PROJECT: DSB.AD007.043 / BIOMOLECULAR AND GENETIC MARKERS IN IMMUNOLOGICAL AND NEURODEGENERATIVE PATHOLOGIES.

Analysis of the genetic and functional mechanisms underlying the inflammatory immunological response processes in the field of kidney transplants and in oncology: definition of biomarkers predicting immune dysregulation.

1. In the field of transplants, the following milestones have been achieved:

   a. **Development of new molecular biology techniques**, such as PCR-SSP amplification, hybridization with radioisotope and colorimetric techniques (PCR-SSO), PCR-SBT and cloning of PCR products (new alleles); analysis of STR fragments (paternity research and microchimerism); Real-Time PCR (StepOne RealTime PCR system) and Taqman chemistry.  
      *(stages: years 1990-92 Immunogenetics Laboratory Institute for the Study and Treatment of Tumors (IST) of Genoa; year 1995 Institute of Microbiology and Immunology of Georgetown University in Washington, United States of America).*

   b. **Evaluation of class I and II HLA histocompatibility at both allelic and residue or CREG levels and correlation of HLA immunogenicity with clinical performance in renal transplantation** (A. Canossi, F. Papola, G. Ozzella).

      Analysis of cytokine genotypes, of the gene polymorphisms of the CTLA-4 molecule and "non-invasive" monitoring of the cDNA expression of the fl- and solCTLA-4 isoforms and of FOXP3 (Treg) for the prediction of clinical outcome post-transplant (cellular and humoral response) in the short and long term.  
      *(Ethics Committee n.0098164 / 2011).*

      Clinical goal: possible use as an immunotherapeutic target in post-renal transplantation and for personalized IS therapy.

      Years 2011-2013: Carispaq Foundation grant (in collaboration with Dr. Aureli A.)

   d. **Study of the allelic polymorphism of HLA class I and II genes with high resolution typing techniques, definition of rare and new alleles, assignment of the best HLA matching in stem cell transplantation**. (A. Canossi, A. Aureli, D. Piancatelli, G. Ozzella, T. Del Beato).
      Contract CNR-Regional Center for Immunohematology of L'Aquila (yrs1993-2008), diagnostic services for HLA histocompatibility in transplants (SBT typing), microchimerism and paternity research (analysis of STR fragments) (years 2006-2008). ASHI and EFI certification.

      Population studies in the context of multicentre Workshops (15-17th IHWG) of the clinical effects of various immunological factors (HLA, mHAg, KIR) on GvHD and GVL after matched and unrelated transplantation.

      Yr 1998: USA-ITA Bilateral Project.

2. In the oncology field, the following results:

b. **Immunogenetic studies of the immune dysregulation of KIR-HLA genes and CD16A receptor in the pathogenesis and progression of colorectal and breast cancer** (A. Canossi, A. Aureli, G. Sconocchia, T. Del Beato, AL Serafino). Participation to: Research Project ART (responsible: Dr. Aureli A.), anni 2014-2015 (contratto 312/U del 2014), Roma Tor Vergata. AIRC grant 10555 “Clinico-pathological role of FcgammaRIII inflammatory infiltrate in common epithelial malignancies” Dr. G. Sconocchia (yrs 2011-2013).


**Collaborations:**

Regional Center for Organ Transplantation (CRT), S. Salvatore Hospital, L'Aquila. Regional Centre of Immunohematology and Tissue Typing, San Salvatore Hospital, L'Aquila.

Contract with Department of Biotechnological and Applied Clinical Sciences, University of L'Aquila (Prof. Pisani, Dr. A. Tessitore).

Department of Experimental Medicine and Surgery, The University of Rome, Tor Vergata, Italy.

Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy.

Suggested Intra-departmental collaborations: CNR Institute RGB, Cagliari.

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**References:**


**Key words:** HLA, kidney transplantation, cancer, stem cell transplantation, KIR, CTLA-4.

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