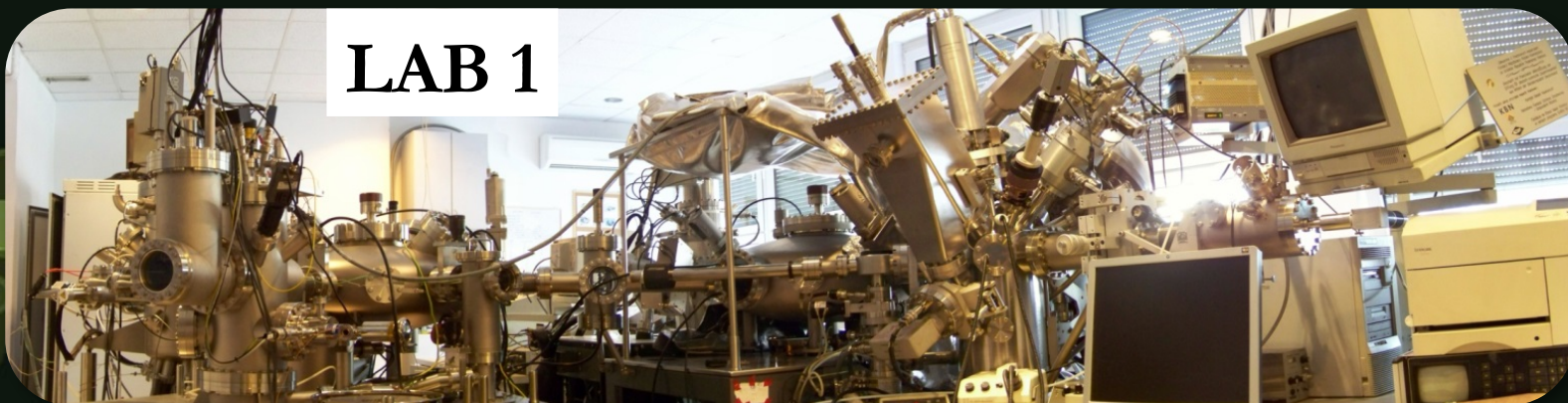


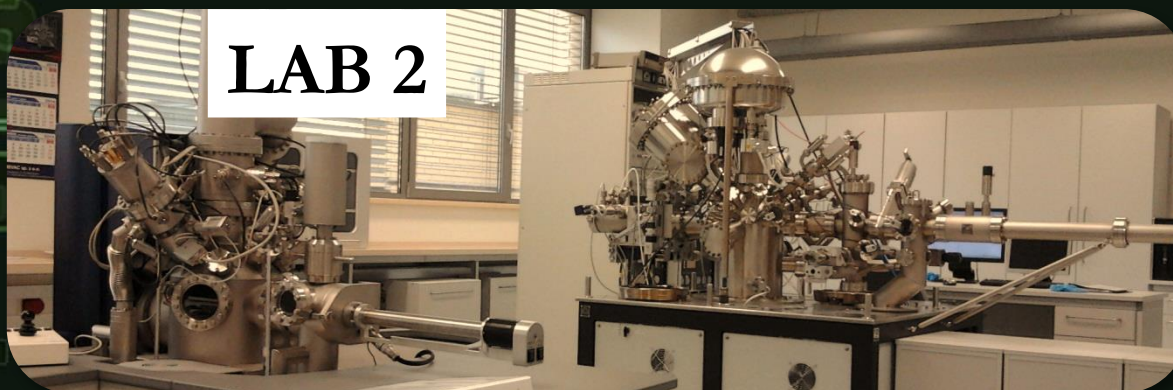
LAB 1



Surface Physics Laboratory

- MBE
- RHEED
- LEED
- XPS
- UPS
- AES & SEM
- AFM
- PREPARATION

LAB 2

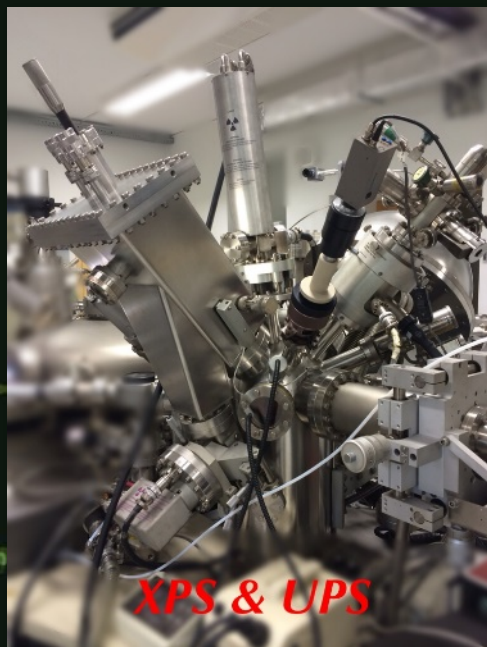


Project - Śląska Biofarma
Laboratory of Electron Spectroscopy

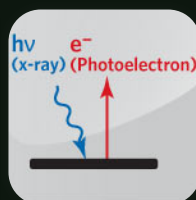
- ToFSIMS
- XPS

SELECTED LABORATORIES dedicated to the CLASTER MedSilesia

XPS –X-ray Photoelectron Spectroscopy



XPS & UPS



- (1) Physical Electronics PHI 5700/660
- (2) VG Scienta & Prevac

Monochromatic X-ray, Al, Mg anodes

Several apertures - probe size:

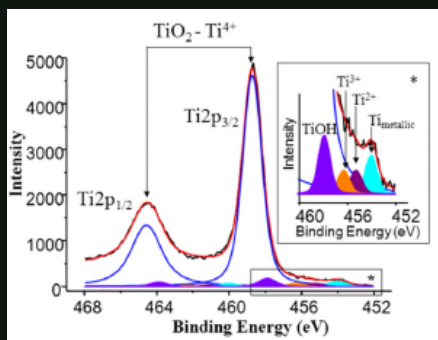
(1) 75 μm , 0.8-2mm

(2) 40-600 μm x 4mm

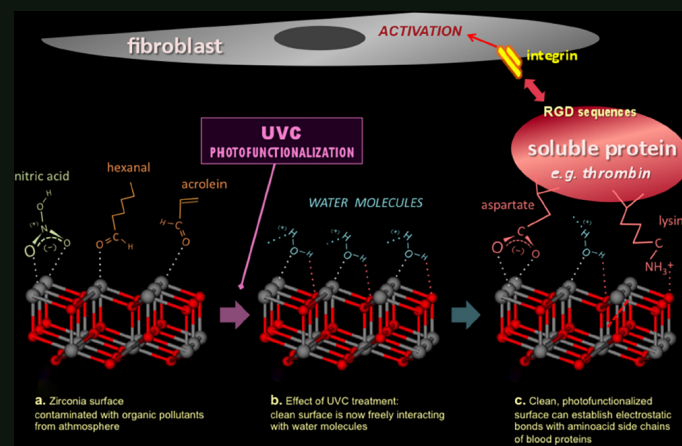
5-axis manipulator (X, Y, Z, tilt, rotation)

- Chemical state identification on surfaces
- Quantitative analysis, including chemical state differences
- Depth profiling, line scans, chemical mapping
- Detection limits typically ~ 0.1 at%, down to 100 ppm

Model of the effects of photofunctionalization on biocompatibility of zirconia surfaces.

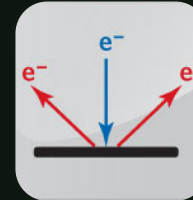
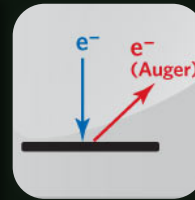
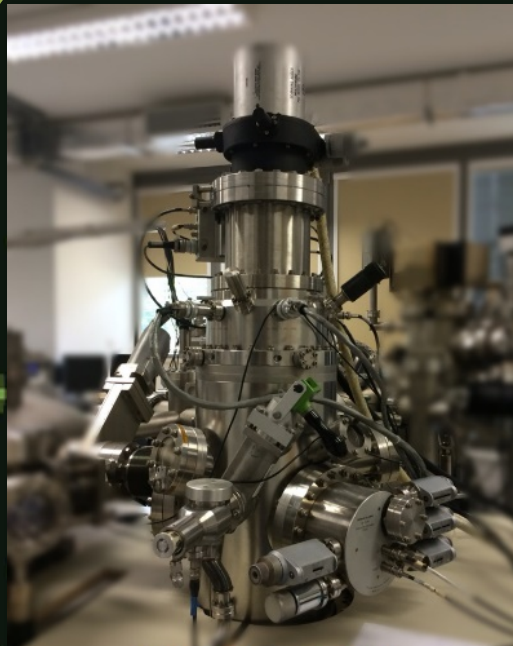


High resolution XPS spectrum of the Ti2p core line for the implant.



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AES – Auger Electron Spectroscopy and SEM – Scanning Electron Microscopy

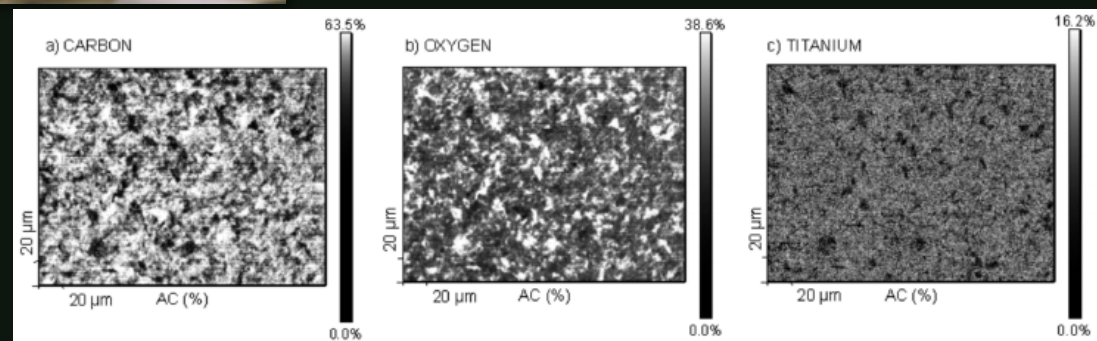


Physical Electronics
PHI 5700/660

Energy range up to 3200eV
Probe size up to 1mm
5-axis manipulator

- Chemical state identification on surfaces
- Identification of all elements except for H and He
- Quantitative analysis, including chemical state differences between samples
- Depth profiling, line scans, chemical mapping
- Small area analysis (~50 nm minimum)
- Excellent surface sensitivity (2-5 nm information depth)
- Detection limits typically ~ 0.1 at%

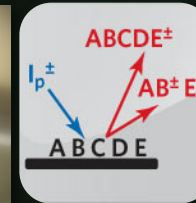
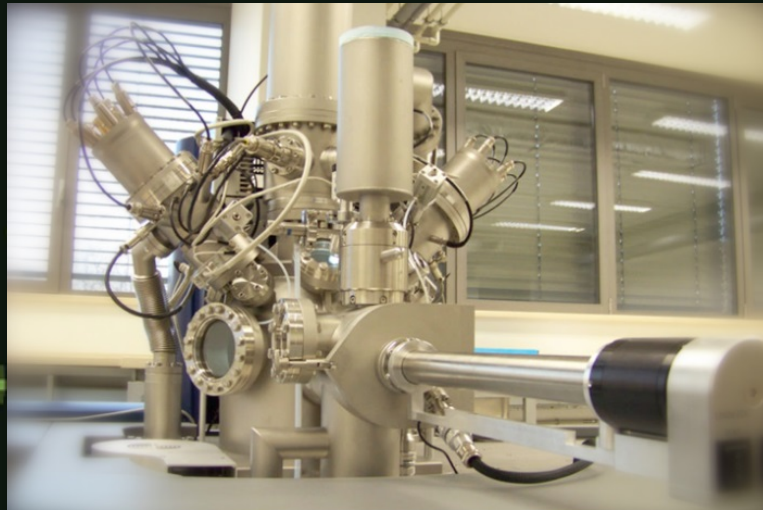
DLC COATINGS



The chemical distribution maps of oxygen (a), carbon (b) and titanium (c) obtained for the RAPID implant.

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Time of Flight Secondary Ion Mass Spectroscopy (Projekt Śląska Biofarma)



IONTOF ToFSIMS5

Primary beam:

Bi LMIG (30kV, 60kV)

Bi⁺, Bi₃⁺, Bi₃⁺⁺

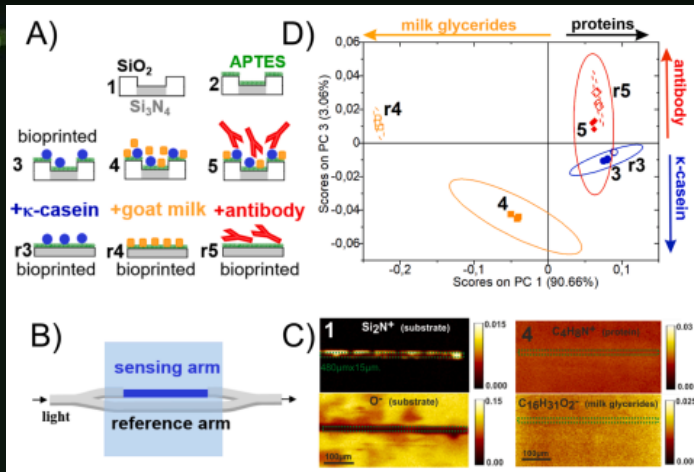
Ion gun: Cs, O, Ar

Beam size: 60nm

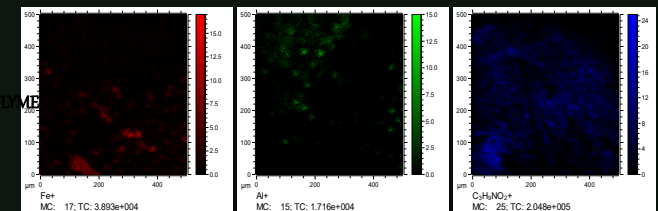
Depth resolution: below 1nm

Mass resolution ~9000

- Specific molecular information
- Excellent detection limits (ppm) for most elements
- Probe size ~0.2 μm for imaging
- Non-destructive
- Depth profiling is possible (3D & linear)



Molecular characterization of integrated on silicon chip biosensors after consecutive biofunctionalization and affinity assay steps.



MOUSE BONE