MBG FOCUS TALK

hosted by MBG - Structural Biology

Thursday 25th OCtober 2018 from 13:00-13:30

MBG meeting room 5 (3140-114), Gustav Wieds Vej 10C, 8000 Aarhus C

By Kelly Frain

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Investigating E. coli strains with novel Tat-based export systems for therapeutic protein production

The Twin Arginine Translocase (Tat) is a protein transport system conserved in plants, archaea and bacteria. Gram-negative E. coli TatABC translocase resides in the inner membrane and is unique as it exports fully folded substrates to the periplasm, moreover, it preferentially exports correctly folded protein. Less information is known about the minimal Gram-positive translocases, TatAdCd and TatAyCy of B. subtilis. Their 'proofreading' abilities and structure were investigated alongside the usefulness of Tat in the biopharmaceutical industry.

E. coli TatABC is able to export a plethora of therapeutic proteins to the periplasm. Using "TatExpress" and CyDisCo (which helps disulphide bond formation in the cytoplasm), up to 5 g/L of biopharmaceutical product can be purified from the E. coli periplasm. However, B. subtilis TatAdCd was shown to exhibit an extreme level of substrate specificity in comparison. Given the difference, TatAyCy was purified by Styrene Maleic Acid copolymers in an attempt to characterise the protein via Cryogenic Electron Microscopy. The data in these studies provide an insight into both the elusive proofreading and mechanism of the Tat translocase.

Hosted by Assistant Prof. Bjørn P. Pedersen, Dept. of Molecular Biology and Genetics, AU

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