

Lung cancer immuno-oncology research team

Clinical and translational research in the field of immunotherapy in Non Small Cell Lung Cancer

Work Programme:

Immunotherapy, with particular reference to the use of immune-checkpoint-inhibitors, has radically changed the therapeutic approach of lung cancer in the last decade, first in advanced disease, more recently also in early stages in non-small cell tumors; this is the case of consolidation strategy after radio-chemotherapy in unresectable locally advanced Non Small Cell Lung Cancer (NSCLC), after surgery in the adjuvant setting, or as neoadjuvant therapy (promising results from ongoing clinical trials with the likelihood of a practice changing scenario). However, a variable portion of patients will undergo progression for the development of primary or secondary resistance to immune-checkpoint-inhibitors.

Novel approaches as cancer vaccines are under development.

The main goal of the research group is to contribute to the study of the role of immunotherapy in lung cancer, both clinically and translationally. This through research projects aimed at studying the biological mechanisms of resistance, including the role of the tumor microenvironment and the dynamics of the cells involved in cancer-immune response, in the development of predictive models of treatment response and through the design of clinical trials in addition to participation to international clinical trials (field in which Thoracic Oncology Unit is engaged since some years).

Actually three main research projects are under development, besides several international phase 2 and phase 3 clinical trials: the investigation of minimal residual disease in early stage and unresectable locally advanced NSCLC, after surgery or chemoradiation; the evaluation of radiomics features associated to response in unresectable locally advanced NSCLC after chemo-radiotherapy and consolidation immunotherapy or to lung toxicity after radiation or immunotherapy in locally advanced or advanced disease; the evaluation of multidisciplinary tumor board in the management of lung cancer with specific focus on stage III disease.

Given the cross sectional nature of the research, the team is composed by professional figures of different extraction, involving clinical oncologists, radiotherapists, thoracic surgeons, pathologists, biologists, biotechnologists, physicists, mathematicians, bioinformaticians, biostatistics.

Team Leader:

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Thoracic Oncology Unit

Team Members:

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Valentina Ungaro, MS (Pharmacist, Pharmacy Unit)

Key Networks:

Thoracic Oncology Unit collaborates with many Italian institutions involved in the field of lung cancer research from several years.

Below are the main institutions currently collaborating:

1. University of Torino, Department of Oncology, Medical Oncology Division at San Luigi Hospital, Orbassano, Turin, Italy.
2. Section of Oncology, Department of Medicine, University of Verona School of Medicine and Verona University Hospital Trust, Verona, Italy.
3. Department of Medical Oncology, Thoracic Oncology Unit, Fondazione IRCSS, Istituto Nazionale dei Tumori Milano, Milan, Italy.
4. Thoracic Surgery Unit, Department of Organ Transplantation and Emergency, University Hospital of Bari, Bari, Italy.

5. Medical Oncology, S.G. Moscati Hospital, Statte, Italy.

Key Funding:

Ricerca Corrente 2022-2024.

Key Publications:

1. Massafra R, Catino A, Perrotti PMS, Pizzutilo P, Fanizzi A, Montrone M, Galetta D. Informative Power Evaluation of Clinical Parameters to Predict Initial Therapeutic Response in Patients with Advanced Pleural Mesothelioma: A Machine Learning Approach. *J Clin Med*. 2022 Mar 16;11(6):1659.
2. Longo V, Catino A, Montrone M, Pizzutilo P, Annese T, Pesola F, Marech I, Cassiano S, Ribatti D, Galetta D. What Are the Biomarkers for Immunotherapy in SCLC? *Int J Mol Sci*. 2021 Oct 15;22(20):11123.
3. Perrone F, Belluomini L, Mazzotta M, Bianconi M, Di Noia V, Meacci F, Montrone M, Pignataro D, Prelaj A, Rinaldi S, Russano M, Sartori G, Bironzo P, Facchinetti F, Menis J, Tiseo M, Galetta D, Novello S, Pilotto S. Exploring the role of respiratory microbiome in lung cancer: A systematic review. *Crit Rev Oncol Hematol*. 2021 Aug;164:103404.
4. Banna GL, Cortellini A, Cortinovis DL, Tiseo M, Aerts JGJV, Barbieri F, Giusti R, Bria E, Grossi F, Pizzutilo P, Berardi R, Morabito A, Genova C, Mazzoni F, Di Noia V, Signorelli D, Gelibter A, Macerelli M, Rastelli F, Chiari R, Rocco D, Gori S, De Tursi M, Di Marino P, Mansueto G, Zoratto F, Filetti M, Montrone M, Citarella F, Marco R, Cantini L, Nigro O, D'Argento E, Buti S, Minuti G, Landi L, Guaitoli G, Lo Russo G, De Toma A, Donisi C, Friedlaender A, De Giglio A, Metro G, Porzio G, Ficarella C, Addeo A. The lung immunoncology prognostic score (LIPS-3): a prognostic classification of patients receiving first-line pembrolizumab for PD-L1 \geq 50% advanced non-small-cell lung cancer. *ESMO Open*. 2021 Apr;6(2):100078.
5. Cortellini A, De Giglio A, Cannita K, Cortinovis DL, Cornelissen R, Baldessari C, Giusti R, D'Argento E, Grossi F, Santoni M, Catino A, Berardi R, Sforza V, Rossi G, Antonuzzo L, Di Noia V, Signorelli D, Gelibter A, Occhipinti MA, Follador A, Rastelli F, Chiari R, Gravara LD, Inno A, De Tursi M, Di Marino P, Mansueto G, Zoratto F, Filetti M, Montrone M, Citarella F, Pensieri MV, Russano M, Cantini L, Nigro O, Leonetti A, Bordi P, Minuti G, Landi L, De Toma A, Donisi C, Ricciardi S, Migliorino MR, Napoli VM, Leone G, Metro G, Banna GL, Friedlaender A, Addeo A, Ficarella C, Porzio G. Smoking status during first-line immunotherapy and chemotherapy in NSCLC patients: A case-control matched analysis from a large multicenter study. *Thorac Cancer*. 2021 Mar;12(6):880-889.
6. Brascia D, De Iaco G, Schiavone M, Panza T, Signore F, Geronimo A, Sampietro D, Montrone M, Galetta D, Marulli G. Resectable IIIA-N2 Non-Small-Cell Lung Cancer (NSCLC): In Search for the Proper Treatment. *Cancers (Basel)*. 2020 Jul 25;12(8):2050.
7. Prelaj A, Lo Russo G, Proto C, Signorelli D, Ferrara R, Galli G, De Toma A, Randon G, Pagani F, Trevisan B, Ganzinelli M, Zilembo N, Montrone M, Longo V, Pesola F, Pizzutilo P, Del Bene G, Varesano N, Galetta D, Torri V, Garassino MC, Di Maio M, Catino A. DiM: Prognostic Score for Second- or Further-line Immunotherapy in Advanced Non-Small-Cell Lung Cancer: An External Validation. *Clin Lung Cancer*. 2020 Sep;21(5):e337-e348.
8. Prelaj A, Rebuzzi SE, Pizzutilo P, Bilancia M, Montrone M, Pesola F, Longo V, Del Bene G, Lapadula V, Cassano F, Petrillo P, Bafunno D, Varesano N, Lamorgese V, Mastrandrea A, Ricci D, Catino A, Galetta

DEPSILoN: A Prognostic Score Using Clinical and Blood Biomarkers in Advanced Non-Small-cell Lung Cancer Treated With Immunotherapy. *Clin Lung Cancer*. 2020 Jul;21(4):365-377.e5.

9. Pinto R, Petriella D, Lacalamita R, Montrone M, Catino A, Pizzutilo P, Botticella MA, Zito FA, Del Bene G, Zonno A, Tommasi S, De Summa S. KRAS-Driven Lung Adenocarcinoma and B Cell Infiltration: Novel Insights for Immunotherapy. *Cancers (Basel)*. 2019 Aug 9;11(8):1145.