

Mads Schak Toustrup-Jensen
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Education

2003

PhD degree in medicine from the Institute of physiology, Faculty of Health Sciences, University of Aarhus. Title of my thesis: Structure-Function Relationship of the A-M3 Sector of Na⁺,K⁺-ATPase Studied by Site-directed Mutagenesis. Supervisors, Associate Professor Bente Vilsen and Professor Jens Peter Andersen.

Prices

2004

Awarded the University of Aarhus Research Foundation ph.d.-price on kr. 50.000. For the most remarkable PhD thesis from the Faculty of Health Sciences, University of Aarhus in 2003. Title of my PhD thesis: "Structure-function relationship of the A-M3 sector of Na⁺,K⁺-ATPase studied by site-directed mutagenesis".

Educational activities

2013

Supervisor, Bachelor student Line Christiansen (Molecular Biology)

2014

Supervisor, Bachelor student's Rasmus Krogh and Signe Petersen (Molecular Biology). Supervisor, Line Christiansen, project in Molecular biology.

2014/2015

Supervisor, Master student Line Christiansen

From 2015

Co-ordinator, Bachelor's Degree Programme in Medicine, Membranes

Employment

1997-1999

From September 1997 to August 1999: Employed as research assistant at the Institute of physiology, Faculty of Health Sciences, University of Aarhus

1999- 2003

From September 1999 to May 2003: PhD student at the Institute of physiology, Faculty of Health sciences, University of Aarhus, under supervision of Associate Professor Bente Vilsen and Professor Jens Peter Andersen. Last 2 years funded by the Faculty of Health

2003

From June 2003 to December 2003: Employed as research assistant at the Institute of physiology, Faculty of Health Sciences, University of Aarhus.

2004-2007

From January 2004: Employed as Assistant Research Professor at the Institute of Physiology and Biophysics, Department of Physiology, Faculty of Health Sciences, University of Aarhus.

2007-2008

From January 2007: Employed as post doc at the Institute of Physiology and Biophysics, Department of Physiology, Faculty of Health Sciences, University of Aarhus. Funded by a Three-year PhD scholarship from Faculty of Health Sciences

2008-

From July 2008: Employed as associate professor at the Institute of Physiology and Biophysics, Faculty of Health Sciences, University of Aarhus (now: Department of biomedicine, Aarhus University)

Important publications

Relationship between intracellular Na⁺ concentration and reduced Na⁺ affinity in Na⁺,K⁺-ATPase mutants causing neurological disease. Toustrup-Jensen, M. S., Einholm, A. P., Schack, V., Nielsen, H. N., Holm, R., Sobrido, M-J., Andersen, J. P., Clausen, T. & Vilsen, B. 2013 I : The Journal of biological chemistry. (E-pub ahead of print, January 2013).

Toustrup-Jensen MS, Holm R, Einholm AP, Schack VR, Morth JP, Nissen P, Andersen JP, Vilsen, B. The C-terminus of Na⁺,K⁺-ATPase controls Na⁺ affinity on both sides of the membrane through Arg935. J. Biol. Chem., 284, 18715-18725,

2009 – JBC Paper of the week.

Morth JP, Pedersen BP, Toustrup-Jensen MS, Sørensen TL, Petersen J, Andersen JP, Vilsen B.* Nissen P.* (*Vilsen and Nissen both corresponding authors). Crystal structure of the sodium-potassium pump. *Nature* 450, 1043-1049, 2007 ("Article"). Selected as favourite structural biology paper in *Nature* 2007.

Einholm AP*, Toustrup-Jensen MS*, Holm R, Andersen JP, Vilsen, B. The rapid-onset dystonia parkinsonism mutation D923N of the Na⁺,K⁺-ATPase alpha3 isoform disrupts Na⁺ interaction at the third Na⁺ site. *J. Biol. Chem.*, 285, 26245-26254, 2010 *Both authors contributed equally to this study.

Toustrup-Jensen M, and Vilsen B Interaction between the catalytic site and the A-M3 linker stabilizes E-2/E2P conformational states of Na⁺, K⁺-ATPase. *J. Biol. Chem.*, 280, 10210-10218, 2005

Einholm AP, Toustrup-Jensen M, Andersen JP, Vilsen B. Mutation of Gly-94 in transmembrane segment M1 of Na⁺,K⁺-ATPase interferes with Na⁺ and K⁺ binding in E2P conformation. *Proc. Natl. Acad. Sci. USA.*, 102, 11254-11259, 2005
Blanco-Arias P, Einholm AP, Mamsa H, Concheiro C, Gutiérrez-de-Terán H, Romero J, Toustrup-Jensen MS, Carracedo A, Jen JC, Vilsen B, Sobrido MJ. A C-terminal mutation of ATP1A3 underscores the crucial role of sodium affinity in the pathophysiology of rapid-onset dystonia-parkinsonism. *Hum. Mol. Genet.* 18, 2370-2377, 2009

Rodacker V, Toustrup-Jensen M, Vilsen B. Mutations Phe785Leu and Thr618Met in Na⁺,K⁺-ATPase, associated with familial rapid-onset dystonia parkinsonism, interfere with Na⁺ interaction by distinct mechanisms. *J. Biol. Chem.*, 281, 18539-18548, 2006

Schack VR, Morth JP, Toustrup-Jensen MS, Anthonisen AN, Nissen P, Andersen JP, Vilsen B.* Identification and function of a cytoplasmic K⁺ site of the Na⁺,K⁺-ATPase. *J. Biol. Chem.*, 283, 27982-27990, 2008

Morth JP, Poulsen H, Toustrup-Jensen MS, Schack VR, Egebjerg J, Andersen JP, Vilsen B, Nissen P. The structure of the Na⁽⁺⁾,K⁽⁺⁾-ATPase and mapping of isoform differences and disease-related mutations. *Phil. Trans. R. Soc. B.*, 264, 217-222, 2009