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Poster #96: Structural and functional characterisation of a membrane associated anti-phage defence system

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Bacteria have evolved a number of diverse strategies to evade and resist phage infection, however the detailed mechanisms for many of these remain to be understood. In particular, fewer membrane associated anti-phage defence systems have been described in detail, especially ones functioning through a non-abortive mechanism. Here we investigate a two-protein defence system where one protein is predicted to be membrane associated and the other lacks any homology with known domains or existing structures. Using cryo-electron microscopy we show the predicted transmembrane protein forms a dimer, lacking any canonical membrane-spanning helices. Additionally, we obtained a high-resolution map of the two proteins in complex, revealing extensive conformational changes relative to the homodimer. Finally, we show a structure of the defence system bound to a nucleic acid, which allows us to speculate on the overall mechanism of direct defence of this previously undescribed system.

Reference #1

Reference #2

Reference #3

Author: RUTBEEK, Nicole (University of Copenhagen)

Co-authors: Dr HU, Haidai (University of Copenhagen); Prof. TAYLOR, Nicholas M. I. (University of Copenhagen)

Presenter: RUTBEEK, Nicole (University of Copenhagen)

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