BIOGRAPHICAL SUMMARY OF ROBERT ROS

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SCIENTIFIC INTERESTS

Nanobiophysics; interactions, dynamics and structures of single (bio)molecules; physics of molecular recognition; nanoparticles; structure of biomolecular assemblies and cells

Scanning probe methods; force spectroscopy technologies; single molecule photonics/nanooptics; combination of cutting-edge force and optical technologies

PROFESSIONAL PREPARATION

1990 - 1992	Diploma program in Physics at the Albert-Ludwigs University, Freiburg, Germany
1992 - 1995	Diploma program in Physics at the Ruprecht-Karls University, Heidelberg, Germany. Subsidiary subject: *Physiology.*
1995 - 1996	Diploma thesis at the Applied Physical Chemistry group of Prof. Grunze, Ruprecht - Karls University, Heidelberg, Germany: *Detection of non-specific protein adsorption at artificial surfaces using acoustic plate mode sensors*.
1996 - 2000	PhD student in the Laboratory for Micro-and Nanotechnology, Paul Scherrer Institute, and group of Prof. Güntherodt, University of Basel, Switzerland.
02/08/2000	PhD exam, University of Basel in Experimental Physics: *Force measurements on single antibody molecules*.
11/2004	*Habilitation*, Physics Faculty, University of Bielefeld and *venia legendi* in experimental physics.

APPOINTMENTS

02-08/2000	Postdoc at Paul Scherrer Institute and University of Bern, Switzerland: *STM investigations of redox labeled protein conjugates.*
09/2000 – 04/2001	Postdoc at the Experimental Biophysics and Applied Nanoscience Group of Prof. Anselmetti, University of Bielefeld, Germany.
05/2001- 11/2004	Scientific Assistent (C1) and project leader at the Department of Physics, University of Bielefeld, Germany.
12/2004-12/2007	University Lecturer ('Hochschuldozent', C2), Physics Faculty, University of Bielefeld, Germany.
01/2008-present	Associate Professor, Department of Physics, Arizona State University, Tempe AZ, USA.

ADDITIONAL SKILLS

09/2004	Organization of the conference Scanning Probe Microscopies and Organic Materials XIII, Bielefeld
01/1999	AFM software development, Topometrix, Inc., Santa Clara, USA
02/1997	Radioprotection surveyor training, School of Radioprotection, Paul Scherrer Institute, Switzerland

MEMBERSHIPS

German Physical Society

Biophysical Society (USA)

POSTDOCTORAL SUPERVISION

H. Frey (2005-2007)

N. Hansmeier (since 2007)

STUDENT SUPERVISION

Arizona State University

Graduate students A. Fuhrmann (since 2006), O. Schulz (since 2008)

University of Bielefeld

Graduate students V. Walhorn (since 2004), D. Wesner (since 2004)

Completed PhD theses

H. Kleine, *Ladungstransport durch DNA* (2004)

C. Haumann, *Einzelmoleküldetektion mittels optischer Nahfeldmikroskopie* (2005)

F. Bartels, *Kraftspektroskopische Bindungsstudien an einzelnen Protein-DNA-Komplexen* (2005)

R. Eckel, *Single Molecules and Nanocrystals: Molecular Recognition Forces and Optomechanical Switching* (2006)

A. Sischka, *Kraftspektroskopie und Einzelmoleküldetektion mit der optischen Pinzette* (2006)

Completed diploma/master theses

F. Bartels, *Rasterkraftmikroskopie und Kraftspektroskopie an einzelnen Biomolekülen* (2002)

A. Sischka, *Aufbau einer optischen Pinzette* (2002)

R. Eckel, *Messung und Simulation der Mechanischen Elastizität einzelner DNA-Ligand-Komplexe* (2002)

J. Martini, *Aufbau eines Rasterkraftmikroskopes für kleine Cantilever* (2003)

S. Molter**,** *Untersuchung von organischen Molekülen auf Oberflächen mit Rastersondentechniken* (2003)

M. Diewald**,** *Molekulare Erkennung von Proteinen an synthetischen Oberflächen (Fullerene)* (2003)

K. Erdsiek**,** *Rasterkraftmikroskopische Untersuchungen an membrangebundenen Biomolekülen* (2003)

V. Baumgärtel, *Charakterisierung der Bindung von ATP an ExoP aus Sinorhizobium Meliloti mittels FCS* (2003)

R. Wilke, *IV-Spektroskopie an organischen Polymeren im Temperaturbereich von 10 – 300 K* (2004)

V. Walhorn, *Raserkraftmikroskopie mit kleinen Cantilevern* (2004)

D. Wesner, *Untersuchung molekularer Interaktionen in der pflanzlichen Signaltransduktion mittels FCS* (2004)

N. Giemla, *Rasterkraftmikroskopie an zweidimensionalen Proteinschichten* (2004)

L. Zahn, *Rastersondenmikroskopie an supramolekularen Polyoxometallaten* (2004)

M. Spengemann, *Rastertunnelmikroskopie an organischen Molekülschichten* (2004)

K. Recker, *Ladungstransport durch einzelne Polymere* (2006)

A. Fuhrmann, *Single Molecule Force Spectroscopy on Protein-Nucleicacid-Complexes* (2006)

K. Brandt, *Atomic Force Microscopy and Force Spectroscopy of Living Bacteria* (2007)

O. Schulz, *Immobilisierung von metallischen Nanopartikeln an AFM-Spitzen* (2007)

Completed bachelor theses

T. Damberg, *Molekulare Oberflächenstrukturen von lebenden Bakterien mit Rasterkraftmikroskopie* (2005)

E. Eilers, *Rasterkraftmikroskopische Untersuchungen an Nanopartikeln und Biomembranen* (2006)

TAUGHT COURSES

University of Bielefeld

Biophysics II [4h/week] with exercises [2h/week] (WS 2007/2008)

Biophysics I [4h/week] with exercises [2h/week] (SS 2007)

Biophysics II [4h/week] with exercises [2h/week] (WS 2006/2007)

Biophysics I [4h/week] with exercises [2h/week] (SS 2006)

Biophysics III [3h/week] with exercises [2h/week] (WS 2005/2006)

Biophysics I [4h/week] with exercises [2h/week] (SS 2005)

Scanning Probe Methods [1 week] (SS 2002)

Parts of *Biophysics I* (WS 2001/2002 and SS2004) and *Biophysics II* (SS 2002 and WS 2004/2005), as well as *Physics I* (WS 2002/2003), *Physics II* (SS 2003) and *Physics III* (WS 2003/2004)

Arizona State University

PHY-111 *General Physics* (Spring 2008)

TAUGHT SEMINARS

University of Bielefeld

Modern aspects of biophysics [2h/week] (from WS 2000/2001 to SS 2007)

Biophysics [2h/week] (WS 2004/2005)

PUBLICATIONS

Peer-reviewed journals (original work)

[1] R. Dahint, R. Ros Seigel, P. Harder, M. Grunze and F. Josse; Detection of non-specific protein adsorption at artificial surfaces by the use of acoustic plate mode sensors: *Sensors and Actuators B* **35-36**, 497-505 (1996).

[2] R. Ros Seigel, P. Harder, R. Dahint, M. Grunze, F. Josse, M. Mrksich and G. M. Whitesides; On-Line Detection of Nonspecific Protein Adsorption at Artificial Surfaces: *Anal. Chem.* **69**, 3321-3328 (1997).

[3] R. Ros, F. Schwesinger, D. Anselmetti, M. Kubon, R. Schäfer, A. Plückthun, L. Tiefenauer; Antigen binding forces of individually addressed single-chain Fv antibody molecules: *Proc. Natl. Acad. Sci. USA* **95**, 7402-7405 (1998).

[4] F. Schwesinger, R. Ros, T. Strunz, D. Anselmetti, H.-J. Güntherodt, A. Honegger, L. Jermutus, L. Tiefenauer and A. Plückthun; Unbinding forces of single antibody-antigen complexes correlate with their thermal dissociation rates: *Proc. Natl. Acad. Sci. USA.* **97***,* 9972-9977 (2000).

[5] T.T. Duong, G. Kim, R. Ros, M. Streek, F. Schmid, J. Brugger, D. Anselmetti and A. Ros; Size Dependent Free Solution DNA Electrophoresis in Structured Micro Fluidic Systems: *Microelectronic Engineering* **67-68C**, 905-912 (2003).

[6] R. Eckel, R. Ros, A. Ros, S.D. Wilking, N. Sewald and D. Anselmetti; Identification of Binding Mechanisms in Single Molecule - DNA Complexes: *Biophysical Journal* **85** 1968-197 (2003).

[7] F.W. Bartels, B. Baumgarth, D. Anselmetti, R. Ros, and A. Becker; Specific Binding of the Regulatory Protein ExpG to Promoter Regions of the Galactoglucan Biosynthesis Gene Cluster of *Sinorhizobium meliloti* – A Combined Molecular Biology and Force Spectroscopy Investigation: *Journal of Structural Biology* **143**, 145-152 (2003).

[8] A. Sischka, R. Eckel, K. Toensing, R. Ros, and D. Anselmetti; Compact, microscope based optical tweezers system for molecular manipulation: *Rev. Sci. Instr.* **74**, 4827-4831 (2003).

[9] H. Kleine, R. Wilke, Ch. Pelargus, K. Rott, A. Pühler, G. Reiss, R. Ros, and D. Anselmetti; Absence of intrinsic electric conductivity in single dsDNA molecules: *Journal of Biotechnology* **112**, 91–95 (2004).

[10] P. Siffalovic, M. Michelswirth, P. Bartz, B. Decker, C. Agena, C. Schäfer, S. Molter, R. Ros, M. Bach, M. Neumann, D. Anselmetti, J. Mattay, U. Heinzmann, and M. Drescher; Large-scale homogeneous molecular templates for femtosecond time-resolved studies of the guest-host interaction: *Journal of Biotechnology* **112**, 139–149 (2004).

[11] M. Raible, M. Evstigneev, P. Reimann, F.W. Bartels, and R. Ros; Theoretical analysis of dynamic force spectroscopy experiments: *Journal of Biotechnology* **112**, 13-23 (2004).

[12] N. Hansmeier, F.W. Bartels, R. Ros, D. Anselmetti, A. Tauch, A. Pühler, J. Kalinowski; Classification of hyper-variable *Corynebacterium glutamicum* surface-layer proteins by sequence analyses and atomic force microscopy: *Journal of Biotechnology* **112**, 177-193 (2004).

[13] B. Baumgarth, F. W. Bartels, D. Anselmetti, A. Becker, and R. Ros; Detailed studies of the binding mechanism of the *Sinorhizobium meliloti* transcriptional activator ExpG to DNA: *Microbiology* **151**, 259-268 (2005).

[14] Sischka, K. Toensing, R. Eckel, S. D. Wilking, N. Sewald, R. Ros, and D. Anselmetti; Molecular mechanisms and kinetics between DNA and DNA binding ligands: *Biophysical Journal* **88**, 404-411(2005).

[15] R. Eckel, R. Ros, B. Decker, J. Mattay, and D. Anselmetti; Supramolecular Chemistry at the Single Molecule Level: *Ang. Chem. Int. Ed.* **44**, 484 – 488 (2005).
R. Eckel, R. Ros, B. Decker, J. Mattay, and D. Anselmetti; Supramolekulare Chemie mit einzelnen Molekülen: *Ang.Chem.* **117**, 489 – 492 (2005).

[16] C. Haumann, J. Toquant, Ch. Pelargus, H. Frey, R. Ros, D. Pohl, and D. Anselmetti; Stand-alone device for the electrolytic fabrication of scanning near-field optical microscopy aperture probes;:*Rev. Sci. Instr. **76***, 033704 (2005).

[17] W. Hellmich, J. Regtmeier, T.T. Duong, R. Ros, D. Anselmetti, A. Ros; Poly(ethyleneoxide) Based Surface Coatings for Poly(dimethylsiloxane) Microchannel: *Langmuir* **21**, 7551 – 7557 (2005).

[18] R. Eckel, S. D. Wilking, A. Becker, N. Sewald, R. Ros, and D. Anselmetti; Single Molecule Experiments in Synthetic Biology – A New Approach for the Affinity Ranking of DNA-binding Peptides: *Ang. Chem. Int. Ed.***44**: 3921 – 3924 (2005).
R. Eckel, S. D. Wilking, A. Becker, N. Sewald, R. Ros, and D. Anselmetti; Einzelmolekülexperimente in der synthetischen Biologie – ein Ansatz für das Affinitätsranking DNA-bindender Peptide: *Ang.Chem.* **117**, 3989 – 3993 (2005).

[19] S. Garcia-Manyes, I. Bucior, R. Ros, D. Anselmetti, F. Sanz, M.M. Burger, and X. Fernàndez-Busquets, Proteoglycan mechanics studied by single-molecule force spectroscopy of allotypic cell adhesion glycans: *J. Biol. Chem.* **281**, 5992-5999 (2006).

[20] N. Hansmeier, A. Albersmeier, A. Tauch, Th. Damberg, R. Ros, D. Anselmetti, A. Pühler, and J. Kalinowski; The S-layer gene *cspB* of *Corynebacterium glutamicum* is transcriptionally activated by a LuxR-type regulator and located on a 6-kb genomic island from the type strain ATCC13032*: Microbiology* **152**, 923-935 (2006).

[21] M. Raible, M. Evstigneev, F. W. Bartels, R. Eckel, M.Nguyen-Duong, R. Merkel, R. Ros, D. Anselmetti, and P. Reimann; Theoretical analysis of single-molecule force spectroscopy experiments: heterogeneity of chemical bonds: *Biophysical Journal* **90**,3851-3864 (2006).

[22] H.G. Frey, C. Bolwien, A. Brandenburg, R. Ros, and D. Anselmetti; Optimized aperture-less optical near-field probes with 15 nm optical resolution: *Nanotechnology* **17**, 3105–3110 (2006).

[23] C. Schäfer, B. Decker, M. Letzel, F. Novara, R. Eckel, R. Ros, D. Anselmetti, and J. Mattay; On the way to supramolecular photochemistry at the single-molecule level: *Pure and Applied Chemistry* **78,** 2247-2259 (2006).

[24] D. Anselmetti, N. Hansmeier, J. Kalinowski, J. Martini, T. Merkle, R. Palmisano, R. Ros, K. Schmied, A. Sischka, and K. Toensing; Analysis of Subcellular Surface Structure, Function and Dynamics: *Analytical and Bioanalytical Chemistry* **387**, 83–89 (2007).

[25] R. Eckel, V. Walhorn, Ch. Pelargus, J. Martini, J. Enderlein, Th. Nann, D. Anselmetti, and R. Ros; Fluorescence emission control of single CdSe nanocrystals using gold-modified AFM tips: *Small* **3***,* 44-49 (2007).

[26] F.W. Bartels, M. McIntosh, Ch. Metzendorf, P. Plattner, N. Sewald, D. Anselmetti, R. Ros, and A Becker; Effector-stimulated single molecule protein-DNA interactions of a quorum sensing system in *Sinorhizobium meliloti*: *Biophysical Journal* **92**, 4391-4400 (2007).

[27] C. Schäfer, R. Eckel, R. Ros, J. Mattay, and D. Anselmetti; Photochemical Single-Molecule Affinity Switch: *J. Am. Chem. Soc.* **129**,1488-1489 (2007).

[28] M. Laxa, S. Barranco-Medina, A. Fuhrmann, T. Seidel, S. Erb, R. Ros, and K.-J. Dietz; Conformational switch enables binding of eukaryotic 2-Cys peroxiredoxin to DNA (submitted to *Proc. Natl. Acad. Sci. USA*)

[29] D. Anselmetti, F.W. Bartels, A. Becker, B. Decker, R. Eckel, M. McIntosh, J. Mattay, P. Plattner, R. Ros, Ch. Schäfer, and N. Sewald; Reverse Engineering of an Affinity-Switchable Molecular Interaction Characterized by AFM Single Molecule Force Spectroscopy *Langmuir* **24**, 1365-1370 (2008).

[30] A. Fuhrmann, S. Getfert, D. Anselmetti, P. Reimann, and R. Ros; Refined procedure of evaluating experimental single-molecule force spectroscopy data: *Phys. Rev. E* **77**, 031912 (2008)

Theses

[1] R. Ros Seigel; Untersuchung der unspezifischen Proteinadsorption auf künstlichen Oberflächen mit Hilfe akustischer Plattenmodensensoren: Diplomarbeit Universität Heidelberg (1996).

[2] R. Ros; Kraftmessungen an einzelnen Antikörpermolekülen: Dissertation Universität Basel (2000).

[3] R. Ros; Kräfte der molekularen Erkennung, Habilitationsschrift Universität Bielefeld (2004).

Reviews and book chapters:

[1] E. zur Mühlen, P. Koschinski, R. Ros, E. Haltner, S. Gehrig, C. M. Lehr, L. Tiefenauer, F. Schwesinger, A. Pückthun, U. Hartmann; Force Microscopy on Cells to Measure Bioadhesion: in *Bioadhesive Drug Delivery Systems*, Marcel Dekker, 197-221 (1999).

[2] L. Tiefenauer and R. Ros; Biointerface analysis on a molecular level: New tools for biosensor research; *Colloids and Surfaces B: Biointerfaces* **23**, 95–114 (2002).

[3] R. Ros, A. Ros, K. Tönsing, und D. Anselmetti; Biomoleküle im Visier: *Forschung an der Universität Bielefeld* **24**, 3-7 (2002).

[4] R. Ros, R. Eckel, F.W. Bartels, A. Sischka, B. Baumgarth, S.D. Wilking, A. Pühler, N. Sewald, A. Becker, and D. Anselmetti; Single molecule force spectroscopy on ligand-DNA complexes: From molecular binding mechanisms to biosensor applications: *Journal of Biotechnology* **112**, 5-12 (2004).

[5] N. Sewald, S.D. Wilking, R. Eckel, S. Albu, K. Wollschläger, K. Gaus, A. Becker, F.W. Bartels, R. Ros, and D. Anselmetti; Probing DNA-peptide interaction forces on the single molecule level, *J. Pept. Sci.* **12**, 160 (2006).

[6] J. Martini, W. Hellmich, D. Greif, A. Becker, T. Merkle, R. Ros, A. Ros, K.Tönsing, and D. Anselmetti; Systems Nanobiology: From Quantitative Single Molecule Biophysics to Microfluidic-Based Single Cell Analysis in *Subcellular Proteomics*, Springer 301-321(2007).

Conference proceedings

[1] R. Ros, F. Schwesinger, C. Padeste, A. Plückthun, D. Anselmetti, H.-J. Güntherodt, L. Tiefenauer; SPM for Functional Identification of Individual Biomolecules: *Proc. of SPIE* **3607**, 84-89 (1999).

[2] T. Duong, M. Streek, R. Ros, F. Schmid, A. Ros, D. Anselmetti; Gel-free electrophoresis of λ- and T2-DNA in structured microfluidic devices: *Proc. of μTAS* **1**, 749-752 (2003).

[3] D. Anselmetti, N. Griemla, W. Hellmich, K. Leffhalm, A. Ros, R. Ros, A. Sischka, and K. Tönsing; Single Cell Analytics for NanoBiology: *Nanobiotechnology* **1**, 267-270 (2005).

[4] Gesthuizen, A. Huerta Miguelanez, R. Ros, and N. Bahlawane; Chemical vapor deposition of nickel thin films of glass using nickel acetylacetonate: *Proceedings of the Electrochemical Society*, **9**, 659-666 (2005).

[5] R. Eckel, V. Walhorn, Ch. Pelargus, J. Martini, Th. Nann, D. Anselmetti, and R. Ros; Combined TIRF-AFM Setup: Controlled Quenching of Individual Quantum Dots: *Proc. of SPIE* **6092**, 609209 (2006).

[6] V. Walhorn, O. Schulz, Ch. Pelargus, D. Anselmetti, and R. Ros; Impact of metal-modified AFM tips on the fluorescence of single nanocrystals, *Proc. of SPIE* **6444**, 644406 (2007).

PRESENTATIONS

[1] R. Ros Seigel, M. Kubon, L. Tiefenauer, and H.-J. Güntherodt; Biochemical recognition of individual molecules; *2nd Hasliberg Workshop on Nanoscience*, 14.-18. October 1996, Hasliberg, Switzerland (Poster).

[2] R. Ros Seigel, F. Schwesinger, A. Plückthun, and L. Tiefenauer; Binding forces between directly immobilized antibody fragments and antigens; *9th International Conference on Scanning Tunneling Microscopy/Spectroscopy and Related Techniques*, 20.-25. July 1997, Hamburg, Germany (Poster).

[3] R. Ros, F. Schwesinger, C. Padeste, A. Plückthun, H.-J. Güntherodt, and L. Tiefenauer; Force spectroscopy on individual single-chain Fv antibody molecules; *3rd Conference on Development and Technological Application of Scanning Probe Methods*, 14.-17. September 1998, Basel, Switzerland (Poster).

[4] R. Ros, F. Schwesinger, A. Plückthun, D. Anselmetti, H.-J. Güntherodt, and L. Tiefenauer; The binding force of a single antibody molecule; *3rd Hasliberg Workshop on Nanoscience*, 12.-16. October 1998, Hasliberg, Switzerland (Poster).

[5] R. Ros; Force spectroscopy on antibody molecules; *Molecular Imaging Corp.*, 21. January 1999, Phoenix, USA. (Invited talk).

[6] R. Ros, F. Schwesinger, C. Padeste, A. Plückthun, D. Anselmetti, H.-J. Güntherodt, L. Tiefenauer; SPM for Functional Indentification of Individual Biomolecules; *International Biomedical Optics Symposium (BIOS'99)*, 23.-29. January 1999, San Jose, USA (Talk).

[7] R. Ros; Force spectroscopy on individually addressed antibody molecules; *Sci & Ski Seminar of the Physical Chemistry Department ETH Zürich*, 15.-19. March 1999, Grimentz, Switzerland (Invited talk).

[8] R. Ros, F. Schwesinger, T. Strunz, A. Plückthun, D. Anselmetti, H.-J. Güntherodt, and L. Tiefenauer; Force spectroscopy on individual single-chain Fv antibody fragments; *Scanning Probe Microscopies and Organic Materials VIII (RSM'99)*, 4.-6. October 1999, Basel, Switzerland (Talk).

[9] R. Ros; Characterization of antibody-antigen interactions using force spectroscopy; *Seminar: Solid State Physics Laboratories,* 26. November 1999, ETH Zürich, Switzerland (Invited talk).

[10] R. Ros, F. Schwesinger, T. Strunz, A. Plückthun, H.-J. Güntherodt, and L. Tiefenauer; Characterization of antibody-antigen complexes using force spectroscopy; *44th Annual Meeting of the Biophysical Society*,12-16 February 2000, New Orleans, USA (Talk).

[11] R. Ros; Unbinding forces of single antibody-antigen complexes correlate with their thermal dissociation rates; *Sci & Ski Seminar of the Physical Chemistry Department ETH Zürich*, 19.-23. March 2001, Andermatt, Switzerland (Invited talk).

[12] R. Ros, F.W. Bartels, B. Baumgarth, A. Becker, A. Pühler, and D. Anselmetti; Specific binding of single regulatory proteins to DNA; *WE-Heraeus-Seminar 282 "Single Molecule Dynamics"*, 18.-21. June 2002, Bad Honnef, Germany (Poster).

[13] R. Ros; Atomic Force Microscopy & Force Spectroscopy of Single Biomolecules; *Seminar: Research Center for Bioelectronics and Nanobioscience*, 6. September 2002, University of Barcelona, Spain (Invited talk).

[14] R. Ros; Single Molecule Force Spectroscopy and Bioanalytic in Microfluidic Systems, *Seminar: Nanoscale Sensing Group*, 26. February 2003, MIT Media Lab. Cambridge, USA (Invited talk).

[15] R. Ros, F.W. Bartels, B. Baumgarth, A. Becker, A. Pühler, and D. Anselmetti; Specific Binding of Regulatory Proteins to DNA: A Combined Ensemble and Single Molecule Investigation; *47th Annual Meeting of the Biophysical Society*, 1.-5. March 2003, San Antonio, USA (Talk).

[16] R. Ros; Single Molecule Force Spectroscopy and Bioanalytic in Microfluidic Systems*, Protiveris Inc,.* 6. March 2003, Rockville, USA (Invited talk).

[17] R. Ros, From Single Molecule Mechanics and Kinetics to Cellular Adhesion, *La superficie cellulare: dalle molecole alla forma*, 25.-27.September 2003, Urbino, Italy (Invited talk).

[18] R. Ros, F. Bartels, R. Eckel, A. Sischka, K. Tönsing, and D. Anselmetti; Interaction, Mechanics and Binding Kinetics of Single Biomolecules, *Elucidating biomolecular networks by single-molecule technologies,* 26.-31. October 2003, Monte Verità, Ascona, Switzerland (Talk & Poster).

[19] R. Ros, Single Molecule Force Spectroscopy, *Parc Cientific de Barcelona,* 7. May 2004, Barcelona, Spain (Invited talk).

[20] R. Ros: Single Molecule Recognition: From Transcriptional Regulation to Supramolecular Chemistry, *International Conference on Nanotechnology: Science and Application*, 20.-25.February 2005, Luxor, Egypt (Key note lecture).

[21] R. Ros: Single Molecule Recognition by AFM Force Spectroscopy: From Transcriptional Regulation to Supramolecular Chemistry, *NanoBionics III - from Molecules to Applications,* 4.-8. April 2005, Marburg, Germany (Talk).

[22] R. Ros: Nanobiotechnologie – Molekulare Erkennung auf dem Einzelmolekülniveau, *IMTEK, University of Freiburg*, 21. April 2005, Freiburg, Germany (Invited Talk).

[23] R. Ros, R. Eckel, F.W. Bartels, V. Walhorn, A. Sischka, and D. Anselmetti: Single Molecule Recognition: From Transcriptional Regulation to Supramolecular Chemistry, *Molecular basis of signal information and energy transduction in biomolecules, Joint meeting of Swiss and German Biophysicist,* 5.-7- May 2005, Hünfeld, Germany (Invited talk).

[24] R. Ros: Force Spectroscopy: From Newton to Single Molecule Biophysics, *Antrittsvorlesung, Fakultät für Physik, Universität Bielefeld*, 20. June 2005, Bielefeld, Germany.

[25] R. Ros and D. Anselmetti: Single Molecule Recognition by AFM Force Spectroscopy: From Transcriptional Regulation to Supramolecular Chemistry, *13th International Conference on Scanning Tunneling Microscopy/Spectroscopy and Related Techniques*, 3.-8. July 2005, Sapporo, Japan (Talk).

[26] R. Ros: Single Molecule Biophysics: Investigation of Functional Biomaterials, *National Institute for Material Science,* 12. July 2005, Tsukuba, Japan (Invited talk).

[27] R. Ros: Nanobiophysics: Imaging, Manipulation and Characterization of Single Biomolecules, *Center for NanoTechnology, University of Münster*, 16. December 2005, Münster, Germany (Invited Talk).

[28] R. Ros: Biophysik mit einzelnen Molekülen, Faculty of *Physics and Astronomy, University of Würzburg*, 13. Januar 2006, Würzburg, Germany (invited talk)

[29] R. Eckel, V. Walhorn, Ch. Pelargus, J. Martini, Th. Nann, D. Anselmetti, and R. Ros: Combined TIRF-AFM Setup: Controlled Quenching of Individual Quantum Dots, *International Biomedical Optics Symposium (BIOS'06)*, 21.-26. January 2006, San Jose, USA (Talk).

[30] R. Ros: Nanobiophysikalische Chemie, Department of Chemistry, Pharmacy and Geosciences, University of Mainz, 20. February 2006, Mainz, Germany (invited talk)

[31] F.W. Bartels, M. McIntosh, Ch. Metzendorf, P. Plattner, N. Sewald, D. Anselmetti, A. Becker, and R. Ros: Specific effector stimulated single molecule protein-DNA interactions, *50th Annual Meeting of the Biophysical Society*, 18.-22. February 2006, Salt Lake City, USA (Talk).

[32] R. Eckel, K. Wollschläger, S.D. Wilking, N. Sewald, D. Anselmetti, R. Ros: Single Molecule Affinity Ranking of Native and Synthetic Point-Mutated Transcription Factors, *International Conference on Nanoscience and Technology*, 31 July – 4. August 2006, Basel, Switzerland (Talk).

[33] R. Ros: Single Molecule Biophysics with Scanning Probe and Optical Methods, *Department of Chemistry & Biochemistry, University of California Santa Cruz*, 8. September 2006, Santa Cruz, USA (invited).

[34] R. Ros: Nanobiophysik: Molekulare Erkennung, Regulation und Struktur auf dem Einzelmolekülniveau, Center for NanoScience, LMU Munich, 8. November 2006, Munich, Germany (invited talk)

[35] R. Ros: Nanobiophysics: Imaging, manipulation and characterization of single biomolecules, *MPI Seminar Series in Environmental, Cellular, and Molecular Microbiology, MPI for Terrestrial Microbiology,* 11. December 2006, Marburg, Germany (invited talk).

[36] V. Walhorn, O. Schulz, Ch. Pelargus, D. Anselmetti, and R. Ros, Impact of metal-modified AFM tips on the fluorescence of single nanocrystals, *International Biomedical Optics Symposium (BIOS'07)*, 20.-25. January 2007, San Jose, USA (Talk).

[37] V. Walhorn, O. Schulz, H. Frey, Ch. Pelargus, D. Anselmetti, and R. Ros: Impact of metal-modified AFM tips on the fluorescence of single nanocrystals, *Linz Winter Workshop on Single Molecule Research*, 2.-5. February 2007, Linz, Austria (talk)

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