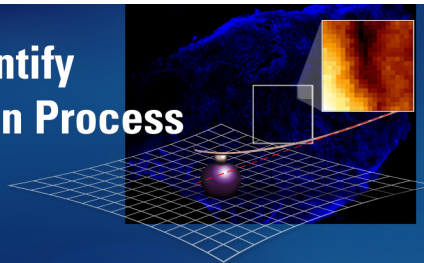


# Open Lab - How to Measure and Quantify Cell Mechanics and the Cell Adhesion Process

JPK  
BIOAFM

Wednesday, November 25th, 2020



Join us and our special guest speakers for a virtual Open Lab session live from the BioAFM laboratories in Berlin, Germany. We would like to accommodate you wherever you are in the world right now and will, therefore, hold two separate sessions. A different guest speaker will open each session and give exciting insights into their work on cell mechanics and adhesion processes. Choose the session that suits you best!

The talks will be followed by a live experimental session that will focus on how the cell adhesion process and mechanical properties of living cells can be characterized using state-of-the-art BioAFM instruments. Our team of applications scientists will perform an entire experiment, from sample preparation to probe selection, parameter settings and data analysis. We will also answer any questions you might have live!

## Session 1: 9:00 - 11:00 AM CET | 5:00 – 7:00 PM JST

Session 1 will be opened by Dr Clemens Franz, Associate Professor, Kanazawa University, Japan.

### Quantitating Cell Adhesion and Mechanics using Atomic Force Microscopy

Dr Franz will review different applications of AFM-based single-cell force spectroscopy to quantitate cell adhesion forces, from the single molecule to the cellular and tissue scale. He will also describe methods for mapping the mechanical properties of individual cells and across entire tissues.



Dr Clemens Franz is an Associate Professor for Biophysics at the Nano Life Science Institute (NanoLSI), Kanazawa University, Japan. He studied biochemistry in Berlin and London and received his PhD in Cell Biology from University College London. He worked as a postdoctoral fellow at Harvard Medical School, at the MPI for Cell Biology and Genetics and at the TU Dresden in Dresden, Germany. He was a group leader at the DFG-Center for Functional Nanostructures (CFN) at the Karlsruhe Institute for Technology (KIT) before moving to Japan in 2018.

### Live experimental Session

Application scientists Dr. Tanja Neumann and Dr. André Körnig, Bruker JPK BioAFM, will demonstrate how the cell adhesion process and mechanical properties of living cells can be characterized using the NanoWizard 4 XP and CellHesion 200 AFMs.

## Session 2: 8:00 - 10:00 AM PDT | 5:00 – 7:00 PM CET

Session 2 will be opened by Anna Taubenberger, Team Leader Oncomechanics group, TU Dresden, Germany.

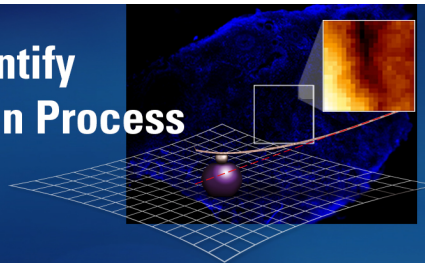
### Tumors under Stress - Mechanical Aspects in Tumor Progression

Cancer cells and their surrounding tissue are characterized by altered mechanical properties. So far, it is not well understood precisely how these mechanical changes affect the cells' metastatic potential in vivo. We address this question by mechanically characterizing tumor samples to instruct physiologically relevant 3D in vitro models, which, in combination with in vivo models, are then used to systematically study the role of cell and microenvironment stiffness on tumor spheroid growth, invasion, drug resistance, and metastasis. We aim at

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elucidating mechanisms by which cells sense their mechanical environment in 3D and how this can be potentially exploited for new therapeutic approaches. In the talk, various examples of cell mechanical measurements on single cells and tissues will be given. Moreover, how AFM single cell force spectroscopy can be used to quantify cell adhesion will be addressed.



Dr Anna Taubenberger received her Master's degree in Bioprocess Engineering (2004) and her PhD in Engineering (2009) on the topic of quantifying adhesive interactions between cells and extracellular matrix by single-cell force spectroscopy from the Technical University (TU) Dresden, Germany. She was a postdoctoral fellow at Queensland University of Technology, Australia (2009-2012) doing research in the field of tissue engineering, developing cancer models to study breast cancer bone metastasis. This was followed by a postdoctoral fellowship at the BIOTEC, TU, Dresden, Germany. She is group leader of the

Oncomechanics research group at BIOTEC, TU Dresden, which focuses on the mechanics of cancer cells and their surrounding tissue and uses engineered 3D in vitro models to study the influence of the microenvironment mechanics on cancer cell behavior.

## Live experimental Session

Application scientists Dr. Tanja Neumann and Dr. André Körnig, Bruker JPK BioAFM, will demonstrate how the cell adhesion process and mechanical properties of living cells can be characterized using the NanoWizard 4 XP and CellHesion 200 AFMs.

## A few good reasons to join

- Gain a deeper insight into cell mechanics and cell adhesion processes
- Talks by leading experts in the field
- A team of specialists will answer your questions live
- Discover the latest Bruker BioAFM technologies and software

## Who should attend

All AFM enthusiasts, beginners and experts alike, biologists, biophysicists, cell biologists, ...

**Find out how AFM can help your Life Science research! Please don't hesitate to contact us at [events.bioafm@bruker.com](mailto:events.bioafm@bruker.com) if you have any questions.**