

BASIC SCIENCE

Person-in-charge Paola Rizzo

Location: LLTA center in Old S. Anna Hospital

12 basic researchers

This unit, consisting of 5 basic science laboratories, is located outside the “New” S. Anna Hospital, in the “old” S. Anna hospital in the centre of the city of Ferrara, within the LLTA centre (*Laboratory for Advanced Therapy Technologies*) of the University of Ferrara. As previously stated, there is a close link between basic science and the clinical cardiology. The unit is under the leadership of Prof Rizzo, expert in studying the role of the NOTCH system both in oncology and in cardiology. Several technologies are available in the unit as:

- a) Cell culture;
- b) In vitro models of isolated heart;
- c) Cell viability assays (necrosis, apoptosis, cell cycle analysis, DNA genotoxicity, autophagy, senescence);
- d) Reporter gene assay;
- e) Cell metabolism assays (spectrophotometric and chemiluminescence-based assays: metabolic labeling);
- f) Immunoblotting, co-immunoprecipitation;
- g) Cellular and nuclear protein extraction;
- h) Nucleic acid extraction;
- i) Genotyping assay;
- j) Primary cultures from tissues;
- k) Real time PCR;
- l) PCR;
- m) Chromatin immunoprecipitation (ChIP);
- n) Electrophoretic mobility shift assay (EMSA);
- o) 3Dprinting.

The most important lines of research include:

- a) Oestrogen mediated regulation of NOTCH in breast cancer and angiogenesis;
- b) Molecular mechanism underlying endothelial dysfunction and atherosclerosis with emphasis of the role of NOTCH pathways on life and death of the endothelium;
- c) Molecular mechanisms underlying the ischaemia-reperfusion damage in the heart;
- d) Natriuretics and reduction of cardiovascular risks;
- e) Reconstruction of human coronary artery with a 3Dprinting technology.

Phase-contrast microscopy analysis of the morphology of live human cells attached to plastic plates and treated with anti-apoptotic agents.



Long-term storage of cells isolated from cancer and cardiovascular patients. The researcher is inserting the cells in scaffolds for storage in containers containing liquid nitrogen (-196°C).



Human cells can be grown in plastic vessels (flasks) in the presence of a liquid medium containing nutrients required for cells proliferation. The researcher, working under a sterile hood to prevent bacterial contamination, is collecting the cells using a pipettor to aspirate the liquid.



f)



g)

h)

The researcher is using the gentleMACS dissociator for the semi-automated dissociation of a tumoral tissue into single-cell suspension



The researcher is inserting a plastic tube containing a suspension of human cells in a centrifuge. The centrifugation utilizes an applied centrifugal force field to separate the cells from the medium in which they were grown.

