

Curriculum Vitae of Dr. Harald Janovjak

University of California, Berkeley
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Personal Data

Born 1979 in Basel, Switzerland (Swiss citizen)

Languages: German and Swiss (Native), English (Fluent), French (Good), Slovak (Basic)

Education and Work Experience

Since October 2006

University of California, Berkeley

Post-doctoral fellow funded by the European Molecular Biology Organization
Project title: "Optical manipulation of ion channel structure and function"

Advisor: Prof. Ehud Y. Isacoff

Division of Neurobiology, Department of Molecular and Cell Biology

January 2006
- March 2009

nAmbition GmbH, Dresden (part of JPK Instruments Group, Berlin)

Scientific advisor and business developer

January 2006
- September 2006

University of Technology, Dresden

Post-doctoral fellow

Advisor: Prof. Daniel J. Müller

Chair of Cellular Machines, Center for Biotechnology

November 2002
- December 2005

University of Technology, Dresden

PhD in Biology with highest honors (*summa cum laude*)

Thesis title: "Exploring the mechanical stability and visco-elasticity of membrane proteins by single-molecule force measurements"

Advisors: Prof. Daniel J. Müller and Prof. Petra Schwille

Chairs of Cellular Machines and Biophysics, Center for Biotechnology

September 2001
- October 2002

Max Planck Institute of Molecular Cell Biology and Genetics, Dresden

Diploma Thesis in Single-Molecule Biophysics with highest honors (grade 6.0)

Thesis advisors: Prof. Daniel J. Müller and Prof. Andreas Engel

(latter from the Biozentrum, University of Basel)

October 1998
- October 2002

Biozentrum, University of Basel

Diploma in Molecular Biology

Supervised Students

July 2009 - February 2010	Josh Levitz (Graduate rotation student in Biophysics, UC Berkeley)
August 2008 - November 2008	Lowry Kirkby (Graduate rotation student in Biophysics, UC Berkeley)
November 2007 - February 2008	Kevin Mann (Graduate rotation student in Neuroscience, UC Berkeley)
March 2005 - October 2005	Helene Knaus (Diploma student in Biotechnology, TU Dresden)
January 2004 - July 2004	Maurice Hubain (Diploma student in Bioinformatics, TU Dresden)
April 2003 - August 2003	Jana Doehner (Undergraduate in Biotechnology, TU Dresden)
February 2003 - August 2003	Michael Kuhn (Undergraduate in Bioinformatics, TU Dresden)

Reviewer Service

The following journals requested my reviewer service:

Biophysical Journal	Journal of Physics - Condensed Matter
European Biophysics Journal	Journal of the American Chemical Society
FEBS Letters	Nature Methods
Int. Journal of Biochemistry and Cell Biology	Nanotechnology
Journal of Chemical Physics	

Selected Awards and Memberships

October 2006	Fellowships of the European Molecular Biology Organization, German Research Foundation and Swiss National Science Foundation
December 2005	PhD thesis honored with highest honors (<i>summa cum laude</i>)
October 2002	Diploma thesis honored with highest honors (grade 6.0)
September 2001	Fellowship of the ERASMUS program

Member of the Biophysical Society, Deutsche Gesellschaft für Biophysik and Swiss Physical Society

Selected Talks

March 2009	Annual Meeting of the Biophysical Society, Boston
Since October 2006	Multiple meetings of the National Institutes of Health, Bethesda
February 2005	Single-Molecule Winterworkshop, Linz
March 2004	Annual Meeting of the Swiss Society for Neuroscience, St. Moritz
March 2003	Annual Meeting of the Swiss Physical Society, Basel

In September 2006, I was organizer and chairman of the international conference "Scanning Probe Microscopies and Organic Materials XV, 2006" in Dresden.

Other Skills and Activities

Computational biology	Experience in molecular dynamics and Monte-Carlo simulations, molecular force fields and development of data analysis software. Programming skills in Perl, C, SQL, Igor and ImageJ. Molecular modeling and computations with Schrödinger Maestro, MacroModel, Jaguar and Visual Molecular Dynamics.
Signal processing	Development of data acquisition, signal processing and digital feedback systems
Business skills	Experience in writing patent applications, initiating and supervising cooperation projects with industry, representing core technologies towards potential partners and venture capital companies (detailed information available on request).
Military service	Swiss Armed Forces (1998)

Publications

Peer-Reviewed Research Articles

18. "A light-gated, potassium-selective glutamate receptor for the optical inhibition of neuronal firing"
H. Janovjak, D. Trauner & E.Y. Isacoff
Submitted.
17. "Periodic forces trigger a complex mechanical response in ubiquitin"
P. Szymczyk & **H. Janovjak**
Journal of Molecular Biology (2009) 390: 443-456 (with frontcover).
16. "Fully automated single-molecule force spectroscopy for screening applications"
J. Struckmeier, R. Wahl, M. Leuschner, J. Nunes, **H. Janovjak**, U. Geisler, G. Hofmann,
T. Jähnke & D.J. Müller
Nanotechnology (2008) 19: 384020.
15. "Digital force-feedback for protein unfolding experiments using atomic force microscopy"
C.A. Bippes, **H. Janovjak**, A. Kedrov & D.J. Müller
Nanotechnology (2007) 18: 044022.
14. "Transmembrane helices have rough energy surfaces"
H. Janovjak, H. Knaus & D.J. Müller
Journal of the American Chemical Society (2007) 129: 246-247.
13. "Free energy of membrane protein unfolding derived from single-molecule force measurements"
J. Preiner, **H. Janovjak**, C. Rankl, H. Knaus, D.A. Cisneros, A. Kedrov, F. Kienberger, D.J. Müller
& P. Hinterdorfer
Biophysical Journal (2007) 93: 930-937.
12. "Pulling single bacteriorhodopsin out of a membrane: Comparison of simulation and experiment"
M. Cieplak, S. Filipek, **H. Janovjak** & K.A. Krzysko
Biochimica et Biophysica Acta (2006) 1758: 537-544 (with frontcover).
11. "Bacteriorhodopsin folds into the membrane against an external force"
M. Kessler, K.E. Gottschalk, **H. Janovjak**, D.J. Müller & H.E. Gaub
Journal of Molecular Biology (2006) 357: 644-654.
10. "Observing folding pathways and kinetics of a single sodium-proton antiporter from *E. coli*"
A. Kedrov, **H. Janovjak**, C. Ziegler, W. Kühlbrandt & D.J. Müller
Journal of Molecular Biology (2006) 355: 2-8.
9. "Direct measurement of single-molecule visco-elasticity in atomic force microscopy force-
extension experiments"
C.A. Bippes, A.D.L. Humphris, M. Stark, D.J. Müller & **H. Janovjak**
European Biophysics Journal (2006) 35: 287-292.
8. "Complex stability of single proteins explored by forced unfolding experiments"
H. Janovjak, K.T. Sapra & D.J. Müller
Biophysical Journal (2005) 88: 37-39.
7. "Molecular force modulation spectroscopy revealing the dynamic response of single
bacteriorhodopsins"
H. Janovjak, D.J. Müller & A.D.L. Humphris
Biophysical Journal (2005) 88: 1423-1431.

6. "Automated alignment and pattern recognition of single-molecule force spectroscopy data"
M. Kuhn, **H. Janovjak**, M. Hubain & D.J. Müller
Journal of Microscopy (2005) 218: 125-132.
5. "Hydrodynamic effects in fast AFM single molecule force measurements"
H. Janovjak, J. Struckmeier & D.J. Müller
European Biophysics Journal (2005) 34: 91-96.
4. "Probing the energy landscape of the membrane protein bacteriorhodopsin"
H. Janovjak, J. Struckmeier, M. Hubain, M. Kessler, A. Kedrov & D.J. Müller
Structure (2004) 12: 871-879 (with frontcover).
3. "Controlled unfolding and refolding of a single sodium/proton antiporter using atomic force microscopy"
A. Kedrov, C. Ziegler, **H. Janovjak**, W. Kühlbrandt & D.J. Müller
Journal of Molecular Biology (2004) 340: 1143-1152.
2. "Unfolding pathways of native bacteriorhodopsin depend on temperature"
H. Janovjak, M. Kessler, D. Oesterhelt, H.E. Gaub & D.J. Müller
EMBO Journal (2003) 22: 5220-5229.
1. "Processing of gene expression data generated by quantitative real-time RT-PCR"
P.Y. Müller, **H. Janovjak**, A.R. Miserez & Z. Dobbie
Biotechniques (2002) 32: 1372-1380.

Peer-Reviewed Review Articles

4. "From valleys to ridges: Exploring the energy landscape of single membrane proteins"
H. Janovjak, K.T. Sapra, A. Kedrov & D.J. Müller
ChemPhysChem (2008) 9: 954-966.
3. "Deciphering molecular interactions of native membrane proteins by single-molecule force spectroscopy"
A. Kedrov, **H. Janovjak**, K.T. Sapra & D.J. Müller
Annual Review of Biophysics and Biomolecular Structure (2007) 36: 233-260.
2. "Imaging and detecting molecular interactions of single membrane proteins"
H. Janovjak, A. Kedrov, D. Cisneros, K.T. Sapra, J. Struckmeier & D.J. Müller
Neurobiology of Aging (2006) 27: 546-561.
1. "Observing structure, function and assembly of single proteins by AFM"
D.J. Müller, **H. Janovjak**, T. Lehto, L. Kuerschner & K. Anderson
Progress in Biophysics and Molecular Biology (2002) 79: 1-43.

Book Chapters

4. "Structure-based design of light-controlled proteins"
H. Janovjak & E.Y. Isacoff
To appear in *Photosensitive Molecules for Controlling Biological Function* (J. Chambers & R. Kamer, Editors)
Humana Press, Totowa, NJ / Springer Verlag GmbH, Heidelberg.

3. "Single-molecule microscopy and force spectroscopy of membrane proteins"
A. Engel, **H. Janovjak**, D. Fotiadis, A. Kedrov, D. Cisneros & D.J. Müller
In *Single Molecules and Nanotechnology* (Springer Series in Biophysics Vol. 12, 2008,
R. Rigler & H. Vogel, Editors)
Springer Verlag GmbH, Heidelberg.
2. "Rastersondenmikroskopie"
H. Janovjak & D.J. Müller
In *Bioanalytik* (2nd Edition, 2006, F. Lottspeich & H. Zorbas, Editors)
Spektrum Akademischer Verlag, Heidelberg.
1. "Atomic force microscopy"
H. Janovjak, R. K. Sawhney, M. Stark & D.J. Müller
In *Techniques in Microscopy for Biomedical Applications* (Manuals in Biomedical Research,
2006, H. Dokland, D.W. Huttmacher & M.M. Ng, Editors)
World Scientific Publishing Company, Singapore.