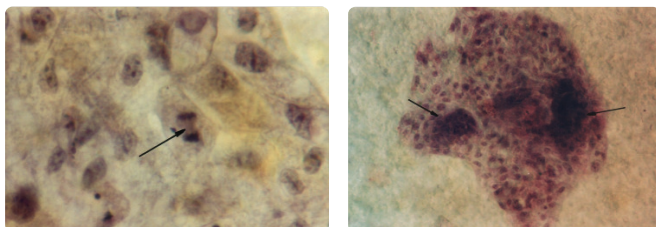




Department of Cellular and Molecular Biology,
National Institute R-D for Biological Sciences Bucharest, Contact Person: Dorian Albisor
University of Bucharest, Faculty of Biology, Contact person: Dr. Otilia Zarnescu

Your competence/your resources

- Light and electron microscopy techniques, image analysis;
- In vitro experimental models on primary cell cultures and stabilized cell lines;
- In vitro biocompatibility testing of biomaterials and nanostructures;
- Histology, immunochemistry, immunohistochemistry and molecular biology (PCR) assays;
- Extraction and purification techniques of natural polymers from animal connective tissues (collagens-COL-proteoglycans/glycosaminoglycans-PG/GAG-, elastin-EL);
- Biochemical assays: chromatography (thin layer, ion-exchange and gel chromatography), electrophoresis, zymography, western-blotting, UV-Vis spectrometry;
- Preparation of composite matrices (natural polymer/ polyvinyl chloride-PVC, polyurethane-PU) and their testing on different cell types (human dermal fibroblasts, epithelial cells, etc).

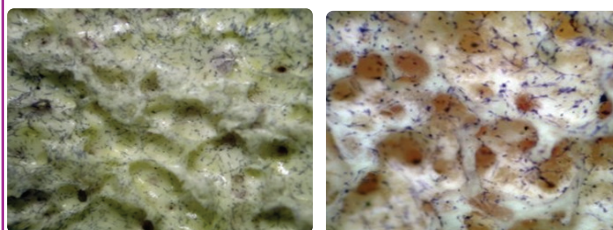


Light micrographs of epithelial cells cultivated on PVC bioactivated with 20% COL.

Our experience in Romanian Research Projects: CEEX-CALIST 6114 "Multifunctional natural matrix biopolymers for increased biocompatibility of medically used synthetic polymers". We coordinate a regional network of 6 partners with an adequate material basis and specialized personnel.

Your proposal/your interest

- Obtaining and structural characterization of natural polymers (COL, EL, GAG) with targeted properties
- New composite materials (synthetic polymers coated/mixed with biopolymers) for medical devices
- Biocompatibility analysis of different composite materials on stabilized and primary cell cultures (fibroblasts, chondrocytes, osteoblasts, epithelial and tumoral cells, etc)
 - evaluation of in vitro cytotoxicity using
 - spectrophotometric (XTT, Neutral red, LDH)
 - and spectrofluorimetric (fluorescence
 - polarization, excitation and emission
 - fluorescence spectra) methods, light and
 - electron microscopy (TEM, SEM);
 - genotoxicity evaluation of chromosomal
 - alteration and DNA analysis;
 - investigating gene activity by PCR and
 - Northern blotting
- Study of nanostructured composite influence on cell membranes using fluorescence measurements.



Stereomicroscope view of human dermal fibroblasts cultivated on PU bioactivated with COL and a COL-EL mixture.

Department of Cellular and Molecular Biology

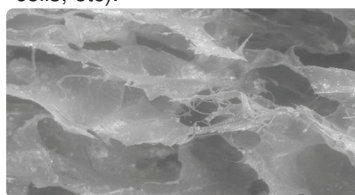
Contact Person: Dr. Lucia Moldovan

Proposal/Interest

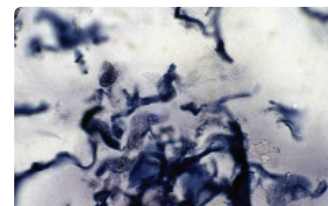
- To design a high biocompatible, bioresorbable composite microporous scaffold consisting of collagen (COL) and glycosaminoglycans (GAG) mixed with calcium phosphates (hydroxyapatite (HA), tricalcium phosphate (TCP)) and angiogenic substances (bFGF, VEGF)
 - Osteoblast and mesenchymal stem cell proliferation in 3D scaffolds
 - In vitro experimental models for biocompatibility testing and angiogenic effect:
 - ⇒ cell viability and proliferation assessment by spectrophotometric (MTT, Neutral red, LDH tests) and spectrofluorimetric methods;
 - ⇒ cell morphology evaluation by light and electron microscopy;
 - ⇒ analysis of matrix metalloproteinases secreted in the culture medium by gelatin-zymography
 - ⇒ angiogenic effect on endothelial cells (EA.hy926)
 - Histochemical and immunohistochemical assays for osteoblast-specific markers (alkaline phosphatase, osteocalcin)
 - In vivo studies of bone defect healing using these new tissue substitutes

Competence/Resources

- Light and electron microscopy techniques, image analysis;
- In vitro experimental models on primary cell cultures and stabilized cell lines;
- In vitro biocompatibility testing of biomaterials and nanostructures;
- Histology, immunochemistry, immunohistochemistry and molecular biology (PCR) assays;
- Extraction and purification techniques for extracellular matrix components (collagens-COL-, proteoglycans/glycosaminoglycans-PG/GAG-, elastin-EL);
- Biochemical assays: chromatography (thin layer, ion-exchange and gel chromatography), electrophoresis, zymography, western-blotting, UV-Vis spectrometry;
- Preparation of composite matrices as scaffolds for different cell types (fibroblasts, osteoblasts, chondrocytes, mesenchymal stem cells, etc).



SEM micrograph of COL sponge



Osteoblasts seeded in 3-D COL-TCP scaffolds