seek out their preferred environmental niches? How can they evade toxins and predators? How do they interact with phages, each other and their host tissue? How can they adapt to thrive in changing environments? Cryo-electron tomography (cryo-ET) is the key research tool used to gain insight into the structure and function of the molecular complexes involved in these behaviors. This technique allows the direct study of microbes in their native state at resolutions capable of visualizing individual proteins. Ariane's research provides insight into chemotactic behavior of bacteria, which allows motile cells to detect changes in nutrient concentrations and to navigate towards preferential environments. She uses this detailed knowledge for practical applications, such as the design of biosensors to detect human diseases. Ariane is also investigating specific adaptations of chemotaxis systems of human pathogens that use this system for infectivity. When bacteria sense environmental changes, they can adapt themselves to survive, both structurally and metabolically. Consequently, cells of the same species may have vastly different morphological and behavioral characteristics depending on the environment they are in. Ariane is investigating these morphological changes and their impact on the susceptibility to environmental stressors such as phage attacks.