CURRICULUM VITAE – ROBERT ROS

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PROFESSIONAL PREPARATION

1990 - 1992	Diploma program in Physics, Albert-Ludwigs University, Freiburg, Germany
1992 - 1995	Diploma program in Physics, Ruprecht-Karls University, Heidelberg, Germany Subsidiary subject: *Physiology*
1995 - 1996	Diploma thesis, 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, Laboratory for Micro-and Nanotechnology, Paul Scherrer Institute, and group of Prof. Güntherodt, University of Basel, Switzerland: *Force measurements on single antibody molecules* (summa cum laude)
11/2004	*Habilitation*, Physics Faculty, University of Bielefeld and *venia legendi* in Experimental Physics

APPOINTMENTS

02-08/2000	Postdoc, Paul Scherrer Institute and University of Bern, Switzerland: *STM investigations of redox labeled protein conjugates*
09/2000 – 04/2001	Postdoc, Experimental Biophysics and Applied Nanoscience Group of Prof. Anselmetti, University of Bielefeld, Germany
05/2001- 11/2004	Scientific Assistent (C1) and project leader, Department of Physics, University of Bielefeld, Germany
12/2004-12/2007	University Lecturer ('Hochschuldozent', C2), Physics Faculty, University of Bielefeld, Germany
01/2008 – 07/2012	Associate Professor, Department of Physics, Arizona State University, Tempe AZ, USA
08/2012 – 07/2014	Associate Professor with tenure, Department of Physics, Arizona State University
08/2012 – present	Director, Biophysics Undergraduate Program, Arizona State University
12/2012 – present	Director, Center for Biological Physics, Arizona State University
08/2014 – present	Professor, Department of Physics, Arizona State University
08/2015 – 07/2016	Visiting Scientist, III. Institute of Physics, Georg August University Göttingen, Germany

SCIENTIFIC INTERESTS

Experimental nanobiophysics. Developing and improving nanobiophysical techniques (in particular the combination of cutting-edge force and optical technologies) and their application to fundamental biological processes related to mechanical forces such as cell adhesion, cell mechanics and gene regulation. This work contributes to the fields of systems nanobiology, cancer biology, cardiovascular diseases, as well as to the development of new drugs and biomaterials.

ADDITIONAL SKILLS

06/2008	Workshop for New Physics and Astronomy Faculty, American Center for Physics, College Park, Maryland
01/1999	AFM software development, Topometrix, Inc., Santa Clara, USA
02/1997	Radioprotection surveyor training, School of Radioprotection, Paul Scherrer Institute, Switzerland

COURSES TAUGHT

Arizona State University

PHY-111 *General Physics Online* (Fall 2016)
PHY-472 *Advanced Biophysics Lab* (Fall 2015)
PHY-111 *General Physics* (Spring 2015)
PHY-472 *Advanced Biophysics Lab* (Fall 2014)
PHY-472 *Advanced Biophysics Lab* (Spring 2014)
PHY-111 *General Physics* (Spring 2013)
PHY-542/NAN-542 *Topics in Biophysics* (Fall 2012)
PHY-111 *General Physics* (Spring 2012)
PHY-542/NAN-542 *Topics in Biophysics* (Fall 2011)
PHY-111 *General Physics* (Spring 2011)
PHY-542/NAN-542 *Topics in Biophysics* (Fall 2010)
PHY-111 *General Physics* (Spring 2010)
PHY-542/NAN-542 *Topics in Biophysics* (Fall 2009)
PHY-111 *General Physics* (Spring 2009)
PHY-111 *General Physics* (Spring 2008)

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)
Biophysics (Seminar) [2h/week] (WS 2004/2005)
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)
Modern aspects of biophysics (Seminar)[2h/week] (from WS 2000/2001 to SS 2007)

MENTORING

Arizona State University

Postdoctoral Fellows
N. Hansmeier (2008)
A. Fuhrmann (2010)

B. Plochberger (2011)

I. Yermolenko (2012-2014 – co-mentoring with T. Ugarova, SOLS, ASU)

S. Sanderius (2012-2014 – co-mentoring with T. Newman, University of Dundee)

Completed PhD Theses

A. Fuhrmann; Force Spectroscopy, from Single Molecules to whole Cells: Refined Procedures of Data Analysis (4.21.2010)

O. Schulz; Tip Induced Quenching Imaging: Topographic and Optical Resolutions in the Nanometer Range (4.5.2012)

J. Staunton; Mechanics of Cancer Cells in 3D Microenvironments (11.12.2014)

B. Doss; Quantifying Mechanical Heterogeneity in 3D Biological Systems with the Atomic Force Microscope (4.17.2015)

W. Christenson; Single Cell Force Spectroscopy for Quantification of Cellular Adhesion on Surfaces (11.07.2016)

Completed Master Thesis

M. Dannemayer; Biophysical Characterization of Cancer Cells by Combined Atomic Force Microscopy - Confocal Fluorescence Microscopy (Fall 2011-Summer 2012, exchange student from Bielefeld University, Germany)

A. Ward; Tip Induced Nanophotonic Effects on Single Fluorophores (Spring 2013)

Graduate Students

A. Fuhrmann (Spring 2008-Spring 2010), O. Schulz (Spring 2008 – Spring 2012), J. Staunton (Fall 2009 – Fall 2014), B. Doss (Fall 2010 - Spring 2015), W. Christenson (Spring 2011-Fall 2016), P. Bookjans (Spring 2010-Fall 2013), C. Gilbert (rotation student Spring/Summer 2011), Q. Zhou (rotation student Spring 2012), N. Ariyasinghe (since Fall 2012), L. van der Feltz (rotation student Spring 2013), A. Ward (PSM 2012 – 2013, PhD Summer 2013 – Spring 2015), K. Rahmani (since Spring 2014), J. Liu (since Fall 2015), S. Shapiro (PSM, since 2017), I. Erickson (PSM, since 2017)

Undergraduate Students

N. Wright (Barrett Honors College honors contract, Spring 2009), B. Duke (research student, Fall 2008 – Spring 2009), J. Russo (Barrett Honors College honors contract, Spring 2009), M. Dunn (research student, Spring 2009), J. Bodea (Barrett Honors College honors contract, Spring 2010), D. Tram (Barrett Honors College honors contract, Spring 2010, S. Nair (Barrett Honors College honors contract, Spring 2010), N. Banyai (research student, Spring 2010 – Spring 2011), E. Meyer (Barrett Honors College honors contract, Spring 2011), E.O'Malley (Barrett Honors College honors contract, Spring 2011), E. Mayer (research student, Summer 2011), M. Linhart (research student, 2011-2012), A. Ward (research student - honors thesis, Summer 2011 – Spring 2013), B. Colling (Barrett Honors College honors contract, Spring 2012), R. Melikian, (Barrett Honors College honors contract, Spring 2012), A. Strumpf (Barrett Honors College honors contract, Spring 2012), C. Mothershead (honors thesis, Summer 2012 – Spring 2013), A.C. Chauhan (Barrett Honors College honors contract, Spring 2013), M. Sampson (Barrett Honors College honors contract, Spring 2013), Nikita Satapathy (research student, 2014 - 2015), T. Marianchuk (research student, Fall 2015 – Spring 2017), Miles Piper (research student, since Fall 2017)

Bielefeld University

Postdoctoral Fellows

N. Hansmeier (2007)

H. Frey (2005-2007)

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)

GRANTS & FUNDING

Active

1510700 06.01.2015 – 05.31.2018 **$449,884**
Three Dimensional Microengineered Diseased Tissue Model to Study Invasive Phenotype of Cancer Cells
PI: M. Nikkhah; Co-PI: R. Ros
National Science Foundation (NSF)

Completed

1R01HL107539 04.06.2011 – 02.28.2016 **$1,677,500**
Molecular Basis for Nonadhesive Properties of Fibrinogen Matrices
PI: R. Ros, T. Ugarova
National Institutes of Health (NIH)

ASU seed funding 10.01.2015-09.30.2016 **$100,000**
Is Nuclear Structure a Driver of Dormancy?
PI: S. Lindsay, Co-PIs: R. Ros, C. Nickerson, J. Park

U54CA143682 09.30.2009-12.31.2014 **$8,588,687**
Center for the convergence of physical science and cancer biology
PI: Davies, Co-PIs: R. Ros, S. Lindsay, B. Grady, T. Newman, D. Meldrum
Project leader Project 1: Quantitative mechanical nanotomography of cells embedded in 3D-matrixes
National Institutes of Health (NIH)

ASU seed funding 04.01.2013 – 03.31.2014 **$50,000**
Cancer Stem Cell Resistance to Proton Irradiation
PI: R. Ros
ASU Office of the Provost, CLAS, and Physics Department

P200A090123 08.15.2009-08.14.2013 **$514,512**
GAANN program at Arizona State University – Physics and Biological Physics moving forward into the 21st Century
PI: R. Ros (since 05.11.2011)
U.S. Department of Education

University of Bielefeld

Characterization and quantification of the interactions between single nanoparticles and cells (part of the Collaborative research project *NanoCare*)
Federal Ministry for Science and Education (BMBF); (3.1.2006-2.28.2009) **349,500 €**

Forces and molecular mechanisms of DNA-protein binding
Collaborative Research Initiative (SFB 613-K1), German Science Foundation (DFG)
(phase I: 01.2002-12.2004, phase II: 01.2005-12.2008) **493,200 €**

Binding of peptides and peptide analoga to DNA
Collaborative Research Initiative (SFB 613-K2), German Science Foundation (DFG)
(phase I: 01.2002-12.2004, phase II: 01.2005-12.2008) **393,700 €**

PUBLICATIONS

Google Scholar (https://scholar.google.com/citations?user=ErCQsdYAAAAJ&hl=en)
h-index: 31, citations: 3208

ISI Web of Knowledge ((AU=Ros R) AND (AD=Villigen OR AD=Bielefeld OR (AD=Tempe)))OR ((AU=Seigel RR) AND (AD=Heidelberg))
h-index: 25 ; citations : 2133

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).

[7] R. Ros and N. Hansmeier: Gene Classification and Quantitative Analysis of Gene Regulation in Bacteria using Single Cell Atomic Force Microscopy and Single Molecule Force Spectroscopy, in Single Cell Analysis, Wiley, 19-37 (2009).

[8] A. Fuhrmann and R. Ros: Single molecule force spectroscopy: a method for quantitative analysis of ligand-receptor interactions, *Nanomedicine*, **5**, 657-666 (2010).

[9] R. Ros: Mechanics and Interactions in DNA and RNA, in *Molecular Manipulation with Atomic Force Microscopy* (eds. Duwez and Willet*),* CRC Press, 129-148 (2011).

Peer-reviewed journals (original work)

[10] 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).

[11] 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).

[12] 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).

[13] 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).

[14] 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).

[15] 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).

[16] 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).

[17] 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).

[18] 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).

[19] 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).

[20] 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).

[21] 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).

[22] 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).

[23] 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).

[24] 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).

[25] 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).

[26] 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).

[27] 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).

[28] 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).

[29] 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).

[30] 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).

[31] 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).

[32] 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).

[33] 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).

[34] 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).

[35] 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).

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

[37] 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).

[38] 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)

[39] K. Wollschläger, K. Gaus, A. Körnig, R. Eckel, S.D. Wilking, M. McIntosh, Z. Majer, A. Becker, R. Ros, D. Anselmetti, N. Sewald; Single-Molecule Experiments to Elucidate the Minimal Requirement for DNA Recognition by Transcription Factor Epitopes, *Small* **5**, 484-495 (2009).

[40] A. Fuhrmann, J.C. Schoening, D. Anselmetti, D. Staiger, and R. Ros; Quantitative analysis of single molecule RNA-protein interaction *Biophysical Journal* **96**, 5030-5039 (2009).

[41] N.P. Podolnikova, I.S. Yermolenko, A. Fuhrmann, V.K. Lishko, S. Magonov, B. Bowen, J. Enderlein, A.V. Podolnikov, R. Ros and, T.P. Ugarova; Control of integrin $\alpha_{IIb}\beta_3$ outside-in signaling and platelet adhesion by sensing the physical properties of fibrin(ogen) substrates, *Biochemistry* **49**, 68-77 (2010).

[42] Z. Deng, O. Schulz, S. Lin, B. Ding, X. Liu, X. Wei, R. Ros, H. Yan, and Y. Liu,; Aqueous Synthesis of Zinc-Blende CdTe/CdS Magic-Core/Thick-Shell Tetrahedral Shaped Nanocrystals with Near-Infrared Emission *J. Am. Chem. Soc.* **132**, 5592–5593 (2010)

[43] I. Yermolenko, A. Fuhrmann, S. Magonov, V. Lishko, S. Oshkadyerov, R. Ros, and T. Ugarova; Origin of the Nonadhesive Properties of Fibrinogen Matrices Probed by Force Spectroscopy, *Langmuir* **26** 17269–17277 (2010).

[44] S. Huang, J. He, S. Chang, P. Zhang, F. Liang, S. Li, M. Tuchband, A. Fuhrmann, R. Ros, and S. Lindsay; Identifying single bases in a DNA oligomer with electron tunneling, *Nature Nanotechnology* **5** 868-873 (2010).

[45] A. Fuhrmann, J. R. Staunton, V. Nandakumar, N. Banyai, P. Davies, and R. Ros; AFM stiffness nanotomography of normal, metaplastic and dysplastic human esophageal cells, *Physical Biology* **8** 015007 (2011).

[46] P. Kaur, Q. Fu, A. Fuhrmann, R. Ros, L. Obenauer Kutner, L.A. Schneeweis, R. Navoa, K. Steger, L. Xie, Ch. Yonan, R. Abraham, M.J. Grace, and S. Lindsay; Antibody-unfolding and metastable-state binding in force spectroscopy and recognition imaging, *Biophysical Journal* **100** 243-250 (2011).

[47] S.K. Lower, S. Lamlertthon, N.N. Casillas-Ituarte, R.D. Lins, R. Yongsunthon, E.S. Taylor, A.C. DiBartola, C. Edmonson, L.M. McIntyre, L.B. Reller, Y.-A. Quee, R. Ros, B.H. Lower, and V.G. Fowler; Polymorphisms in fibronectin binding protein A of Staphylococcus aureus are associated with infection of cardiovascular devices. *Proc. Natl. Acad. Sci. USA.* **108** 18372-18377 (2011).

[48] I. Ashur, O. Schulz, C. McIntosh, I. Pinkas, R. Ros, A.K. Jones; Transparent gold as a platform for adsorbed protein spectroelectrochemistry: investigation of cytochrome c and azurin. *Langmuir* **28** 5861−5871 (2012).

[49] A. Fuhrmann, S. Getfert, Q. Fu, P. Reimann, S. Lindsay, and R. Ros; Long lifetime of hydrogen-bonded DNA basepairs by force spectroscopy, *Biophysical Journal* **102** 2381-2390 (2012).

[50] M.-H. Lee , P.-H. Wu , J. Staunton , R. Ros , G. Longmore, D. Wirtz; Mismatch in mechanical and adhesive properties induces pulsating cancer cell migration in epithelial monolayer, *Biophysical Journal* **102** 2731-2741 (2012)

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[54] W. Christenson, I. Yermolenko, B. Plochberger, F. Camacho-Alanis, A. Ros, T.P. Ugarova, and R. Ros; Combined single cell AFM manipulation and TIRFM for probing the molecular stability of multilayer fibrinogen matrices, *Ultramicroscopy* **136** 211–215 (2014).

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[57] J. Staunton, B. Doss, S. Lindsay, R. Ros; Correlating confocal microscopy and atomic force indentation reveals metastatic cancer cells stiffen during invasion into collagen I matrices, *Scientific Reports* **6:19686** (2016).

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[62] I. Gregor, M. Spiecker, R. Petrovsky, J. Großhans, R. Ros, and J. Enderlein; Rapid Non-linear Image Scanning Microscopy, *Nature Methods* **14**, 1087–1089 (2017).

[63] J.J. Faust, W. Christenson, K. Doudrick, J. Heddleston, T.-L. Chew, M. Lampe, A. Balibayev, R. Ros, T.P. Ugarova; Fabricating Optical-quality Glass Surfaces to Study Macrophage Fusion, JoVE (accepted)

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Theses

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

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

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

Conference proceedings

[69] 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).

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[71] 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).

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Patents

J. Faust, K. Doudrick, W. Christenson, R. Ros, Ugarova; An optical-quality glass surface

that imparts spatial control of macrophage fusion (2016 provisional patent application filed)

INVITED PRESENTATIONS

[1] Force spectroscopy on antibody molecules; *Molecular Imaging Corp.*, 21. January 1999, Phoenix, USA

[2] Force spectroscopy on individually addressed antibody molecules; *Sci & Ski Seminar of the Physical Chemistry Department ETH Zürich*, 15.-19. March 1999*,* Grimentz, Switzerland

[3] Characterization of antibody-antigen interactions using force spectroscopy; *Seminar: Solid State Physics Laboratories,* 26. November 1999, ETH Zürich, Switzerland

[4] 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

[5] Atomic Force Microscopy & Force Spectroscopy of Single Biomolecules; *Seminar: Research Center for Bioelectronics and Nanobioscience*, 6. September 2002, University of Barcelona, Spain

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

[7] Single Molecule Force Spectroscopy and Bioanalytic in Microfluidic Systems*, Protiveris Inc,.* 6. March 2003, Rockville, USA

[8] From Single Molecule Mechanics and Kinetics to Cellular Adhesion, *La superficie cellulare: dalle molecole alla forma*, 25.-27.September 2003, Urbino, Italy

[9] Single Molecule Force Spectroscopy, *Parc Cientific de Barcelona,* 7. May 2004, Barcelona, Spain

[10] 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).

[11] Nanobiotechnologie – Molekulare Erkennung auf dem Einzelmolekülniveau, *IMTEK, University of Freiburg*, 21. April 2005, Freiburg, Germany

[12] 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

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

[14] Single Molecule Biophysics: Investigation of Functional Biomaterials, *National Institute for Material Science,* 12. July 2005, Tsukuba, Japan

[15] Nanobiophysics: Imaging, Manipulation and Characterization of Single Biomolecules, *Center for NanoTechnology, University of Münster*, 16. December 2005, Münster, Germany

[16] Biophysik mit einzelnen Molekülen, Faculty of *Physics and Astronomy, University of Würzburg*, 13. Januar 2006, Würzburg, Germany

[17] Nanobiophysikalische Chemie, Department of Chemistry, Pharmacy and Geosciences, University of Mainz, 20. February 2006, Mainz, Germany

[18] Single Molecule Biophysics with Scanning Probe and Optical Methods, *Department of Chemistry & Biochemistry, University of California Santa Cruz*, 8. September 2006, Santa Cruz, USA

[19] Nanobiophysik: Molekulare Erkennung, Regulation und Struktur auf dem Einzelmolekülniveau, Center for NanoScience, LMU Munich, 8. November 2006, Munich, Germany

[20] 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

[21] Single Molecule Recognition in Regulatory Systems, *DPG- Frühjahrstagung, Arbeitskreis Biologische Physik,* 26.-30 March 2007, Regensburg, Germany (Key note lecture)

[22] Nanobiophysics with Scanning Probe and Optical Methods, *Department of Physics, Arizona State University*, 16. April 2007, Tempe, USA

[23] Molekulare Erkennung, Regulation und Struktur auf dem Einzelmolekülniveau, Fakultät für Naturwissenschaften, Universität Ulm, 18. June 2007, Germany

[24] Single Molecule Protein-Nucleic Acid Interactions, *Euro AFM Forum 2007*, 3.-5. September, Münster, Germany

[25] Nanoscale Biophysics with Scanning Probe and Optical Methods, *Scanning Probe Microscopies and Organic Materials,* 26.-28. September, Hamburg, Germany

[26] Imaging manipulation and characterization of single biomolecules with scanning probe and optical methods, *International Graduate Collage, University of Konstanz,* 15. October 2007, Konstanz, Germany

[27] Nanobiophysik: Molekulare Erkennung, Regulation und Struktur auf dem Einzelmolekülniveau, Physikalisches Institut, Universität Bayreuth, 23.November 2007, Bayreuth, Germany

[28] Nanobiophysik mit Rastersondenmethoden und optischen Technologien, *Leibniz-Institute for Surface Modification*, 11. December 2007, Leipzig, Germany

[29] Single Molecule Recognition in Regulatory Systems, *Biophotonics/Biophysics Seminar, UC Davis,* 23. May 2008, Davis CA, USA

[30] Bothering single molecules with force, *Center for Biological Physics - Chalk Talks*, 16. September 2008, Arizona State University, Tempe, USA

[31] Single Molecule Recognition in Regulatory Systems, *Seminar 3. Physikalisches Institut,* Universität Göttingen*,* 24. Novmber 2008, Göttingen, Germany

[32] Nanobiophysik mit Rastersondenmethoden und optischen Technologien, *Fakultät für Biowiss., Pharm. u. Psychol.*, Universität Leipzig, November, 6. 2009, Leipzig, Germany

[33] Mechanics of single molecules, biomaterials and cells, *Cancer Forum Workshop 1: Mechanical Properties of Cancer Cells and Their Micro-Environment*, Arizona State University, February 10 - 12, 2010, Tempe, USA

[34] Combined atomic force and fluorescence microscopy: Nanophotonic effects and mechanics of single molecules, biomaterials and cells, *EMDL Seminar*, Palo Alto Research Center, February 19. 2010, Palo Alto, USA

[35] Nanobiophysics: From Single Molecule Interactions to Cellular Mechanics and Adhesion Institute for Applied Physics, Technical University of Vienna, May 19. 2010, Vienna, Austria

[36] Mechanical properties of MCF10-A and MDA-MB-231 cells, 2nd Cell Line Exercise Meeting, Center for Applied Molecular Medicine, University of Southern California, June 19. 2010, Los Angeles CA, USA

[37] Application of force spectroscopy and nanoindentation to single molecule interactions, cell mechanics and cell adhesion *Biophysics Seminar, Department of Physics and Biophysics Graduate Program, Ohio State University*, October 29. 2010, Columbus, USA

[38] Cell Adhesion and Cell Mechanics Explored with Scanning Probe and Optical Methods, *Colloquium of the Department of Physics, Arizona State University,* November 4. 2010 Tempe, USA

[39] Application of force spectroscopy and nanoindentation to single molecule interactions, cell mechanics and cell adhesion *Seminar, Laboratory for Micro- and Nanotechnology, Paul Scherrer Institute*, November 16. 2010, Villigen, Switzerland

[40] Mechanical properties of human epithelial cancer cells, XI *Linz Winter Workshop 2011,* February, 4.-8. 2011, Linz, Austria

[41] Simultaneous atomic force and fluorescence microscopy for nanophotonics, single molecule interactions, cell mechanics and cell adhesion, *Seminar, Laboratory of physics of living matter, EPFL,* February, 9. 2011, Lausanne, Switzerland

[42] Consistency and discrepancy between single molecule force spectroscopy experiments and theoretical models, American Physical Society March Meeting, 21.-25 March 2011, Dallas, USA

[43] Mechanical properties of human epithelial cancer cells, *ASME Applied Mechanics and Materials Conference*, May 31-June 2, 2011, Chicago, USA

[44] Tip induced fluorescence quenching for nanometer optical and topographical resolution, *7th Workshop on Advanced fluorescence spectroscopy and microscopy: From cells to single molecules*, January 19, 2012, UCLA, Los Angeles, USA

[45] Tip induced fluorescence quenching for nanometer optical and topographical resolution, XIV. Annual Linz Winter Workshop, February, 3.-7. 2012, Linz, Austria

[46] Stiffness nanotomography of human epithelial cancer cells, *243rd ACS National Meeting,* March 25-29, 2012, San Diego, USA

[47] Simultaneous atomic force and confocal Fluorescence microscopy for correlated nanometer topographical and optical resolution; *Microscopy & Microanalysis 2012 Meeting*, July 29-August 2, 2012, Phoenix, USA

[48] Mechanical properties of breast cancer cells embedded in matrices; *Symposium on "Biomembrane Structure, Mechanics, and Dynamics"* at the *244 National Meeting of the American Chemical Society* April 7-11, 2013, New Orleans, USA

[49] Nanobiophysics: From single molecules to living cells, *Colloquium of the Department of Physics, Arizona State University,* September 12, 2013 Tempe, USA

[50] Cell Adhesion and Cell Mechanics Explored with Scanning Probe and Optical Methods, *APS Four Corner Section Meeting*, October 18-19, 2013, Denver, USA

[51] Force measurements for the quantification of molecular interactions, cell adhesion and cell mechanics, *Seminar, College of Medicine, Texas A&M Health Science Center*, December 10, 2013, College Station, USA

[52] Mechanical properties of metastatic breast cancer cells invading into collagen I matrices, *American Physical Society March Meeting*, 3-7 March 2014, Denver, USA

[53] Combining CLSM and AFM indentation reveals metastatic cancer cells stiffen during invasion into collagen I matrices, at the *247 National Meeting of the American Chemical Society* March 16-20, 2014, Dallas, USA

[54] Mechanical nanotomography of cells invading 3D-matrices; *International Scanning Probe Microscopy Conference,* June 30 - July 2 2014 ,Seoul, Korea

[55] Mechanical nanotomography of cells invading 3D-matrices, *36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, NCI mini-symposium "Onco-Mechanics: The Forces of Cancer"*, August 26 – 30, 2014 Chicago, USA

[56] Nanobiophysics: From Single Molecules to Living Cells; *Physics Colloquium, Wake Forest University*, October 22, 2014, Winston-Salem, USA

[57] *2014 MRS Fall Meeting, Symposium: Advances in Nanoscale Subsurface, Chemical and Time-resolved studies of Soft Matter*, November 30 -December 5. 2014 Boston, USA

[58] Mechanical nanotomography of cells invading 3D-matrices, *6th AFMBioMed Conference*, 13-17 December 2014, San Diego, USA.

[59] Pico-Newton Forces and Nanometer Optical Resolution Measured on Biomolecules and Living Cells, *Physics Colloquium, Tufts University*, April 9. 2015, Medford, USA

[60] Mechanical nanotomography of cells invading 3D-matrices*, Society for In Vitro Biology (SIVB) annual conference*, May 31st – June 3rd 2015, Tucson, USA.

[61] Mechanical nanotomography of cells invading 3D-matrices, *Symposium IRIS Adlershof*, July 10th 2015, Berlin, Germany.

[62] Physical Properties of Fibrinogen Matrices Control the Adhesion of Blood Cells, *International Biophysics Conference on Fluorescence Microscopy, Spectroscopy and Molecular Cell Mechanics*, October 8 -11, 2015, Mallorca, Spain.

[63] Force measurements for the quantification of molecular interactions, cell adhesion and cell mechanics, *Seminar über BioNano-Physik/Medizinische Physik*, February 1, 2016, University of Tübingen, Tübingen, Germany

[64] Force measurements for the quantification of molecular interactions, cell adhesion and cell mechanics, Colloquium of the Graduate School 'Nanocell', March 22, 2016, Johannes Kepler University Linz, Linz, Austria.

[65] Force measurements for the quantification of molecular interactions, cell adhesion and cell mechanics, *Physics Colloquium, Bielefeld University*, May 2. 2016, Bielefeld, Germany

[66] Force measurements for the quantification of molecular interactions, cell adhesion and cell mechanics *Biomaterials and Bioinspired Materials Seminar, Instituto de Ciencia de Materiales de Madrid (ICMM),* May 17, 2016, Madrid, Spain.

[67] Cell mechanics in 3D, *Colloquium of the Physics Department and the Biomolecular Sciences Institute*, October 28, 2016, Florida International University, Miami, USA.

[68] Mechanics of cells and extracellular matrix during cancer progression, 3rd Biophysics by the sea conference, September 25-29, 2017, Mallorca, Spain.

[69] Mechanics and morphology of cells and extracellular matrix during cancer progression, XX. Annual Linz Winter Workshop, February, 2.-5. 2018, Linz, Austria.

CONTRIBUTED PRESENTATIONS

[70] 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

[71] 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

[72] 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

[73] 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

[74] 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

[75] 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

[76] 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

[77] 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

[78] 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

[79] 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

[80] 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

[81] 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

[82] 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

[83] 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

[84] 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

[85] 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

[86] 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

[87] A. Fuhrmann, J. Schöning, S. Getfert, D. Anselmetti, P. Reimann, D. Staiger, and R. Ros: Single Molecule Protein-RNA Interactions, *51th Annual Meeting of the Biophysical Society*, 3.-7. March 2007, Baltimore, USA

[88] M. Koenig, F. Koberling, R. Ros, O. Schulz, D. Walters; Integration of an AFM with a Confocal Fluorescence Microscope for Combined AFM and Time-resolved Fluorescence Data Acquisition down to the Single Molecule Level, XI *Linz Winter Workshop 2009,* February, 6.-9. 2009, Linz, Austria

[89] A. Fuhrmann, J.C. Schoening, D. Anselmetti, D. Staiger, and R. Ros; Quantitative analysis of single molecule RNA-protein interaction, XI *Linz Winter Workshop 2009,* February, 6.-9. 2009, Linz, Austria

[90] I. Yermolenko, A. Fuhrmann, T. Ugarova, and R. Ros; Physical properties of fibrinogen substrates control integrin mediated cell adhesion, *54th Annual Meeting of the Biophysical Society*, 20-23. February 2010, San Fransisco, USA

[91] A. Fuhrmann, J. R. Staunton, V. Nandakumar, N. Banyai, P. Davies, and R. Ros: AFM Stiffness nanotomography of normal, metaplastic and dysplastic human esophageal cells, *55th Annual Meeting of the Biophysical Society*, 5.-9. March 2011, Baltimore, USA

[92] R. Ros: In-depth analysis of AFM nanoindentation experiments on soft heterogeneous samples, *Third Annual Physical Sciences in Oncology Meeting,* April 16-18, 2012*,* Tampa, Florida, USA

[93] J. Staunton, B. Doss, S. Lindsay, R. Ros**;** Mechanical nanotomography of cells invading 3D-matrices, *EMBO conference Physics of Cells,* August 30 – Septermber 4, 2015, Bad Staffelstein, Germany

[94] W. Christenson, I. Yermolenko, T. Ugarova, R. Ros, Quantifying Single Molecule Interactions from Single Cell Force Spectroscopy Data, *MRS Fall Meeting*, November 29-December 4, 2015, Boston, USA

SERVICE

Professional Service and Memberships

Conference and Seminar Organization

Organizer, Conference - Scanning Probe Microscopies and Organic Materials XIII, Bielefeld, Germany (09/2004)

Organizer, Chalk Talk series, Center for Biological Physics, ASU (Fall 2009)

Organizer, Center for Biological Physics Seminar, ASU (Fall 2010)

Session co-chair, 55th Annual Meeting of the Biophysical Society, Baltimore, MD (3/2012)

Organizer and Session Chair, Focus Topic “Materials and functional structures for biological interfaces”, APS March Meeting, Boston, MA (03/2012)

Organizer and Session Chair, of Track 6 “Biological Nanomechanics: Materials Factors in Physiology, Disease and Treatment” at NanoEngineering for Medicine and Biology (NEMB2013), Boston, MA (2/2013)

Session Chair, 6th AFMBioMed Conference, San Diego, CA (12/ 2014)

Organizer MRS Symposium “Frontiers in Scanning Probe Microscopy”, MRS Fall Meeting 2015, Boston, MA (11/2015)

Conference Chair, 20th International Scanning Probe Microscopy Conference, Tempe, AZ (5/2018)

Editorial Services, Manuscript and Grant Review

Associate Editor, Ultramicroscopy (for all publications related to scanning probe microscopy) (2011-2016)

Referee: Biophysical Journal, Nanotechnology, Ultramicroscopy, Macromolecules, The Analyst, Journal of Biotechnology, Nanoletters, Europhysics Letters, Langmuir, Small, European Biophysics Journal, Biopolymers, Physical Review E., Biomedical Microdevices, Analytical Biochemistry, Phys. Rev. Letter, Physical Biology, Proc. Natl. Acad. Sci. USA, PLOS One, Soft Matter, Scientific Reports.

Referee: Department of Energy (DOE), Center for Materials Innovation (CMI) Proposals - Washington University in St. Louis, and Roy J. Carver Charitable Trust.

NSF Panel Member (03/2011)

Special Emphasis Panel Member, Exceptionally Innovative Tools and Technologies for Single Cell Analysis, NIH (5/2012)

Study Section Panel Member, Non-HIV Infectious Agent Detection/Diagnostics, Food Safety, Sterilization, Disinfection and Bioremediation, NIH (3/2013)

Member, SEG- Evaluation - S13086 "High Content Cellular Characterization of Physical-Based Properties

of PS-OC Cell Line Panel" (04/2013)
Mail in reviewer, NIH EBIT study section (9/2013)
Study Section Panel Member, Physical Sciences- Oncology Projects, NIH-NCI (2/2016)
NSF Panel Member (10/2017)

Professional Societies
Member, German Physical Society
Member, Biophysical Society (USA)
Member, American Physical Society
Member, German Association of University Professors and Lecturers

University Service (since joining ASU)
Member, University Senate (since Fall 2017)

College Service (since joining ASU)
Member, CLAS Research Advisory Committee (Fall 2014 - Spring2016)
Member, CLAS Senate (since Fall 2017)

Department Service (since joining ASU)
Standing Committees
Member, Graduate Program Committee (Fall 2008 - Spring 2010)
Member, Graduate Examination Committee (Fall 2010 – Spring 2012)
Member, Center for Biological Physics Graduate Committee (Fall 2009 – Spring 2011)
Member, Personal Committee (Fall 2011-Spring 2013)
Member, Department of Physics Self Study Committee (Fall 2011-Spring 2012)
Member, Undergraduate Committee (Fall 2012 – Spring 2015)
Member of the Executive Committee (Fall 2013 – Spring 2015)
Director, Undergraduate Biophysics (BS) program (Fall 2012 – Spring 2015)
Member, Budget and Policy Committee (since Fall 2016)

Faculty Searches
Member, Nano- and Materials Physics Search (Fall 2009/Spring10)
Member, Experimental Biophysics Search (Fall 2010/Spring11)
Member, Experimental Biophysics Search (Fall 2011/Spring12)
Member, Experimental Biophysics Search (Fall 2012)
Member, XFEL Biophysics Search (Fall 2013/Spring 2014)

Examination Committees
Chair, Dissertation Committee: A. Fuhrmann (2008-2010), O. Schulz (2008-2012), J. Staunton (2009-2014), B. Doss (2010 - 2015), W. Christenson (since Spring 2011), N. Ariyasinghe (since Fall 2012)

Member, Dissertation Committee (ASU): Q. Spadola (2008), S. Qamar (2009), S. Sanderius (2009-2010), S. Huang (2011), X. Wang (2011), B. Addison (Chemistry, 2011-2014), J. Binder (Chemistry, 2011-2015), E. Stennett (Chemistry, 2011-2015), Y. Sun (2011), T. Glembo (2011), S. Cope (2011-2013), D. Kong (2013-2015), S. Basu (Chemistry, since 2013), Sanchari Bhattacharya (Chemistry 2012-2013), Mohammadhasan Dinpajooh (since 2013), S. Sizemore (2012-2015), Y. Zhao (2014), W. Song (2014-2015), A. Navaei (SBHSE, since 2015), Q. Moe (2015), J.O. Im (2014-2016), T. Modi (since 2016),

H. Saini (SBHSE, since 2016), S. Seyedi (since 2017)

Member, Dissertation Committee (external): A. Dumitru (2016, Universidad Autónoma de Madrid, Spain)

Member, Master Thesis Committees: A. Dozier (PSM, 2010), J. Heper (PSM, 2011), M. Mosher (PSM, 2011), J. Burkhartsmeyer (PSM, 2013), A. Ward (PSM, 2013); F. Sam (BMI, 2015)

Member, Oral Comprehensive Exam Committee: J. Liu (2008), S. Cope (2009), S. Bhattacharya (Chemistry, 2010), A. Kumar (2010), D. Bian (2010, 2011), D. Kong (2010), D. Wang (2010), S. Hihath (2011), N. Ariyasinghe (2011), B. Eller (2011), B. Regan (2011), J. Tomlinson (2011), R. Tucker (2011), Y. Zhao (2011), A. Rezikyan (2011), J. Binder (Chemistry, 2011), E. Stennett (Chemistry, 2011), B. Addison (Chemistry, 2012), Y. Jiang (2012), S. Basu (2013)

Community Service (since joining ASU)

Mentoring the high school teachers in the ASU Mathematics and Science Teacher Fellows Program funded by Science Foundation Arizona: Joanne Cox (Trevor Browne HS), Merville Nicholls (Central HS), and Trudi Wimberley (Casa Verde HS) (Summer 2009); Adrian Boyarsky (Desert Vista HS) Catherine Love (Shonto Preparatory HS) (Summer 2010)

Public lecture at ASU Night of the Open Door ASU (Spring 2012).

CURRENT COLLABORATIONS

Dr. Tatiana Ugarova, Arizona State University – *Integrin mediated cell adhesion*

Dr. Stuart Lindsay, Arizona State University – *Physics of Cancer*

Dr. Jörg Enderlein, Universität Göttingen, Germany – *Nanophotonics & Superresolution Microscopy*

Dr. Mehdi Nikkhah*,* Arizona State University – *3D tissue models, cell and tissue mechanics*

Dr. Nicholas Stephanopoulos, Arizona State University – *3D tissue models, cell and tissue mechanics*

Dr. Banu Ozkan, Arizona State University – *Protein – peptide interactions*

Dr. Giovanna Ghirlanda, Arizona State University – *Protein – peptide interactions*

Dr. Steve Presse, Arizona State University – *Single Cell Force Spectroscopy*

Dr. Douglas Lake, Arizona State University –*Cell mechanics*