PIUMA CHIARO

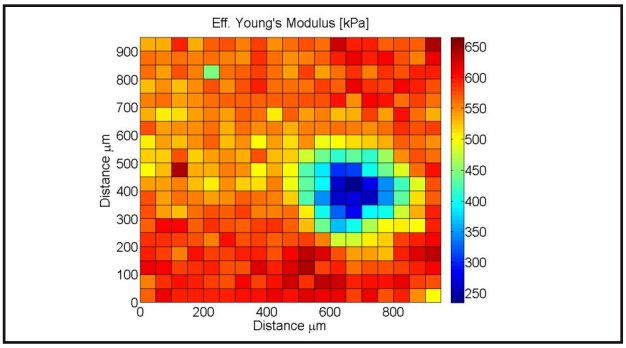
Nanoindentation of soft (bio)materials, tissues and cells

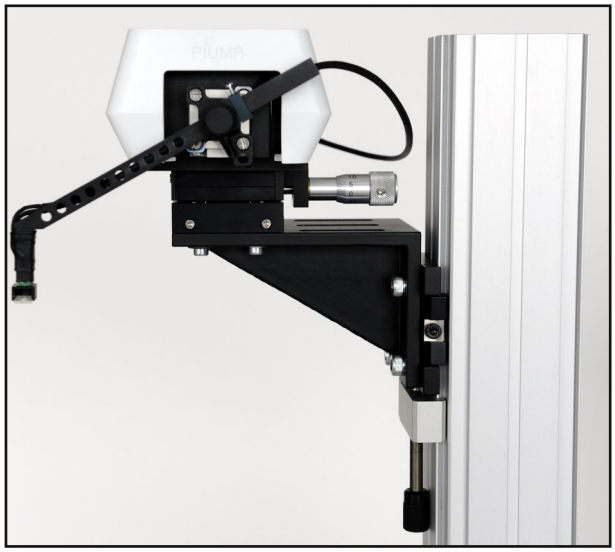
Explore the local mechanical properties of soft (bio)materials, tissues and cells in just one click!

- **How do the visco-elastic properties of this non-uniform sample vary from point to point?**
- **Is there a relation between the stiffness and biochemical function of living cells?**
- **Do my engineered hydrogels provide the desired mechanical properties for tissue formation?**

The Piuma Chiaro Nanoindenter is engineered to enable the fields of **tissue engineering**, **regenerative medicine** and **soft (bio)materials** with an accurate and easy way to **non-destructively** measure the **local mechanical properties** of soft (bio)materials and tissues, in combination with **advanced microscopy**. Amongst the many applications possible, the Piuma Chiaro Nanoindenter is used to examine the local mechanical properties of hydrogels and hydrogel structures, (stem)cell microenvironments, microtissues, 3D-printed scaffolds and structures, tissue scaffolds, healthy and regenerated tissues, plant sections, synthetic- and bio-polymers, silicones, biodegradable materials and many more.

- **Mount to existing inverted microscopes**
- **Measure Young's Moduli from 10 Pa to 1 GPa**
- **Variable tip size and cantilever stiffness**
- **Measure in dry or liquid conditions**
- **Scan areas of up to 12x12 mm in one go**





The dimensions of the Piuma Chiaro indentation tips can be varied over several orders of magnitude, covering the whole range of scales that are relevant in tissue engineering and soft (bio)material research. Just plug in the probe, use the microscope to identify the feature or region you want to have information on, and click the start button!

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PIUMA chiaro in a nutshell	
Young's Modulus range	10 Pa up to 1 GPa
Typical repeatability	< 1 %
Indentation tip size	100 nm to 100's of µm
Maximum displacement	20 µm
Indentation dynamic range	~DC100 Hz (Continuous)
Force resolution	0.1 nN
Motorized arm movement range	12 x 12 x 12 mm^2
Minimum lateral pitch	< 1 µm
Grid mapping speed	Up to 1 point / s

Optics11's Piuma instrument family uses novel proprietary precalibrated probes that reduce the preparation time for any experiment to a matter of minutes.

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