Electronic Supplementary Information

Nanomechanical sub-surface mapping of living biological cells by force microscopy

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In order to obtain an approximate estimate of the lower limit of quantification, we refer to the data of Figure 3d and calculated the respective histogram:

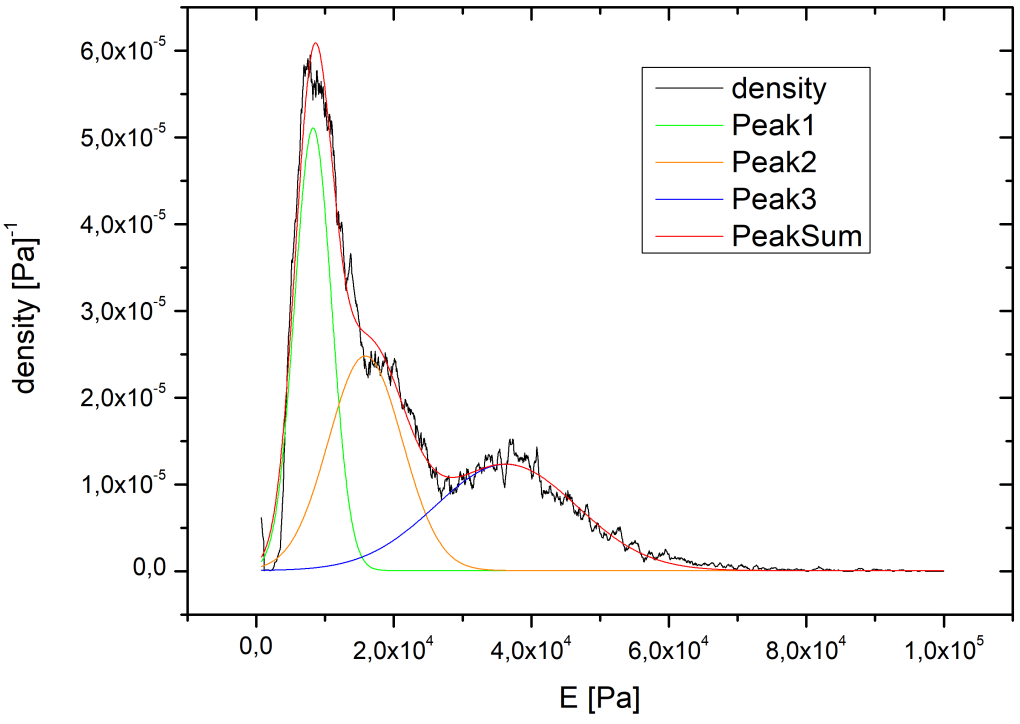

Figure ESI 1 Histogram of the measurement data of Figure 3d.

	Center
Peak 1	8.3 kPa
Peak 2	10.7 kPa
Peak 3	36.3 kPa

Three maxima can be deduced from the histogram. The first maximum is at approx. 8 kPa, the second at 11 kPa. Another maximum can be found at 36 kPa. The values can be referred to the values found for the Young's modulus of the peripheral area, the cytoskeleton and the nucleus region, respectively. The higher value for the modulus of elasticity of the nucleoli is not visible in the histogram because of the low number of data points given by their small size. As the first two peaks in the histogram appear clearly separated, we assume a lower limit of quantification of 10 kPa.

Additional Measurements:

We measured different samples of a thin films of PDMS and determined the Young's modulus in the same way as described in the experimental section. The obtained distributions of the Young's modulus for the different samples are shown in the figure.

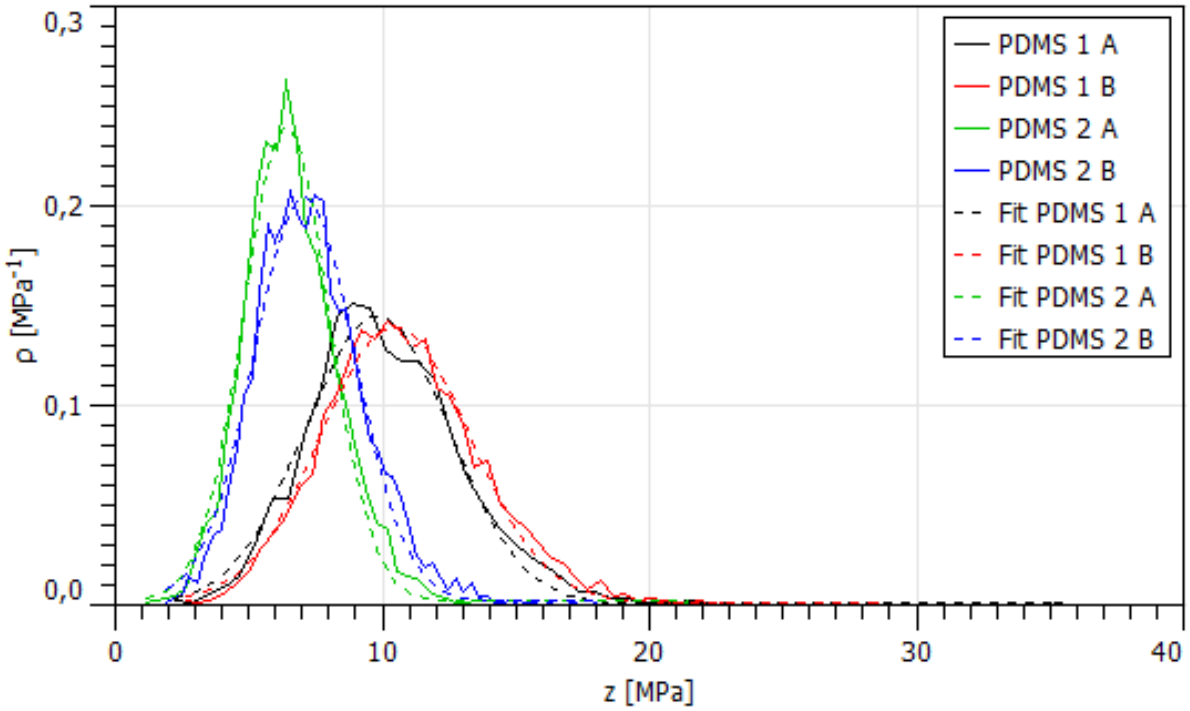

Figure ESI 2 Histogram of the Young's modulus of two different PDMS thin film samples, measured as described in the experimental section.

The fits were accomplished with a Gaussian function (see table).

$f(x) = y_0 + a \cdot exp[-(x - x_0)^2/b^2]$				
	x_o	y_o	a	b
PDMS 1 A	9.8 MPa	748.5 TPa^{-1}	144.8 GPa^{-1}	3.8 MPa
PDMS 1 B	10.5 MPa	1.3 GPa^{-1}	138.2 GPa^{-1}	3.9 MPa
PDMS 2 A	6.4 MPa	1.7 GPa^{-1}	238.7 GPa^{-1}	2.3 MPa
PDMS 2 B	7.1 MPa	2.3 GPa^{-1}	201.9 GPa^{-1}	2.7 MPa

The values measured are one order of magnitude higher than the values determined on cells and are typical for this material. This demonstrates that the elastic modulus of samples with considerably greater stiffness than that of cells can be detected with the type of cantilever used in this study and the measurement parameters chosen.