



# Measuring Mechanical Tension Across Specific Proteins in Cells

by **Carsten Grashoff, PhD**

Cardiovascular Research Center  
University of Virginia, USA

## Abstract:

Mechanical forces are central to developmental, physiological and pathological processes. However, limited understanding of force transmission within sub-cellular structures is a major obstacle to unravelling molecular mechanisms.

I will present a genetically encoded biosensor that measures forces across specific proteins in cells with pico-Newton (pN) sensitivity. The method was applied to vinculin, a protein that connects integrins to actin filaments in focal adhesions (FAs). The data will show that tension across vinculin is ~2.5 pN, and reveal that the ability of vinculin to bear force determines whether FA assemble or disassemble under tension.

The presented technique should be applicable to other molecules involved in force transmission and be useful to study mechanisms of mechanotransduction under physiological conditions.

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**Room PH 3024**

Contact:

Prof. Matthias Rief, [mrief@ph.tum.de](mailto:mrief@ph.tum.de), phone: 089 / 289-12471