

Position: Full Professor in Biochemistry
 Affiliation: University of Groningen
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Career

1984 – 1987 PhD student in Microbiology, University of Groningen, The Netherlands
 1987 - 1989 Scientist at Genencor Inc., South San Francisco, USA
 1990 - 1995 Fellow of the Royal Netherlands Academy of Arts and Sciences (KNAW)
 1991 Visiting Scientist at Transgene, S.A., Strasbourg, France (EMBO fellow)
 1995 - 1999 Associate Professor Microbiology, University of Groningen
 1999 - present Full Professor of Biochemistry, University of Groningen
 2003 Visiting professor in biochemistry at the Division of Chemistry and Chemical Engineering at California Institute of Technology, Pasadena, U.S.A.
 2008 - present Program Director Centre for Synthetic Biology
 2014 - present Scientific Director of the Groningen Biomolecular Sciences and Biotechnology Institute (GBB)

Education

1978 VWO-B, Menso Alting College Hoozeveen, NL
 1983 Undergraduate student at the University of Bern, Switzerland;
 1984 Masters degree in Molecular Biology and Biochemistry (*Cum laude*), University of Groningen
 1987 Ph.D. degree in Microbiology (*Cum laude*), University of Groningen

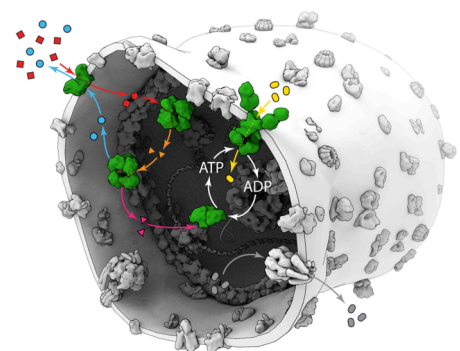
Output

Over 275 publications in peer refereed international scientific journals (ISI Web of Science *h*-index of 67; >16,000 citations); 4 patents; supervised or co-supervised ~60 Ph.D. students and ~25 post docs; several former members of the Poolman group now hold their own academic position. Poolman and Schraauwers wrote the book "Synthetische Biologie: de Mens als Schepper" (in Dutch and German); Poolman has contributed to various science policy reports and regularly exposes his scientific achievements to the society at large through media appearances.

Short biography

Bert Poolman was trained in bioenergetics and microbiology and is now active in biochemistry and biophysics. Central questions in his research are: (i) *how do molecules permeate biological membranes?* (ii) *how can one control the volume and physicochemistry of the cell?* and (iii) *what tasks should a living cell minimally perform and how this can be accomplished with a minimal set of components.* Poolman has a track record in vectorial biochemistry, including membrane transport and cell volume regulation as well as the development of innovative technologies in membrane biology. He has advanced the field of ATP-binding cassette (ABC) and secondary active transporters by combining functional and structural studies. His main current research areas include:

- *Bacterial cell-volume regulation*: elucidation of the homeostatic mechanisms that control the physicochemistry of the cell.
- *Building of synthetic cells*: construction of functional far-from-equilibrium systems for metabolic energy conservation and development of cell volume regulatory networks.
- *Traffic of membrane proteins*: understanding of the targeted delivery, localization and energetics of nutrient transporters in the plasma membrane of yeast.



Major Fellowships, Honours and Positions

- 1989 Biochemistry Award of the Dutch Biochemistry Organisation (NVBMB)
 1989 Fellowship from the Royal Netherlands Academy of Arts and Sciences (KNAW)
 1992 HFSP Program award: 'Molecular Biology of Secondary Transport Proteins'
 1997 SON 'Jonge Chemici' award
 2001 NWO TOP grant
 2003 Fulbright Scholarship and visiting professorship at the California Institute of Technology, USA
 2005 Multimillion support for Membrane Proteomics Centre in Groningen
 2007 NWO TOP Grant
 2007 Rated as ISI Highly Cited researcher
 2008 NGI grant renewal (NPCII) for the Membrane Proteomics Centre
 2009 Elected as member of the Royal Netherlands Academy of Arts and Sciences (KNAW)
 2010 NWO TOP-GO Grant
 2011 Elected as Faculty 1000 member
 2012 Board Member of Faculty 1000
 2013 Chairman of KNAW Earth and Life Sciences Board
 2014 FEBS National Lecturer Award
 NWO-TOP-PUNT grant
 2015 ERC Advanced Grant
 2016 Joel Mandelstam Memorial Lecture
 2016 Member of Council for Physics and Chemistry (RNS)
 Vice-chair of KNAW Council for Natural and Technical Sciences (RNTW)
 2017 Gravitation Program BaSyC

Contributions to science: selected articles from the past 10 years**ABC transport and cell volume regulation**

- van den Berg J, Boersma AJ & Poolman B (2017) Microorganisms maintain crowding homeostasis *Nat Rev Microbiol* 15:309
- Berntsson, R., Doeven, M.K., Fusetti, F., Duurkens, H.H., Sengupta, D., Marrink, S.J., Thunnissen, A.M., Poolman, B., and Slotboom, D.J. (2009) The structural basis for peptide selection by the transport receptor OppA. *EMBO Journal*, 28, 1332.
Highlighted in News & Views (2009) *Nature Microbiol. Rev.* 7, May issue & Research Highlight at ESRF.
- Birkner JP, Poolman B & Koçer, A. (2012) Hydrophobic gating of Mechanosensitive channel of large conductance evidenced by single-subunit resolution. *Proc Natl Acad Sci USA* 109: 12944.
- Boersma AJ, Zuhorn IS & Poolman B (2015) A sensor for quantification of macromolecular crowding in living cells. *Nat Meth* 12:227.
- Gouridis G, Schuurman-Wolters GK, Plotz E, Husada F, Vietrov R, de Boer, M, Cordes T and Poolman (2014) Ligand-binding mechanism and substrate delivery in ATP-binding cassette transporter at the single-molecule level. *Nat Struct Mol Biol* 22: 57.
- Liu B, Poolman B & Boersma AJ (2017) Ionic Strength Sensing in Living Cells. *ACS Chem Biol*. **12**: 2510.
Featured in Chemical Engineering News:
<http://pubs.acs.org/doi/10.1021/cen-09540-notw5>
- Scheepers GH, Lycklama A Nijeholt JA, Poolman B. (2016) An updated structural classification of substrate-binding proteins. *FEBS Lett.* **590**:4393-4401. doi: 10.1002/1873-3468.12445.
Featured in FEBS Letters
<http://febs.onlinelibrary.wiley.com/hub/journal/10.1002/%28ISSN%291873-3468/>

Membrane protein biogenesis, including expression, and quality control

- Bianchi F, Syga L, Moiset G, Spakman D, Schavemaker PE, Punter M, Seinen AB, van Oijen AM, Robinson A and Poolman B (2018) Steric exclusion and protein conformation determine the localization of plasma membrane transporters. **Nat Comm** 5:501.
- Franken LE, Oostergetel GT, Pijning T, Puri P, Arkhipova V, Boekema EJ, Poolman B, Guskov A (2017) A general mechanism of ribosome dimerization revealed by single-particle cryo-electron microscopy. **Nat Comm** 8: 722.
- Geertsma ER, Slotboom DJ & Poolman B (2008) Quality control of overexpressed membrane proteins. **Proc. Natl. Acad. Sci USA** 105: 5722.
- Meinema AC, Laba JK, Hapsari RA, Otten R, Mulder FAA, Kralt A, van den Bogaart, G, Lusk CP, Poolman B & Veenhoff, L.M. (2011) Long Unfolded Linkers Facilitate Membrane Protein Import Through the Nuclear Pore Complex. **Science** 333: 90.
Highlighted in Science (Perspective) by RW Kriwacki & MK-Yoon 'Fishing in the nuclear pore'.
- van Gijtenbeek LA, Robinson A, van Oijen AM, Poolman B and Kok J (2016) On the spatial organization of mRNA, plasmids and ribosomes in a bacterial host overexpressing membrane proteins. **PLoS Genetics** 12:e1006523.
Recommended in F1000Prime as being of special significance in its field by F1000 Faculty Member
- Schavemaker PE, Śmigiel WM & Bert Poolman (2017) Ribosome surface properties may impose limits on the nature of the cytoplasmic proteome. **eLIFE** 6: e30084..
Editorial (Digest): DOI: <https://doi.org/10.7554/eLife.30084.002>
Insight article by Conrad Mullineaux: How bacteria keep proteins moving. DOI: 10.7554/eLife.30084
- Schavemaker PE & Poolman B (2018) (Membrane) protein production in context. **Trends Biochem Sci** 43: 858.

Membrane model systems

- Geertsma ER, Mahmood NAB, Schuurman-Wolters GK & Poolman B (2008) Membrane reconstitution of ABC transporters and assays of translocator function. **Nat Protocols** 3: 256.
- Moiset G, Lopez C, Bartelds R, Syga L, Rijpkema E, Cukkemane A, Baldus M, Poolman B & Marrink SJ (2014) Disaccharides Impact the Lateral Organization of Lipids. **J Am Chem Soc** 136: 16167.
- Ramadurai S, Holt A, Krasnikov VV, van den Bogaart G, Killian JA & Poolman B (2009) Lateral diffusion of membrane proteins. **J Am Chem Soc** 131: 12650.
- van Meervelt V, Soskine M, Singh S, Schuurman-Wolters G, Wijma HJ, **Poolman B** & Maglia G. (2017) Real-time conformational changes and controlled orientation of native proteins inside a protein nanoreactor. **J Am Chem Soc** 139: 18640
- Zollmann T, Moiset Coll T, Tumulka F, Tampé R, Poolman B & Abele R (2015) Single-liposome analysis of peptide translocation by the ABC transporter TAPL. **Proc. Natl Acad Sci USA** 112: 2046.