DEPARTMENT OF BIOMEDICINE
HEALTH
AARHUS UNIVERSITY

Honorary Skou Professors Seminar

Dear Colleagues,

The first 21 Honorary Skou Professors have been selected. In that occasion, we are happy to celebrate this within the ***MEMBRANES Research Theme*** by inviting you to a joint seminar with three of the recipients.

The seminar will be on **Monday, October 7th, 2019**. Location: Small Anatomy Auditorium, building 1231-424, Aarhus University. The program will be as follows:

11.00-12.00 pm	What is the activation signal for phosphoryl transfer in the calcium pump? – Lessons from recent studies of Ca-ATPase structures ***Chikashi Toyoshima, The University of Tokyo, Tokyo, Japan*** *Champion: Bente Vilsen*
	Break
1.00- 2.00 pm	Role of Nuclear Factor of Activated T-cells in vascular complications of diabetes ***Professor Maria F Gomez, Lund University, Department of Clinical Sciences*** *Champion: Ebbe Bødtkjer*
	Break with coffee and cake
2.15-3.15 pm	Optical Imaging of Oxygen Delivery and Consumption : Novel Physiological Insights and Guiding Interpretation of BOLD fMRI ***Professor David Boas, Neurophotonics Center, Boston University*** *Champion: Vladimir Matchkov*

On behalf of the organizers,
Søren Brandt Poulsen
Research Theme Manager
MEMBRANES

The MEMBRANES Research Theme is a professional network with more than 25 group leaders promoting collaboration, fund raising and carrier development. Want to know more? Visit us on

biomed.au.dk/research/membranes/

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AARHUS UNIVERSITY

AU Honorary Skou Professor Seminar

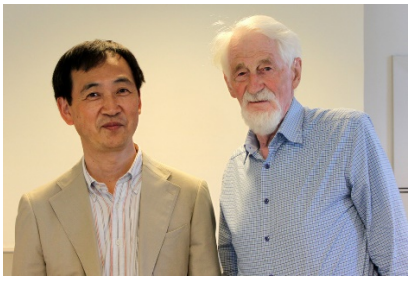
by Chikashi Toyoshima, University of Tokyo

Title: *What is the activation signal for phosphoryl transfer in the calcium pump? – Lessons from recent studies of Ca-ATPase structures*

Date: Monday October 7, 11.00 – 12.00

Venue: Small Anatomy auditorium, Building 1231-424 (4th floor)

On October 8, Chikashi Toyoshima will be inaugurated as an Honorary Skou Professor, motivated by his outstanding contribution to the research in ion transporting ATPases, which has been a central theme at Aarhus University, since the discovery of the Na,K-ATPase by our late Nobel Laureate Jens Christian Skou in 1957.



In 2000, Toyoshima published the first high-resolution crystal structure of a member of the P-type ATPase family, the sarcoplasmic reticulum Ca-ATPase, revealing for the first time the location of the bound calcium ions in the protein. In the following years, he determined the structures of several Ca-ATPase intermediate forms of the reaction cycle, thereby allowing understanding of the transport process at atomic level.

In 2009 and 2013 Toyoshima published – in collaboration with scientists from Aarhus University, Health – high resolution crystal structures of the Na,K-ATPase in the respective K- and Na-bound forms, thus providing fundamental key insight in how the enzyme distinguishes Na from K, so that these ions are pumped in opposite directions. Jens Christian Skou's comment was: "It is an impressive achievement and something I haven't even dared dreaming of". The picture of Toyoshima and Jens Chr. Skou was taken in 2013.

Kind regards,

Bente Vilsen
Skou Professor Champion

Optical Imaging of Oxygen Delivery and Consumption : Novel Physiological Insights and Guiding Interpretation of BOLD fMRI

David Boas
Neurophotonics Center
Boston University

BOLD fMRI is used extensively to map out brain activity patterns elicited by varied stimuli. BOLD fMRI measures the vascular response to neuronal activity and is thus not a direct measure of the underlying neuronal response to stimulus. A detailed understanding of neurovascular coupling is required to understand this relationship. Further, BOLD fMRI is an uncalibrated measure of the changes in deoxygenated hemoglobin during brain activation. BOLD is usually calibrated with a hypercapnic procedure and a model of the BOLD signal that itself is not well validated. I will review our efforts to understand the vascular response to neuronal activity at a macroscopic level and our procedures to cross-validate the BOLD calibration procedure. To gain a more microscopic validation of the BOLD signal model, we have performed numerous microscopic studies of the microvascular blood flow and oxygenation response to neuronal activity. I will review these microscopic methods and our validated bottom up model of the BOLD signal and the predictions it made that we have subsequently verified. Along the way, these microscopic studies have provided insight into novel mechanisms of increasing the efficiency of oxygen delivery to the brain in times of increased oxygen demand.