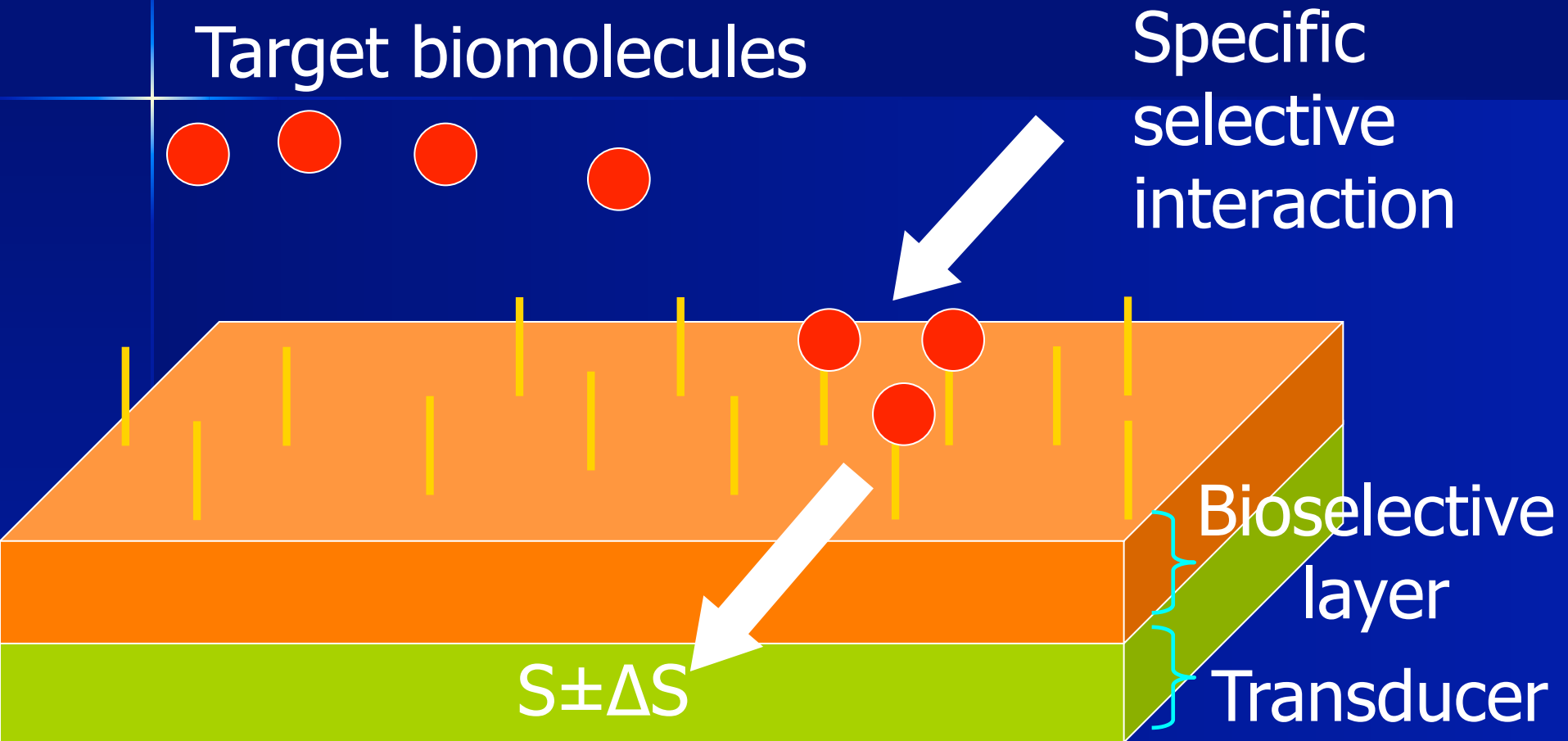# **Roman Viter**

Senior researcher
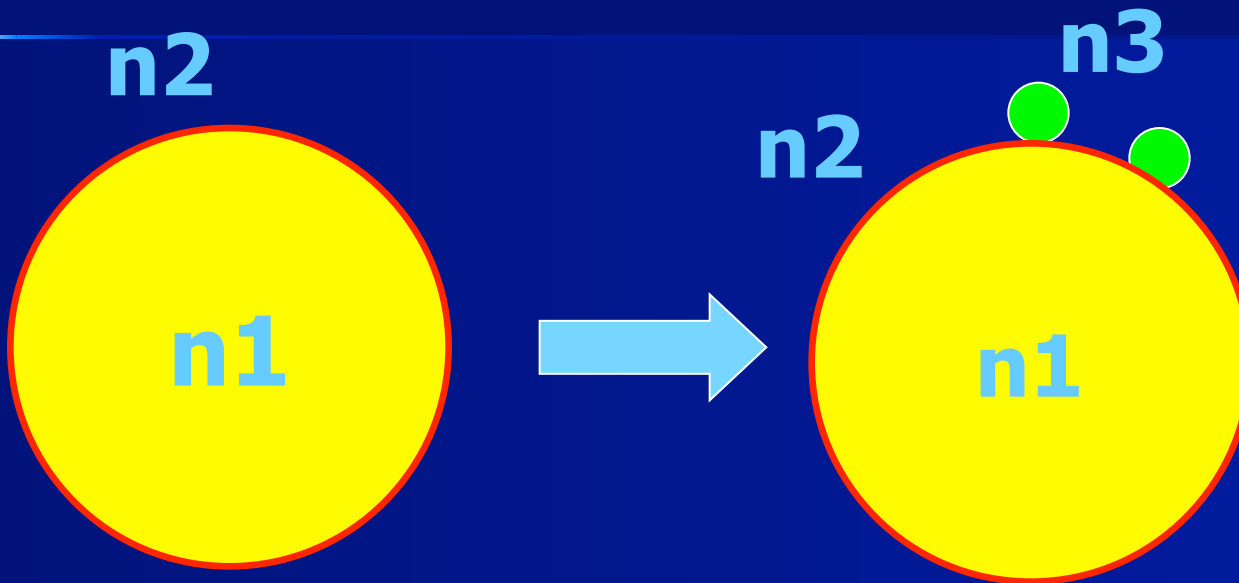Institute of Atomic Physics and Spectroscopy,
University of Latvia, Riga, Latvia

roman.viter@lu.lv

# Principle of biosensor work

Target biomolecules

Specific selective interaction

Bioselective layer
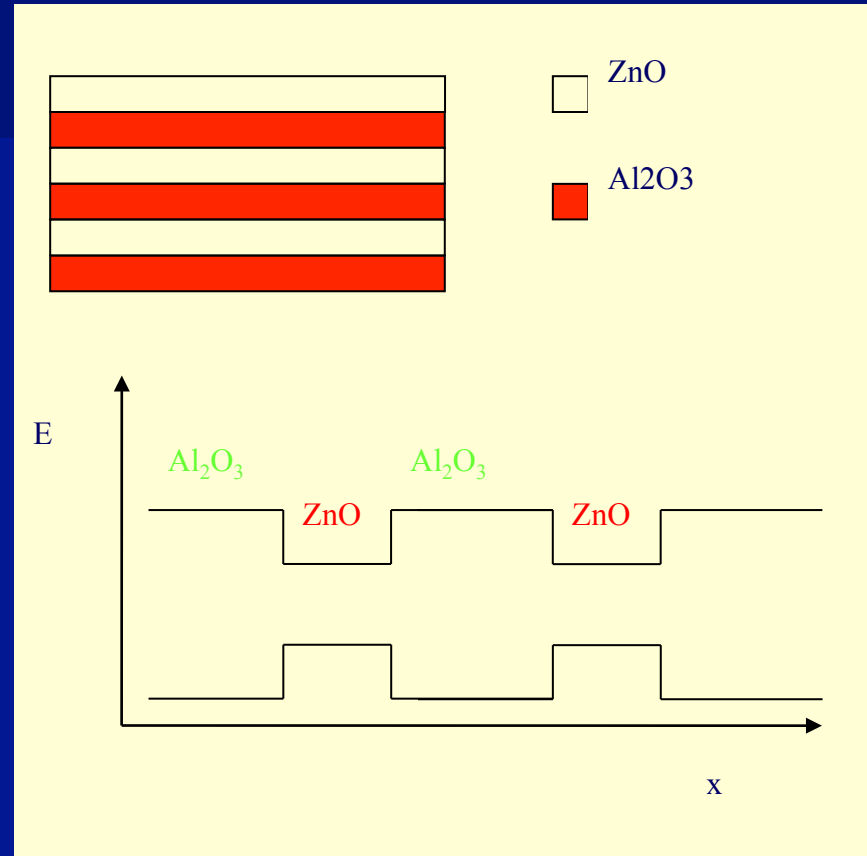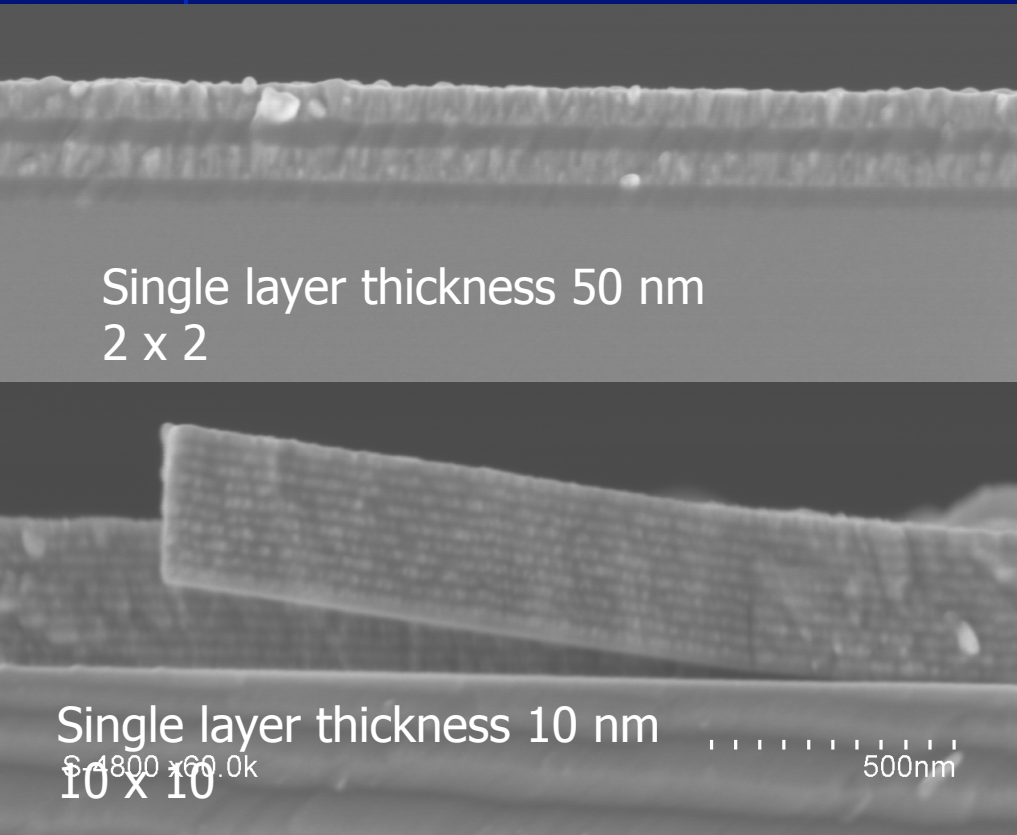
Transducer

$S \pm \Delta S$

# WGM biosensors



$$\Delta n(\,C\,) \longrightarrow \Delta v$$

# Surface modification of the WGM biosensor surface

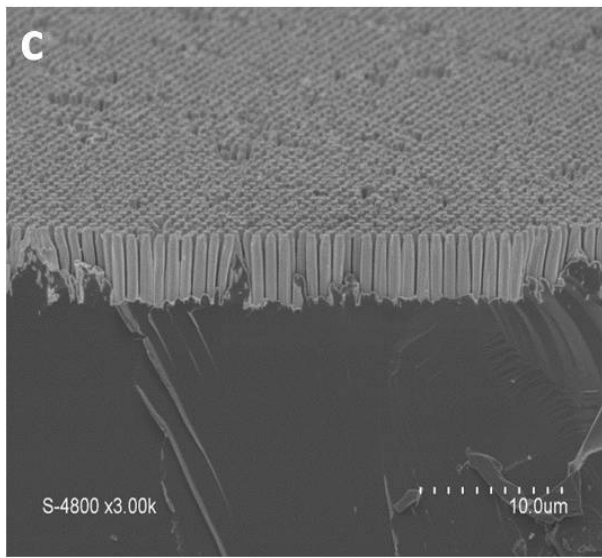# ALD deposition of Al$_2$O$_3$/ZnO nanolaminates



Single layer thickness 50 nm
2 x 2

Single layer thickness 10 nm
10 x 10

S-4800 x60.0k          500nm

SEM of Al$_2$O$_3$/ZnO nanolaminates

Adib Abou Chaaya, Roman Viter, et al., J. Phys. Chem. C, 118 (7) (2014) 3811–3819

# SiNWs and ALD deposition of ZnO and Al$_2$O$_3$/ZnO nanolaminates
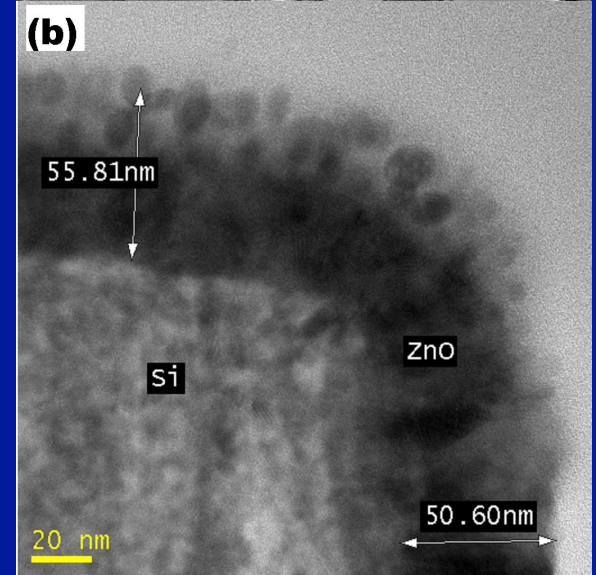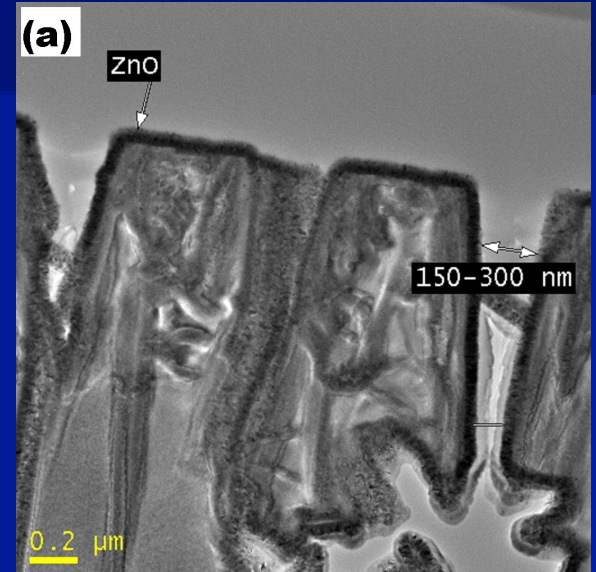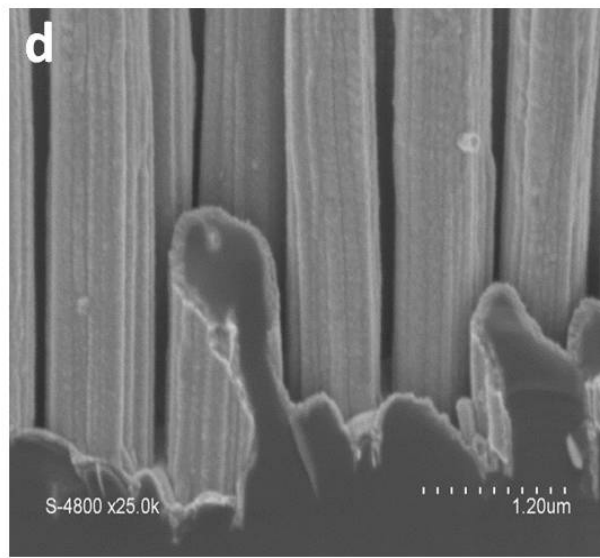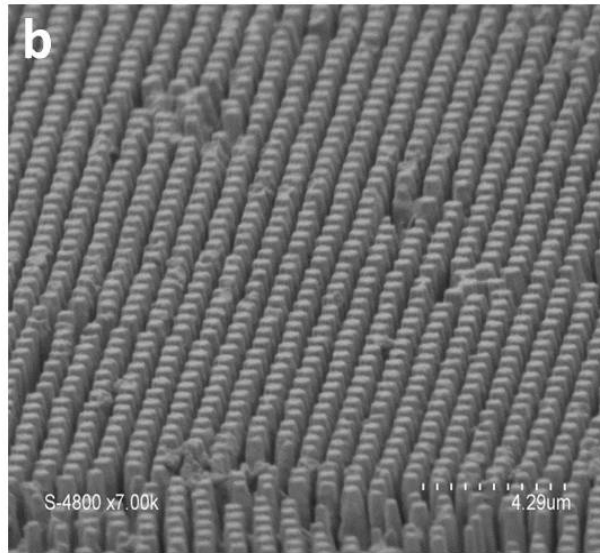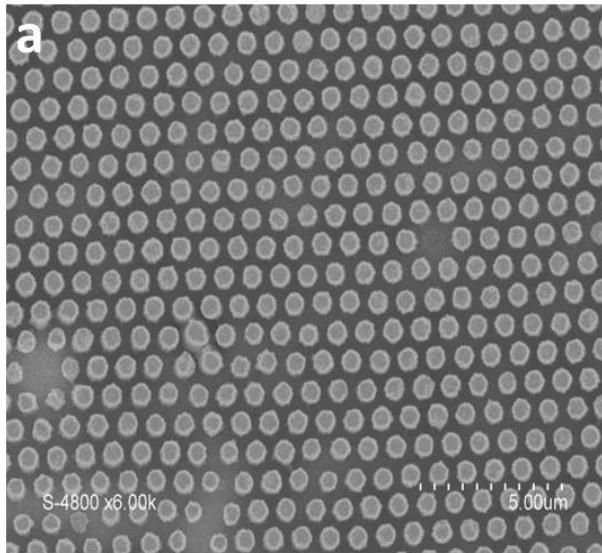
# ZnO nanoforests



S4800 10.0kV 7.8mm x20.0k SE(M)                    2.00um
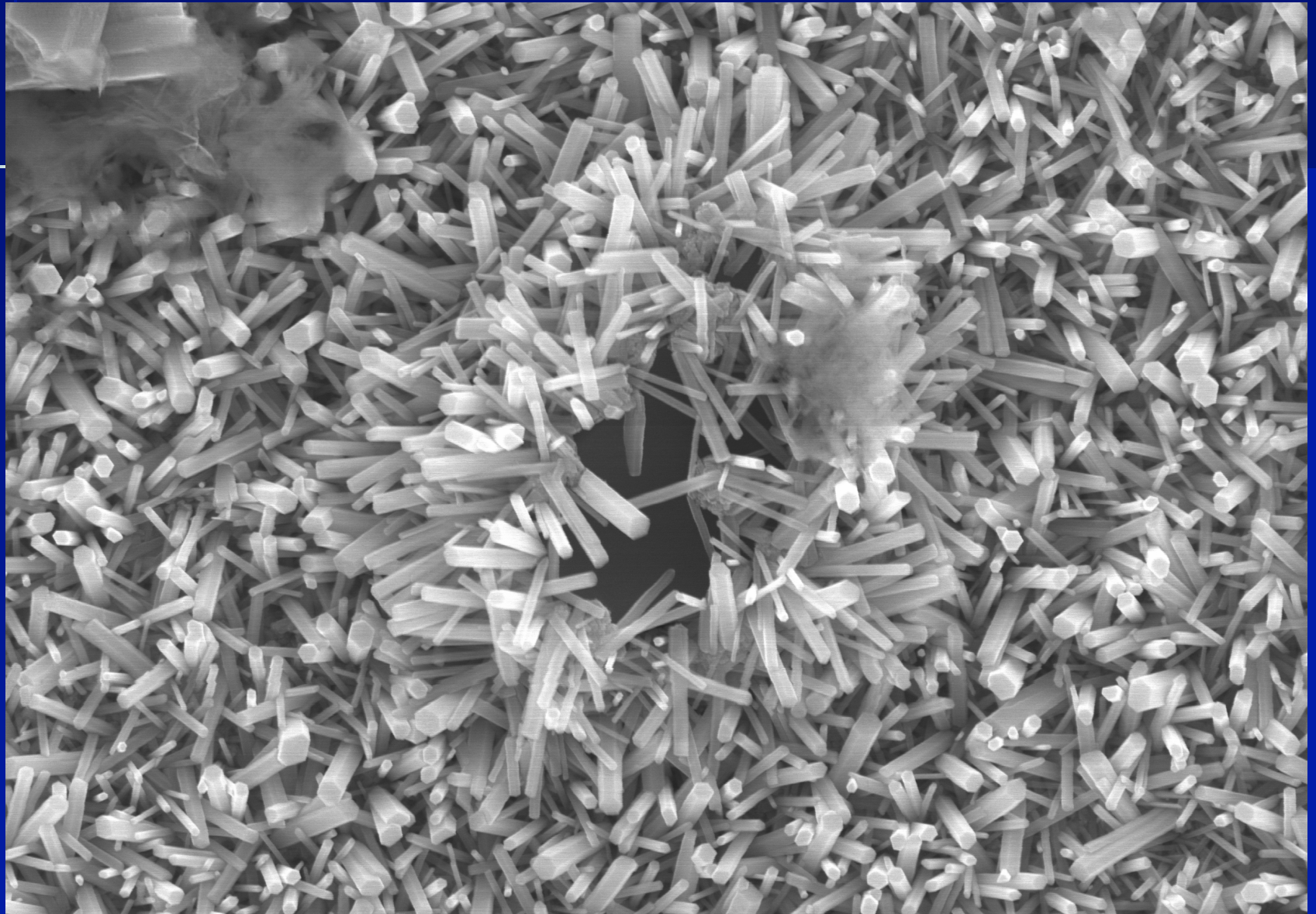
- Au SPR nanostructures
- PANI, PPy conductive polymers

The main idea to combine WGM with absorption spectroscopy

# Tested biomolecules

- Toxins
- Glucose
- Proteins
- Cells

# Applied methodologies

- Steady state (isotherm)
- Kinetics (dynamic)
- Selectivity and cross-selectivity

# Additional facilities and human resources

- Latvia-France Osmosis project
- Latvia-Ukraine bilateral project
- Polish National project 'SONATA 11'
- Erasmus MSc and BSc students from Lithuania and Poland

# Thank you for attention