

Institute of Complex Systems, FFPW, University of South Bohemia

<http://web.frov.jcu.cz/cs/ustav-komplexnich-systemem>



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CZECH
OPTICAL
CLUSTER

*Let's Make Optics for the Future.
Together.*

Introduction

We built new concept of microscopes:

- (a) Large field sight – largest sensors in the world
- (b) Quasi - spectral resolution in each of the images
- (c) Built-in real time analyses
- (d) Mechanically robust and stable

We seek:

- (a) Customers
- (b) Investors

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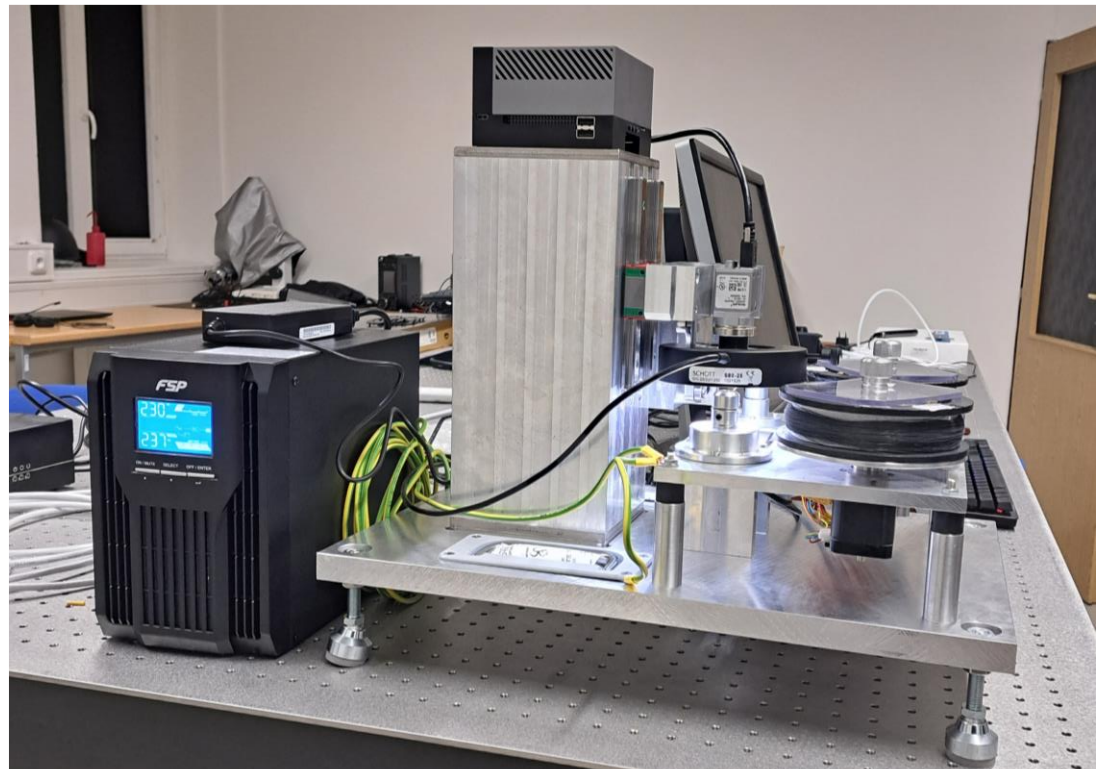
<http://web.frov.jcu.cz/cs/ustav-komplexnich-systemu-uks>

Dalibor Štys

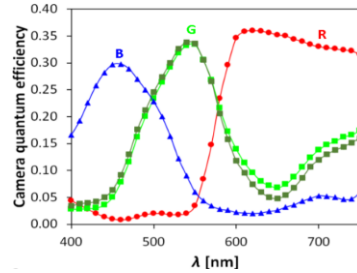
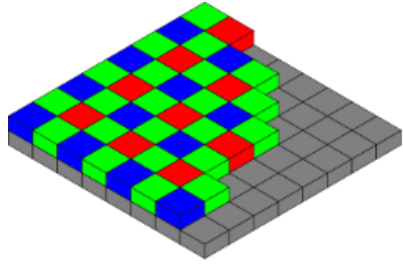
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**We develop
microscopes
for any combination of needs**



Digital camera as scientific instrument



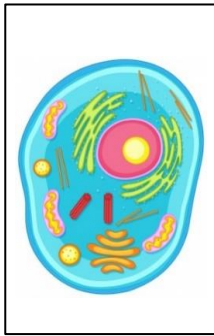
Color channels are not independent

Light source



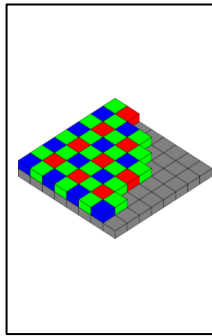
Spectrum
 $S(\lambda)$

Sample



Transparency
 $T(\lambda)$

Sensor filter



Transparency
 $F_c(\lambda)$

Signal

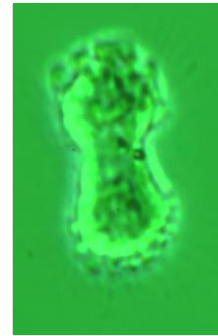
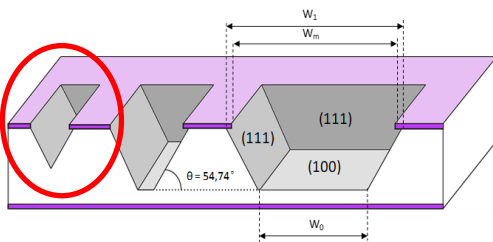


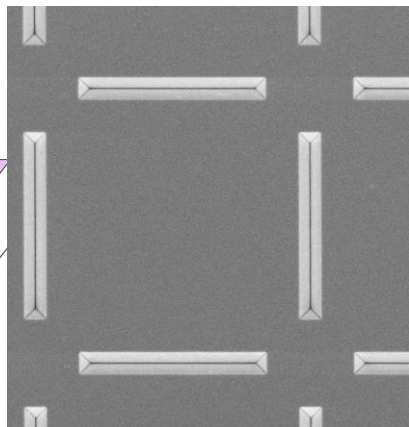
Image
 I_c

In - depth analysis of the whole image enables pointwise spectrum detection

Comparison to scanning electron microscopy



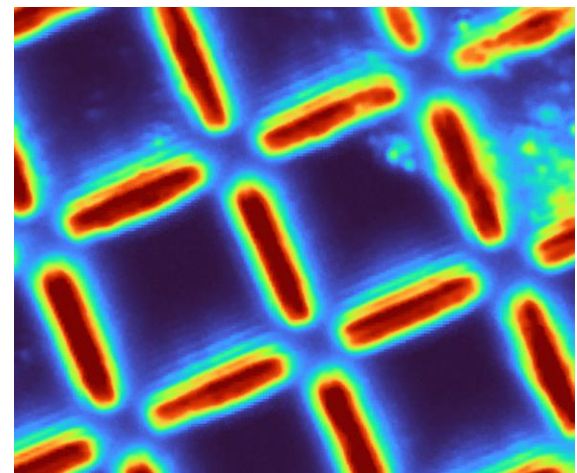
ELM
lithographic
standard



SEM image

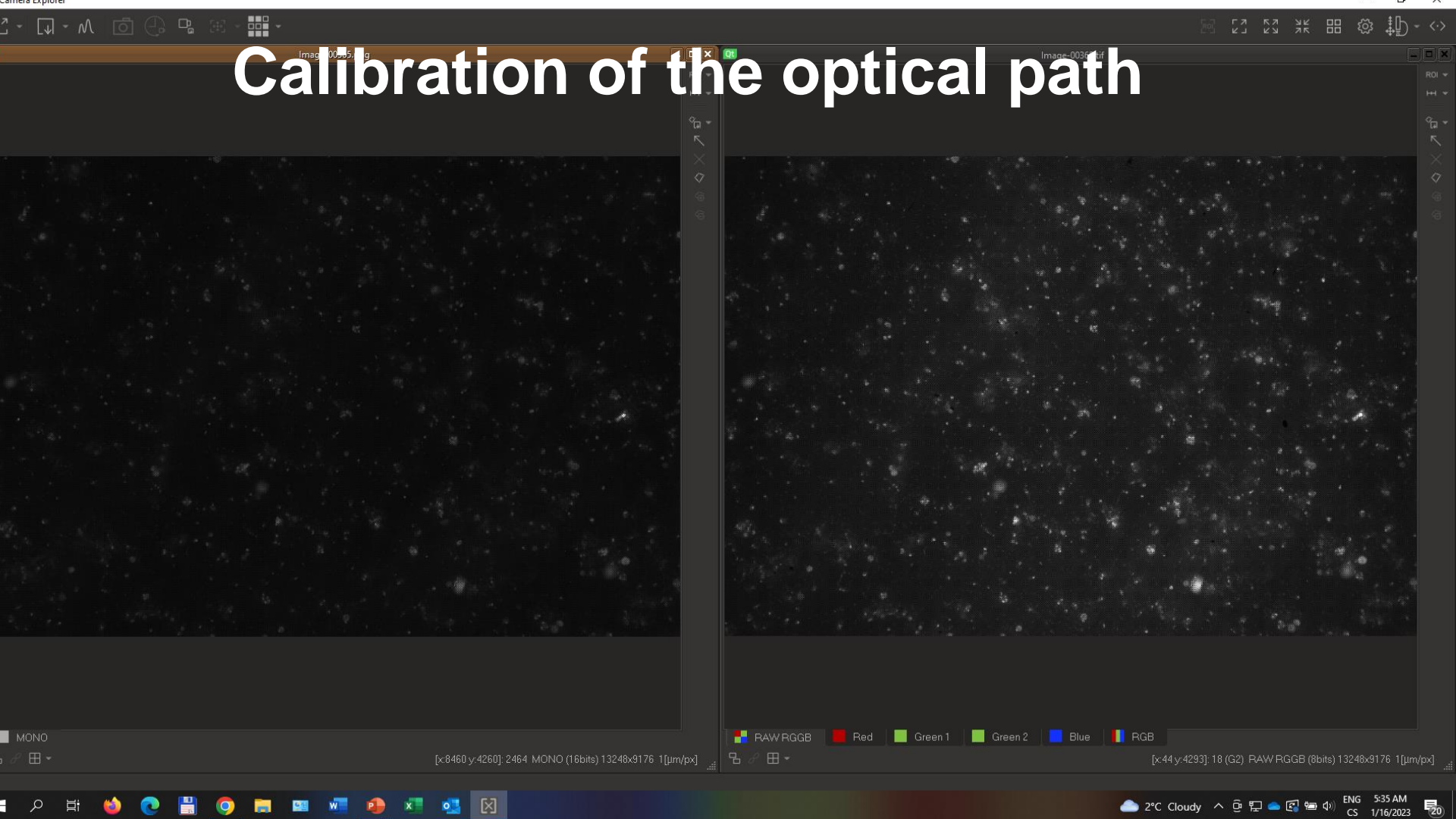


Selected
spectra



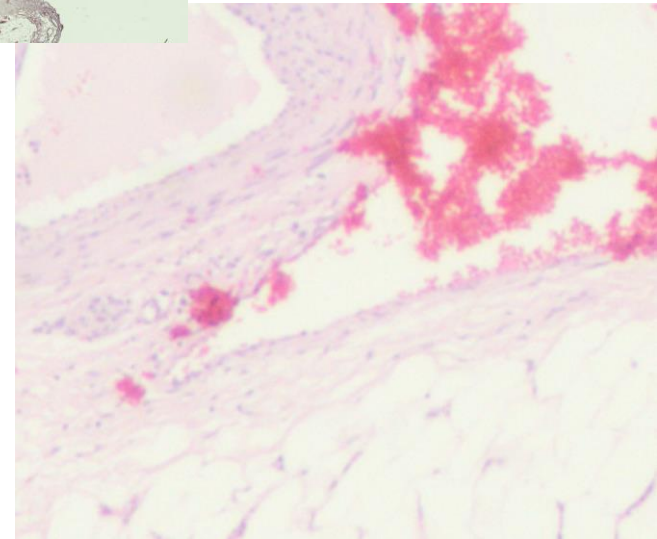
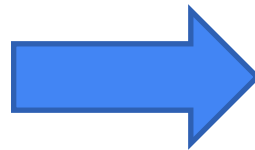
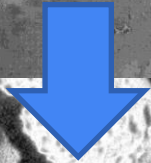
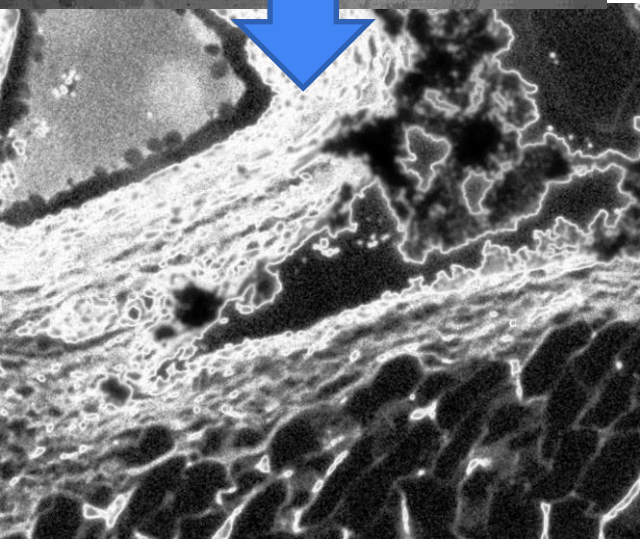
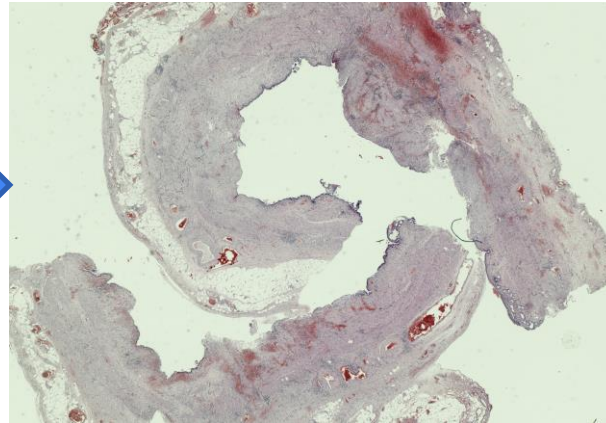
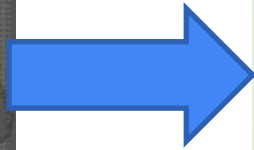
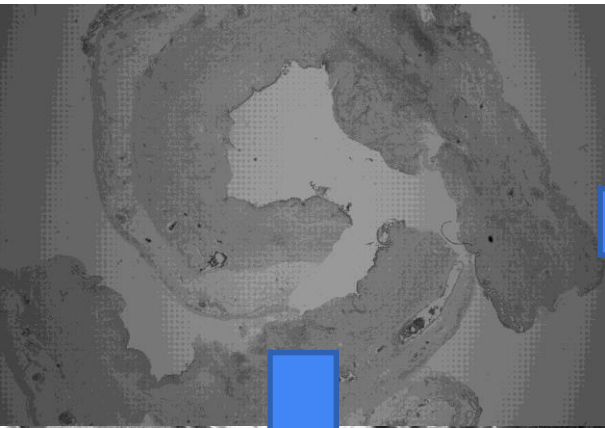
Complete
spectral image
in
pseudocolours

Calibration of the optical path

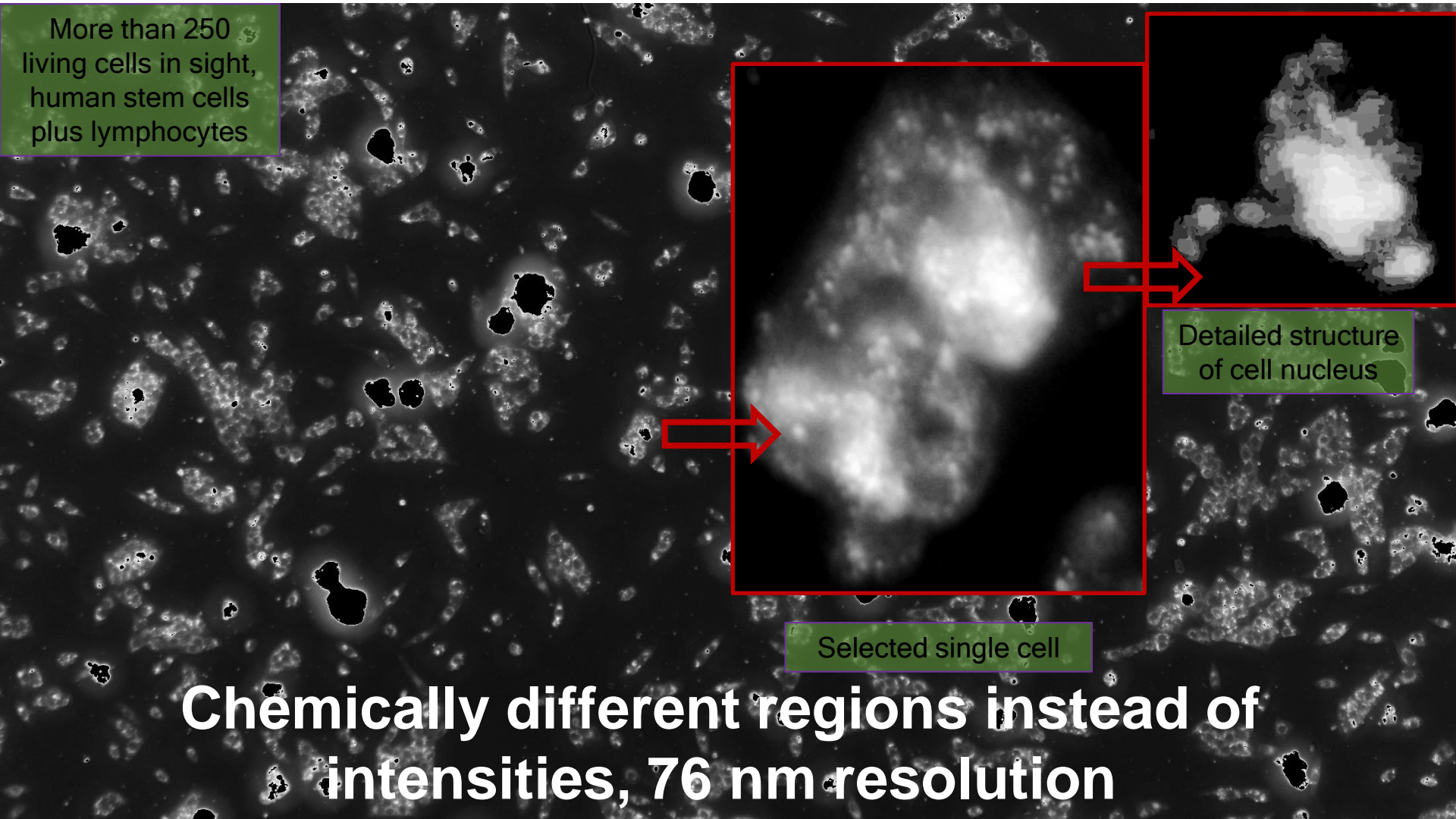


Reconstruction of native colours in the 1x1,5 cm² image with 330 nm resolution

Fast digital pathology



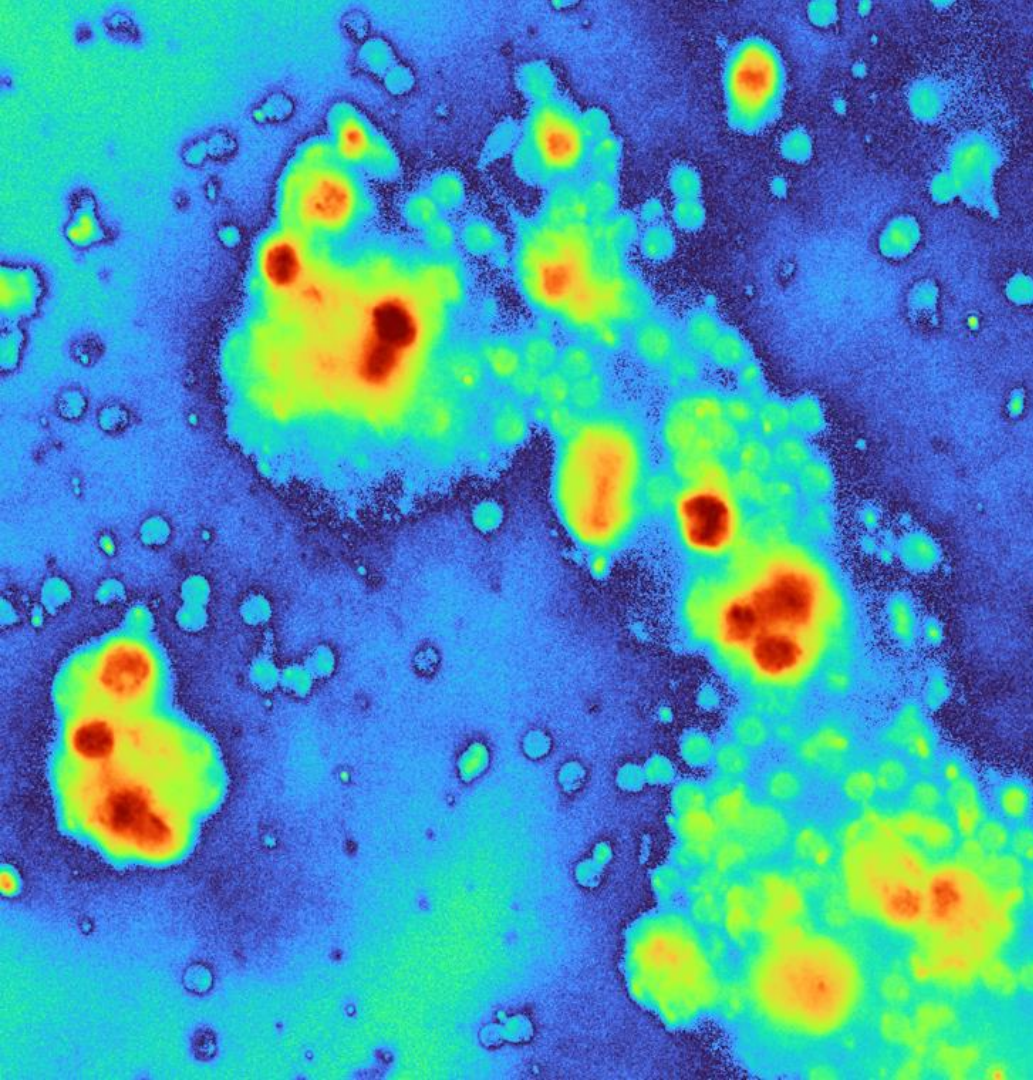
More than 250
living cells in sight,
human stem cells
plus lymphocytes



Detailed structure
of cell nucleus

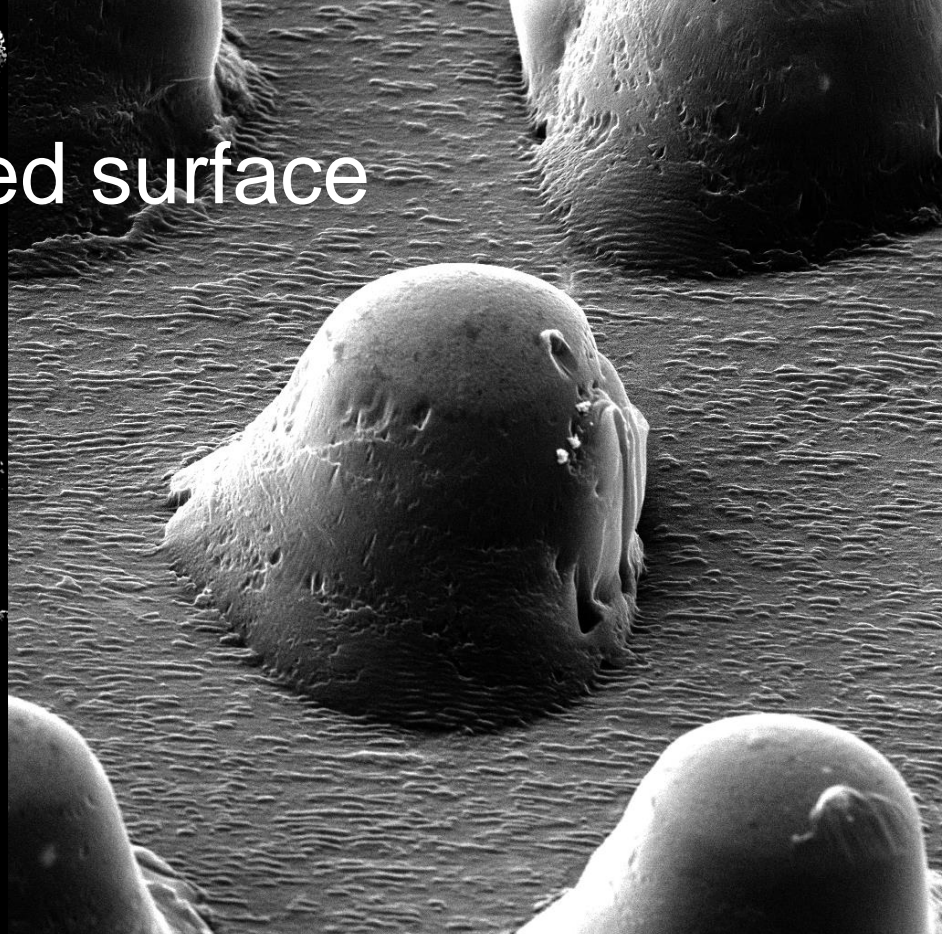
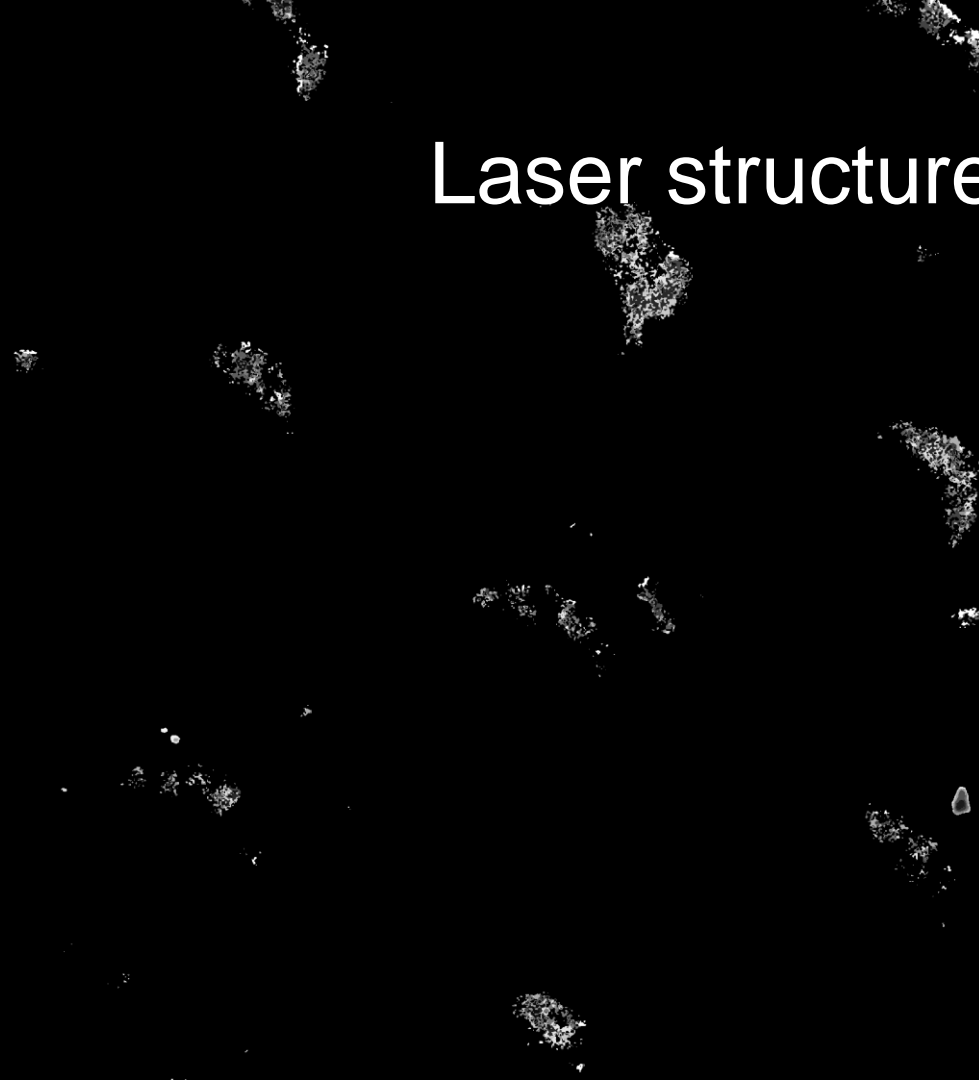
Selected single cell

**Chemically different regions instead of
intensities, 76 nm resolution**



**Faster and more
specific
immunological
analysis**

Laser structured surface



	Mag 5.00 kx	FoV 55.8 μm	WD 18.61 mm	10 μm
Speed 5	BC 300 pA	Scan Mode RESOLUTION	Energy 15 keV	



**Large field of sight quality control, i.e $2 \times 3 \text{mm}^2$
at $76 \times 76 \text{nm}^2$ pixel size**

⚡ START

🛑 STOP

7084

A



Focus
1.50



Origin
-429



23:56:00 16.04.23



Current state
Switched off



Position
3.910 mm



Travel velocity
56.6 mm/s

⚙️ SETTINGS

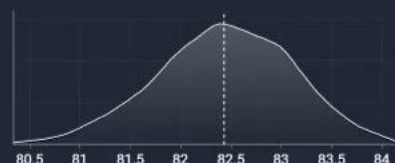


Continuous microscopic process control with continuous artificial intelligence analysis

- Run start
🕒 4 minutes ago
- Run start
🕒 14 minutes ago
- Run start
🕒 16 minutes ago
- Run start
🕒 17 minutes ago
- Run start
🕒 18 minutes ago
- Run start
🕒 20 minutes ago
- Run start
🕒 21 minutes ago
- Run start
🕒 22 minutes ago
- Run start
🕒 41 minutes ago
- Run start
🕒 43 minutes ago
- Run start
🕒 1 hour ago



Inclination, °



Intercoil distance, μm

- 20
- 8
- 3



Wire thickness, μm



Und viele andere Anwendungen

Wir suchen

Aufträge

Investoren

Technische und naturwissenschaftliche Fragen

Wir sind spezialisiert auf tschechisch-österreichische
Projekte

Wir sprechen Deutsch

WE ARE RETURNING THE WORD QUALITY ITS CONTENT

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