

Cytometry Unit

Founded in 1999 as a **Flow Cytometry Unit** associated to Immunopathology Laboratory, led by Dr. Cornel Ursaciuc, this new unit was fulfilling a major goal of the Immunology Department - to undertake its own flow cytometry studies.

The first flow cytometer was Coulter "Epics Profile II" (1 laser, 2 color, 4 parameters), received as a donation from „Wilhelminen” Hospital, Wienn. With a relatively advanced degree of usage, this device was used intermittently for two years and served mainly for studies of cell cycle and apoptosis in cultured tumor cells treated with malignant proliferation inhibitors (inhibitors of protein kinases, antitumoral cytokines).

In 2000, following the equipment supplied programme of Ministry of Health, the unit received a new Becton-Dickinson flow cytometer "FACSCalibur" (2 laser, 4 color, 6 parameters), which replaced the old unit. Since then, benefiting from the contribution and experience of Dr. Eugen Radu and then the young researchers in the department Bioch. Adrian Munteanu and Chem. Mihaela Surcel, flow cytometry unit has diversified, making a large number of tests largely involving research, but also an important diagnostic activity:

- Peripheral blood lymphocyte immunophenotyping in immune diseases (immunodeficiency, autoimmune disease, chronic hepatitis, malignancy)
- Immunophenotyping of lymphoid cell cultures or tumor cells
- Immunophenotyping of peripheral blood platelets pre-eclamptic syndrome
- Phenotypic characterization of dendritic cells
- Immunophenotyping in leukemia and lymphoma
- Evaluation of the cell cycle and apoptosis for tumor cells and lymphocytes
- Evaluation of phagocytes activity
- Determination of HLA-B27 phenotype
- Characterization of cellular dynamics of Ca²⁺ ions
- Characterization of intrahepatic lymphocyte populations in mouse liver

Due to the importance of the study of cell markers by flow cytometry, a large number of projects within the Immunology Department and other departments of the Institute have included this methodology in the current research activities. Also, assessing the cellular immune response for immunodiagnostic purposes is done at present by flow cytometry. These needs have made that the number of determinations in Cytometry Unit to be significant, and the accuracy of these measurements was certified by BD Company.

In 2005, from Lecturer MD PhD Mihai Hinescu initiative, scientific director, the unit was rearrange into a new location and upgraded with a confocal microscope and an inverted microscope with fluorescence and image capture, becoming Cytometry Unit. The unit is designed for cellular imagistic studies, involving flow cytometry (analysis and sorting), fluorescence microscopy, confocal microscopy, image acquisition and processing by computer.

In 2009, through an institutional development project - PN2 National Research Programme, the unit acquired a new flow cytometer BD "FACSCanto II" (3 lasers, 8 colors, 10 parameters), which works besides the existing device. This cytometer is designed for research studies and clinical investigation, at a much more complex level than so far, the investigation area increasing in diversity and rapidly.

The unit has not a staff by itself, but is intended for use by all research groups from institute, interested in the field. The coordination of the Cytometry Unit and supervision of the activities was carried out between 2005-2007 by MD, PhD Eugen Radu, and since 2007 of Chem. Mihaela Surcel.

The unit is open to all potential users from institute and accessible to research groups from other centers. Work unit will be improved and will be diversified, by the numerous requests for flow cytometry or confocal microscope determinations, for institute and partnerships projects and for external collaborators.



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Personnel*

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