Curriculum Vitae - Poul NISSEN
Professor of Protein Biochemistry

University of Aarhus (AU), Department of Molecular Biology
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Civil Status
Born May 11, 1967 to Thora and Erik Nissen, Augustenborg, Denmark
Married to MD Marie Louise Jespersen. Two children (8 and 9)

Academic training and degrees

Nov. 1997 - Oct. 2000	Post-doctoral fellow with Prof. T. A. Steitz, Yale University
Nov. 1993 - Feb. 1997	Ph.D. with Asc. prof. Jens Nyborg, Dept. Molecular Biology, AU
Sep. 1987 - Oct. 1993	MSc in Chemistry, Faculty of Science, Dept. Chemistry, AU

Professional Employment

May 2006 -	Full professor of Protein Biochemistry, Dept. Molecular Biology, AU
Oct. 2002 - April 2006	Associate professor, Dept. Molecular Biology, AU
Oct. 2000 - Sep. 2004	Ole Rømer research associate professor, Dept. Molecular Biology, AU
Nov. 1997 - Sep. 2000	Post-doc, Dept. Mol. Biophys. Biochem., Yale University with T.A. Steitz
Feb. 1997 - Oct. 1997	Post-doc, Dept. Molecular Biology with Jens Nyborg

Research competences
Cloning, expression, purification, biochemical characterisation and crystallization of´proteins, membrane proteins, protein-ligand complexes, and ribosomes. X-ray crystallographic structure determination of biological macromolecules. Interdisciplinary and collaborative approaches in biological systems.

Research areas
Transmembrane transport, P-type ATPase pumps, sodium-dependent symporters, Sortilin-type neuroreceptors, eukaryotic ribosomes, structure-based drug discovery and design

Awards and honorary appointments
- 2008 Member, The Royal Danish Academy of Sciences and Letters
- 2008 Elite Researcher Prize, Danish Ministry of Science and Technology
- 2007 Lars Ernster Lecture, Dept. Biochemistry Biophysics, Stockholm University
- 2006 Anders Jahre Prize for Young Researchers, Oslo University
- 2006 Member, European Molecular Biology Organisation (EMBO)
- 2006 Hede-Nielsen Prize for Young Researchers, Hede-Nielsen Foundation, Denmark
- 2005 Hallas-Møller stipend, Novo Nordisk Foundation
- 2002 Program grant award, Human Frontier Science Program
- 2002 Newcomb Cleveland Prize, American Association for the Advancement of Science
- 2001 EMBO Young Investigator
- 2000 Ole Rømer award, Danish Natural Science Research Council
- 1997 Gold Medal for Ph.D. thesis, Danish Academy of Natural Sciences
- 1997 Post Doctoral award, Danish Natural Science Research Council

Organizational and administrative duties (selected)
- Director of PUMPKIN-centre of the Danish National Research Foundation (April 2007-)
- Director of Centre for Structural Biology (August 2005-)
- Chairman of the Ph.d. Committee of Molecular Biology, Univ. Aarhus (September 2005-)

- Principal investigator of research collaboration on neurotransmitter transporters (2004-2008)
- Principal investigator of HFSP program “Structure and function of the yeast ribosome” (2002-2006)
- Member of the Research Committee, Dept. Molecular Biology (2005-)
- Member of the Science Advisory Board, EMBL at PETRA-III synchrotron (2008-)
- Member of the International Advisory Board, Novo-Nordisk Protein Research Centre (2008-)
- Member of the Scientific Steering Committe and Work-package leader, EU-FP7 EDICT (2008-)
- International Reviewer and site-visit committee (Rennes, B. Felden), INSERM, France (2006)
- International Reviewer, Natural Sciences Engineering Research Council of Canada - NSERC (2006)
- International Reviewer, CNRS-USAR France "Jeunes Chercheuses, Jeunes Chercheurs" (2007)
- International Reviewer, Netherlands Organisation for Scientific Research - NWO (2008)
- Reviewer and interviewer on EMBO fellowship and YIP applications (approx. five per year)
- Member of Professor evalution committee, Univ. Copenhagen (2008)
- Member of Professor evalution committee, Univ. Aalborg (2008)
- Member of Professor evalution committee, Carlsberg Research Laboratories (2005)
- Chairman of two Asc. prof. evaluation committees, Univ. Aarhus (2005, 2008)
- Chairman of six Ph.D. dissertation committees, Univ. Aarhus
- Member of five Ph.D. dissertation committees, Univ. Copenhagen
- International member of two Ph.D. dissertations/viva, CEA Saclay & MRC-LMB Cambridge
- External reader of two Ph.D. dissertations (Yale University, Mol. Biophysics Biochemistry)
- Referee since 1997 for major international journals, including *Nature, Science, Cell, EMBO J., PNAS, J. Mol. Biol., RNA, J. Biol. Chem., Acta Cryst.*
- Contributor to Biomed Central “Faculty of 1000” (2002-)

Publications
Total number of citations: >5000, H-index 24 (ISI Web of Science)
Co-author of 49 papers (peer-review), 4 book chapters
Approximately 10 annual reports at synchrotrons, funding agencies and University

Invited talks at international conferences, meetings and seminars
Approx. 70 invited talks since 1993
22 invited talks since Jan. 1 2007 (35 including invitations transferred to students and post-docs)

Patents
Co-inventor, US patents 6,952,650 / 6,947,845 / 6,947,844, / 6,939,848
4 patent applications

Supervision
Completed: 7 MSc, 4 Ph.D., 4 post-doc
Currently supervising: 4 undergraduate students, 2 MSc, 6 Ph.D., 8 post-doc,
Support staff: 1 research associate, 1 teaching assistant, 2 research assistants, 2 technicians, 1 administrator

Current Undergraduate Teaching
- "Protein Crystallography 2", Dept. Molecular Biology - principal lecturer (2004-)
- "Protein Crystallography 1", Dept. Molecular Biology - principal lecturer (2004-)
- "Physical Biochemistry", Dept. Molecular Biology (2005-)
- "Biophysical Chemistry", Dept. Chemistry (2008-)

Current Graduate Teaching
- "Bionanotools", iNANO Center, Aarhus (2005-)
- "Molecular Physiology", Dept. Molecular Biology (2008-)

Publications, Poul Nissen, 2003 - 2008

Peer-reviewed papers and reviews

48. Morth JP, Poulsen H, Toustrup-Jensen M, Schack VR, Egebjerg J, Andersen JP, Vilsen B, Nissen P (2008). The structure of the Na+,K+-ATPase and mapping of isoform differences and disease-related mutations. *Phil. Trans. R. Soc. B* **[**accepted for publication]

47. Schack VR, Morth JP, Toustrup-Jensen MS, Anthonisen AN, Nissen P, Andersen JP, Vilsen B (2008). Identification and function of a cytoplasmic K+ site of the Na+,K+-ATPase. *J Biol Chem*. [Epub ahead of print]

46. Sengupta J, Nilsson J, Gursky R, Kjeldgaard M, Nissen P, Frank J (2008). Visualization of the eEF2-80S ribosome transition-state complex by cryo-electron microscopy. *J Mol Biol*. **382**, 179-87

45. Buch-Pedersen MJ, Pedersen BP, Veierskov B, Nissen P, Palmgren M (2008). Protons and how they are transported by proton pumps. *Pflugers Arch*.; [Epub ahead of print]

44. Marchand A, Lund Winther AM, Holm PJ, Olesen C, Montigny C, Arnou B, Champeil P, Clausen JD, Vilsen B, Andersen JP, Nissen P, Jaxel C, Moller JV, le Maire M (2008). Crystal structure of D351A and P312A mutant forms of the mammalian sarcoplasmic reticulum Ca2+-ATPase reveals key events in phosphorylation and Ca2+ release. *J Biol Chem*. **283**, 14867-14882.

43. Morth JP, Pedersen BP, Toustrup-Jensen MS, Sørensen TL, Petersen J, Andersen JP, Vilsen B, Nissen P (2007). Crystal structure of the sodium-potassium pump. *Nature* **450**, 1043-1049.

42. Olesen C, Picard M, Winther AM, Gyrup C, Oxvig C, Morth JP, Moller JV, Nissen P (2007). The structural basis of calcium transport by the calcium pump. *Nature* **450**, 1036-1042

41. Pedersen BP, Buch-Pedersen MJ, Morth JP, Palmgren MG, Nissen P (2007). Crystal structure of the plasma membrane proton pump. *Nature* **450**, 1111-1114.

40. Taylor DJ, Nilsson J, Merrill RA, Andersen GR, Nissen P, and Frank J (2007). Structures of modified eEF2.80S ribosome complexes reveal the role of GTP hydrolysis in translocation. *EMBO J,* **26***,* 2421-31

39. Nilsson J, Sengupta J, Gursky R, Nissen P, Frank J (2007). Comparison of fungal 80 S ribosomes by cryo-EM reveals diversity in structure and conformation of rRNA expansion segments. *J Mol Biol*. **369**, 429-38

38. Picard M, Jensen AM, Sorensen TL, Champeil P, Moller JV, Nissen P (2007). Ca2+ versus Mg2+ coordination at the nucleotide-binding site of the sarcoplasmic reticulum Ca2+-ATPase*. J Mol Biol*. **368**, 1-7

37. Parmeggiani A, Nissen P (2006). Elongation factor Tu-targeted antibiotics: four different structures, two mechanisms of action. *FEBS Lett.* **580**, 4576-81

36. Morth JP, Sørensen TL, Nissen P (2006). Membrane's eleven: heavy atom derivatives of membrane protein crystals. *Acta Cryst* **D62**, 877-882

35. Jensen AM, Sørensen TL, Olesen C, Møller JV, Nissen P (2006). Modulatory and catalytic modes of ATP binding by the calcium pump. *EMBO J,* **25**, 2305-14

34. Parmeggiani A, Krab IM, Okamura S, Nielsen RC, Nyborg J, Nissen P (2006). Structural basis of the action of pulvomyinc and GE2270 A on elongation factor Tu. *Biochemistry,* **45**, 6846-685

33. Sorensen TL, Olesen C, Jensen AM, Moller JV, Nissen P (2006). Crystals of sarcoplasmic reticulum Ca(2+)-ATPase. *J Biotechnol*. **124**, 704-16

32. Søhoel H, Jensen AM, Møller JV, Nissen P, Denmeade SR, Isaacs JT, Olsen CE, Christensen SB (2006). Natural products as starting materials for development of second-generation SERCA inhibitors targeted against prostate cancer cells. *Bioorg. Med. Chem*. **14**, 2810-2815

31. Parmeggiani A, Krab IM, Watanabe T, Nielsen RC, Dahlberg C, Nyborg J, Nissen P (2006). "Enacyloxin IIa pinpoints a binding pocket of elongation factor Tu for development of novel antibiotics*." J. Biol. Chem*. **281**, 2893-2900

30. Møller JV, Olesen C, Jensen AL, Nissen P (2005). The structural basis for coupling of Ca2+ transport to ATP hydrolysis of the Sarcoplasmic Reticulum Ca2+-ATPase*. J. Bioenerg. Biomem*., **37**, 359-64

29. Møller JV, Nissen P, Sorensen TL, Maire M. (2005) Transport mechanism of the sarcoplasmic reticulum Ca2+-ATPase pump. *Curr. Op. Struct. Biol*. **15**, 387-393.

28. Jidenko M, Nielsen RC, Sørensen TL, Møller JV, le Maire M, Nissen P, Jaxel C (2005). Crystallization of a mammalian membrane protein overexpressed in *S. cerevisiae. Proc. Natl. Acad. Sci USA* **102,** 11687-11691

27. Nilsson J, Nissen P (2005). Elongation factors on the ribosome. *Curr. Op. Struct. Biol*. **15**, 349-353

26. Brodersen D, Nissen P (2005). The social life of ribosomal proteins. *FEBS J* **272**, 2098-2108

25. Olesen C, Sørensen TL, Nielsen RC, Møller JV, Nissen P (2004). Dephosphorylation of the calcium pump coupled to counterion occlusion". *Science* **306**, 2251-2255

24. Nilsson J, Sengupta J, Frank J, Nissen P (2004). "Regulation of eukaryotic translation by the RACK1 protein: a platform for signalling molecules on the ribosome." *EMBO Rep*. **5**, 1137-1141.

23. Sørensen TL, Clausen JD, Jensen AL, Vilsen B, Møller JV, Andersen JP, Nissen P (2004). "Localization of a K^+-binding Site Involved in Dephosphorylation of the Sarcoplasmic Reticulum Ca^{2+}-ATPase". *J. Biol. Chem.* **279,** 46355-46358.

22. Sengupta J*, Nilsson J*, Gursky R, Spahn CMT, Nissen P, Frank J (2004). "Identification of the Versatile Scaffold Protein RACK1 on the Eukaryotic Ribosome by Cryo-Electron Microscopy." *Nat. Struct. Biol.*,**11**, 957-62. **These authors contributed equally*

21. Sørensen TL, Møller JV, Nissen P (2004). "Phosphoryl transfer and calcium ion occlusion in the calcium pump." *Science*, **304**, 1672-5.

20. Andersen GR, Nissen P, Nyborg J (2003). "Elongation factors in protein biosynthesis." *Trends Biochem Sci*, **28,** 434-41.

19. Jorgensen R, Ortiz PA, Carr-Schmid A, Nissen P, Kinzy TG, Andersen GR (2003). "Two crystal structures demonstrate large conformational changes in the eukaryotic ribosomal translocase." *Nat Struct Biol*, **10,** 379-85.

18. Valle M, Zavialov A, Li W, Stagg SM, Sengupta J, Nielsen RC, Nissen P, Harvey SC, Ehrenberg M, Frank J (2003). "Incorporation of aminoacyl-tRNA into the ribosome as seen by cryo-electron microscopy." *Nat Struct Biol*, **10,** 899-906.

Book chapters

Møller JV, Nissen P, Sørensen TL (2005). X-ray Crystallographic Structures of Sarcoplasmic Reticulum Ca^{2+}-ATPase at the Atomic Level, In *Structural biology of membrane proteins,* Grisshammer R & Buchanan S eds. Royal Chemical Society

Nissen P (2005). Large structures by X-ray crystallography. *In: "Genetics, Genomics, Proteomics and Bioinformatics Online"* (Eds. L.P. Jorde, P.F.R. Little, M.J. Dunn, S. Supramaniam), Wiley Press

Patents, applications and issuances

"Design of specific ligands to Sortilin", application no. P1886DK00 (2008)

"Design and use of Sortilin specific molecular imaging ligands", application no. P1854DK00 (2008)

"Crystal structure of the sodium-potassium pump", application submitted (2007)

"Crystal structure of the plasma membrane proton pump", application submitted (2007)

"Method of rational drug design based on binding ability with elongation factor Tu". Application no. PA 2004 01923, Inventors: Poul Nissen and Andrea Parmeggiani

"Determination and uses of the atomic structures of ribosomes and ribosomal subunits and their ligands". "Ribosome structure and protein synthesis inhibitors". Inventors: T.A. Steitz, P.B. Moore, N. Ban, P. Nissen and J. Hansen. US patents 6,952,650 / 6,947,845 / 6,947,844, / 6,939,848