

Division of Pathology and Laboratory Medicine

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Activities 2007. The 2007 clinical activity of the Division has included 19,087 histological diagnoses and 11,077 cytologic diagnoses (4900 fine needle aspiration biopsies or extrvaginal exfoliation cytology samples and 6,177 PAP tests), with 2,667 cases seen in consultation for a second opinion and 3,768 frozen section examinations for intraoperative diagnosis. Among the different tumor types, we have examined over 3900 breast cancer samples with 1934 biopsies of sentinel lymph nodes, over 2000 surgical specimens of gynaecological pathology, almost 900 specimens of thoracic pathology and 373 skin malignant melanomas.

Besides a diagnostic laboratory supplied with the most updated equipments for histologic and cytologic investigations, the Division includes two functional sections of immunohistochemistry and molecular pathology supplied with automatized instruments that are able to offer extensive immunophenotyping and molecular characterization of normal and tumor tissues by using a large array of monoclonal and polyclonal antibodies, fluorescence *in situ* hybridization (FISH), and polymerase chain reaction (PCR) techniques. More than 40,000 immunohistochemical reactions, 1014 FISH assays and 828 PCR analyses have been routinely carried out in 2007 for tumor geno-phenotyping, including the immunohistochemical evaluation of estrogen and progesterone receptors, HER-2 and EGFR in tumors for tailoring individual therapy; the characterization of malignancies from unknown primary sites; the assessment of gene amplification in carcinomas and gene translocation in malignant non-Hodgkin lymphomas and soft tissue tumors; and the mutational analysis assessment of EGFR, PDGFRA, PDGFRB, and c-kit genes.

The research activities accomplished during 2007 have been related to the clinical implications of micrometastases and isolated tumor cells in sentinel lymph nodes of breast carcinoma patients, to chemoprevention trials for breast and lung carcinoma, to the pathologic and



molecular characterization of spiral computed tomography scan-detected lung carcinoma, to the modulation of receptor status of tumor cells by therapy, and to the search for new biological parameters and the assessment of their clinical implications in patients with laryngeal, mammary, pulmonary and colonic carcinomas, melanomas, and lymphoproliferative disorders. Research activities also included the methylation status evaluation of lung cancers, the mutational analysis of EGFR, PDGFRA, PDGFRB and c-kit genes and the detection of cell-free circulating nucleic acids (DNA&RNA) in the plasma of cancer patients. All these activities have required extensive immunophenotyping and molecular characterization

of tumor tissues, using automatized immunostainers, PCR-, *real time* PCR-based and FISH techniques, tissue microarrays, and laser capture-assisted microdissection for tumor cell enrichment.

The research activities of the Division, including the studies performed in collaboration with the Divisions of Experimental Oncology, Senology, Medical Oncology, Thoracic Surgery and Chemoprevention, have resulted in 55 full articles published during 2007 in peer-reviewed international journals, with an overall IF of 211.738 (mean IF: 3,849). The Division hosts the 2nd Postgraduate Medical School in Pathology of the University of Milan.