Location (city, country): Lisbon, Portugal

Director: Maria de Fátima Montemor

Contact person in NEWGEN: Catarina Santos - catarina.santos@estsetubal.ips.pt

Working Group involvement: WG3 (Fatima Montemor; Catarina Santos; Maria João Carmezim; Marta Alves)

Staff: Catarina Santos, Marta Alves, Maria João Carmezim

Research topics:
Metallic implants; bio-functionalization; bio-coatings; physic-chemical characterization

Researchers expertises: Biocompatible sol-gel coatings, degradable polymers, biocomposite coatings and bio-functional metallic implants; Synthesis and functionalization of calcium phosphate nanostructures;
Research expertise

- Biocompatible sol-gel coatings
- Calcium phosphate nanostructures
- Physico-chemical characterization
- Biofunctional metallic implants
- Biocomposite coatings

CSSE - Corrosion Science and Surface Engineering
BIODEGRADABLE, BIOFUNCTIONAL AND BIOACTIVE NANOSTRUCTURED COATINGS
SYNTHESIS AND FUNCTIONALIZATION OF CALCIUM PHOSPHATE NANOPARTICLES
<table>
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<th>PHYSICOCHEMICAL PROPERTIES</th>
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<tr>
<td>Size (distribution)/ Shape /Agglomeration and aggregation condition</td>
<td>FEG-SEM; TEM; AFM;</td>
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<td>Crystalline structure</td>
<td>XRD; Electron diffraction</td>
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<td>XPS; AES; ξ-potential; BET; Raman confocal; FTIR</td>
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<td>Stability/dissolution</td>
<td>ICP; UV-Vis; HPLC</td>
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<td>“In-Situ” monitoring of corrosion activity</td>
<td>EIS; SVET; SECM; LEIS</td>
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FEG-SEM- Field emission scanning electron microscopy; TEM-Transmission electron microscopy; AFM-Atomic force microscopy; XRD- X-Ray diffraction; XPS, X-ray photoelectron spectroscopy; AES- AES, Auger electron spectroscopy ; BET- nitrogen adsorption/desorption isotherm; FTIR- Fourier transform infrared spectroscopy, ICP- inductively coupled plasma, HPLC- High Performance Liquid chromatography; EIS- Electrochemical Impedance Spectroscopy; Scanning SVET-Vibrating Electrode Technique, SECM- Scanning Electrochemical Microscopy; LEIS- Localized Electrochemical Impedance Spectroscopy
CSSE CHARACTERIZATION FACILITIES

- JEOL 7001F FEG-SEM with Oxford light elements EDS detector and EBSD detector;
- SEM: Hitachi S2400 with Rontec standard EDS detector
- Hitachi H8100 TEM with ThermoNoran light elements EDS detector;
- Ion Mill: Gatan DuoMill 600DIF;
- Atomic force microscopy (including electrochemical) laboratory.
- Nanoindentation and sub micron self healing studies.
CSSE CHARACTERIZATION FACILITIES

- Two systems for Scanning Vibrating Electrode Technique (SVET) and one Selective Ion Electrode Technique (SIET);
- Scanning Electrochemical Microscope (SECM). Scanning Kelvin Probe (SKP);
- XPS-Auger, Microlab 310 F (Vg Scientific);
- Scanning Raman system, model LabRAM HR Evolution;
- Nicolet 5700 FTIR spectrometer;