

## Immunology Section

The IMMUNOLOGY SECTION is composed by: 1 Full Professor (presently on temporarily leave from work), 1 Associate Professor, 2 Assistant Professors with permanent contract, 2 Temporary Assistant Professor (type A researcher), 1 Graduate Technician, 3 Laboratory Technicians.

Since 1982, this Section hosts also the Complex Operative Unit (UOC) of Immunology of the Hospital of Verona (Azienda Ospedaliera Universitaria Integrata di Verona). At the present, the UOC of Immunology is directed pro tempore by Dr. Giovanna Zanoni (MD) and composed by: 3 Hospital MDs, 2 Hospital Biologists, 1 University Full Professor in convention with the Hospital (presently on temporarily leave from work), 2 University Assistant Professors in convention with the Hospital, 8 Hospital Technicians and 3 University technicians in convention with the Hospital, 2 Secretary Assistants.

### LOCATION

The IMMUNOLOGY SECTION is at the second floor of the building named "PIASTRA SERVIZI" of the Policlinico G.B. Rossi (see the document: map of Section entry), occupying a surface of about 1200 mq (see the document: map of the Section) is composed by 21 laboratories, for a total area of 1,200 square meters, equipped to perform cell cultures (10 cell-incubators, 12 laminar flow hood), molecular biology (RNA extraction area, a PCR-laboratory divided into three areas, according to the number of technological operations: (a) sample preparation area; (b) reaction mix preparation area; (c) detection area), cytofluorimetric analysis (1 Facs-CANTO II, 2 Gallios Beckman Coulter), radioisotope manipulation, standard plasmid cloning (1 ultracentrifuge), lentiviral/retroviral vector production (SBL2 and 2 independent SBL3 containment labs). In addition to offices, research laboratories and secretariat room, the section is also equipped with a meeting room and a library.

### TEACHING ACTIVITIES.

The lecturers of the section teach at different courses:

- Combined Bachelor's + Master's degree in Medicine and Surgery (Verona)
- Combined Bachelor's + Master's degree in Medicine and Surgery (Trento)
- Combined Bachelor's + Master's degree in Dentistry and Dental Prosthetics (Verona)
- Bachelor's degree in Biomedical Laboratory Techniques (to qualify as a biomedical laboratory worker) (Verona),
- Bachelor's degree in Biotechnology (Verona)

Moreover, the lecturers of the section organize three elective courses Combined Bachelor's + Master's degree in Medicine and Surgery: i) Supplementary research and laboratory diagnostic informations on Autoimmunity; ii) Tumor immunology and immunomodulation; iii) The use of basic Immunology in clinical practice. Finally, the lecturers of the section teach also in 4 post-graduate Specialization schools of the Medical School and in the research practical course of Propedeutic sciences to Medical Practice. Indeed, some AOUI member actively participate in teaching activities of Specialization schools:

- Dr. Giovanna Zanoni, tutor of Specialization School of Allergologia ed Immunologia Clinica (D.I. 68/2015) and Specialization School of Igiene e Medicina Preventiva
- Dr. Arcolaci Alessandra, tutor of Specialization School of Allergologia ed Immunologia Clinica (D.I. 68/2015)

### RESEARCH ACTIVITY

The research activity of the section is mainly on tumor immunology as testified by different research grants (2011-2022): **20 approved international/national grants for a total of 9.528.050€** supported from different entities such as Associazione Italiana per la Ricerca sul Cancro (AIRC), Fondazione Cariverona, Italian Ministry of Health, Italian Ministry of Education, University and Research,

European Commission, Cancer research Institute (USA) and Qatar National program) and **239 peer-reviewed articles** (total impact factor: 2122.29; average of impact factor 8.88; total citations: 17.593; average of citation: 73.61). In the last 10 years, Prof. Bronte filled 4 international patents and Prof. Ugel filled 2 international patents as result of research activity. To finalize this intense research program the Immunology section is supported by local, national and international research groups (>60 collaborations) such as Humanitas University (Milano), University of G. D'Annunzio (Chieti), University of Padova, Istituto Oncologico Veneto (Padova), University of Sacro Cuore (Roma), University of Modena e Reggio Emilia, Istituto Nazionale dei Tumori (Milano), University of Lyon (France), Inserm (France), King's College of London (United Kingdom), Norwegian University of Science and Technology (Norway), Io-biotech (Denmark), BioNtech (Germany), Tron (Germany), Max-Planck Institute of Biochemistry (Germany), Elpis Biopharmaceuticals (USA), Codiak (USA), University of Miami (USA), University of Minnesota (USA), National cancer Institute (USA), Loyola University Chicago (USA), Broad Institute (USA), Icahn School of medicine at Mount Sinai (USA), Weizmann Institute of Science (Israel), Wuhan Institute of Virology (China), Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen University (China).

The most relevant research fields are:

- Regulatory mechanisms of tumor immunoevasion and development of innovative strategies to reinforce cancer immunotherapy (Prof. Vincenzo Bronte, Prof. Stefano Ugel, Dr. Stefania Canè, Dr. Francesco De Sanctis, Dr. Silvia Sartoris);
- Cancer-mediated reprogramming of myeloid cells (Prof. Vincenzo Bronte, Prof. Stefano Ugel, Dr. Stefania Canè, Dr. Francesco De Sanctis, Project supported by Associazione Italiana per la Ricerca sul Cancro AIRC: AIRCIG2019\_Prof. Bronte; MIFAG2018\_Prof. Ugel);
- Arginase-1 targeting (Prof. Vincenzo Bronte, Dr. Stefania Canè, Project supported from Cancer Research Institute: CLIP 2017 Prof. Bronte);
- Cell-communication between T cells and cancer cells in the tumor-microenvironment (Prof. Vincenzo Bronte, Dr. Francesco De Sanctis, Project supported from Cancer Research Institute: CLIP 2020 Prof. Bronte);
- Myeloid cells involvement in the metastatic process (Prof. Vincenzo Bronte, Prof. Stefano Ugel, Dr. Stefania Canè, Dr. Francesco De Sanctis, Project supported by AIRC: AIRCIG2016\_Prof. Bronte);
- Myeloid-derived suppressor cells (MDSC) definition and molecular characterization as potential predictive biomarker for cancer patients' outcome and response of immunotherapy (Prof. Vincenzo Bronte, Prof. Stefano Ugel, Dr. Stefania Canè, Dr. Francesco De Sanctis, Dr. Silvia Sartoris, Euronanomed 2017\_Prof. Bronte);
- Set up of new cancer immunotherapeutic strategies (Prof. Vincenzo Bronte, Prof. Stefano Ugel, Dr. Stefania Canè, Dr. Francesco De Sanctis, Dr. Silvia Sartoris, Italian Ministry of Education, University and Research PRIN2017\_Prof. Ugel);
- Myeloid cell alteration induced by infection and cancer (Prof. Vincenzo Bronte, Prof. Stefano Ugel, Dr. Stefania Canè, Dr. Francesco De Sanctis, Dr. Silvia Sartoris; Project supported by Fondazione Cariverona: ENACT2020 Alleati contro il COVID-19\_Prof. Bronte; Italian Ministry of Education, University and Research PRIN2017\_Prof. Bronte)
- Cancer immunotherapy (Dr. Vladia Monsurrò);

Clinical research activity is also performed by the Hospital personnel:

- ✓ gluten-dependent pathologies (Dr. Giovanna Zanoni, MD of the Hospital staff and Director pro tempore of the Hospital Unit, in collaboration with the Internal Medicine section of the Dept. of Medicine)
- ✓ vaccine-surveillance (Dr. Giovanna Zanoni, MD of the Policlinico hospital staff, responsible of the Pre-vaccinal Consultancy Regional Program and vaccination adverse events surveillance "Green

Channel", MD of the Policlinico hospital staff, in collaboration with Prof. Ugo Moretti, Dept. of Diagnostics and Public Health, Pharmacology Section, and with the Directory of Prevention, Food Security, Veterinary of the Veneto Region)

### **EDUCATION ACTIVITY**

The lecturers of the section participate to the PhD School in Inflammation, Immunity and Cancer.

From 2011 to 2021, **10 PhD students finalized their program** at immunology section: 4 were enrolled in national education system, 2 were enrolled in pharmacological industry, 2 were enrolled in other research groups, 2 are still in the immunology section as Post-Doc.

From 2011 to 2021, numerous students were enrolled as Bachelor's students: 8 Master Degree in Molecular and Medical Biotechnology, 10 Degree in Biotechnology, 5 Master Degree in Medicine and Surgery, 1 Biomedical Laboratory Techniques. Moreover, 3 visiting students select the immunology section for their program: Alberto Utero Urico (Spain, supported by EFIS Board 2019), Hiroshi Tsujii (Japan, supported by Erasmus Traineeship 2019) and Fang Qi (China, supported by China Scholarship Council 2021).

### **DIAGNOSTIC AND DAY HOSPITAL ACTIVITY**

Since 1982 the Immunology Section hosts also the Complex Operative Unit (UOC) of Immunology of the Hospital of Verona (Azienda Ospedaliera Universitaria Integrata di Verona). The Immunology Unit is organized as a specialist service that provides laboratory and outpatient services. The laboratory performances mainly concern the diagnosis and the follow-up of Allergic Diseases, Autoimmune Diseases and Lymphocyte Population Analysis (Lymphocyte Typing). The outpatient activity consists of activities for the certification of rare diseases (Primary Immunodeficiencies) and adverse events in vaccination called "Green Channel". All information can be found on the website:

<https://www.aovr.veneto.it/dipartimenti-sanitari/-/departments/immunologia/informazioni-general>

### **COMPOSITION of the SECTION**

University Components (in alphabetical order):

1. Adamo Annalisa: PhD (AIRC-fellow)
2. Anselmi Cristina: Laboratory Technician
3. Barouni Roza Maria: PhD
4. Brentonego Marica: Fellow
5. Bronte Vincenzo: Full Professor and e Director of the Dept. Section and of the Hospital Operative Unit, presently on temporarily leave from work)
6. Caligola Simone: PhD
7. Canè Stefania: Assistant professor type A (RTDA) in convention with the Hospital
8. Cestari Tiziana: Laboratory Technician
9. De Sanctis Francesco: Assistant Professor type A (RTDA)
10. Dusi Silvia: PhD
11. Fracasso Giulio: Laboratory Technician
12. Frusteri Cristina: PhD
13. Giacobazzi Luca: Fellow
14. Hu Yushu: Fellow
15. Matteoli Aurora: Laboratory Technician
16. Monsurrò Vladia: Assistant Professor (RTI)
17. Musiu Chiara: PhD

18. Poffe Ornella: Laboratory Technician
19. Qi Fang: Visting student
20. Rizzini Davide: Fellow
21. Sartoris Silvia: Assistant Professor (RTI) in convention with the Hospital
22. Ugel Stefano: Associate Professor
23. Wang Tian: PhD-student

Hospital Components (in alphabetical order):

1. Alessandra Arcolaci: MD
2. Brentegani Monica: Laboratory Technician
3. Brutti Nadia: Laboratory Technician
4. Chiesa Elena: Laboratory Technician
5. Gabrielli Oretta: Laboratory Technician
6. Gomirato Selena: Biologist (presently on temporarily leave from work)
7. Lovato Daniel: Secretary Assistant
8. Lucchini Elena: Laboratory Technician
9. Martini Morena: Laboratory Technician
10. Quitadamo Raffaella: Laboratory Technician
11. Scamozzino Rocco: MD
12. Valentini Antonella: Secretary Assistant
13. Vella Antonio: Biologist
14. Zanoni Giovanna: MD and Director pro tempore of the Hospital Unit