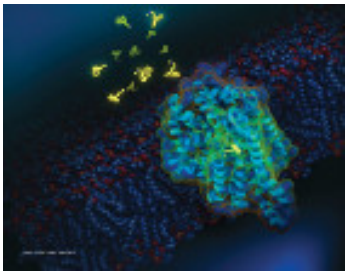

Contribution ID: **50** Type: **not specified**

APPLICATION OF SMALL-ANGLE SCATTERING TO INVESTIGATE CYANOBACTERIAL THYLAKOID MEMBRANES

Dainius JAKUBAUSKAS1,2, Lucja KOWALEWSKA3, Poul Erik JENSEN2, Kell MORTENSEN1 and Jacob KIRKENSGAARD1*

1 Niels Bohr Institute, University of Copenhagen, Denmark
2 Copenhagen Plant Science Center, University of Copenhagen, Denmark
3 Faculty of Biology, University of Warsaw, Poland

*Corresponding author : E-mail: jjkk@nbi.ku.dk

Cyanobacteria are relative simple unicellular photosynthetic prokaryotes, considered ancestors of higher plant chloroplasts. We have investigated thylakoid stacking and dynamics of three cyanobacterial species with various thylakoid arrangements in vivo by means of small-angle scattering and have correlated it to the results of transmission electron microscopy.
We have formulated a mathematical model describing thylakoid membrane ultrastructure and stacking using the designated form factor and the lamellar structure factor. This mathematical model has been implemented in the scattering curve-fitting framework 'WillItFit?', what now enables the fitting of experimental scattering data from photosynthetic organisms and obtaining thylakoid ultrastructural parameters: thylakoid membrane thickness, lumen width, thylakoid repeat distance and related uncertainty parameters.
The investigation of cyanobacterial thylakoid membranes by small-angle scattering can provide information on photosynthetic organism adaptation and thylakoid dynamics in relation to environmental factors and stimuli: e.g. ion concentration, illumination or temperature changes.

Author: Dr JAKUBAUSKAS, Dainius (Malmö university)

Presenter: Dr JAKUBAUSKAS, Dainius (Malmö university)