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Cryo electron tomography studies of bacterial chemosensory arrays

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Stellingen

Propositions accompanying the thesis

Cryo Electron Tomography Studies of Bacterial Chemosensory Arrays

1. Beyond the canonical chemotaxis system in *E. coli*, there is a vast diversity in the chemotaxis pathways and the chemosensory arrays.
This thesis: Chapter 2
2. Chemotaxis proteins exhibit various composition, stoichiometry and variability in the chemosensory arrays.
This thesis: Chapter 3
3. Despite the universal packing order of the chemoreceptor lattice, the kinase distribution pattern in the baseplate may be a species-dependent feature.
This thesis: Chapter 4
4. The chemoreceptor trimers-of-dimers undergo quaternary conformational changes when switch between different output states for kinase control.
This thesis: Chapter 5
5. Serendipitously, the relative simplicity of chemotaxis system in *E. coli* greatly facilitated the identification of components and their roles. As is often the case, chance enhanced scientific progress.
Hazelbauer GL, *Annu Rev Microbial* 2012
6. The pursuit of a molecular understanding of signal transduction will continue to provide controversies and challenges for years to come.
Falke JJ & Piasta KN, *Curr Opin Struc Biol* 2014
7. No single software can satisfy all data processing need for cryo-EM; the advantages lie in using different software packages collectively, and wisely.
8. "Seeing is believing" does not necessarily apply to interpreting cryo-ET and subtomogram averaging results.
9. The statement by Richard Feynman that scientific knowledge is a body of statements of varying degrees of certainty is perfectly applicable to this thesis.
10. There is no experiment to end all experiments. There can never be.
11. Time spent on making mistakes adds up to experience only; time spent on correcting mistakes develops into expertise.

Wen Yang
Leiden, July 2020