PIUMA

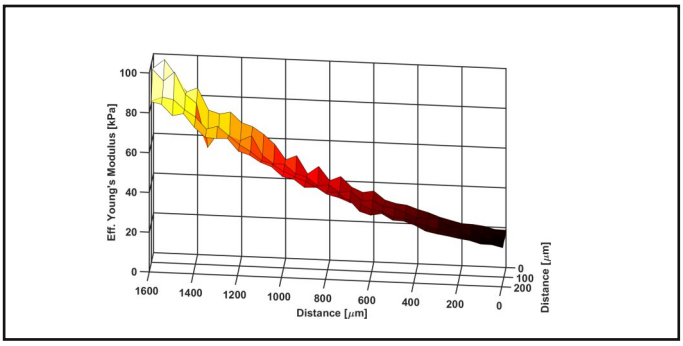
Nanoindentation of soft (bio)materials and tissues

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

- **How do the visco-elastic properties of this non-uniform sample vary from point to point?**
- **Is there a correlation between the nano-, micro-, and macroscale mechanical properties of the tissue I am working on?**
- **Do my engineered hydrogels provide the desired mechanical properties for tissue formation?**

The Piuma 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. Amongst the many applications possible, the Piuma 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.

- **Young's Modulus range: 5 Pa up to 5 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 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 built-in microscope to select the region of interest, and click the start button!

Optics11 • De Boelelaan 1081 • 1081HV Amsterdam • +31 (0)20 598 7917 • info@optics11.com • www.optics11.com

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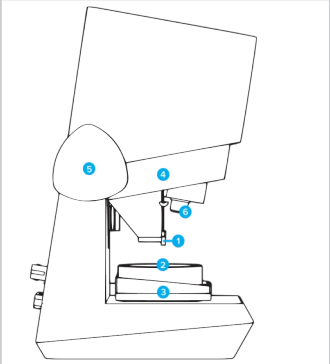
PIUMA in a nutshell	
Young's Modulus range	5 Pa up to 5 GPa
Min. force transducer stiffness	0.01 N/m
Indentation tip diameter	5 to 500 µm
Maximum displacement	20 µm
Indentation dynamic range	~DC-100 Hz (Continuous)
Min. force resolution	0.02 nN
Sample stage movement range	12 x 12 mm
Minimum lateral pitch	< 1 µm
Grid mapping speed	Up to 1 point / s
Temperature control	Ambient - 60°C +/_ 0.5°C



1 All-in-one optical probe
2 Flexible sample mounting
3 Motorized X-Y stage
4 Automated find-surface
5 Manual stage
6 On-board microscope

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