SICHH

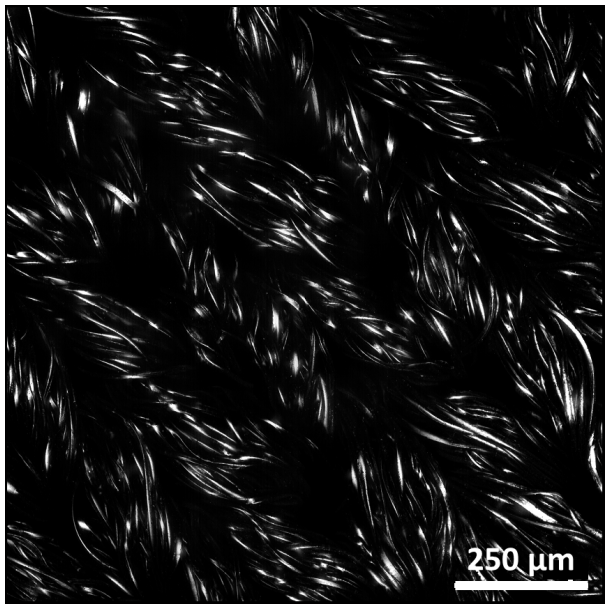
Swiss Integrative Center for Human Health

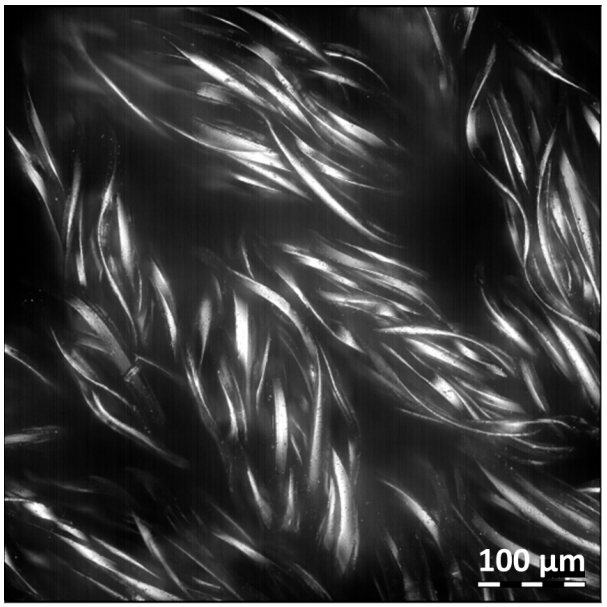
Materials Facility

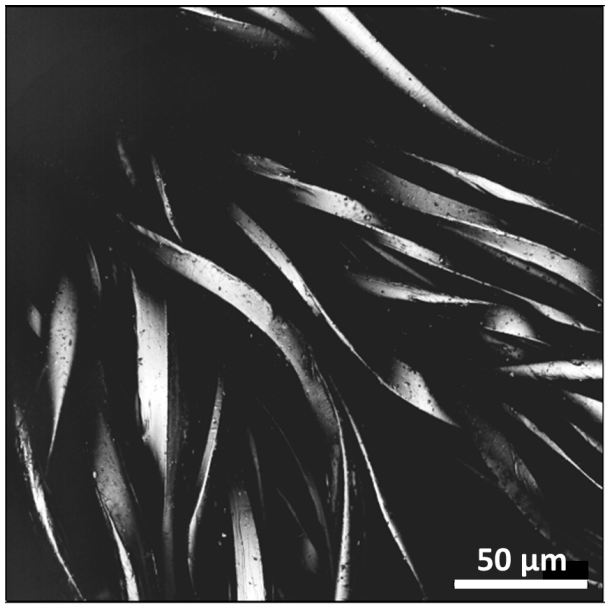
Confocal Microscopy

Confocal microscopy, is an optical imaging technique that captures multiple two-dimensional images at different depths in a sample. This technique enables the reconstruction of three-dimensional structures (a process known as optical sectioning) within an object.

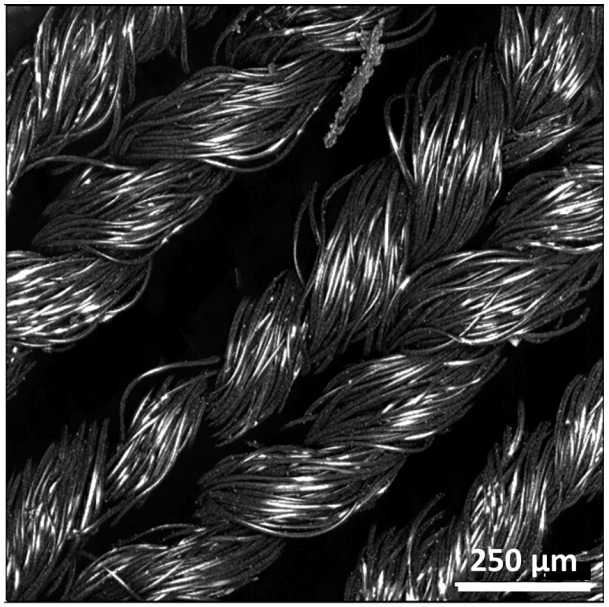
Relaxed tissue sample – mask 1.0

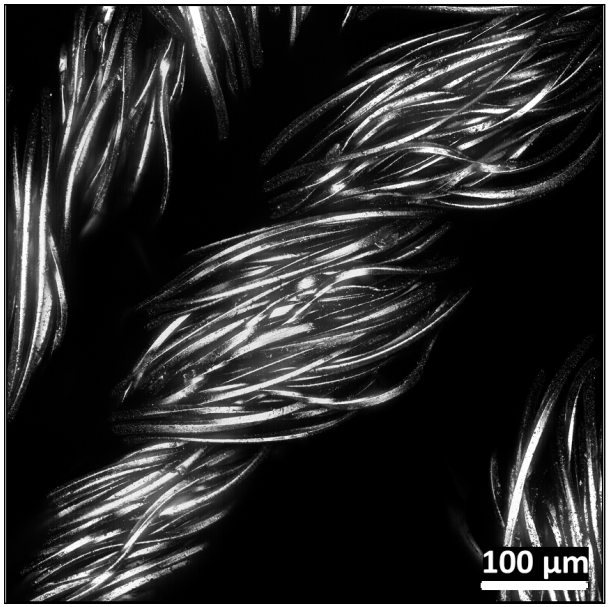


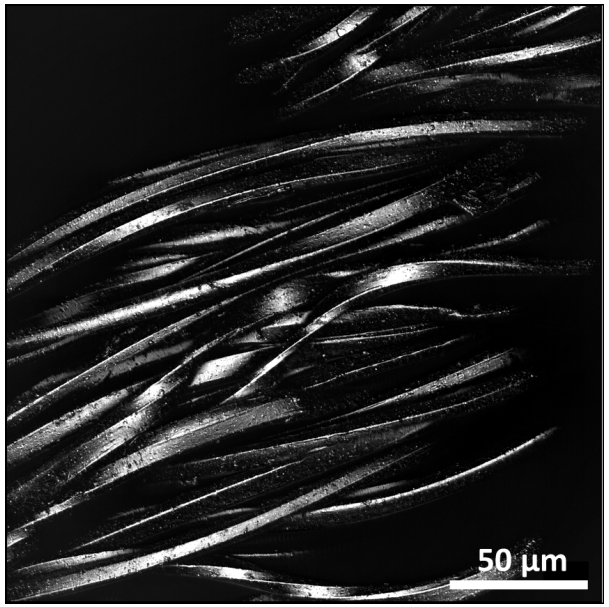




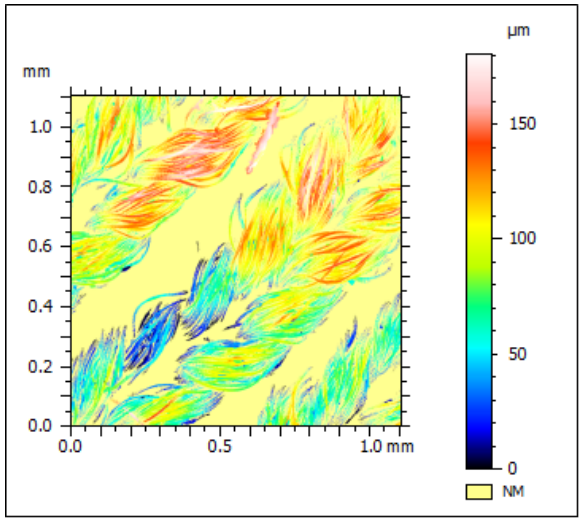
Stretched tissue sample – mask 1.0

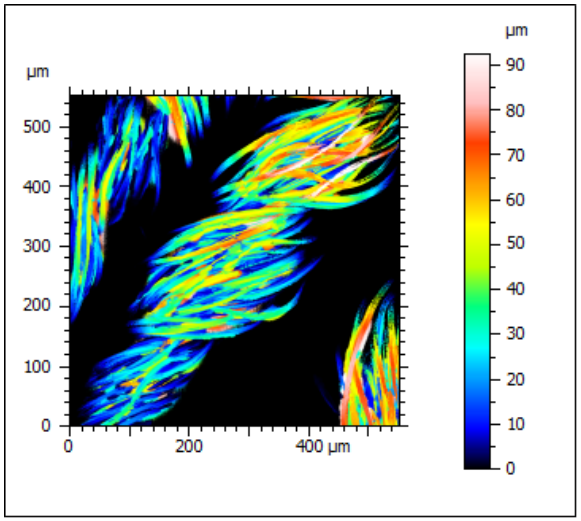


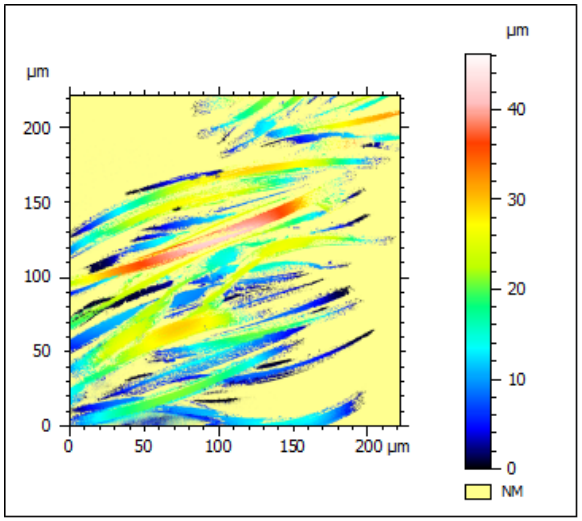




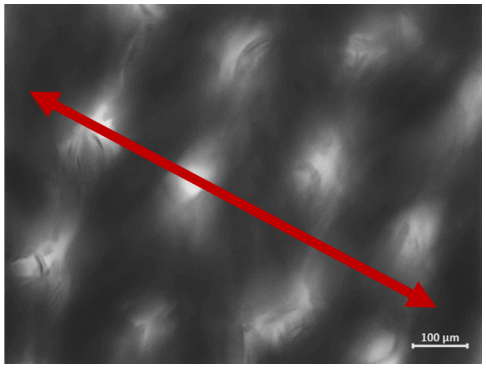
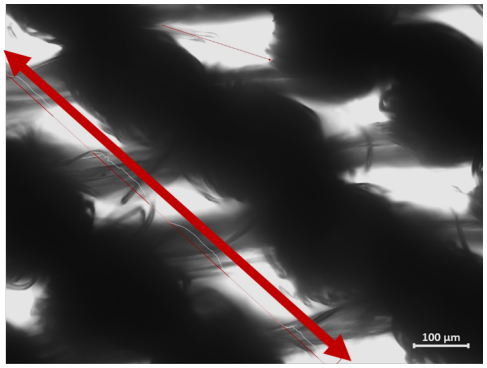
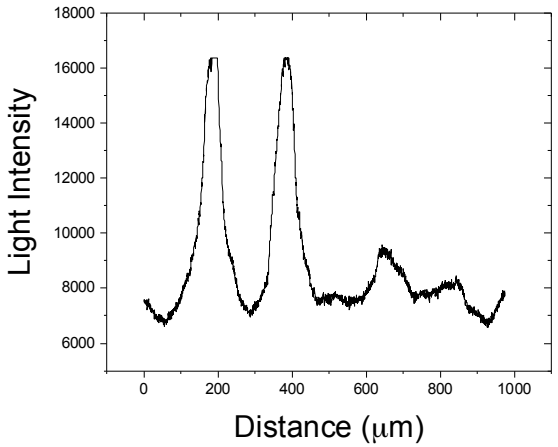
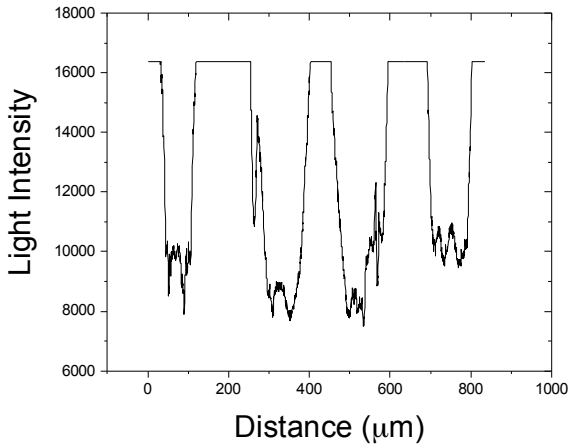
Topography graphs – mask 1.0







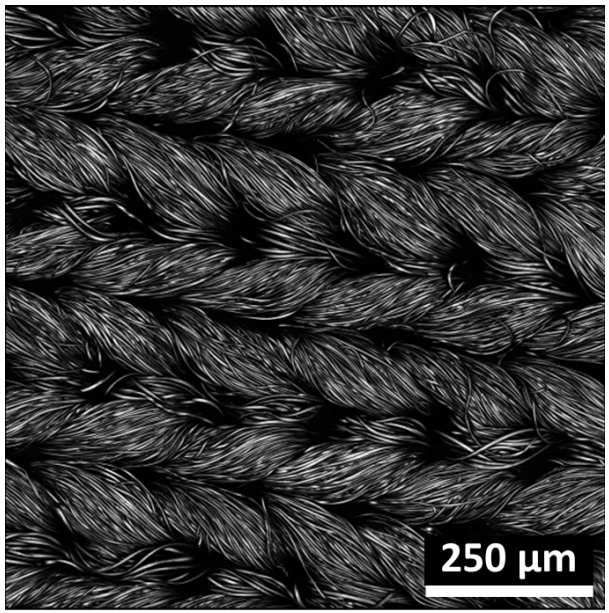
Pore size characterization mask 1.0

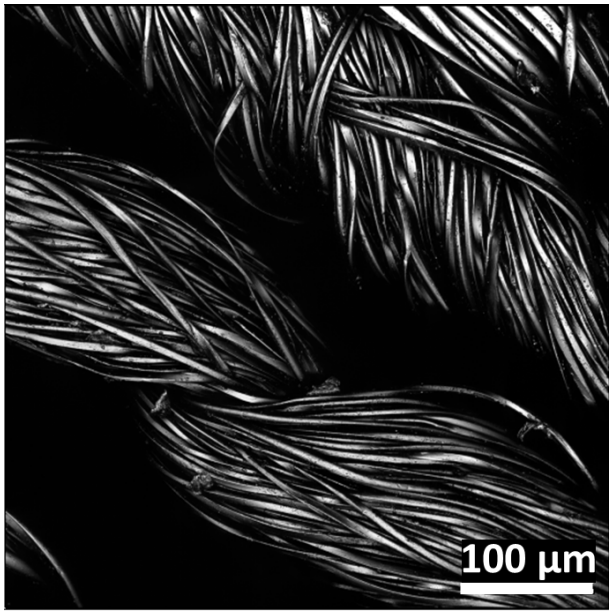
	Relaxed Tissue sample	Stretched Tissue sample
Image		
Profile		

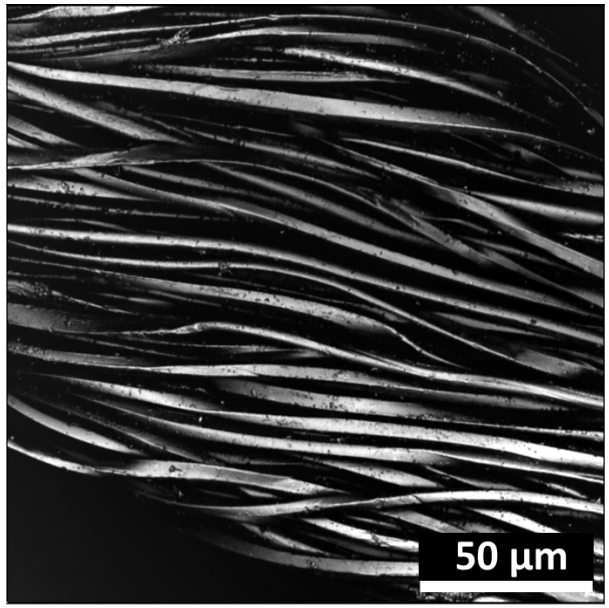
Pore size characterization – mask 1.0

	Pore Size diameter	Frequency
Relaxed tissue sample	73 ± 15 µm	222 µm
Stretched tissue sample	110 ± 35 µm	238 ± 40 µm

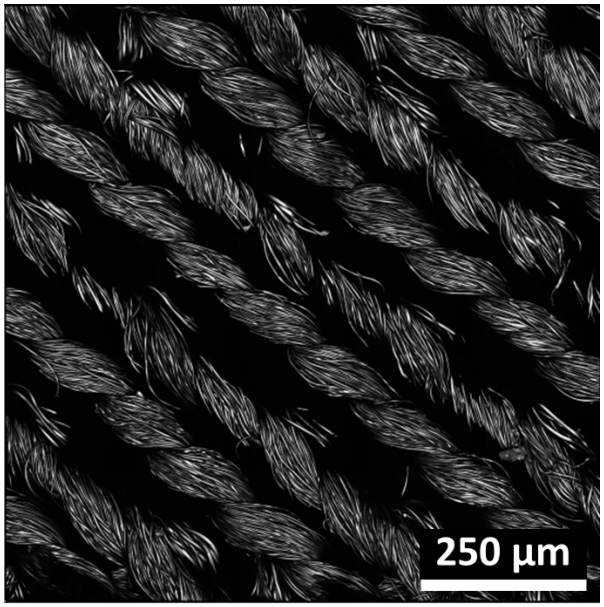
Relaxed tissue sample - mask 2.0

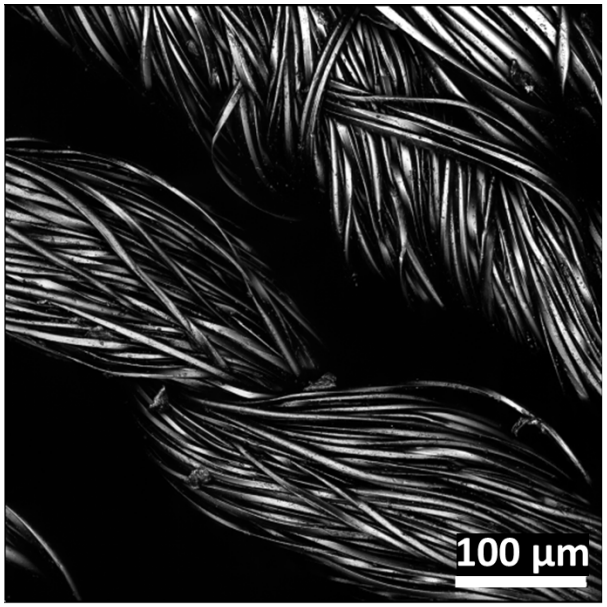


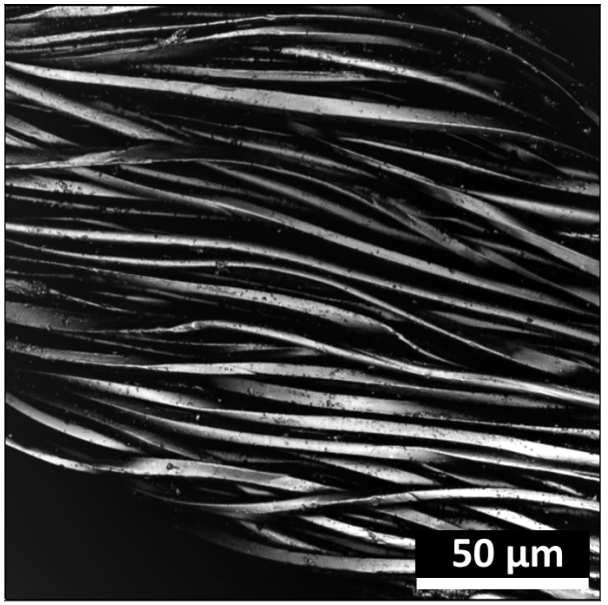




Stretched tissue sample – mask 2.0

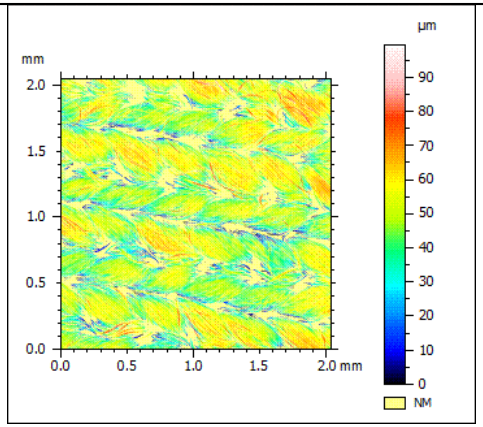


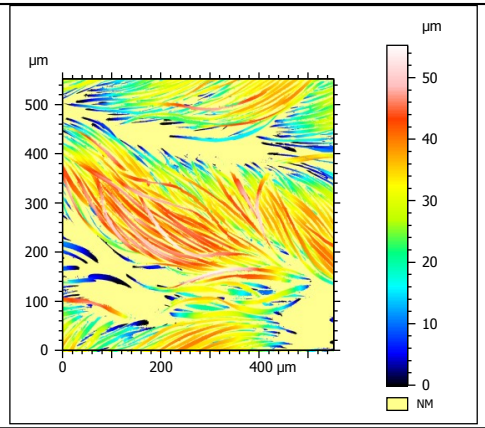


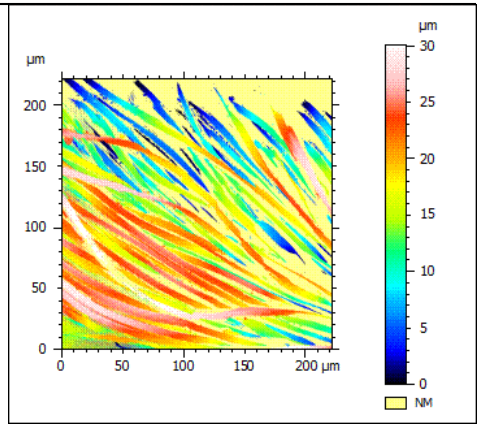


Topography graphs – mask 2.0

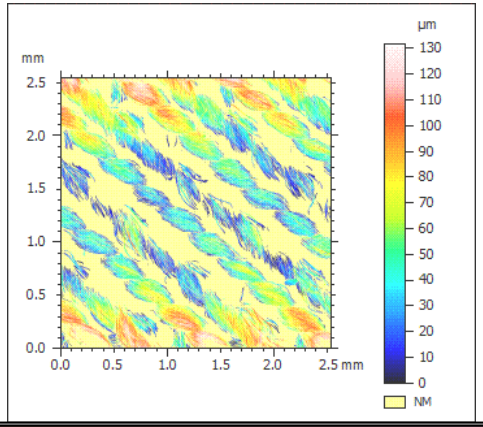
Relaxed tissue

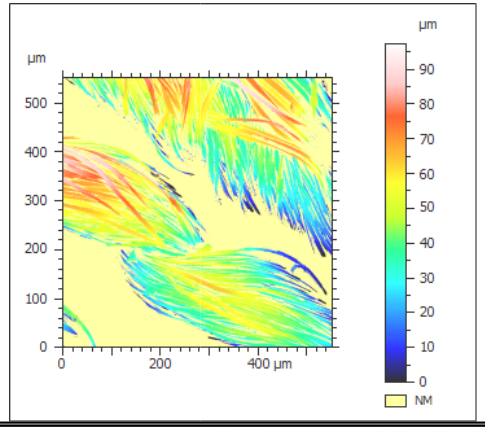


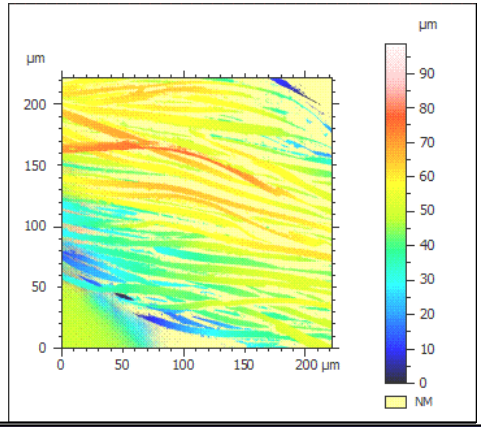




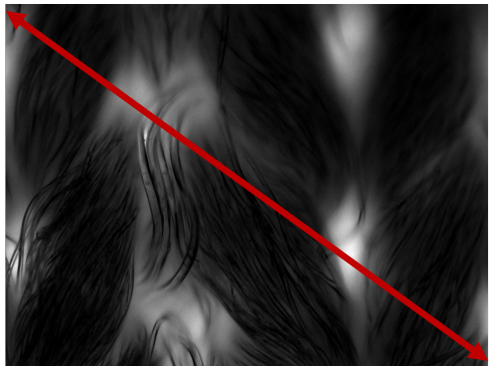
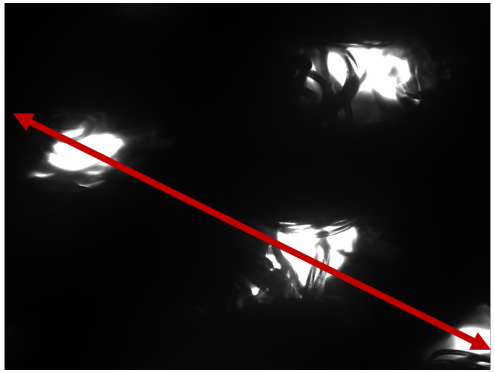
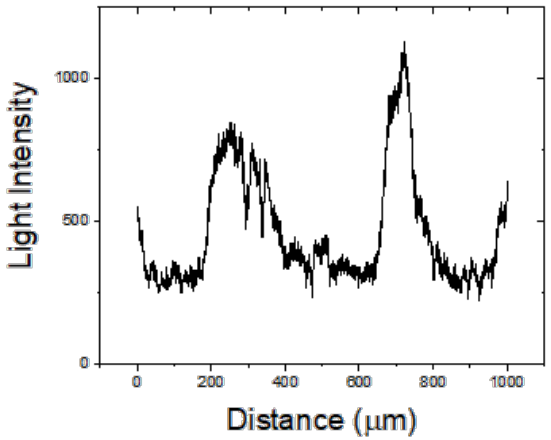
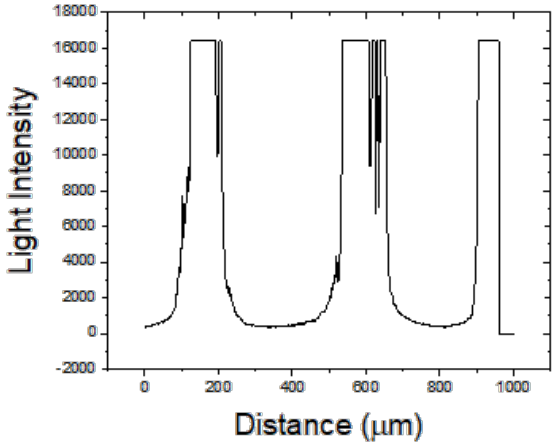
Stretched tissue







Pore size characterization mask 2.0

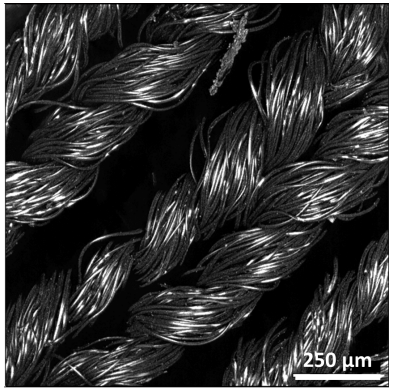
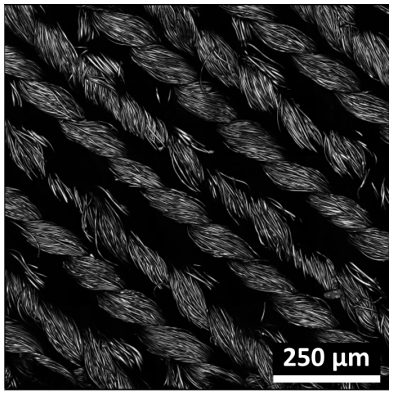
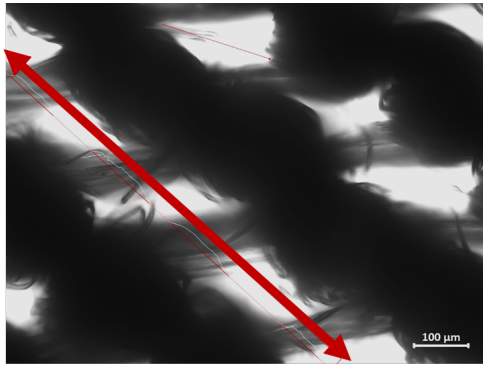
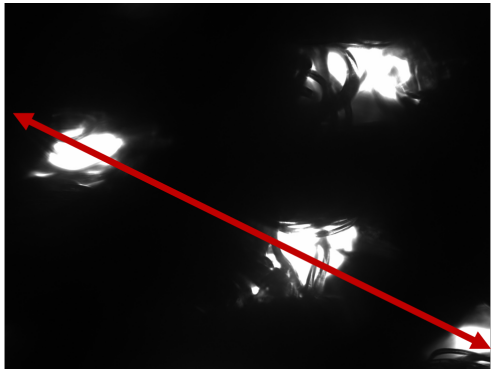
	Relaxed Tissue sample	Stretched Tissue sample
Image		
Profile		

Pore size characterization – mask 2.0

	Pore Size diameter	Frequency
Relaxed tissue sample	87 ± 50 µm	373 µm
Stretched tissue sample	90 ± 30 µm	268 ± 40 µm

Comparison:

Mask 1.0
Vs
Mask 2.0

	Mask 1.0	Mask 2.0
Stretched tissue		
Pore size characterization		

Conclusions

Confocal microscopy, gives a high resolution imaging to determine the fibers location in the tissue and the pore size. More images and characterization could be done to have an statistical relevant result.

Mask 2.0 is more performant compared to mask 1.0. This are the measured facts:

- Relaxed mask 2.0 does not have fully opened pores. There are peaks and valleys but the light cannot completely cross the tissue.
- Stretched mask 2.0 has a pore size 20% smaller than stretched mask 1.0
- Mask 2.0 has a 40% higher distance between pores than mask 1.0 meaning that there are less pores per surface unit.

Materials platform can additionally offer other services like virus/bacteria neutralization test and antiviral/antibacterial coatings.