



UNIVERSITY
OF LATVIA

**"Jauna fotoluminescences platforma
Listeria mono citogēnu noteikšanai"
1.1.1.5/21/A/001**

Maksym Pogorielov

First year plan

Training

- Training of “hard skills” in fields of ZnO-Au synthesis, optical physics, characterization methods (SEM, EDX, AFM, Raman, FTIR, etc.)
- Training in MIP layer formation and mAb conjugation;
- Training in transferable skills

Research

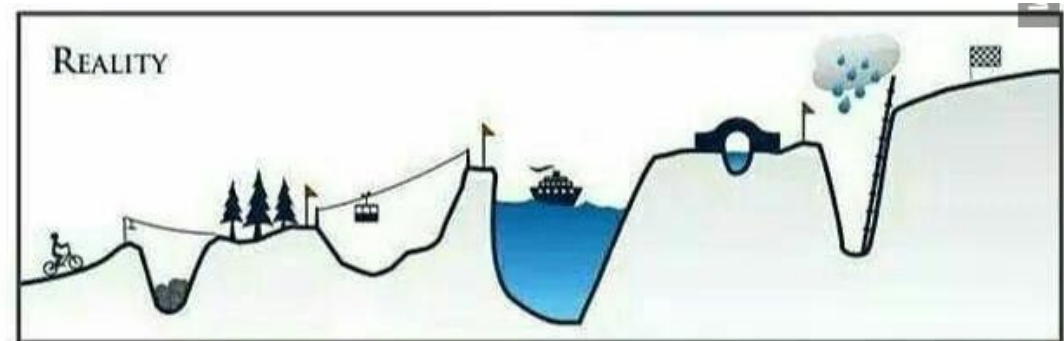
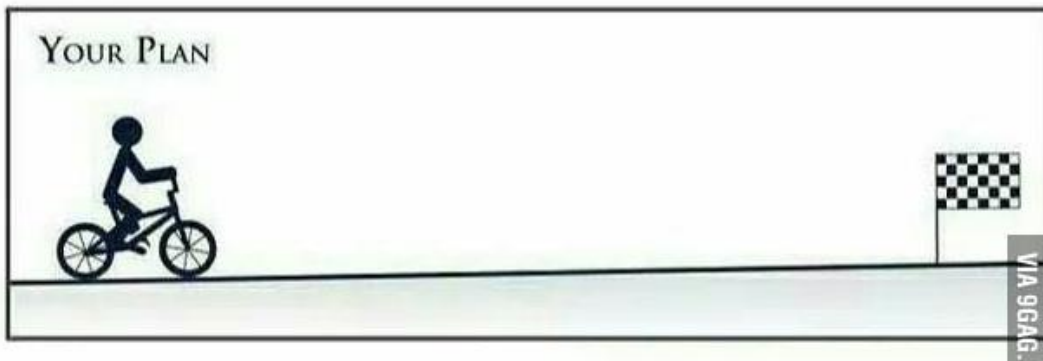
- Fabrication of SPR-photoluminescence ZnO-Au nanostructures with tailored properties.
- Formation of molecular imprinting polymer layer on ZnO-Au nanostructured surface.
- SPR- photoluminescence ZnO-Au nanostructures with monoclonal antibodies towards *Listeria monocytogens*.

Project writing

- 2 international projects that pass threshold

Secondments

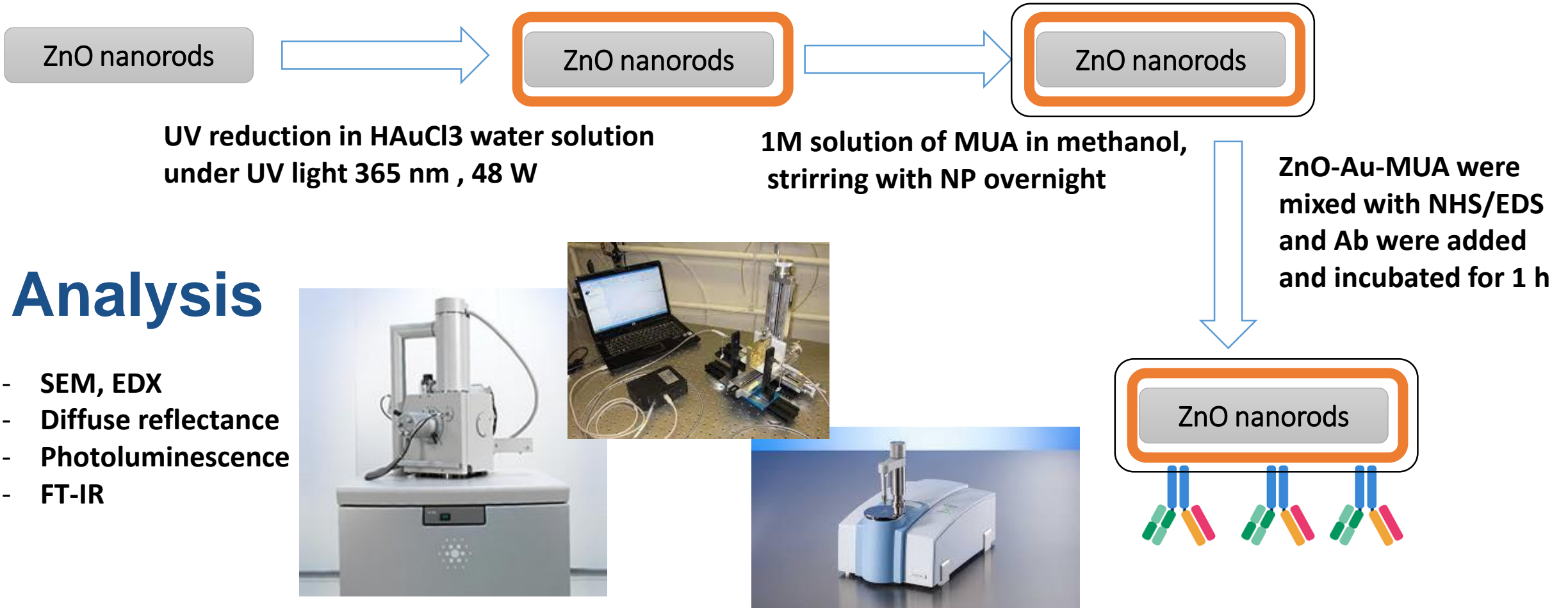
- 1 secondment to VU (Lithuania)



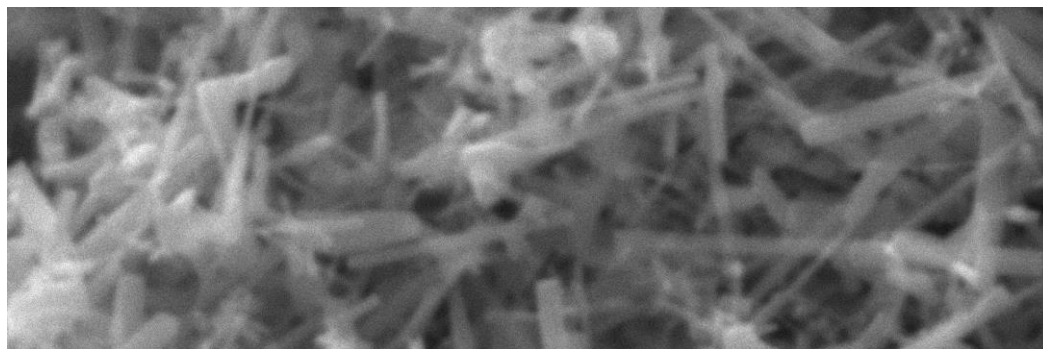


Research

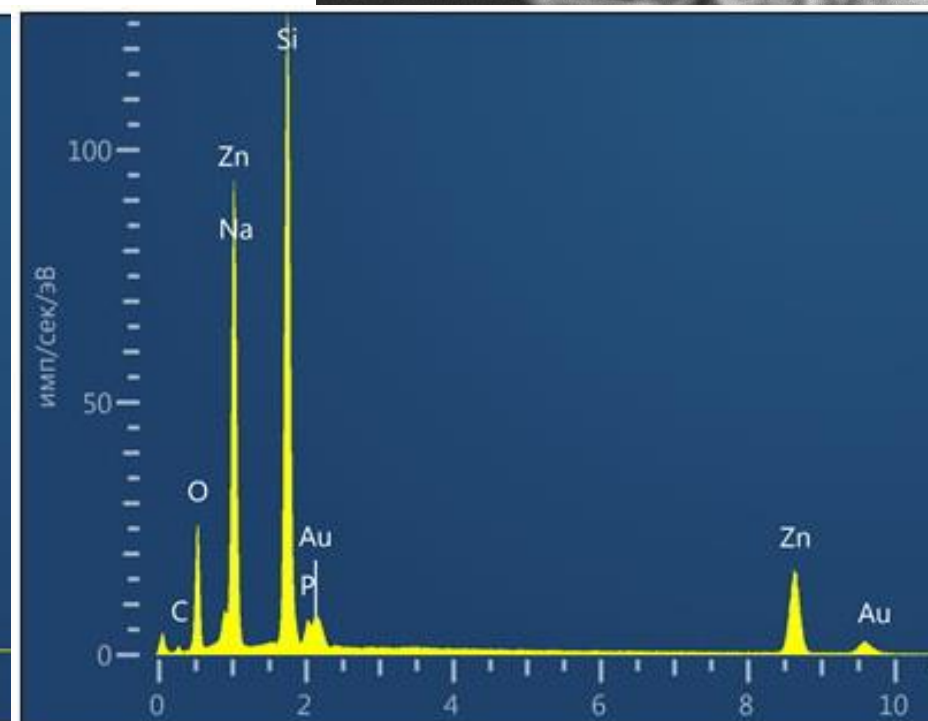
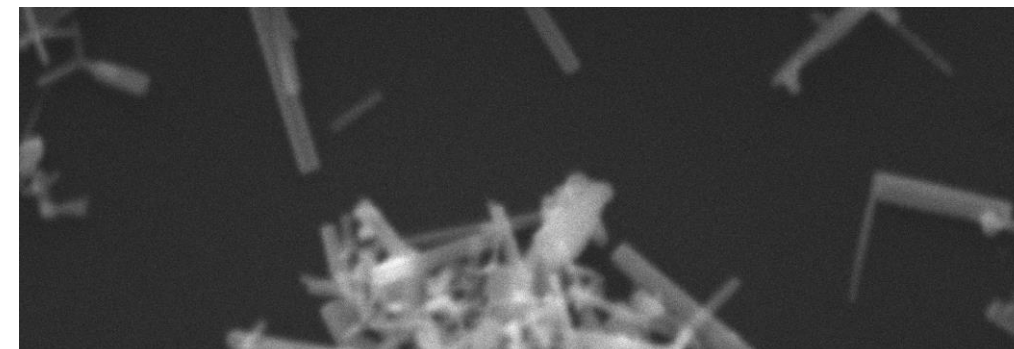
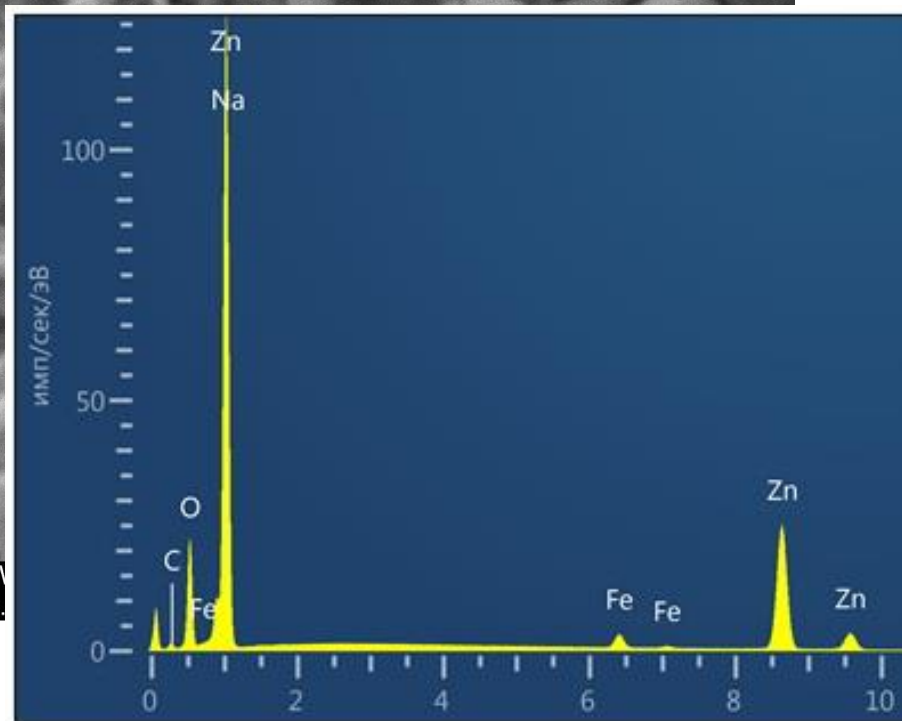
ZnO-Au-mAb platform development for *Listeria monocytogenes* detection



Structural parameters

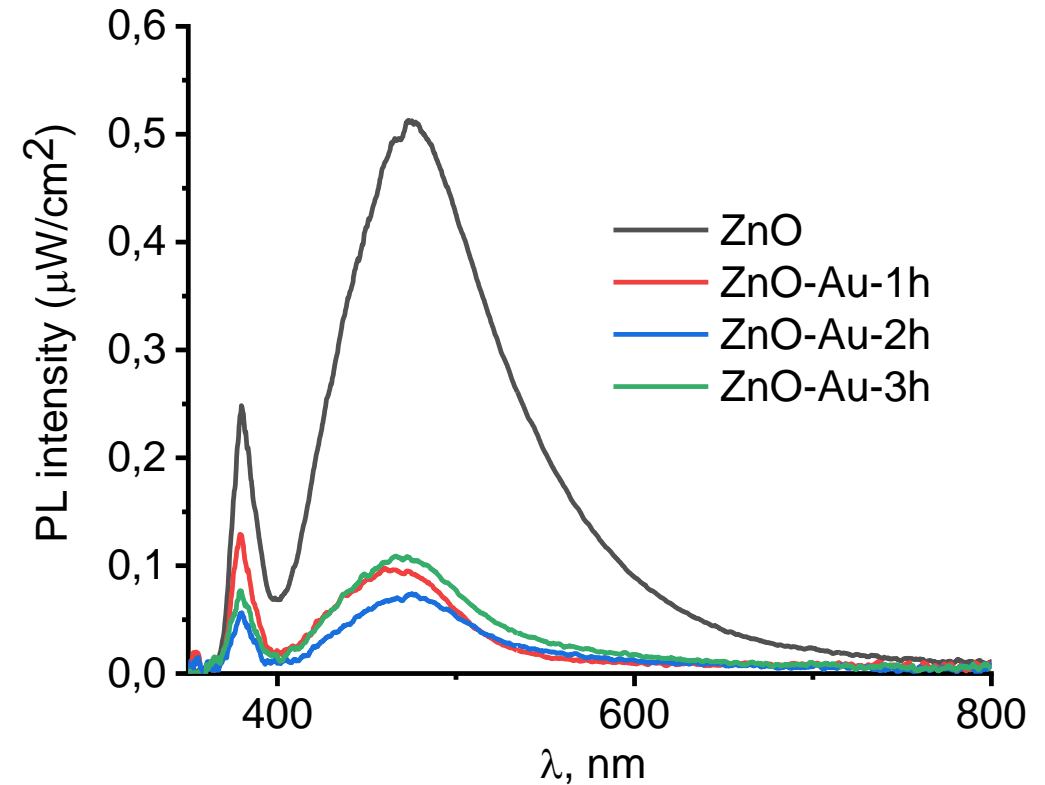
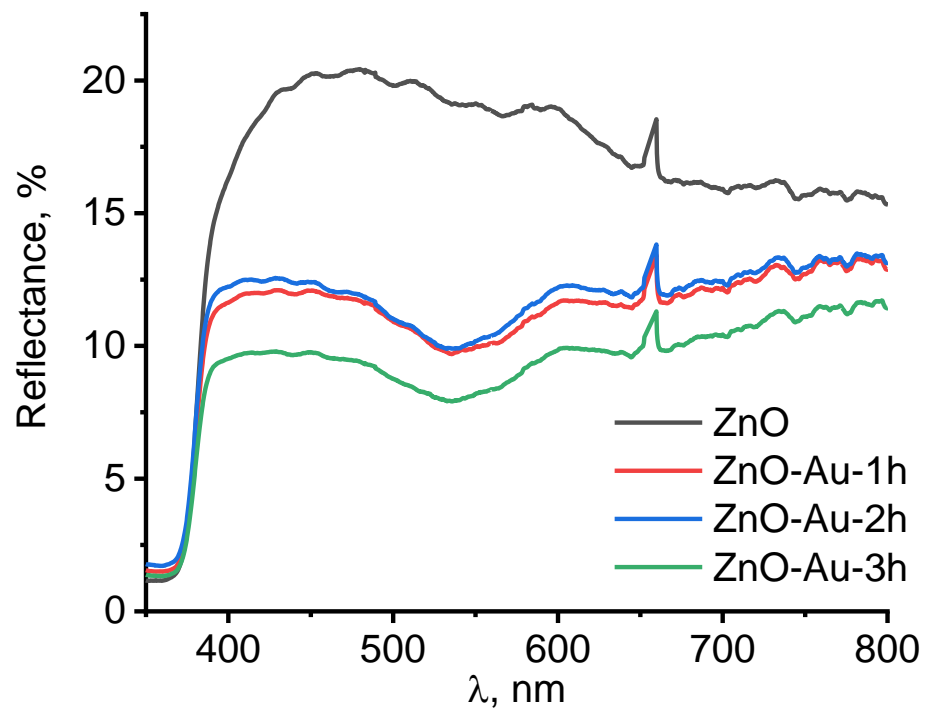


HV 15.00 kV mag 50 000 x 10.0



2 μm
Sumy State University

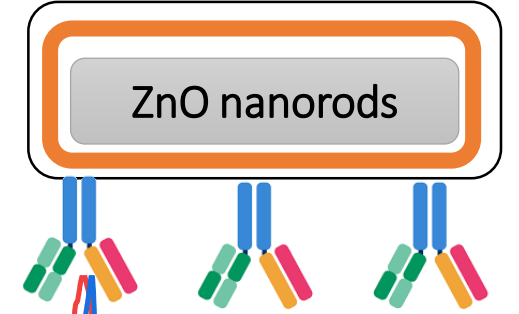
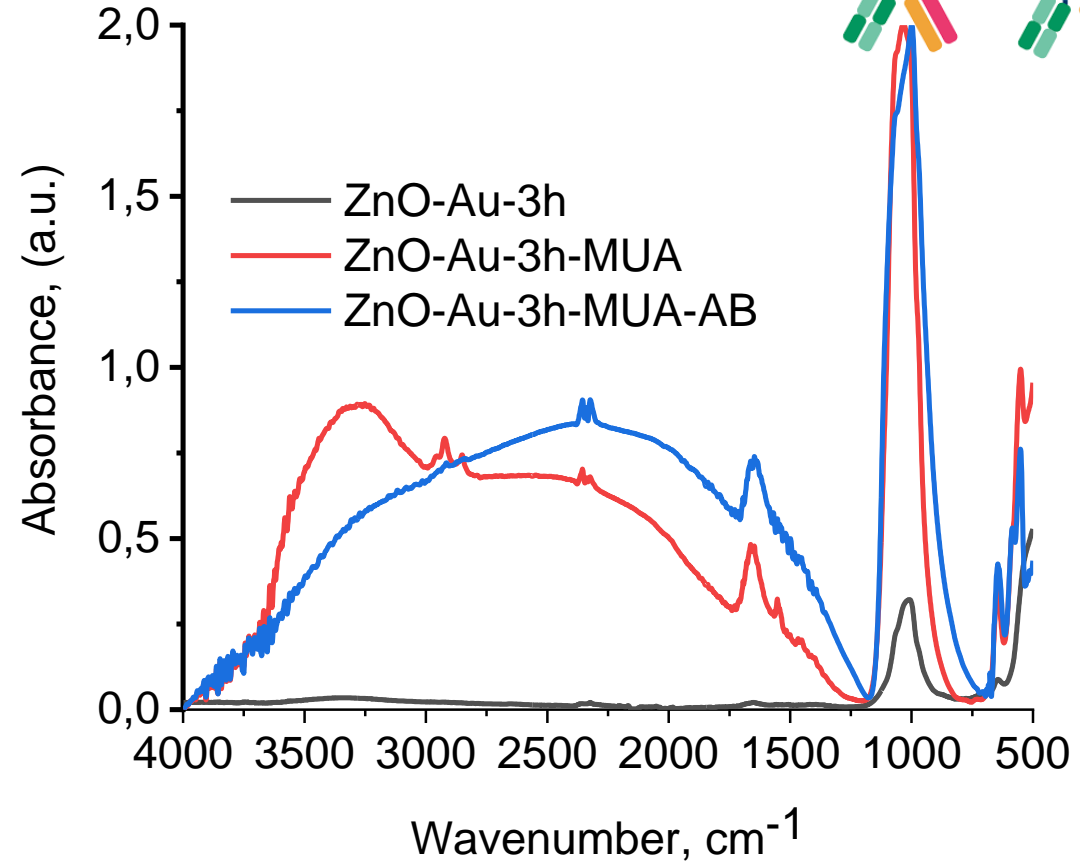
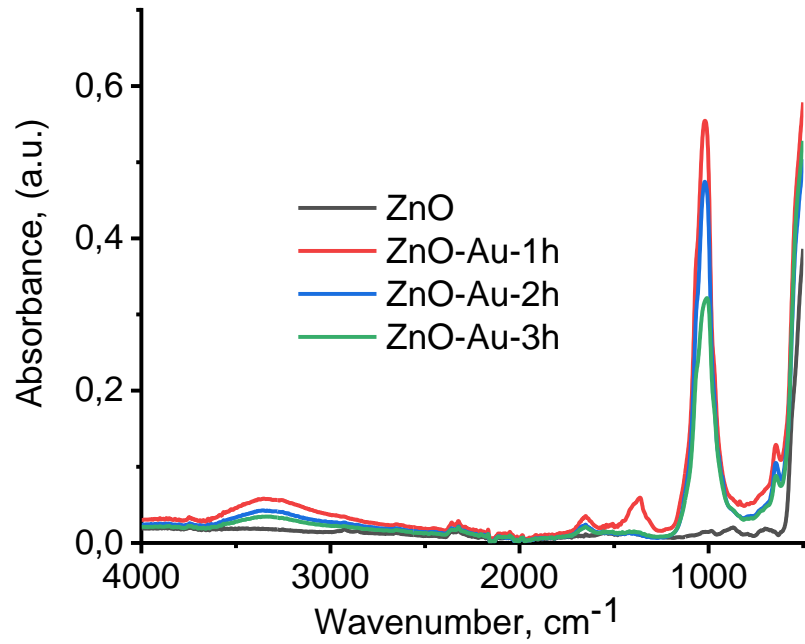
Optical measurements



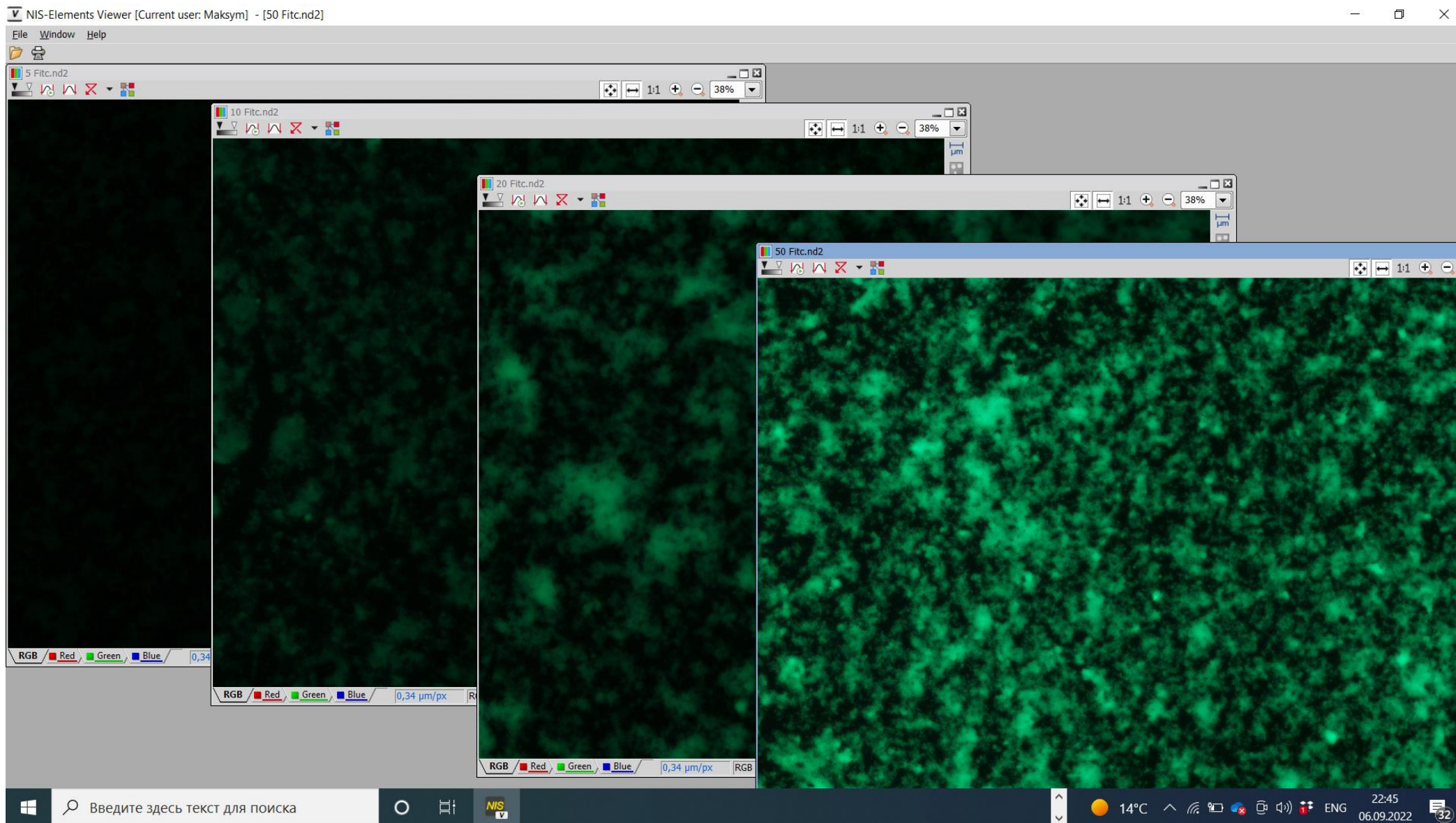
FT-IR spectroscopy

ZnO nanorods

ZnO nanorods



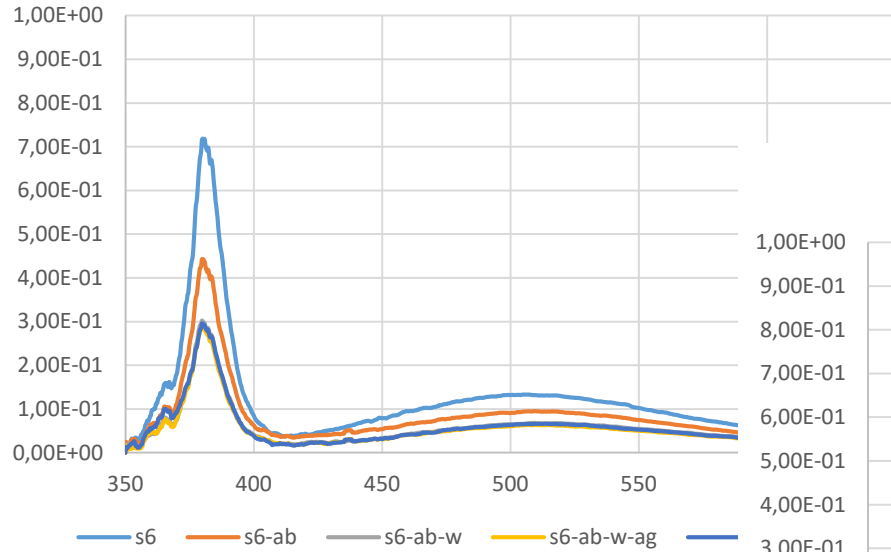
Antibody adhesion



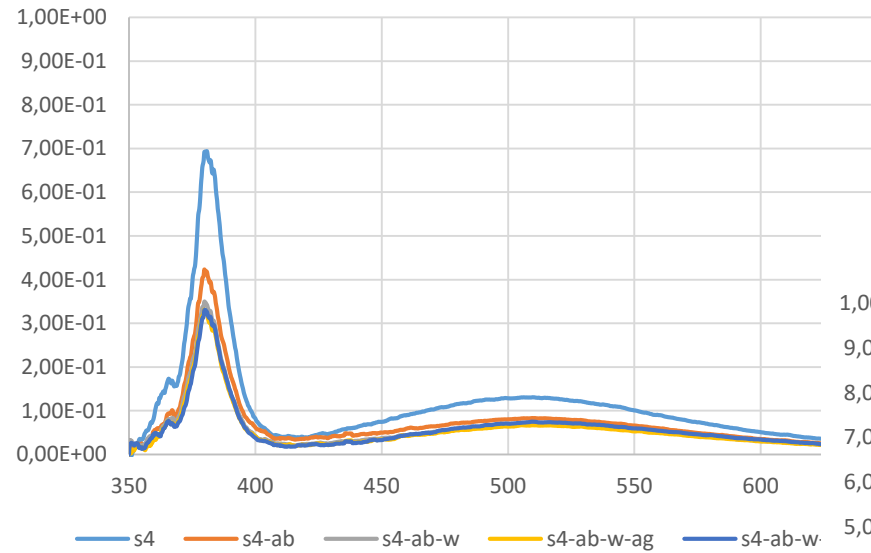
PL measurement of real bacteria



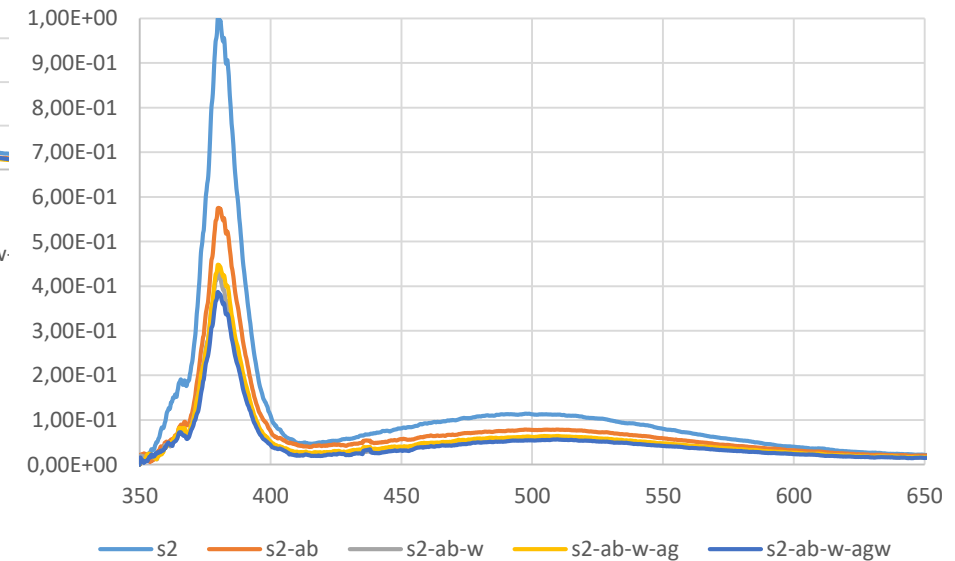
50mkg-10⁴



50mkg-10⁵



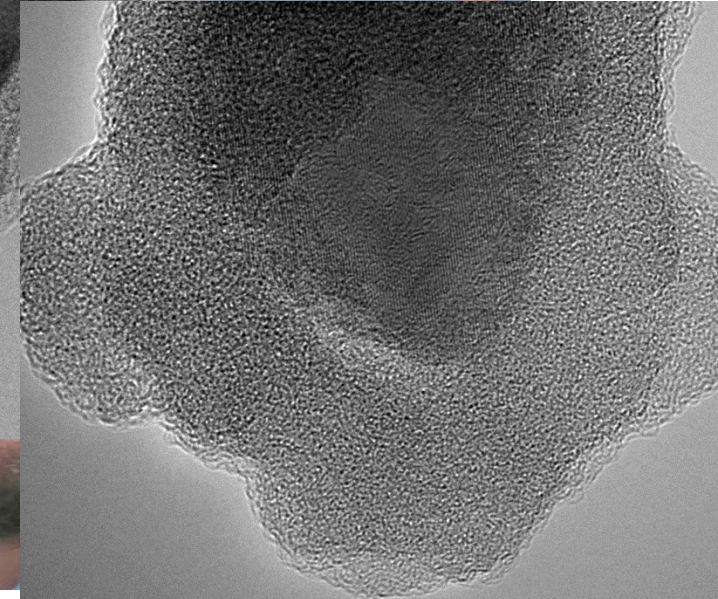
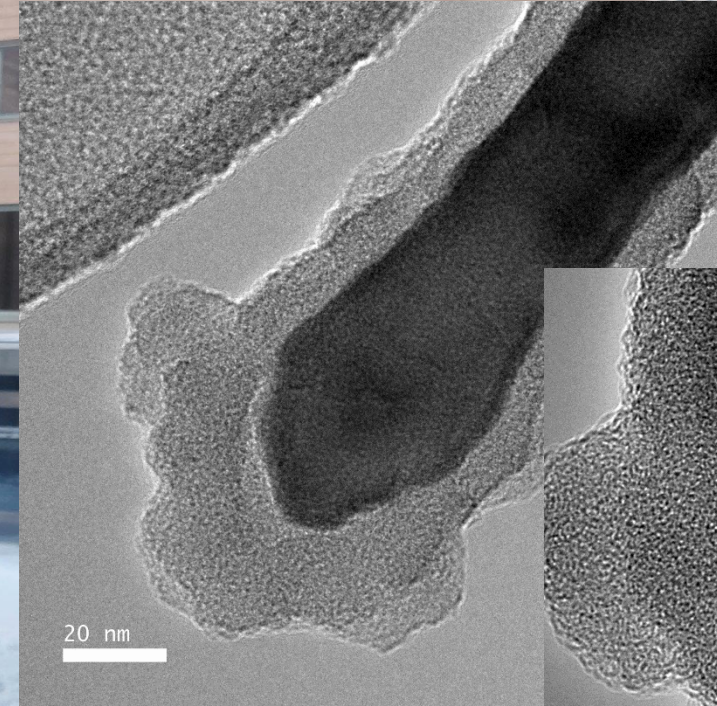
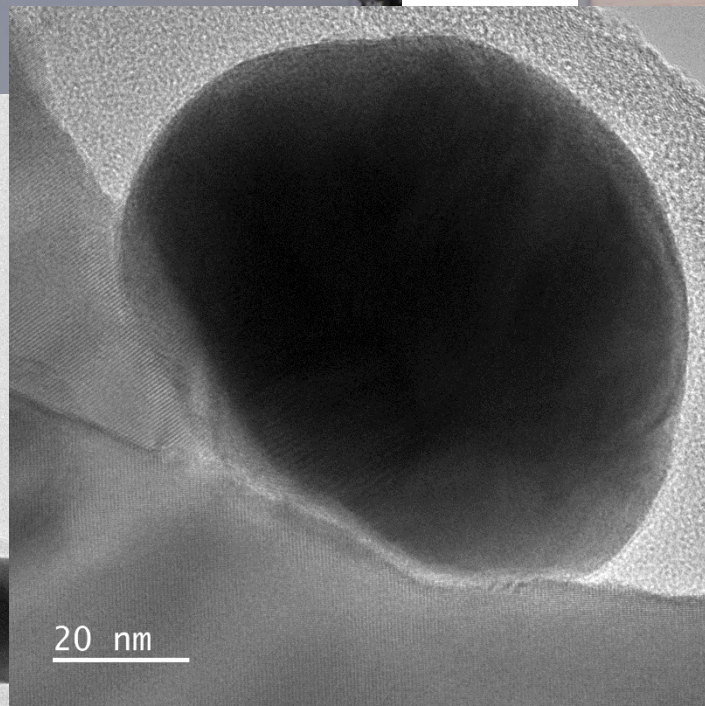
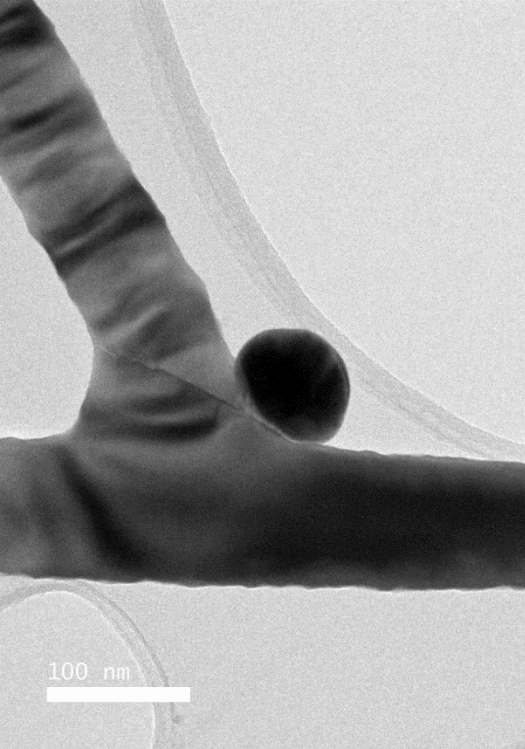
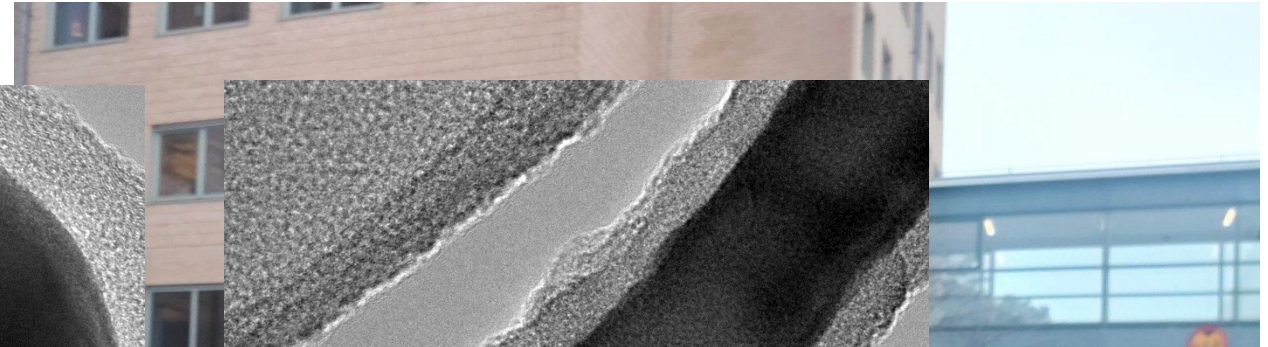
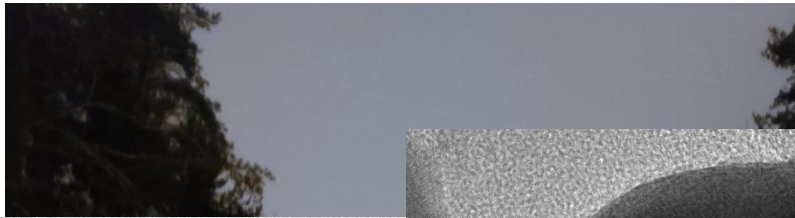
50mkg-10⁶





Secondments

The aim is to selection of L.Monocitogenes Antigen and TEM of ZnO-Au nanoplatforms



ZnO-Au

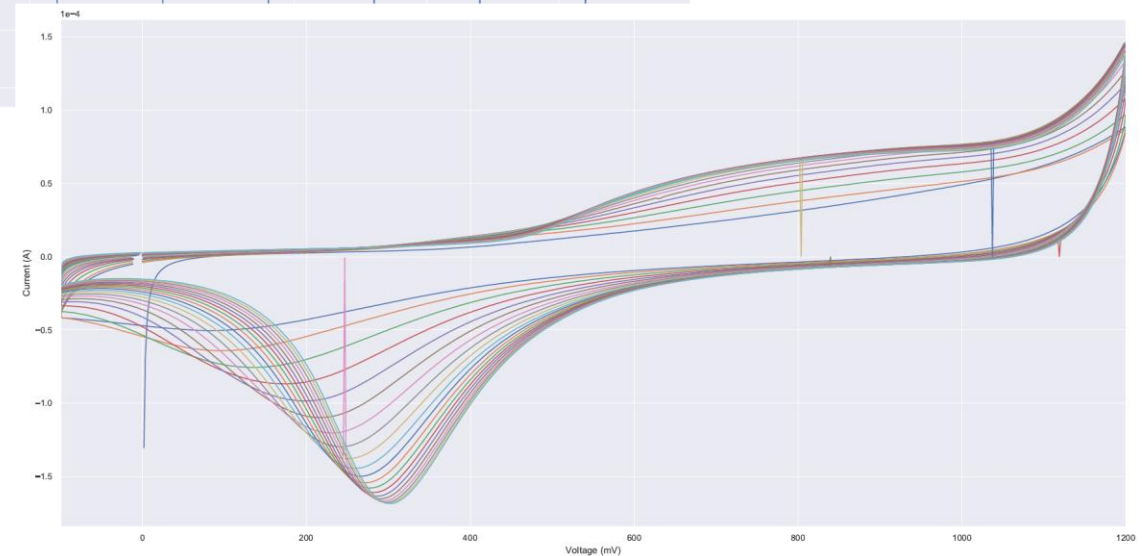
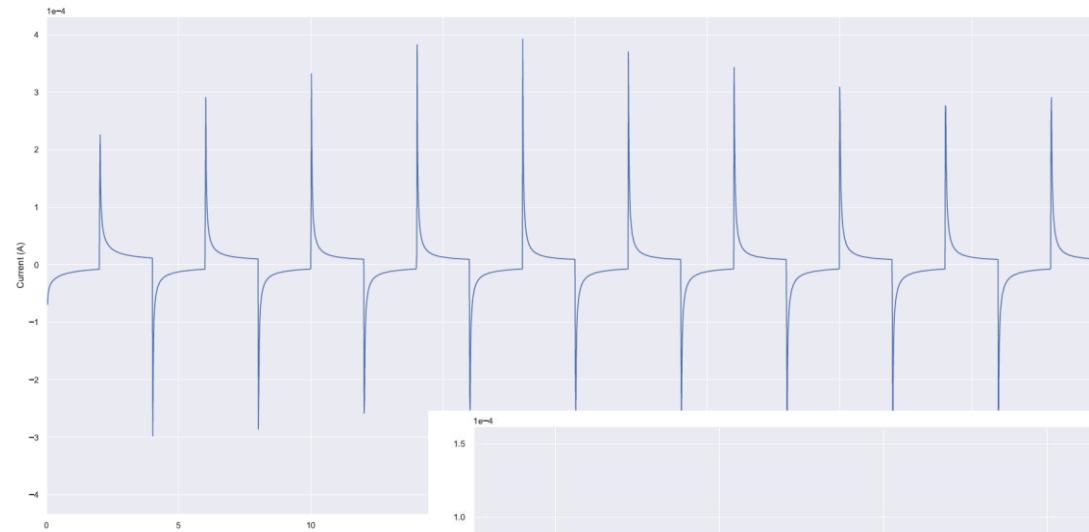
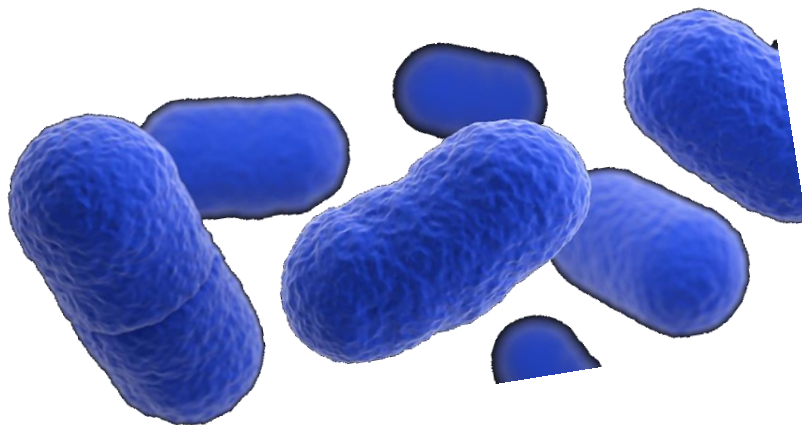
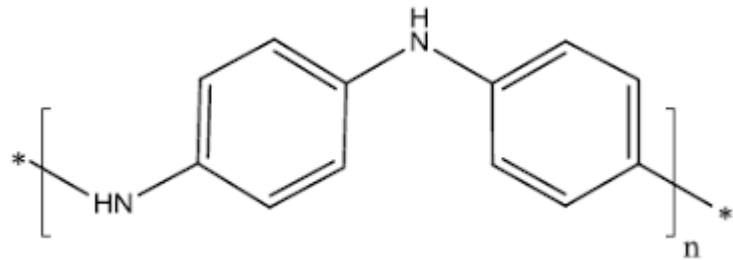
ZnO-PDA-PEI

Vilnius University



UNIVERSITY OF LATVIA

The aim is to development of MIP layer on ZnO and Pt electrodes





Submitted proposals

Best practices to submit your proposal: check this [FAQ](#) to find out some best practices to prepare the forms for your proposal and submit it.

My Proposal(s)

Results: 21

PROGRAMME	CALL	FUNDING SCHEME	PROPOSAL ID	ACRONYM	STATUS	REMAINING TIME	CLOSURE DATE (Brussels time)
HORIZON	HORIZON-CL4-2022-DIGITAL-EMERGING-01	HORIZON-RIA	101093134	PHOTOCOMP...	Final	Closed	05/04/2022 17:00:00
HORIZON	HORIZON-MSCA-2021-DN-01	HORIZON-TMA-MSCA-DN	101073477	TIREX	Final	Closed	16/11/2021 17:00:00
HORIZON	HORIZON-MSCA-2021-DN-01	HORIZON-TMA-MSCA-DN	101073189	AVANT	Final	Closed	16/11/2021 17:00:00
HORIZON	HORIZON-EIC-2021-						25/05/2021

Above the threshold

Under the evaluation



Latvijas Zinātnes padome

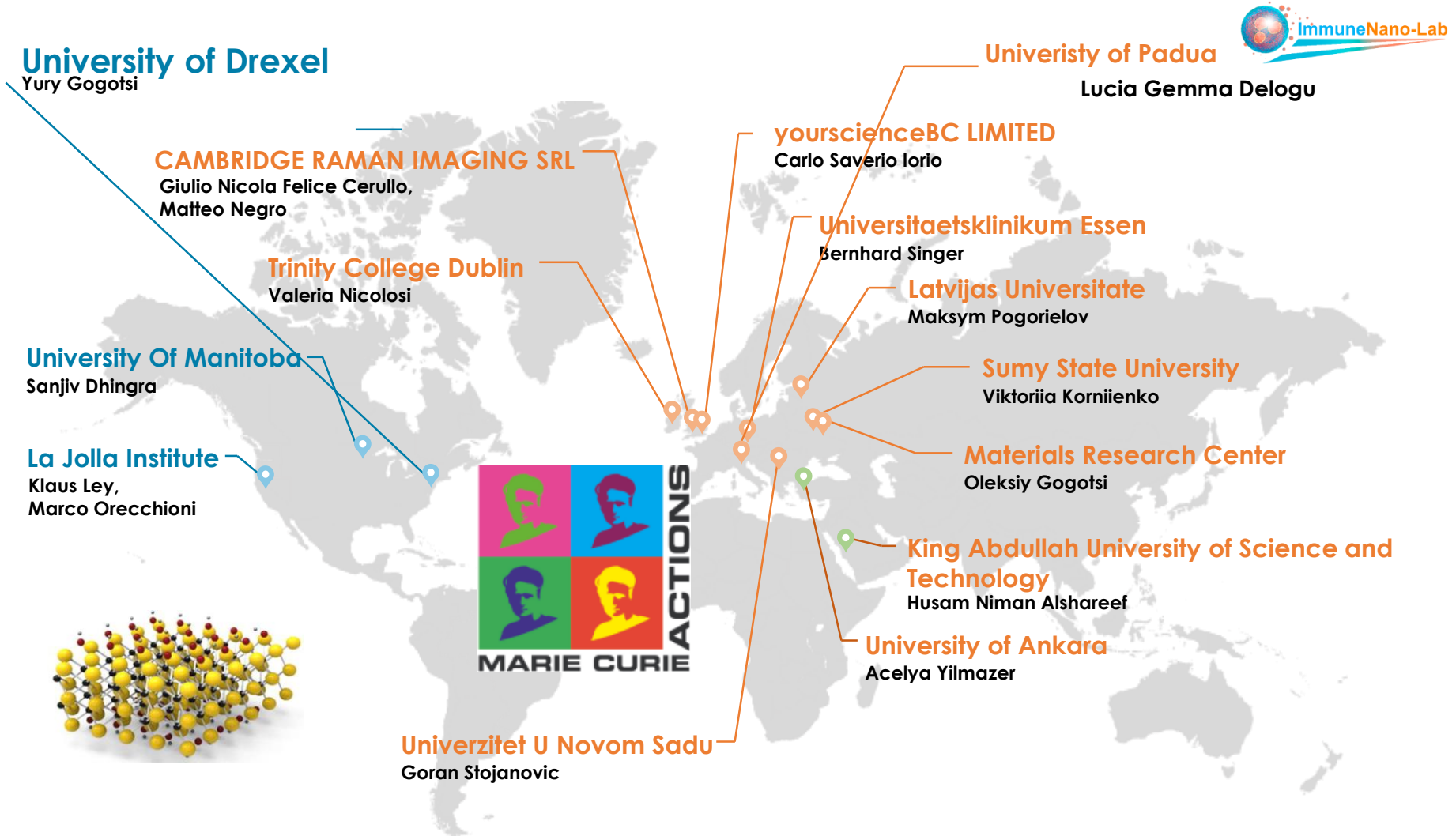




Two Horizon-Europe projects

Towards **MXenes**' biomedical applications by high-dimensional immune MAPping

MX-MAP



Opening new the perspectives of MXene in biomedicine by high-dimensional immune profiling

Towards **MXenes**' biomedical applications by high-dimensional immune MAPping

MX-MAP

Scientific excellence,
Interdisciplinarity,
inclusiveness.

*Uncovering the MXene interactions with the
main player of Human health:*

the immune system



The Consortium in numbers:

14 Partners

11 Countries

2 Companies

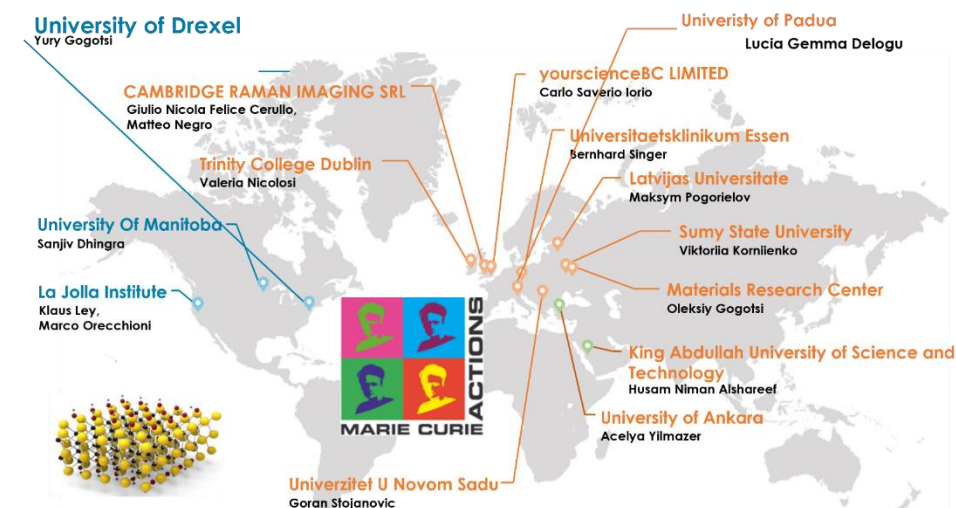
1.4 Mln EUR budget

half of the PIs comes from Chemistry and Material science

half of the PIs comes from Medicine and Biology

half of the PIs are female

half of the PIs are under 40'y old





Towards development of new antibacterial strategy for dentistry

ARGO



Development of new antibacterial materials for dentistry, particular for the development a new antibacterial root-filling material



Umea University
Thomas Boren

Umeadentallaboratory
Fredrik Jonson

Latvijas Universitate
Maksym Pogorielov

Vilnius University
Arunas Ramanavicius

NanoWave
Rafal Banasiuk

Sumy State University
Roman Moskalenko

6 Partners
5 Countries
3 Companies
915 K EUR budget



Conference participation



80th International Scientific Conference of the University of Latvia 2022



LATVIJAS UNIVERSITĀTE
ATOMFIZIKAS UN
SPEKTROSKOPIJAS
INSTITŪTS



FUNCTIONAL MATERIALS
& NANOTECHNOLOGIES

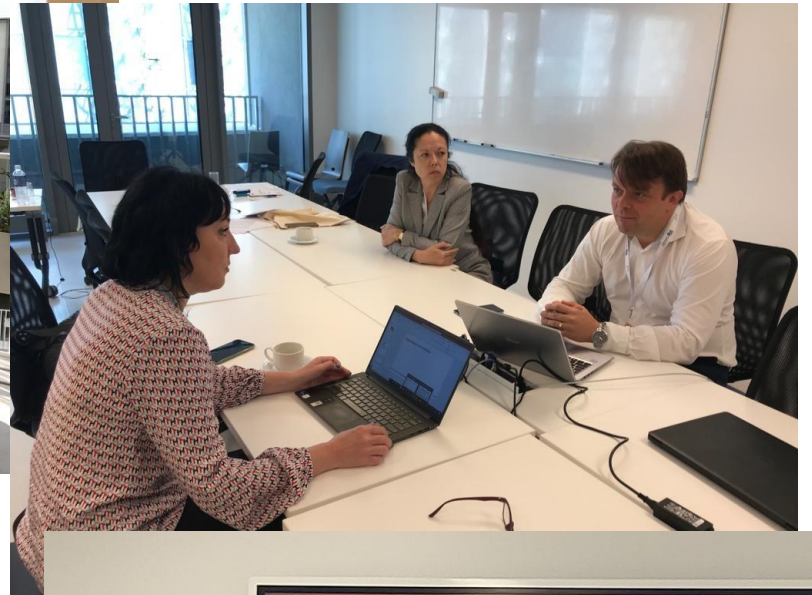
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Dr. Maksym Pogorielov





Networking



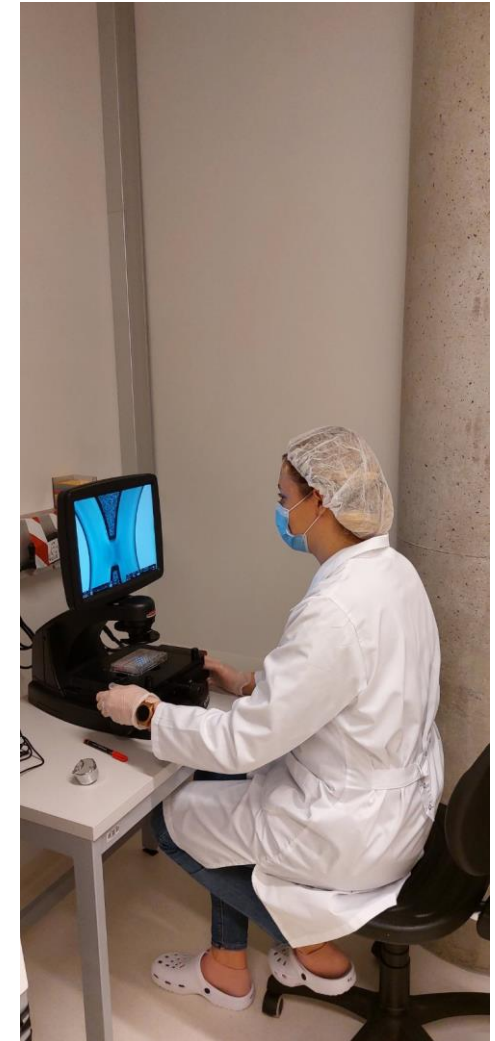
Collaboration



UNIVERSITY
OF LATVIA



LATVIJAS UNIVERSITĀTE
**MEDICĪNAS
FAKULTĀTE**



Social activities



What the main achievements during
the first year?



From the bottom of my heart –
thank you for the support!



UNIVERSITY
OF LATVIA





Paldies!

Thank You!

Даркю

NATIONAL
DEVELOPMENT
PLAN 2020



EUROPEAN UNION
European Regional
Development Fund

INVESTING IN YOUR FUTURE