

14:30-16:30 **Coffee Break and Poster Session** **Sommerhotel Julius-Raab-Heim, Ground Floor**

Session IV: Nano-microbiology

Chairman: Ana Paola Pego

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|-------------|--|-----------|--|
| 16:30-16:45 | <i>Mitchell Doktycz</i> Oak Ridge National Laboratory, USA | 10 | Identification and characterization of lantibiotic activity in the <i>Populus</i> microbiome |
| 16:45-17:00 | <i>Dave Allison</i> University of Tennessee, USA | 11 | An AFM approach to target and destroy antibiotic resistant microbes |
| 17:00-17:15 | <i>Claire Valotteau</i> Universite Catholique de Louvain, Belgium | 12 | Mechanical strength and inhibition of the <i>Staphylococcus aureus</i> collagen-binding protein Cna |
| 17:15-17:30 | <i>Cecile Feuillie</i> Universite Catholique de Louvain, Belgium | 13 | Biofilm accumulation by the staphylococcal protein SdrC: molecular mechanism and inhibition |
| 17:30-17:45 | <i>Yoo Jin Oh</i> University of Linz, Austria | 14 | Nanoscale characterization of interactions between single bacterium and polycationic brushes by force microscopy |
| 18:45-23:00 | Conference Dinner in Schloss Wildberg | | Buses depart in front of the Sommerhotel Julius-Raab-Heim at 18:45 |

Sunday, Feb. 5

Session V: Nanomechanical Force Spectroscopy

Chairman: Hongbin Li

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|-------------|--|-----------|--|
| 09:00-09:25 | <i>Ricardo Garcia</i> CSIC Madrid, Spain | 15 | Nanomechanical spectroscopy: from single proteins to single cells |
| 09:25-09:40 | <i>John Elie Sader</i> The University of Melbourne, Australia | 16 | A virtual instrument to standardise the calibration of atomic force microscope cantilevers |
| 09:40-10:05 | <i>Joon Won Park</i> Pohang University, South Korea | 17 | Mapping and quantification of miRNA in neuronal cells |
| 10:05-10:30 | <i>Nuno Santos</i> University of Lisbon, Portugal | 18 | Atomic force microscopy as a tool to evaluate the risk for cardiovascular diseases in patients |
| 10:30-11:00 | Coffee Break | | Sommerhotel Julius-Raab-Heim, Ground Floor |

Session VI: Optical Super-resolution Microscopy

Chairman: Gerhard Schütz

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|-------------|--|-----------|--|
| 11:00-11:25 | <i>Bernd Rieger</i> Delft University of Technology, The Netherlands | 19 | Super-resolution microscopy: what is the resolution? |
| 11:25-11:50 | <i>Helge Ewers</i> FU Berlin, Germany | 20 | Nanosopic compartmentalization of membrane protein motion at the axon initial segment |
| 11:50-12:15 | <i>Johann Georg Danzl</i> IST Austria / MPI Göttingen, Germany | 21 | Novel approaches for improving coordinate-targeted nanoscopy of living cells and tissues |
| 12:15-13:30 | Lunch | | Sommerhotel Julius-Raab-Heim, Ground Floor |

Session VII: High-Speed AFM

Chairman: Ricardo Garcia

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|-------------|---|-----------|---|
| 13:30-13:55 | <i>Toshio Ando</i> Kanazawa University, Japan | 22 | GroEL-GroES interaction cycle revealed by high-speed AFM |
| 13:55-14:20 | <i>Takayuki Uchihashi</i> Kanazawa University, Japan | 23 | Structural flexibility and chaperone activity of TC1pB revealed by high-speed AFM |
| 14:20-14:35 | <i>Carlos Amo</i> CSIC Madrid, Spain | 24 | Fundamental high speed limits in single-molecule and nanoscale force spectroscopies |
| 14:35-14:50 | <i>Gerald Kada</i> Keysight Technologies, Austria | 25 | Advances in quick-scanning Atomic Force Microscopy |
| 14:50-16:40 | Coffee Break and Poster Session | | Sommerhotel Julius-Raab-Heim, Ground Floor |

Session VIII: Nanopatterning and Nano-tracking

Chairman: Eric Lesniewska

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|-------------|---|-----------|---|
| 16:40-17:05 | <i>Ralf Jungmann</i> LMU Munich, Germany | 26 | Super-resolution microscopy with DNA molecules |
| 17:05-17:20 | <i>Andreas Arnold</i> TU Vienna, Austria | 27 | Monte Carlo simulations of protein micropatterning in biomembranes: effects of immobile sticky obstacles |
| 17:20-17:45 | <i>Mervyn Miles</i> University of Bristol, UK | 28 | Paintballing cells |
| 17:45-18:10 | <i>Laurent Cognet</i> University of Bordeaux, France | 29 | Single (nano)particle tracking and localization microscopy reveal nanoscale organizations in cells and live brain tissues |
| 19:15 | Meeting point Main Square | | Yellow trains depart for City Tour |
| 20:00-23:00 | Conference Dinner | | LENTOS Art Museum |

Monday, Feb. 6

Session IX: Cell Membrane Mechanics

Chairman: Malgorzata Lekka

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|-------------|--|-----------|---|
| 09:00-09:25 | <i>Manfred Radmacher</i> University of Bremen, Germany | 30 | Measuring the viscoelastic properties of cells by AFM |
| 09:25-09:50 | <i>Ana Paula Pego</i> University of Porto, Portugal | 31 | Atomic force microscopy at the service of nanoBiomaterials for targeted therapies to the nervous system |
| 09:50-10:05 | <i>Raya Sorkin</i> University of Amsterdam, The Netherlands | 32 | The soft side of extra-cellular vesicles |
| 10:05-10:30 | <i>Thomas Schmidt</i> Leiden University, The Netherlands | 33 | From shape to force |
| 10:30-10:50 | Coffee Break | | Sommerhotel Julius-Raab-Heim, Ground Floor |

Session X: Single Molecule Force Spectroscopy

Chairman: Manfred Radmacher

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|-------------|---|-----------|---|
| 10:50-11:05 | <i>Mareike Dieding</i> Bielefeld University, Germany | 34 | Functional characterization of cardiomyopathy-related desmoglein-2 variants |
| 11:05-11:20 | <i>Sofia Brander</i> Freiburg University, Germany | 35 | Adhesion and friction of single polystyrene molecules on supported lipid bilayers |
| 11:20-11:35 | <i>Lukas Traxler</i> University of Linz, Austria | 36 | Detailed analysis of the interaction mechanism between calmodulin and Orai proteins by combination of equilibrium, force, and kinetic studies |
| 11:35-11:50 | <i>Sandra Posch</i> University of Linz, Austria | 37 | VWF polymorphism p.Phe2561Tyr increases the bond life-time to platelet receptor GPIIb/IIIa: a single molecule force spectroscopy study |
| 11:50-13:00 | Lunch | | Sommerhotel Julius-Raab-Heim, Ground Floor |

Session XI: Single Cell Force Spectroscopy

Chairman: Toshio Ando

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|-------------|---|-----------|---|
| 13:00-13:25 | <i>Malgorzata Lekka</i> Polish Academy of Sciences, Cracow, Poland | 38 | Specific interactions of syndecans and integrins in human bladder cancer cells |
| 13:25-13:40 | <i>Martin Delguste</i> Université catholique de Louvain, Belgium | 39 | Deciphering cell-herpesvirus interactions using force-distance curve-based AFM |
| 13:40-13:55 | <i>Ricardo Pires</i> University of Minho, Portugal | 40 | Surface chemistry promotes distinct fibronectin adsorption and stem cell response |
| 13:55-14:10 | <i>Anais Sadoun</i> LAI Marseille, France | 41 | Mechano-transduction of T lymphocytes |
| 14:10-14:25 | <i>Bartlomiej Zapotoczny</i> University of Krakow, Poland | 42 | AFM imaging of fenestrations in living liver sinusoidal endothelial cells |
| 14:25-15:00 | Coffee Break | | Sommerhotel Julius-Raab-Heim, Ground Floor |

Session XII: Membrane Transporters

Chairman: Peter Hinterdorfer

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|-------------|--|-----------|---|
| 15:00-15:15 | <i>Andreas Horner</i> University of Linz, Austria | 43 | Permeation through the bacterial urea transporter Urel |
| 15:15-15:30 | <i>Anny Fis</i> University of Linz, Austria | 44 | Investigating the bacterial translocon at the single molecule level |
| 15:30-15:45 | <i>Melanie Köhler</i> University of Linz, Austria | 45 | Key differences in the binding mechanism of purine nucleotides to mitochondrial uncoupling proteins studied by recognition force spectroscopy |
| 15:45-16:00 | <i>Tamas Hegedus</i> Semmelweis University, Budapest, Hungary | 46 | <i>In silico</i> modelling of ABCG2/BCRP structure and dynamics sheds light on xenobiotics recognition and transport function |

Poster Sessions

Authors

Number

Title

Saturday, 4th of February 2017

1 Ę Advances in microscopy & spectroscopy

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|---|-----|---|
| <u>Enrico Brinciotti</u> , Georg Gramse, Silviu Tuca, Ivan Alic, Markus Kasper, and Ferry Kienberger <i>University of Linz, Keysight Labs, Linz, Austria</i> | 1-1 | Nanoscale complex impedance and dielectric properties at GHz frequency by scanning microwave microscopy |
| <u>Luís Fernando Hill de Moura Abicair</u> , Gustavo Miranda Rocha, Ricardo Cunha Michel, Gilberto Weissmüller <i>Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil</i> | 1-2 | Development of a 3D printed fluid/gas cell designed for AFM use |
| <u>Heiko Haschke</u> , Philipp Rauch <i>JPK Instruments AG, Berlin, Germany</i> | 1-3 | Quantitative easy-to-use atomic force microscopy in conjunction with super-resolution optical microscopy and optical tweezers |
| <u>S.-S. Tuca</u> , G. Gramse, E. Brinciotti, M. Kasper, Y. J. Oh, R. Zhu, C. Rankl, G. Badino, P. Hinterdorfer, F. Kienberger <i>University of Linz, Keysight Labs, Linz, Austria</i> | 1-4 | Calibrated impedance of cells and bacteria using scanning microwave microscopy |

2 Ę Advanced optical microscopy

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|---|-----|--|
| <u>Sujitha Puthukodan</u> , Richard Wollhofen, Jaroslav Jacak and Thomas Klar <i>University of Linz, Linz, Austria</i> | 2-1 | Stimulated emission depletion microscopy |
| <u>E. Sobakinskaya</u> , M. Schmidt am Busch, T. Renger <i>University of Linz, Linz, Austria</i> | 2-2 | Accuracy of the Förster theory in the interpretation of FRET experiments |
| <u>Fabian Hauser</u> , Sandra Mayr, Bianca Buchegger, Jaroslav Jacak <i>University of Applied Science Upper Austria, Linz, Austria</i> | 2-3 | 3D dSTORM algorithms improvement by application of geodisc acceleration |
| <u>F. Faschinger</u> , M. Zimmermann, G. Knör and H. J. Gruber <i>University of Linz, Linz, Austria</i> | 2-4 | New thiol-reactive Eu complex for distance measurements by LRET |
| <u>Lijuan Zhang</u> , Stephanie Werner, Marçal Gallemí, Jixiang Kong, Edmundo R. Sánchez Guajardo, Yvon Jaillais, Thomas Greb, Youssef Belkhadir, Kareem Elsayad <i>Vienna Biocenter Core Facilities, Vienna Austria</i> | 2-5 | Brillouin light scattering (BLS) spectroscopy and correlative fluorescence Brillouin imaging (FBI) based non-invasive mechanical phenotyping of <i>Arabidopsis</i> mutants |
| <u>Reismann AWAF</u> , Atanasova L, Lichius A, Gruber SG, Zeilinger S, Schütz GJ <i>Technical University of Vienna, Vienna, Austria</i> | 2-6 | Visualizing signaling complexes in filamentous fungi |

3 Ę High-Speed AFM

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| <u>Andreas Karner</u> , Jürgen Strasser, and Johannes Preiner <i>Center for Advanced Bioanalysis GmbH, Linz, Austria</i> | 3-1 | High speed atomic force microscopy . imaging proteins in action |
| <u>Yusuke Sakiyama</u> , Adam Mazur, Larisa E. Kapinos, Roderick Y.H. Lim <i>University of Basel, Basel, Switzerland</i> | 3-2 | Structural dynamics of nuclear pore complexes resolved by High-Speed AFM |
| <u>Sourav Maity</u> , Mark Loznik, Andreas Herrmann and Wouter H. Roos <i>University of Groningen, Groningen, The Netherlands</i> | 3-3 | Studying viral disassembly by high speed atomic force microscopy |

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| <u>J. Kokavecz</u> , D. Faragó, P. Kele, I. Casuso <i>University of Szeged, Szeged, Hungary</i> | 3-4 | Amplitude and phase determination using half cycle discrete Fourier transform for high speed atomic force microscopy |
| <u>Friederike Benning</u> , Shubham Singh, Yusuke Sakiyama, Adam Mazur, Roderick Lim, Timm Maier <i>University of Basel, Basel, Switzerland</i> | 3-5 | Watching molecular machines at work |
| <u>Je-Kyung Ryu</u> , Allard Katan, Jorine Eeftens, Shveta Bisht, Christain Haering, and Cees Dekker <i>Delft University of Technology, Delft, The Netherlands</i> | 3-6 | High Speed atomic force microscopy imaging on condensin |

4 Æ Molecular Forces and AFM imaging

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| <u>Rong Zhu</u> , Saanfor Hubert Suh, Michael Bindl, Marion Holy, Vivek Kumar, Andreas Ebner, Hermann J. Gruber, Michael Freissmuth, Amy Hauck Newman, Harald H. Sitte and Peter Hinterdorfer <i>University of Linz, Austria</i> | 4-1 | Forces between dopamine transporter (DAT) and its substrates |
| <u>Martin Fölser</u> , Viktoria Motsch, Mario Brameshuber, Gerhard Schütz <i>Technical University of Vienna, Vienna, Austria</i> | 4-2 | Investigation of early T cell activation dynamics |
| <u>Lukas Schrangl</u> , Janett Göhring, Florian Kellner, Melanie Köhler, Peter Hinterdorfer, Johannes Huppa, Gerhard J. Schütz <i>Technical University of Vienna, Vienna, Austria</i> | 4-3 | Measurement of forces in the immunological synapse |
| <u>Gerald A. Meininger</u> , Linda Irons, Leike Xie, Markus Owen, Michael A. Hill, Luis A. Martinez-Lemus, Olga V. Glinskii, Vladislav V. Glinsky, Reuben O'Dea, Bindi S. Brook <i>University of Missouri, Columbia MO, USA</i> | 4-4 | Cell adhesion interactions between bone marrow endothelial cells and breast cancer cells modelled using predictive mechano-biological models |
| <u>Liang Qin</u> , Ramon A. van der Valk, Jocelyne Vreede, Geri F. Moolenaar, Andreas Hofmann, Nora Goosen, Remus T. Dame <i>Leiden University, Leiden, The Netherlands</i> | 4-5 | Environmentally driven conformational changes modulate H-NS-DNA bridging activity |
| <u>J. Teckentrup</u> , O. Al-Hamood, T. Steffen, H. Bednarz, V. Walhorn, K. Niehaus, D. Anselmetti <i>Bielefeld University, Bielefeld, Germany</i> | 4-6 | Comparative analysis of different xanthan samples by atomic force microscopy |
| <u>Arzu Çolak</u> , Bin Li, Roland Bennewitz <i>Leibniz Institute for New Materials</i> | 4-7 | The streptavidin-biotin interactions for different linkers |

5 Æ Nano-assemblies and micropatterning

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| <u>Charlotte Yvanoff</u> , Vytautas Navikas, Petar Stupar, Giovanni Dietler, Sandor Kasas, Ram nas Valiokas, Ronnie Willaert <i>Vrije Universiteit Brussel, Brussels, Belgium</i> | 5-1 | Single-cell micropatterning of osteocytes and nanobiological characterization |
| <u>Viktoria Motsch</u> , Gerhard J. Schütz and Eva Sevcsik <i>Technical University of Vienna, Vienna, Austria</i> | 5-2 | DNA origami platform for protein interaction analysis |
| <u>Gerg Fülöp</u> , Gerhard J. Schütz, Eva Sevcsik <i>Technical University of Vienna, Vienna, Austria</i> | 5-3 | Probing the membrane environment of palmitoylated transmembrane proteins: a micropatterning approach |
| <u>G.Aylaz</u> , Ö.Çelikb çak, M.Duman <i>Hacettepe University, Ankara, Turkey</i> | 5-4 | Molecularly imprinted polymeric nanoparticle modified film based MALDI sample probe for detection of ciprofloxacin |
| <u>Eljesa Murtezi</u> , Richard Wollhofen, Jaroslaw Jacak and Thomas A. Klar <i>University of Linz, Linz, Austria</i> | 5-5 | Sub-diffractive laser induced molecular patterning |

Sunday, 5th of February 2017

6 Ę Cellular nano-mechanics & nanosensing

- Piotr Deptuġa, Ewelina Piktel, Mateusz Cie luk, Urszula Wnorowska, Katarzyna Niemirowicz and Robert Bucki
Medical University of Bialystok, Bialystok, Poland 6-1 Mechanical and proliferative markers of breast cancer cells upon selected nanosystems treatment
- K. Owczarczyk, B. Zapotoczny, K. Szafranska, O. Czarnik, E. Kus, S.K. Chlopicki, M. Szymonski
Jagiellonian University, Krakow, Poland 6-2 Force spectroscopy probing of liver sinusoidal endothelial cells in progression of the non-alcoholic fatty liver disease
- Starodubtseva M. N., Yegorenkov N. I., Starodubtsev I. E., Petrenyov D. R., Suslov A. A., Chizhik S.A.
Gomel State Medical University, Gomel, Belarus 6-3 Temperature- and scale-dependent parameters of lateral force maps of cell surface
- Petar Stupar, Onya Opota, Giovanni Longo, Guy Prodhom, Giovanni Dietler, Gilbert Greub, Sandor Kasas
EPFL, Lausanne, Switzerland 6-4 Nanomotion susceptibility of blood infectious agents
- Petar Stupar, Wojciech Chomicki, Caroline Maillard, David Mikeladze, Aleksandar Kalauzi, Ksenija Radoti, Giovanni Dietler and Sandor Kasas
EPFL, Lausanne, Switzerland 6-5 Mitochondrial oscillations
- Wojciech Chomicki, Petar Stupar, Sandor Kasas, Giovanni Dietler
EPFL, Lausanne, Switzerland 6-6 Automation of device to detect oscillations induced by living organisms
- Y. Guo, S. Maity, G. J. Wuite, W. H. Roos
Rijksuniversiteit Groningen, The Netherlands 6-7 Mechanical properties of viral nanoshells
- Christian Ganser, Caterina Czibula, Daniel Tscharnuter, Christian Teichert, Ulrich Hirn
University of Leoben, Leoben, Austria 6-8 A combination of a viscoelastic material model with contact mechanics to study cellulosic materials with AFM
- Petar Stupar, Charlotte Yvanoff, Wojciech Chomicki, Giovanni Dietler, Sandor Kasas and Ronnie Willaert
Vrije Universiteit Brussel, Brussels, Belgium 6-9 Exploring nanoscale motion of yeast cells

7 Ę Structure and function of biological membranes

- Anand Kant Das, Marco Niello, Harald Sitte and Gerhard Schuetz
Technical University of Vienna, Vienna, Austria 7-1 Nanoscopic organization of dopamine transporter in living cells
- Michael Stadlbauer, Marc Fahrner, Martin Muik, Christoph Romanin
University of Linz, Linz, Austria 7-2 The STIM1 R304W mutant associated with Stormorken syndrome
- Maria Österbauer, Ewald Weichselbaum, Peter Pohl, Günther Knör
University of Linz, Linz, Austria 7-3 Caged protons facilitate studies of proton transport along lipid bilayers
- Constanze Lamprecht, Josef Madl, Winfried Römer, Mathias Gehrmann, Andreas Ebner
University of Linz, Linz, Austria 7-4 AFM investigations on model membranes to uncover the mechanism of the cancer specific association of Hsp70A1A with the cell membrane
- Christof Hanneschläger, Peter Pohl
University of Linz, Linz, Austria 7-5 Membrane permeability of ascorbic acid
- Ewald Weichselbaum, Maria Österbauer, Günther Knör, Peter Pohl
University of Linz, Linz, Austria 7-6 Regulation of proton migration along the lipid bilayer surface
- Denis Knyazev, Roland Kuttner, Mirjam Zimmerman, Christine Siligan, Peter Pohl
University of Linz, Linz, Austria 7-7 Conductivity of the bacterial translocon involved in translocation at the single molecule level

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| <u>Mirjam Zimmermann</u> , Denis Knyazev, Roland Kuttner and Peter Pohl <i>University of Linz, Linz, Austria</i> | 7-8 | Insertion of hydrophobic membrane spanning stretches via the bacterial translocon |
| <u>B. K. Rossboth</u> , R. Platzler, J. Huppa, G. Schütz, M. Brameshuber <i>Technical University of Vienna, Vienna, Austria</i> | 7-9 | PS-CFP2 blinking introduces bias in commonly used clustering algorithms |
| <u>Dylan Marques</u> , Adelaide Miranda, Ana G. Silva, Pieter A. A. De Beule <i>Universidade Nova de Lisboa, Portugal</i> | 7-10 | Optical scattering of endocytosis |
| <u>Thomas Schick</u> , Olivier Biner, Yannic Müller, Christoph von Ballmoos <i>University of Basel, Switzerland</i> | 7-11 | Delivery of membrane proteins into small and giant unilamellar vesicles by charge-mediated fusion |

8 Ę Cell characterization at the nanoscale

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| <u>H. Lozano</u> , R. Millán, P. Astola, E.Torrents, G. Gomila <i>IBEC, Barcelona, Spain</i> | 8-1 | Electrical and morphological characterization of bacterial polar flagella |
| <u>Donggyu Lee</u> , Hyun Jin Kim, Joung-Hun Kim and Joon Won Park <i>Pohang University, South Korea</i> | 8-2 | Quantitative analysis of an antigen from a single cell using single molecule force spectroscopy |
| <u>Rosana Alves</u> , Daphné Dambournet, Alexander Sorokin, Adelaide Miranda, Pieter A. A. De Beule, David Drubin and Sandra Paiva <i>University of Minho, Braga, Portugal</i> | 8-3 | Characterization of intracellular trafficking of nutrient transporters using combined fluorescence optical sectioning and nanomechanical mapping atomic force microscopy in mammalian cells |
| <u>KozioŃA.</u> , Cybulska J., Pieczywek P.M., Zdunek A. <i>Institute of Agrophysics, Lublin, Poland</i> | 8-4 | <i>In vitro</i> pectinase-induced changes of pectin structures and cell wall stiffness |
| <u>Ikbum Park</u> , Hyunseo Koo, Youngkyu Kim, Joung-Hun Kim, Joon Won Park <i>Pohang University, South Korea</i> | 8-5 | Visualization of non-coding cellular RNA distribution in a neuronal cell using Atomic Force Microscopy |
| <u>Silvia Caballero-Mancebo</u> , Benoit Godard, Carl-Philipp Heisenberg <i>IST Austria, Klosterneuburg, Austria</i> | 8-6 | Ooplasmic segregation in ascidian embryos |
| <u>Lilia A. Chtcheglova</u> , Peter Hinterdorfer, Siegfried Priglinger, Claudia S. Priglinger <i>University of Linz, Austria</i> | 8-7 | Following the epithelial-to-mesenchymal transition (EMT) of retinal pigment epithelial (RPE) cells at nanoscale |
| <u>M. B. Brodesser</u> , S. Mayr, F. Hauser, J. Breuss, M. Aspetsberger, D. Borgmann, S. Winkler, C. Gabriel, E. Priglinger, J. Jacak, B. Plochberger | 8-8 | A fast and reliable online-system for platelet viability studies |